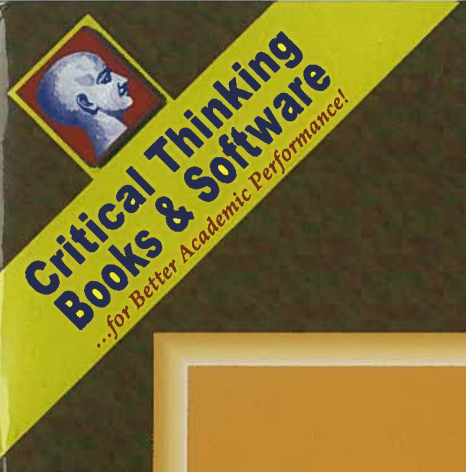


Teacher's Manual

Book Two

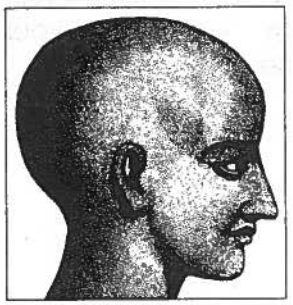
CRITICAL THINKING

Problem Solving, Reasoning, Logic, and Arguments

Anita Harnadek

TEACHER'S MANUAL
CRITICAL THINKING
BOOK TWO

ANITA HARNADEK



CRITICAL THINKING BOOKS & SOFTWARE
www.criticalthinking.com
P.O. Box 448 • Pacific Grove • CA 93950-0448
Phone 800-458-4849 • FAX 831-393-3277
ISBN 0-89455-060-8
Printed in the United States of America

TO THE TEACHER

I believe that a student learns how to think critically not by being told how to do it but by doing it. Consequently, neither the textbook nor this Teacher's Guide is intended to serve either as a workbook for students or as an instrument which will help you stand in front of the class and lecture the students on what they should be learning and then read them the "correct" answers when they've answered a problem or question.

With rare exceptions, the textbook problems and questions are designed to provoke class discussions. This Teacher's Guide gives you many comments and suggestions about the materials, about teaching the class, and about stimulating class discussions. Let the students settle their own differences of opinion and do their own arguing, for the more you step in and settle arguments, the less thinking the students will do themselves, and so the less the students will practice what you're trying to teach them.

Comments, criticisms, or suggestions you or your students may have about the text or this Teacher's Guide will be appreciated. It is hoped that both you and your students enjoy this course.

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PART 1. GENERAL INFORMATION

CONTENT, INTEREST, AND READING LEVELS

Content level:

Critical Thinking, Book 2 (CTB2) assumes that the students have completed *Critical Thinking, Book 1* (CTB1). Brief reviews of some CTB1 materials are given in CTB2, but these reviews will not serve as a substitute for the detailed explanations, examples, and class discussions needed for a thorough understanding of the materials in CTB1.

Whereas CTB1 concentrated on some of the obvious reasoning errors and propaganda techniques and asked questions about some of the more obvious items in the materials studied, CTB2 assumes that the students are now thoroughly familiar with such materials and are past the stage of needing to have the obvious pointed out. CTB2 takes looks at uses and misuses of words, at more subtle reasoning errors and propaganda techniques, at hidden assumptions, and at what is **probably** meant by a speaker or writer. There are more problems to illustrate uses of combinations of questionable statements and reasoning, and the questions asked are more probing and more detailed in order to analyze the illustrations more thoroughly.

Whereas CTB1 merely asked the student to decide whether a statement following a story was true, false, or questionable, chapter 5 of CTB2 asks the student to distinguish among seven possibilities: absolutely true (or false), true (or false) beyond a reasonable doubt, probably true (or false), or none of these. Furthermore, the CTB2 student is expected not only to be able to tell whether or not a statement supports a viewpoint (as distinguished from merely favoring the viewpoint) but, if so, to tell whether the statement is a strong support or a weak support.

Whereas the problems discussed in CTB1 were primarily of the kind to which the student could respond "I agree" or "I disagree," many problems in CTB2 are not that simple and the student is asked instead to think of acceptable solutions to the problems. In other words, the CTB1 problems involving value judgments could almost invariably be answered, "This is either black or white," but many of the CTB2 problems which call for value judgments involve gray areas —i.e., what may be "right" for one case may be "wrong" for another and may be neither "right" nor "wrong" for still another case.

Finally, the problems in CTB1 were somewhat compartmentalized, with some, but not a great deal of, integration of materials from earlier chapters into later chapters. In CTB2, however, materials from the first chapters appear again and again in many different contexts throughout the book. (This is not evident from the index, however, for most of these appearances are brought out by questions such as, "What reasoning errors does the writer use in the third paragraph?") By using such a wide variety of contexts to expose the uses of various errors and techniques, the students learn automatically to look for such things and to think critically when they are not in the classroom.

It can be seen, then, that the level of the content of CTB2 will result in the development of a considerably higher level of reasoning ability than CTB1. This assumes, of course, that the student has reached a level of mental maturity where such abilities are present and are waiting only to be developed. As mentioned in the Teacher's Guide for CTB1, we can't teach a six-months-old baby to ride a bicycle, because the baby lacks the necessary muscular strength and coordination. Similarly, we may not be able to teach some of the CTB2 materials to a pre-teen or to a young teenager, since the thinking abilities needed may not yet be present. (More research needs to be done on this topic.)

Interest level:

In order to expose the students to a realistic sampling of the kinds of reasoning and arguing which are common in our society, a great many of the basic ideas for problems used in CTB2 were taken from newspaper articles, editorials, letters to editors, advice columns, and commentaries, and from newscasts, ads, ordinary conversations, political speeches and circulars, and government regulations, as well as from various other sources. Consequently, the material is at

the secondary school level of interest, with emphasis on the high school level.

Reading level:

As in CTB1, it is recognized that many secondary school students have reading difficulties. With this in mind, the reading level of the sections preceding the problems and of most problems and questions has been kept the same as in CTB1. However, in order to approximate more closely actual newspaper articles, etc., the reading level of some of the problems is higher than in the rest of the text.

Daily newspapers are often said to be written at approximately a sixth grade reading level, and yet I found many words (in newspaper articles I wished to use as a basis for problems) which were not on my reference list of words for the sixth grade level. I struggled with the decision of whether or not to include such words in the problems and finally decided that if we are going to teach our students to reason well when they read something in a newspaper or hear it on TV, then we'd better expose them to the vocabulary such sources use.

The next decision was whether or not to include the "newspaper" words in the glossary. Again, my decision was based on giving the students a realistic exposure to such items, and (with a handful of exceptions) such words are not in the glossary, so you may find it helpful to keep a couple of dictionaries handy when your class is discussing such problems.

The glossary does include about forty other words used in the text, however, and you will want to point out to the students that the book does have a glossary. Words which are explained within the text are not included in the glossary but are included in the index, so if a student wants to find the meaning of a word, both the glossary and the index can be checked. If it does not appear in either place, then a dictionary should be used.

TEACHING GOAL

Your teaching goal here, as in CTB1, should be to teach your students to think critically. Among the specific objectives included in reaching the goal this time are to get your students to do all of these: to know when to ask questions; to know which kinds of answers are reasonable and which kinds are not; to learn how choices of words and phraseology can influence listeners' attitudes; to know when more evidence is needed to reach a reasonable conclusion; to distinguish among conclusions which are possibly true (or false), probably true (or false), true (or false) beyond a reasonable doubt, and absolutely true (or false); to recognize invalid arguments; to recognize faulty reasoning; to recognize techniques of propaganda and argument; to recognize strong points (and be able to refute them) for both sides of a two-sided issue; to analyze arguments (and statements of opinion); to be able to think of several solutions to problems which are not simply two-sided; to distinguish between fact and opinion; to recognize which side (if either) a statement supports; to know whether a supporting argument is strong or weak; to look for and recognize unstated assumptions.

GENERAL COMMENTS

In this book, the word "argument" is used in different ways at different times. It can be

(1) a discussion between two people who disagree on the answer to a question, with each person making statements to convince the other person to change her or his mind;
(2) one of the statements made in the discussion in (1) above; or
(3) a set of premises and a conclusion (as in chapters 2 and 6).

In many cases, the decision of where in the book to place material was arbitrary. As examples: most of the reasoning errors discussed (chapter 3) are also used as propaganda techniques (chapter 4), and vice versa; faulty inferences (chapter 5) are made as a result of reasoning errors (chapter 3); weak arguments (chapters 2, 6, and 7) can be made to sound more plausible by the clever use of words (chapter 1) and by use of the proper propaganda techniques (chapter 4); misuse and overly clever use of words (chapter 1) are generally techniques of argument and propaganda (chapter 4); deciding how well an argument is supported (chapters 2, 6, 7, and 8) often involves the recognition of reasoning errors (chapter 3), techniques of propaganda and argument (chapter 4), unstated assumptions (chapter 7), and misuse or overly clever use of words (chapter 1).

In several problems, "Big City" is mentioned. Tell the students to assume that Big City is, in fact, a big city—say, a population of 1,000,000 or more.

The index will show that there is a wide variety of problems here, which means that the students will be exposed to a good selection of everyday

life situations which require critical thinking. Furthermore, even within a given category (such as "Court cases," for example) the problems have been chosen to bring out different points from each other and so avoid being repetitious.

GENERAL SUGGESTIONS

The suggestions in the Teacher's Guide for CTB1 apply here, too, and you may wish to read them again to refresh your memory. In addition to those suggestions, you might consider these:

1. Don't take for granted that my answers are infallible. Do encourage the students to think of and support their own answers. The fact that I think right now that my answers are right doesn't mean I wouldn't change my mind if presented with a good reason to do so.

2. When a problem has several answers (such as, "What reasoning errors are present here?"), don't take for granted that you're through with it once the students come up with my answers. Do encourage the students to see if they can find additional answers I didn't think of.

3. Make a habit of throwing in many questions about the materials being studied. I am constantly amazed at the way many of my students have to grope for answers to what I think are "giveaway questions"—questions whose answers I think will be obvious to the students and which are asked primarily to build up their confidence. For example, a student may (1) know what a proposition and its converse are, (2) be able to state the converse of any proposition I state, (3) know that the converse of "All tigers are animals" is "All animals are tigers," (4) know that all tigers are animals but that not all animals are tigers, and yet (5) have to stop and think a while about the answer to, "Suppose a proposition is true. Then does its converse have to be true, too?"

4. Although we encouraged the students to be nit-pickers and hair-splitters in most of the CTB1 answers to problems and questions, we want to discourage this in answering most of the problems and questions in CTB2. That is, we want the students to realize (and take into account) that remote possibilities exist, but we also want them to recognize such possibilities for what they are and to be able to decide what is <u>probably</u> true (or false). Many students will find such decisions to be very difficult, so be prepared to allow a good deal of time for class discussions when such decisions are involved.

5. Don't feel that your students must go through all problems and questions in the book. Although the problems and questions have been carefully chosen to bring out different points, it is important to keep the students interested in the material. When you feel they have spent enough time on a particular section, feel free to go to the next section. (You can always come back to the previous section later and do more problems if you feel that certain points still need to be brought out.)

6. Certain chapters have a great many problems and questions in the Chapter Review sections. It is suggested that you have the students do as few of them as are needed to provide a good review, and ignore the rest of the problems for the time being. Then once a week or so, go back and choose an unused problem or two from each Chapter Review section for the students to do. This will provide a constant review of old material and so make it easier for the students to apply the knowledge to new situations.

7. If a student presents a questionable line of reasoning, follow the reasoning through to its logical conclusion. Whereas we tended to be rather careful about pointing out students' reasoning errors during CTB1 (in order to encourage the students to keep participating and in order not to embarrass them), we may now assume that students who have survived CTB1 are ready for some serious and objective observations about their own thinking processes. This is not to suggest that you be pedantic or tactless about pointing out students' reasoning faults, but rather that the students' reasoning processes should now have matured to the point were a dogged (but not dogmatic) line of questioning is no longer mistaken for a put-down.

8. Although you will encourage class discussion of all answers, the discussions will be quite short on some, since some problems encourage convergent thinking. Be especially careful, however, about suggesting that a student has a wrong answer to a question which asks an opinion—e.g., "Do you think . . .?" "What would you do if . . .?" "Do you agree . . .?" "What seems to be the purpose of . . .?" In cases where I give answers to such questions, remember that such answers are simply my personal opinions. Don't think that the students are "supposed" to arrive eventually at the answers I give. (My answers to such problems are sometimes prefaced with, "Answers will vary," and sometimes are not so prefaced.) Give a student credit for any

answer which is backed up well. The student may or may not have a change of mind after hearing classmates' arguments, but either way, he or she should not feel pressured to go along with the others.

9. The kinds of questions mentioned in item 8 above are often matters of value judgments and, although it may bother you personally that a student has made a "wrong"—i.e., immoral or unethical—judgment, your job as a teacher of critical thinking is to get the student to be consistent. Make a mental note of a "wrong" decision and then point out the inconsistency when the student makes a "right" decision in a similar case.

10. You may find it helpful to read the materials listed in the bibliography. Some items listed are good primarily for background on thinking skills, but most will supply you with many more examples and problems you can give your class for discussion. I particularly enjoyed the writing and the examples given by Engel and Potter in their books. In the Arendt books, I found a great many statements whose truth I questioned. If your class is unusually sharp, you might like to choose some of Arendt's statements for the class to discuss. And, although I based many problems and questions on items found in Detroit's two major daily newspapers, your own local paper(s) should supply you with many additional possibilities for class discussion.

PART 2. ANSWERS AND SUGGESTIONS

CHAPTER 1

General Comments:

We can hear things and be influenced without even realizing it. Or if we do realize we are being influenced, we may not quite know why. Underlying this influence may be any of a number of the topics discussed in this chapter. As you go from section to section, it would be a good idea to keep pointing out to the class how we can be influenced without being aware of it.

An excellent source of examples of the misuse of words is "The Public Doublespeak Newsletter," published by the Committee on Public Doublespeak of the National Council of Teachers of English. As of this time, subscriptions are $2.50 a year (payable to NCTE) and may be sent to The Committee on Public Doublespeak, NCTE, 1111 Kenyon Road, Urbana, Illinois 61801.

Sec. 1.1 comments:

At this stage of the students' critical thinking development, we would like to discourage nit-picking except in parts of the book which specifically call for it. The students are informed of this in this section. As implied in the second paragraph of the section, it will sometimes be a battle to teach the students the difference between nit-picking and a good possibility. Although we will go into this in some detail later in the book, we start out by giving situations where nit-picking exceptions are (we hope) obviously not the probable answers. At the same time, in section 1.5 (Vague Sentences) and section 1.8 (Meaningless Words . . .), we want the students to distinguish between nit-picking and honestly not having enough information to draw an intelligent conclusion.

Although there are no exercises for this section, you will want to discuss this section with your students so that they will know what they will be studying and why they will be studying it.

Sec. 1.2 comments:

This section points out that we automatically react to many words with a value judgment of "pleasant" or "unpleasant." It follows that such words influence us one way or the other when they are used to describe something. Although the text refers only occasionally to emotional words per se, they are used in problems throughout the text. As you go from section to section and chapter to chapter, keep pointing out that emotional words are being used so that the students learn to recognize automatically the bias such words introduce into sentences.

Emphasize that we are not saying it is wrong to use emotional words or to express opinions instead of facts. But we do want the students to recognize emotional words for what they are, and we do want the students to be able to tell the difference between a fact and an opinion. Section 7.4 discusses the difference between a fact and an opinion in more detail.

Sec. 1.2 answers:

1. Answers may vary. My answers are these: Pleasant: true, dependable, honor, paramedic, tidy, interesting, champion, physician, talent, friendship. Unpleasant: boring, sloppy, awkward, nasty, disorganized, disloyal, clumsy, mismanage, failure, messy. (If your students' lists disagree, ask them to discuss how come. Remember, the lists were to be made according to the first reaction to the word, not to whether or not the word "should" sound pleasant or unpleasant to us.) **2. a.** Pleasant: steadfast, leader, organized, pal, physician, honesty. Unpleasant: counterfeit, bungling, enemy, false, hatred, unreliable **b.** Other answers are possible. Answers could be: steadfast enemy, false honesty, organized hatred, counterfeit pal, bungling physician, unreliable leader. (Watch for answers which seem not to make sense, such as "enemy pal" or "false steadfast." Ask students who have such answers to use them in a clear context. For example, clear contexts for my answers are: (1) He was a steadfast enemy. He never let up. He twisted meanings, assumed the worst, and pounced on the smallest errors. (2) She claimed she was being honest, but it was a false honesty. She told the truth all right, but she didn't tell the whole truth. She said she saw the big kid take away the little kid's toy and slap the little kid and make him cry. But she didn't mention that the little kid's toy was a loaded BB-gun which the little kid was using to try to force the big kid into giving him money in order not to be shot. (3) In Nazi Germany, it was a campaign of organized hatred against the Jews: Jews were inferior; Jews were pushy; Jews observed strange rituals; Jews were the cause of all the money problems; once Jews were eliminated, Germany would be a great country. (4) He was a counterfeit pal. His apparent affection was part of a calculated plan to be accepted into the

social circle of his "pal" in order to get financial backing for his questionable schemes. (5) He was a bungling physician. He couldn't even tell a case of measles from a case of pneumonia. (6) She was an unreliable leader. She'd call a meeting and not show up. She'd propose plans and then not follow through on them.) **3. a.** Pleasant: reformed, patience, integrity, playful, strength. Unpleasant: criminal, unrelenting, ghost, stubborn, unbending. **b.** reformed criminal, playful ghost, unrelenting patience, stubborn strength, unbending honesty. (Other answers are possible. Watch for answers which seem not to make sense or which don't make "marvelous" phrases, such as "playful criminal" or "unbending playful.") **4. a, b, d.** opinion. **c.** fact.

Sec. 1.3 comments:

When describing actions, we often give ourselves and our friends the benefit of the doubt but are less charitable with strangers. The students will know there are differences in connotations among the words used in this section, and they will know that you and I know it, too. But they will also know that there are real differences between a "reason" and an "excuse," between being "obstinate" and being "firm," and they may not realize that you and I know this, too. That is, from the way the material is presented, they may get the impression that we think the words are interchangeable, and we're not saying this at all. We are saying that people automatically tend to describe their own actions in more pleasant terms than they use to describe the actions of other people and, as critical thinkers, we should be aware of this tendency and keep an open mind when we hear such descriptions. Stress this point to your students.

Ask your students to watch for and bring to class other examples of this kind of special pleading.

Sec. 1.3 answers:

Note for all answers: The context is given so the students will know how to use the words, but they should not be required to mention the context if their sentences are completely clear without it. In problem 2, the context is needed: to say, "He crashed," is not at all the same thing as, "He crashed the party." In problem 3, the context is not needed, for the sentences, "I am firm," "You are stubborn," etc., clearly imply that we are talking about changing our minds. The sentences used for the answers will vary, of course. The answers given here show only the order in which the words should be used.

1. participated, interrupted, butted into. **2.** dropped in, intruded, crashed. **3.** firm, stubborn, obstinate, pig-headed. **4.** slipped into, crept in, sneaked in. **5.** thrifty, stingy, miserly, penny-pinching tightwad. **6.** cautious, cowardly, yellow-bellied.

Sec. 1.4 comments:

The students will have had work in recognizing ambiguous words and sentences in previous grades, but this may have been limited to teaching them how to avoid particular kinds of ambiguity in their own writing and speaking. (For example, "Wanda told Jenny that she should have studied for the test." Who did Wanda say should have studied—herself, or Jenny?) In this section, however, we look at two other kinds of ambiguity: first, the kind which is caused by the ambiguity of a particular word rather than by the construction of the sentence; second, the "slippery word" fallacy, which is the fallacy of using a word in more than one sense but treating it as though it is used consistently.

A footnote briefly describes the three kinds of averages. (You could give your students more problems on this if they seem interested in pursuing it.) Newspapers sometimes report a median salary figure for a company and the public tends to assume that most people in the company are making somewhere around that amount when, of course, about half are making below that figure and the other half are making above that amount. You might like to point this out to the students and caution them against making generalizations based on averages and against trying to apply an average figure to an individual case. ("I read that the average salary in your company is well above the usual average for such companies, so you must be pretty well paid." Or, "The average U.S. male is 5'10" tall, and that's not your height, so you're abnormal.")

Sec. 1.4 answers:

1. After losing the race, (1) she was angry, (2) her muscles were sore. **2.** Compared to the average person, she has more (1) physical strength, (2) emotional strength. **3.** As an umpire, (1) his decisions were unbiased, (2) he could have been better, but he could have been worse, too. **4.** Where I work, my wage is (1) an average one (as described in the footnote for this section), (2) very low. **5.** (1) We can get a lower price now than the price which was quoted to us. (2) For the time being, we can ignore the price of the business and talk about the advantages and disadvantages aside from

price. (3) The price is no longer a problem to us. **6.** (1) fine = good (2) fine = monetary penalty. **7.** (1) nothing = nothing to eat = going hungry—i.e., nothing = none (2) nothing is = there is no thing which exists which is—i.e., nothing is better = everything else is either equal to or worse. **8.** (1) cats = the usual household tabby cats (2) cats = the biological family of cats. **9.** (1) as a rule = in general = usually (2) rules = things to be obeyed. **10.** When someone offers us more of something to eat or drink, the implication is that we've already had some, and we are being offered "more" in the sense of "extra." That was Alice's interpretation of the Hare's offer. The Hatter interpreted the offer of "more" in its completely literal sense, as "more than you've already had"—i.e., "if you haven't had some before and you take some now, then you have more than you did; and if you have had some before and you take some now, then you still have more than you did." **11.** The ad is ambiguous. We can't tell whether the price was $47.95 minus an $8 refund (leaving you to pay $39.95 with the refund), or whether the price was $39.95 minus an $8 refund (or $31.95).

Sec. 1.5 comments:

This text distinguishes a vague sentence from an ambiguous sentence this way: With an ambiguous sentence, we can usually say, "Well, it means either this or that." Sometimes it may have more than two possible meanings, but each possibility is quite definite. With a vague sentence, however, the terms used are general rather than ambiguous, and we're left wondering just what the speaker meant.

An example of the difference between an ambiguous sentence and a vague sentence is this: Ambiguous: "This is a poor man." Vague: "This is a poor man. He hasn't enough money to buy food to eat. I think we should do something for people like this." In the latter case, the first two sentences are not vague or ambiguous (since the second sentence is clear and explains the first), but the third sentence is vague. What does the speaker have in mind when she or he says "we should do something"? There are so many possible meanings that the sentence passes the point of being merely ambiguous and becomes vague.

The first problem in this section is a rather thorough analysis (via questions) of some statements in a political circular. CTB1 presented a few situations which were analyzed by questions, but the analyses there were not as thorough as they will be in CTB2. Also, once we get through the first few chapters in CTB2, we'll start tying all the information together with thorough analyses of many other situations.

Sec. 1.5 answers:

Again, keep in mind that practically all answers to questions of opinion ("What do you think . . . ?") are acceptable. The answers I give to such questions are my opinions, and it should not be assumed that your students should agree with them. **1. (1)** I give up. (Don't accept an answer of, "There are a lot of problems in today's world," for the same question applies to that answer.) **(2)** I give up, but he'd sure like us to think it has stopped moving, and when it was moving, it was moving in the wrong direction, whatever he means by that. **(3) a-b.** I give up. **(4)** It's a general (vague?) term which includes all kinds of disagreements about political matters among members of the same political party. **(5)** He feels it is very serious, since he claims that it "has caused our state government to lose sight of where we are going as a people." **(6)** He doesn't. **(7)** I give up. **(8)** He doesn't. **(9) a.** No. By nature, an election in the U.S. is a political contest. When we vote, we have made a political decision. When we vote a straight party ticket, we are not putting politics aside. Even when we split our vote between or among parties, we are not putting politics aside—on the contrary, we are saying, in effect, "I like this candidate's political views better than the other candidate's." **b-c.** Of course not. **(10)** Because it sounds good. **(11) a.** He implies that "the serious business of running the State of Midstate" has been interrupted by politics. **b.** He doesn't. **(12) a.** Midstate has stopped moving. When it was moving, it was moving in the wrong direction. Midstate's priorities need to be re-established. Political infighting is a problem. Our state government has lost sight of where we are going as a people. The serious business of running the state has been interrupted. **b.** He doesn't say. **c.** Very probably not. His last sentence, along with the fact that he has not proposed any solution to any of the problems he chose to list, pretty well tells us that he can't solve the problems, either. **(13) a-b.** I give up. **(14)** "In times like these"; "a man like this"; "get Midstate moving again"; "in the right direction"; "re-establish its priorities"; "political infighting"; "where we are going as a people"; "put politics aside" (this one is included as vague, since questions (9)-(11) make it clear that he didn't really mean to put politics aside); "get on with the serious business of running the

State of Midstate"; "the many problems we face." **2. (1)** ½ **(2)** I give up. **(3)** Not really. They didn't specify "our regular price." Their regular price may already be 50% less than the regular price charged at some expensive store. So maybe they're just offering it at their own normal price. **3. (1)** (1) All merchandise is for sale. (2) All merchandise is on sale—i.e., for sale at less than its regular price. (3) From one end of the store to the other, some merchandise is on sale, and the rest is for sale. **(2)** We can't tell for sure. The catch is the "up to." We can be sure they're not giving 50% discount on all items, for they would have stated such a discount if they were giving it. So the discounts given could be from 0% up to 50%. **(3)** Again, we can't tell. "Up to 50%" lets us know not to expect any discount more than 50%, but it doesn't say what the least per cent of discount is. **4.** All phrases except the first and last are vague. They are vague because they are comparative phrases, but they give us no comparisons. Take the first one, for example: "Cleans cleaner!" Cleaner than what? Than it used to? Than other similar products? Than if you used nothing at all for a cleaner? Than the worst brand on the market (but doesn't clean as well as the other brands)? (I don't count the first word—MIRACUCLEAN—as being vague: although I don't know exactly what product MIRACUCLEAN is from reading the problem, I know that MIRACUCLEAN is the name of the product, so it isn't vague.)

Sec. 1.6 comments:

There are many kinds of inconsistent statements, and we give special names to some of them—e.g., contradictory statements, hypocritical statements, special pleading, and doublethink. Special names are also given to some other kinds of inconsistent statements, but these are enough for our purposes. We want the students to recognize inconsistent statements for what they are, rather than to have the vague feeling that "something about that just doesn't sound right."

The distinction drawn in this text between a hypocritical statement and special pleading may be more artificial than genuine, and I wouldn't be too upset if my students decided to call all such situations by one name or the other. In this case, I think I would prefer that they all be called hypocritical, however, simply because this is the more common term among the general population.

Allow a lot of time for your students to kick around the last question asked (just before the problems) in this section. With enough room, they should be able to come up with the answer: In effect, the questioner is trying to make two contradictory statements true at the same time. That is, the questioner is saying, "Everything is possible, and some things are not possible." From my viewpoint (as the person who is being asked the question), everything is possible for me, so the concept of "impossible" does not exist for me. Therefore, the question has no meaning for me—just as the question, "What sit did you go inside?" has no meaning.

Sec. 1.6 answers:

1. (1) No. His reasoning was entirely consistent. His criterion for pass-fail was whether or not the student knew the material, and he was consistent in applying this criterion. **(2)** Not as far as we know. He consistently ignored it. **(3)** Not in my mind. **(4)** On the basis of what we're given, I wouldn't. What would it get me? Nothing, since my average is below the school's standard for passing. But it might result in changing Linda's grade to E. So going to the principal wouldn't help my grade, and it could hurt Linda's grade. **2.** It is inconsistent. If he is not well informed about other legislatures, how can he possibly know whether or not Midstate's legislature is among the worst? **3.** No. A misdemeanor is a relatively minor crime, while a felony falls into the "major crime" category. Helping a prisoner escape should not be considered to be a worse crime than escaping. **4.** It is hypocritical and inconsistent. All hypocritical statements are inconsistent statements. It is hypocritical by definition—she takes the kids to church so that other people will think she has more goodness than she has. **5. (1)** No. Apparently he objects morally to the Nazi party, and he is following his moral conviction by refusing to allow his building to be used to further what he belives to be an immoral cause. **(2)** I don't think so, for the reason stated in my answer to (1) above. **(3)** I don't think so. He is not making any attempt to keep them from conducting business before their first month's contract is up, nor is he suggesting that nobody else rent them a building or that they not be allowed to promote their cause. **(4) a.** "for our people to have to walk by that place" **b.** This isn't clear. Certainly, Jews are meant. But whether it means "Jews in general," "members of our temple," or "survivors and relatives of survivors of Nazi Germany" is unclear. **c.** The Nazi party's bookstore. **d.** After a traumatic experience (not just a good-sized shock or scare), memories of it come flooding

back when even the least thing connected with the experience is seen or heard. To see the swastika, the Nazi flags, and the Nazi uniforms again on their own streets would thus be a terrible reminder of their (or their relatives') experiences in Nazi Germany. **e.** I don't think so. The fact that they would have to go out of their way to avoid seeing the bookstore would be in itself a reminder of what is there. It might even be worse to try to avoid it, because in trying to avoid it, it might seem to them as though they were again having to hide from the Nazis in order to avoid being tortured and killed. **6. (1)** See Mr. G's second and third sentences. He lists two rights for the Nazis and one for himself. **(2)-(3)** I do. **(4)** I agree. If the Nazi party has the rights stated for it, then Mr. G's right is destroyed. And if Mr. G has the right stated for him, then the Nazi party's right is destroyed. **(5)** I think so. I think everyone should have the right to walk in public places without deliberate reminders of past traumas or implications of future ones. **(6)** Yes and no. (How's that for a contradictory answer?) No, because I don't believe that anyone who seriously advocates having a government like Nazi Germany's (including the assumption that certain races, religions, and national origins are "inferior" and should be eliminated) should be allowed to spread their dangerous ideas. Yes, because I don't see how the right of one such group can be cut off without threatening the rights of all groups which someone believes has dangerous ideas. For example, someone may believe it is dangerous to teach students history, since history is full of wars and this may give students the idea of becoming leaders and starting wars. If we cut off the rights of the Nazi party because I think it's dangerous, why not cut off the rights of public schools to teach history because the other person thinks that teaching history is dangerous? **(7)** [Don't accept an answer such as, "They should be resolved" (contradictions cannot be resolved), or, "They should work something out" (HOW?! Be specific!).] My own answer is that I give up, for the reasons stated in my answer to (6) above. **7.** It is clear that January appears to think that copying from someone else's paper is wrong. The circumstances (and, consequently, the answer) are like those of Example 5 in this section. **8.** This question is exactly like the last question in this section above these problems. Since we're saying that God can do anything, the concept of something He cannot do does not exist. (To say otherwise would be to say that contradictory statements can both be true.) Consequently, the concept of "a rock so heavy that He can't lift it" does not exist. The question is meaningless, just as "Was Judy house before she sky the vacation?" is meaningless.

Sec. 1.7 comments:

Misleading statements can be made with malicious intent, they can be made to "cover up" for someone or something, they can be made to get us to do something, or they can be made through carelessness. Advertising often uses misleading statements, and the students should be taught to look for them. Newspaper headlines (of articles as well as of the front page) are another source of misleading statements, for headlines often make allegations not supported in the accompanying articles. Your students may be able to find examples of such headlines and bring them in to share with the class.

Stress to your students that euphemisms often serve the purpose of blocking critical thinking. (After all, the purpose of a euphemism in the first place is to make something which is unpleasant or disagreeable sound less unpleasant or disagreeable.) Also stress that the use of a perfectly acceptable word in place of a slang expression (or a vulgarism) is not using a euphemism. For example, "He died," is not a euphemism for, "He kicked the bucket"; but, "He went to his final resting place," is a euphemism for, "He died." Ask your students to bring in other examples of euphemisms. Ads are a good source for these. (Occasional irregularity = constipation; preowned home = used house; mobile home = house trailer; cuts of meat for the thrifty person = tough cuts of meat or cuts that most people don't care for, such as liver, heart, and kidneys.)

Doublethink is a particularly insidious form of propaganda. It says, in effect, "This thing is true, but it is not true," but it is disguised in such a way that the contradiction is not so obvious. Another form of doublethink is the denial of historical facts and the substitution of more acceptable statements. Orwell's *Animal Farm* has many examples of doublethink, and your students might enjoy reading this as part of their class activities.

Sec. 1.7 answers:

1. Misleading statement. (Make sure your students realize that the ad was not untruthful. Three hours is 180 minutes, so you <u>are</u> only minutes—180 of them—away.) **2.** Mislead-

ing statement. (The cutting board will not be invisible.) **3.** Doublethink. **4.** Doublethink. (If they cared so much about them, why did they bomb them? They would have known before the bombing that the camps were filled with civilians.) **5.** Misleading statement. **6.** Misleading information. (There is nothing in the article to support the headline's statement that the researchers were shocked.) **7.** I'm unsure of whether or not to call this a misleading statement. National Advertising Division of the Council of Better Business Bureaus said it was, but I tend to disagree, for it's too obvious to me that meat does not have vegetable protein. **8.** Misleading statement. **9.** We have here either misleading information or doublethink. If "with use" in the second paragraph means "some time after the time this repair program will take," then the first paragraph is misleading, for the ovens would not yet be leaking excessive radiation. However, if "with use" means "in a time for which no minimum has been determined," then the first paragraph is not misleading, and the second paragraph is doublethink. (If the ovens are already leaking excessive radiation, then there is certainly a danger from their use before they are repaired.) **10-11.** Euphemism. **12.** Misleading statement. **13.** Euphemism. **14.** Misleading statement. **15. (1)-(2)** Misleading information. (Make sure your students see that "big auto" instead of "large-size car" is part of what's misleading.)

Sec. 1.8 comments:

The reading level for the examples of gobbledegook is well above the level maintained in the rest of this book. This could not be helped, however, since gobbledegook is, by nature, tough reading. It would be a good idea to have several dictionaries available while the class is trying to do these problems, for vocabulary, too, is above the usual level, and I did not include words from these problems in the glossary.

Sources of gobbledegook include laws and regulations, insurance policies, legal contracts, and (sometimes) teachers' handbooks published by school districts. Stress to your students that not all complicated reading is gobbledegook. For example, U.S. income tax laws, which provide for many special cases, exceptions, and extenuating circumstances, are complicated. Even when the reading level is simplified, as it is in the government publications on income taxes, the reading is still fairly complicated simply because the ideas are complicated.

Sec. 1.8 answers:

1. What fraction? (1/10th? 100/100?) Original cost to whom? (the manufacturer? the retailer? the consumer?) **2.** What does "new" batteries mean? (Unused, but purchased 5 years ago?) What does "other brands" mean? (Were they in the same price range as X, or were they cheap while X is expensive?) Was the "continuous use" of X and the other batteries the same? (Or did you make conditions so that X used very little current and the other brands used a lot of current while being used?) What's the lower limit on "up to"? (Was it a tie most of the time? How many times did X lose? Did X last only twice as long as a different brand which costs only half as much?) Just how many times did X last 5 times longer? (Once?) **3.** What does "study" mean? (By whom? For what purpose? Under what conditions?) What are "aspirin substitutes"? (Headache tablets? Pain relievers? Fever reducers?) "Were not found safer than aspirins" has an obvious meaning—i.e., aspirins are not more dangerous—but under what conditions? (We're back to the "study" again. Did the study compare the effects of taking 12 aspirin against the effects of taking, say, 12 antibiotic capsules? or against the effects of taking, say, 24 of an "aspirin substitute"?) **4.** Does "fits" mean with, or without, modifications? What does "99% of cars and trucks" mean? (99% of brands? 99% of styles? 99% of vehicles in use? 99% of vehicles now being manufactured?) Does the fact that it fits 99% of cars and trucks mean that it will fit **yours**? **5.** Don't put this can in a fire, because it might explode if you do. **6.** We've put your kid on independent study. There are different ways to learn the material, and the material comes in different levels of difficulty and coverage. The teacher keeps an eye on the whole thing. **7.** This project is supposed to show the colleges and the community how to work together and pool their resources so that the colleges can offer courses the community needs to have. **8.** Leave the plant life alone. **9.** Our customers don't trust us. Why? Because you dress as though you don't care about your job. So shape up! And I mean now!

Sec. 1.9 comments:

The purpose of discussing five different kinds of loaded questions is simply to give the students more exposure to loaded questions so that they will recognize such questions more readily. It is not suggested that the students be taught to distinguish one kind from another, for I can see no good purpose in doing so.

Once you've finished with the problems and so have pointed out how results of surveys can be biased by loading the questions, your students might be interested in designing a questionnaire (for an opinion survey among other students in the school) so that each loaded question has a cross-checking question. (Problems 2 and 6 are cross-checking questions, for example.) Cross-checking questions should be separated from each other so that the person being interviewed does not connect one question with the other.

Sec. 1.9 answers:

1. Loaded. Assuming you've already admitted you did it, your answer will either say that you knew it was wrong when you did it (bad) or that you have no sense of right and wrong (worse). **2.** Loaded. If you say "no," you're saying that you don't care if the programs are a bad influence on innocent little kids. (Ask your students for **their** answers to this particular question. Then ask them to explain why they answered as they did.) **3.** Loaded. If you tell why you did it, you're admitting it was terrible. If you don't tell, then you're being uncooperative. **4.** Not loaded against the person asked, but certainly an admission of guilt by the questioner. **5.** Loaded. Whether you answer "yes" or "no," you're admitting it's a pack of lies. **6.** Loaded. If you answer "no," you're practically saying that it's OK to be a dictator and that you're not willing to extend freedom of the press to TV. (Ask your students for their answers to this question, too. Again, ask them to explain why they answered as they did. When they are finished, point out that they are being inconsistent if they answered "yes" both to this question and the problem 2 question. Most will probably be quite surprised at this. It is a good opportunity to point out how results of surveys can easily be biased by the ways the questions are asked.)

Sec. 1.10 answers:

1. I was in a smash hit. Your play got a few rave notices. Her play got some good reviews. **2.** I am indulgent with my children. You are overly lenient with yours. He lets his run wild. **3.** When I meet new people, I am friendly. You are pushy. **4.** I have firm opinions. You are unresponsive to new opinions. She is closed-minded. **5.** I believe in the tried-and-true. You are against progress. He is a stick-in-the-mud. **6.** To get around the red tape, I am enterprising. You take chances. She breaks the rules. **7.** I am open-minded. You are irresolute. He is unstable. **8.** This is an example of the "slippery word" fallacy. "No bird" is being used in two different senses: first, "there is nothing which is a bird and which"; second, "nothing." **9. (1)** I'm not sure. It might mean the bishop's taking such a stand (since he is so well-known and widely respected), or it might mean not having young men go to war. **(2)** It's probably young men, but we can't be sure. It could mean "young men," "society in general," or (since the writer could be a woman) "young women."**(3)** We can't tell. The writer may feel that we should simply surrender to any attacker. Or the writer may feel that women, or middle-aged or old men, or children, should fight the war. **(4)** The phrase is too vague to tell us what the writer means. The writer might mean any or none of these things: "the social pressure from being opposed to sending young men to war"; "the social pressure of being opposed to defending our country in the case of war"; "the emotional pressure of our young men's not knowing if and when they'll be sent to war"; "the horror of having young men killed in wars." **(5)** He probably thought it because most bishops are men of peace—i.e., opposed to war. **(6)** He will go to great lengths to avoid a war (but will fight if pushed too far). He is in favor of peace at any price. **(7)** The (my) second. **(8)** Using the writer's interpretation of "man of peace," this supported the second part of the first sentence. **10.** Meant: "haven't been invented as of today." Misinterpretation: "will not have been invented by that time." **11. (1)** Alice assumed the usual meaning of "every other day"—i.e., one day "yes," the next day "no," the next day "yes," etc. **(2)** The Queen meant "all other days except today." **(3)** No. Since it is always "today," and since jam is never given "today," there would be no jam. **12. (1)** The purpose of "Last Resort" (stated above the letter) rules out "a" and "b." The context of the letter is consistent with "d" but not with "c." **(2) a.** "Match three prize amounts and win that amount." **b.** "Get three prize amounts which are all the same, and win that amount." **c.** "Get three prize amounts, match each of them, and win that amount." **d.** No. If there are three different prize amounts, then "win that amount" doesn't make sense. **13. (1)** "say" **(2)** "say" **(3)** "suppose for the sake of argument" **14.** Five, four of which we always called "legs," and the other of which we used to call a "tail." Words mean whatever people agree they mean. We call a TV

set "a TV set." We call an elephant "an elephant." We used to call an automobile "a horseless carriage" but then agreed to call it "an automobile," so it's a automobile. (I might be convinced to change my mind.) **15. (1)** Bad. **(2)** He didn't. **(3) a.** (We judge from the context.) U.S. foreign policies as interpreted by X, but we can't be more specific than that. **b.** Bad. Again, we go by the context. **c.** There is no "good" or "bad" implied in the (a) definition, but "bad" is implied in the (b) definition when it is applied to someone old enough to have a sense of morality. In order to be consistent with our answer to (3)b above, (b) is the correct answer here. **d.** Yes. On the whole, U.S. citizens like to think they are a moral people, and they want the U.S. to be a moral country. The U.S. cannot be a moral country if it has amoral foreign policies. **(4)a.** D. There is nothing in the context to indicate the tone of X's dealings with the media or in his personal life, so "A" and "B" are both wrong. The "C" answer includes the "A" answer, so the "C" answer must be ruled out (since we've already ruled out "A"). On the other hand, the context does describe (in the first paragraph) some of X's dealings with foreign governments, so "D" is correct. **b.** He thinks they should not have been secretive. (Again, we judge by the context.) **c.** No. By nature, negotiations between hostile nations are sensitive and delicate. They start off with neither side willing to concede enough to satisfy the other side. If the go-between (X, in this case) were to make these positions public, then each side would feel bound by honor not to change its position at all. By keeping the negotiations secret, each nation can have the go-between carry messages such as, "If they'll do such-and-such, then we'll do so-and-so." In other words, such negotiations must be secret(ive) if they are to be successful. **(5)** c. The context makes it clear that "a" and "d" are wrong answers. There is no indication that X was bragging a lot, so "b" is out. There is some indication that, with the exception of keeping the President informed, he worked pretty much without consulting others: **he** was trusted to keep secrets, **he** offered U.S. dollars, **he** was a successful mediator, **he** "engages in international adventurism" (whereas if he were thought to be consulting with other State Department officials, it is likely that the candidate would have included more than just X in his first statement). **(6)** He disapproves. **(7)** I'm not sure. Six possibilities strike me: (1) X's one-man show has ignored (or strayed from) the decency, etc. of our people; or (2) negotiations should not be handled by one man but should be handled by our people, whose decency, etc. can be depended upon to do the job well; or (3) we, the people, have abandoned our decency, etc., by allowing X to be a one-man show; or (4) "someone" has taken our (we, the people's) decency, etc. away and substituted X's one-man show; or (5) X's negotiations do not reflect the decency, etc. of our people; or (6) X's negotiations are indecent, ungenerous, and they lack common sense. Certainly, he implies that the decency, etc. of our people has gone someplace, but where or why is certainly vague. **(8)** I give up. **16. (1)** d **(2)** No. "Incredible" also means "hard to believe." "Unbelievable" is commonly used to mean "surpassing previous belief." The speaker is saying, "What we found was so horrible that we couldn't believe it at first. That it was true was verified by witnesses who were obviously being truthful." There is no inconsistency here. **17.** He put on a big show of being against having the bookstore in the neighborhood; yet he is contributing to its success by buying books there. Furthermore, we may reasonably assume that the reason he was against the bookstore was because of the kinds of books they sold, and yet he bought some of them. That is, they shouldn't sell them, but he'll help them sell them. **18.** Technically, no, since all X says is that you can ask anyone to do a commercial, but some stars will turn you down. Realistically, yes, since the context makes X's third sentence seem to say, "Any celebrity will do a commercial for the right amount of money." His last sentence then says there are some stars who would not do a commercial regardless of the amount of money. These statements are not only inconsistent but are contradictory. **19. (1)** Disapproves. **(2) a.** It seems to imply that there is a cancer risk from overdosage of alcohol, but the writer may have meant only that there are risks of serious health problems from overdosage of alcohol. **b.** I tend to agree more than disagree with the implication of a risk of cancer, since there is some medical evidence that a person who is both a heavy smoker and a heavy drinker tends to develop a certain type of brain cancer more readily than other people. I definitely agree with the implication of serious health problems from overdosage of alcohol, for this is well documented. **(3) a.** It implies that the FDA is inconsistent. **b.** The backup starts in the first paragraph (FDA bans saccharin because it may cause some health problems) and ends in

the second paragraph (FDA doesn't ban cigarets or alcohol, even though they, too, possibly cause health problems). I'm not sure that the part about cigarets does back up the writer's point, since I don't know whether or not FDA has jurisdiction over cigarets. **(4)** Yes. See the answer to (3)b above. Even if we discount the part about the cigarets, we're still left with the ban on saccharin but not on alcohol. **(5)** It depends on (1) what the FDA's duty is and (2) whether or not FDA has authority to ban cigarets. Suppose FDA has authority to ban cigarets. Then the answer is yes, since the writer's last question in the letter suggests a solution. Now suppose FDA does not have authority to ban cigarets, and suppose further that FDA is bound by law to ban any food (or food additive) which has been found to have harmful effects. Then FDA is still inconsistent for banning saccharin but not alcohol, and the writer has not suggested a solution. **(6)** The accusation is the FDA is allowing political pressures to keep it from doing its duty. **20. (1)** Yes; otherwise, sponsoring TV programs would be a waste of money and the sponsors would stop sponsoring the programs. **(2)** Yes. Except for the first sentence of the third paragraph, every sentence in the letter says the writer believes this. **(3)** Yes, provided that it is not taken to mean **all** people in these categories. There are documented cases of people's copying violent acts they have seen on TV. **(4)** Since the writer says "are working their brains" (as opposed to "using their talents"), I assume that the writers, directors, and/or producers of the TV programs (rather than the actors and actresses) are meant. Certainly the sponsors were not meant. **(5)** Since everyone is potentially violent, I'm not sure. I assume the writer meant people whose anger, frustration, aggression, or whatever, is close to the surface and who are looking for ways to vent it. **(6)** Apparently not. I don't know what the writer means by "cause," but I certainly call it "cause" if it does the things the writer claims in the rest of the letter. I could say, for example, "Holding your hand in a fire doesn't cause a burn. The heat from the fire is so concentrated that your skin can't dissipate it rapidly enough to avoid damage (and so on)," but that's being so nit-picking that I have to reject it. **(7)** Yes, as explained in the answer to (6) above. **(8)-(9)** Yes. There are documented cases of crimes which have been almost exact copies of crimes shown on TV shortly before. **(10)** Yes. Since I believe the second sentence of the third paragraph, I must also believe that more people are victims of crime. That automatically increases the probability that I will be one of the victims. **(11)** Yes. (No explanation necessary for a "yes" answer.) **21.** No. To "take a stronger hand in managing their careers" could mean to make definite plans for advancement (instead of merely going to work every day) or to be alert for better job opportunities (instead of feeling stuck in an unliked job) or to go by personal feelings about choosing a career (instead of leaving the decision to someone else such as parents, counselors, or aptitude tests). People can "need career counseling" for reasons which are not inconsistent with the things already mentioned—to get suggestions on how to get ahead on the job, or to talk about the pros and cons of starting a different career, for example. **22.** These are contradictory premises. If an irresistable force exists, then an immovable object cannot exist, and vice versa. The question has no meaning, just as "How many centimeters are in a kilogram?" is meaningless. **23. (1)-(4)** Answers will vary. **24. (1)** He says it is "safer than ever." **(2)** No. The catch is the word "ever." I would believe that the downtown area is now safer than it was a few years ago when people were routinely mugged and assaulted. But I would not believe it is now safer than it was, say, forty years ago. **(3)** We can't really tell, any more than we can tell the mayor's opinion. That is, we know what the mayor said, and we know what the department store did, but that doesn't tell us the real opinion of either one. Based on what the department store did, their opinion is that downtown Big City is not safe without guards. **(4)** Yes. As the problem states, a bad reputation is hard to overcome. Downtown Big City might really be safe again but the department store, knowing that many people don't believe it is safe now, announces guarded parking so that these people will feel safe about coming downtown. **(5)** Technically yes, but realistically, no. (Make sure your students bring this point out. At this stage of critical thinking, we are looking for realistic answers rather than technicalities.) Technically, we take the two statements without regard to the facts in Big City, and we ask, "Can a downtown area be safer than ever and still need guarded parking?" Yes, for a downtown area may have been a haven for active criminals right from its start, and now that some of the criminals are no longer active, it is "safer than ever," but it still needs guarded parking because too many criminals are still active. In this case,

the two statements are consistent. But realistically, we take the facts about Big City's downtown area, starting with the first two sentences in the problem. From these, we know that people used to shop and work in the downtown area without fear. It is possible, but improbable, that guarded parking was provided even then. If we assume that guarded parking was not provided in those days, then the statements are inconsistent, for it can hardly be true both that downtown is safer than when no guards were needed and that guards are needed now. **25.** The last sentence shows a contradiction in the charges: if the author knew the denial was false, he could not have failed to try to find out whether it was true or false. **26. (1)** The first sentence says that the UN conference experts disagree with the President, but the report does not show a disagreement. To say that we have enough gas and oil for another hundred years does not say we are not running out. On the contrary, the statement that conventional sources may be depleted in 40-50 years seems to support, rather than disagree with, the President's statement. **(2)** No, if "even further" means enough extra years to make up the 100 years. Yes, if "even further" means only for another 20 years or so beyond the next 50 years. **27. (1)** The writer meant the first amendment to the U.S. Constitution. **(2)** The First Amendment guarantees (states), "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech or of the press; or the right of the people peaceably to assemble, and to petition the government for a redress of grievance." **(3)** No. The First Amendment guarantees us that Congress can't do certain things; it carries no such injunction against private individuals or businesses. One can insist that Congress abide by the First Amendment and yet disapprove of some of the practices that position allows. For example, I might believe that the U.S. should continue to have freedom of religion, and yet disapprove of some of the religions this freedom allows. If I refuse to help them succeed by, say, refusing to rent them a building I own, this is not being inconsistent with First Amendment guarantees. **28. (1)** It means making inconsistent, perhaps even contradictory, statements. **(2)** Not necessarily. He may have thought that they were right to resist but wrong in the way they did it. Since the Supreme Court ruled that objection to this war did not constitute grounds for not being drafted, I see three choices of ways to avoid being drafted: hide, go to prison, or leave the country. Since the President stated that leaving the country was wrong, he must have felt that hiding or going to prison was a more honorable choice. We may disagree with this position without feeling that the President was being inconsistent in his beliefs. **29.** No. Making "the furnaces work all the harder" does not "save fuel." **30.** Yes, for practical purposes. If "it is being rewritten to better reflect the actual results of the research, then the original writing must not have reflected "the actual results of the research" as well. Boiled down, the executive seems to be saying, "We told the truth but not the whole truth in the ad." **31.** The Bayers thought the card was misleading. It wouldn't have been to me, since "to commemorate" is quite different from "to attend." (Ask your students if it would have been misleading to them.) **32.** Euphemism (and gobbledegook). **33.** Misleading. **34.** Doublethink. **35.** Euphemism. **36.** "Forging" a name usually implies intent to deceive, so simply writing someone else's name is not forging it. If the Senator signed her secretary's name in her own handwriting—i.e., without trying to make it look like his signature—then is it not doublethink. But if the Senator did try to make it look like her secretary's signature, then it would be hard to believe that she did not intend to deceive whoever read the signature, and (until I'm convinced otherwise), it is doublethink. **37.** Doublethink. **38.** Doublethink twice here: first, in overthrowing Snowball and then denying that he wanted to be the leader; second, in saying that he would like to let everyone make their own decisions but won't let them, since they might make "wrong" decisions. **39.** Doublethink (we're all equal, but let's not be too rigid about equality) and euphemism ("readjustment" instead of "reduction"). **40.** Misleading, for the article does not support either the headline's statement or the first paragraph. [The article mentions a total of only 69% of the drivers. Ask your students if the figures must then be wrong,since they do not account for 100% of the drivers. (Answer: No, we can assume that the other 31% do not fall into either of the "clean records" or "problem drivers" categories.)] **41.** Misleading. **42.** Misleading. (Make sure the students don't think the last sentence of the ad would lead people to think that the $17.50 plus mileage is not charged.) **43.** Euphemism. (Anesthetic, setting the leg, and pain killers would have put the

horse out of its misery without killing it.) **44.** Misleading. **45.** Since I can multiply 60¢ by 52 weeks by 5 years, I do not consider this to be in the least misleading. But Michigan's Attorney General apparently did, for his office sued the company and recovered money for 12,000 Michigan subscribers. **46.** Again, I don't consider this misleading, but some people do. **47.** Taken as a whole, the ad is not misleading, since it states explicitly that you get 125 buttons for the money. But the heading ("A BUSHEL OF BUTTONS!") is certainly misleading. **48.** I think each paragraph of the ad is misleading. In the first paragraph, "no wasted food . . . ground down to the last piece" is not true. (Cooks who did not use carrot tops before will not use them with the X. Cooks who peeled onions before will still peel them before using the X.) In the second paragraph, a reader unfamiliar with food processors might interpret "prepared to perfection" to mean "cooked to perfection." In the third paragraph, "no more" is ambiguous. It could mean "no more than you have been doing without the X." Or it could mean "no," which is what the context appears to make it mean. Now I don't fuss at the dinner table anyhow, so the X wouldn't make any difference to me in that respect. But for someone who does, I think the ad is misleading, for it makes it sound as though processing the food in the X will end the fussing at the dinner table. But the ad says, "No fussing . . . when you serve . . . dishes prepared the X way," which could mean, "If you stick with the dishes we recommend and prepare them the way we recommend, then there's no fussing." **49.** I'm undecided about this. I tend to think it is misleading, since the great majority of cat owners do not know which nutrients their cats need for good health and are likely to assume that the listing given is complete, and I strongly suspect that the cat food manufacturer knows this, too. **50.** Misleading. **51.** Euphemism. **52.** Euphemism (and doublethink?) **53.** preowned car = used car **54.** nervous wetness = odorous perspiration = smelly sweat **55.** genuine imitation = fake **56.** personal preservation flotation devices = life jackets and life savers **57.** coach = second class **58.** eliminated redundacies in our human resources = fired several people **59.** new morality = old immorality **60.** What's a "leading store"? It's a store which sells that product, of course. **61.** What's their "appetite control plan"? (Do you take some drug to control appetite? Do they simply tell you to control it yourself?) "Up to 6" can be anything from 0 to 6. **62.** What's "all the help you need"? (In whose judgment? Do they simply give you a list of rules of grammar and punctuation?) What's "successful," what's "author," and what's "successful author"? (Rich? Famous? Published? Or simply "able to write so that other people can understand what you're saying"?) **63.** So what? (Has it been made to **anyone** before? And did they bite?) **64.** What's that supposed to mean? (Is the merchandise so raunchy that it was always thrown out before and now they're going to try to sell it instead of discarding it? Do they mean they're charging higher than normal sale prices, and no one has ever had the nerve to try that before?) **65.** State laws or regulations which limit the employment of females just because they <u>are</u> females are no longer in effect. **66.** You do not have to give preference to any person or group in order to correct imbalances among categories covered by this law. **67.** If you're already being paid more than the top pay for your job, then you won't get the raise unless you're making less than the top pay for your job. (Notice that everything after "unless" is nonsense. That is, how can you be making less if you're making more?) **68.** We know people are stealing from us, and we're going to try to catch them. **69.** Loaded. Whichever way you answer, you've admitted the story is a fairy tale. **70.** Not loaded. **71.** Loaded. If you answer "yes," you're in favor of "untold damage . . .." **72.** Loaded. If you answer "no," you're not in favor of allowing the public to help, and you don't care whether or not the new plants grow well. **73.** Loaded. Whether or not you explain the delay, the insinuation has been made that you did not do your duty as a good citizen and that you were too stupid to face the facts.

CHAPTER 2

General Comments:

It is suggested that your students not attempt this chapter unless they have learned and felt comfortable with the material in chapter 2 of CTBI. Although the review section here summarizes the main ideas and provides practice problems to refresh the students' memories, it is not meant to replace the 30 pages in chapter 2 of CTBI. To jump into this chapter without this previous foundation will discourage and frustrate your students, since the rest of the chapter uses the

section 2.1 (Review) material as a basis for introducing more complicated concepts and, consequently, takes for granted that the section 2.1 material is thoroughly understood and can be almost instantaneously applied by the students.

Use the material in this chapter as you do the material in the other chapters—that is, as a basis for class discussion and argument. It is one thing to get the students to the point where they know what answers you and I expect for the kinds of problems here. It is another thing to get them to the point where they understand why we think these answers are correct. And it is still a third thing to get them to the point where they, themselves, can coordinate and synthesize their knowledge and their reasoning abilities so well that they can (1) come up with answers which make sense, without worrying about whether or not you and I will agree with them, (2) pretty well know in advance whether or not we will agree with them, and (3) be prepared in advance to defend their answers against ours in case of disagreement. In order to reach this stage of development of knowledge and reasoning ability, however, the students have to be given room to think and talk about what they're studying.

General Comments about Chapters 2 and 6:

There is a lot of material about logic in chapters 2 and 6, but there is also a lot of material about logic which isn't here. In some cases, the decision of what to include and what to omit was strictly arbitrary, but in most cases the decision to exclude something was made on the basis that such material would probably not be well understood by the average secondary school student who was trying to learn it. Examples of such items are these:
(1) sentences containing the word "except"; (2) validity of arguments containing at least one universally quantified premise and more than one existentially quantified premise; (3) validity of arguments having a universally quantified conclusion, where not all premises are universally quantified; (4) sentences containing mixed quantifiers (such as, "All plumbers sometimes use plastic pipe"); (5) negation of statements with quantifiers such as "many," "most," and "at least two"; (6) statements indicating possibility or probability, rather than facts (such as, "It is possible that the thieves entered by the window," or, "Jerry probably won't try out for the team"); (7) formal proofs of validity; (8) methods of proof of validity or invalidity where the choices of truth values are not forced; (9) sentences which are contraries but are not negations; (10) logic symbols used for quantified statements (such as: "All tigers are animals" is symbolized here simply as "$T \rightarrow A$," even though the accepted symbolization is "$\forall x, T_x \rightarrow A_x$").

So, although your students will realize that they are learning a lot about logic in these two chapters (and will, therefore, be better equipped to be good reasoners), they should not take for granted that there is very little they don't know about logic. In fact, if you are successful in getting them to think about the material in these two chapters, they will ask a great many questions whose answers will not be found in this book and so they will know automatically that they still have a lot to learn about logic.

Although the whole book has many problems so that the students can be provided with the practice they need for the concept under discussion, these chapters in particular are loaded with practice problems. Don't make the mistake of thinking that every problem must or should be done. Do enough problems in each section so that your class has a good grasp of the material. But don't reach the point where the students feel they are just killing time by doing problems and so become bored. A group of students may sail along for several sections needing only a few practice problems for a good understanding of the material, and then suddenly (and for no apparent reason) have trouble understanding some concept. At this point, enough problems for a good understanding are provided and should be done with the students. But where will the group reach the snag in understanding? Who knows? Different classes of mine reach the snags at different points, so throughout chapters 2 and 6 enough problems are provided to give the students the practice they need just in case that's the point at which they have trouble understanding.

However, do make it a point to do some of each **kind** of problem with your students. In particular, the problems which ask questions (as distinguished from the problems which are simply drill problems) are meant to make the students think about what they've learned, manipulate the knowledge, and come up with a more thorough knowledge.

Sec. 2.1 comments:

The main ideas in chapter 2 of CTBI are summarized here. Also, some ideas from the last section there have been applied to provide more

substitutions for the words "if" and "then." That is, we know that any argument can be put in the form of an "if-then" statement, where the premises of the argument become parts of the "if," and where the conclusion of the argument becomes the "then." It follows that the word "if" can be (logically) substituted for any words which designate premises (such as 'for," "because," and "since"), and the word "then" can be (logically) substituted for any words which designate a conclusion (such as "so," "therefore," and "thus").

It might be a good idea to make sure your students know that, even though we make these substitutions, we do not pretend that the substitutions have the precise everyday connotations of the original words. For example, we might say to someone, "Call me when you get back." Logically, we translate this to, "If you get back, then call me." Our use of "when" in this case implied a definite expectation that the other person would, in fact, get back, whereas the translation of "if" could be interpreted as a feeling somewhere between doubt and neutrality about the person's getting back. It is important that the students not think of this as just another example of learning something in school which doesn't apply to everyday life. That is, they can learn the rules about the substitutions and do them perfectly but still feel that the substitutions don't make good common sense. It might be helpful to point out that the substitutions remove some subjective feelings from the statements, thus allowing us to examine and test the statements more objectively. And, of course, the substitutions allow many statements which, on the surface, appear to be quite different to be written in a single standardized form. Furthermore, the substitutions can make unstated assumptions (missing premises of arguments) more obvious, thus giving the listener a better chance to determine whether or not the argument is logical. Consequently, the substitutions are written for definite purposes and do have real life applications.

Sec. 2.1 answers:

1. yes **2.** no **3.** yes **4-6.** no **7.** no (No nonletter symbols are to separate the letters.) **8. a.** If Amy will go alone, then Betty will not go with her. **b.** Yes. **9. a.** If Amy won't go alone, then Charlene will go along, too. **b.** Yes. **10. a.** If Betty will go with Amy, then Charlene will go along, too. **b.** Yes **11. a.** It is false that if Amy will go alone, then Betty will go with her. **b.** Yes. **12. a.** If Amy will go alone, then Charlene will go along, too. **b.** No. **13. a.** If Amy will not go alone and if Betty will go with her, then Charlene will go along, too. **b.** Yes. **14. a.** If Amy will not go alone and if Betty will go with her, then Charlene will not go along, too. **b.** Yes. **15. a.** If Betty and Charlene will go with Amy, then Amy will go alone. **b.** No. **16. a.** If Amy will not go alone and if Charlene will go along, too, then Betty will not go with Amy. **b.** Yes. **17. a.** Amy will go alone or Betty will go with Amy. **b.** Yes. **18. a.** Amy will go alone and Betty will go with Amy. **b.** No. **19. a.** Amy will go alone only if Betty will not go with her. Or: If Amy will go alone, then Betty will not go with her. **b.** Yes. **20. a.** It is false that Amy will not go alone. Or: Amy will go alone. **b.** Yes. **21. a.** It is false that either Amy will not go alone or Betty will go with her. (Notice that the sentence is ambiguous without the word "either." That is, it is unclear whether "it is false" applies to the rest of the sentence or whether it applies only to "Amy will not go alone.") **b.** Yes. **22. a.** Either Amy will go alone, or Betty and Charlene will go with her. **b.** Yes. **23.** If you promise not to repeat it, then I'll tell you a secret. **24.** If we can send you this product, then you'll call us immediately. **25.** If someone studies hard enough, then he or she can do well. **26.** If we don't get that ice off the sidewalk, then someone will slip and fall. **27.** If there is plant life, then there is a sufficient water supply. **28.** If you won't do me a favor, then I won't do you one. **29.** If someone is dead, then he or she is not breathing. **30.** If a plane can fly, then it has sufficient fuel. **31.** If you behave yourself, then you can go with me. **32.** If someone is to pass this class, then he or she must do all of the required homework. **33.** If someone has a good credit record, then he or she makes payments on time. **34.** If I am to believe you, then you tell me the truth. **35.** If you tell me the truth, then I will believe you. Or: If you tell me the truth, then you will get me to believe you. **36.** If someone is caught lying, then that person will be mistrusted. **37.** If you can go with me, then there is room in the car. **38.** If I will allow you to get a bicycle, then you can pay for it yourself. **39.** If Basser or Cutter committed the crime, and if Basser didn't do it, then Cutter must have done it. **40.** If you're ready, then let me know. **41.** If Min-Shio is taller than Ramon and Ramon is taller than Celeste, then Min-Shio

is taller than Celeste. **42.** If all squares are rectangles and all rectangles have four sides, then all squares have four sides. **43.** If you're ready for the report, then I'll give it to you. **44.** Anyone with common sense should be able to figure it out. You have common sense. Therefore, you should be able to figure it out. **45.** Anyone who isn't going to the game doesn't care what time it starts. I'm not going to the game. Therefore, I don't care what time it starts. **46.** Any animal which is not tame is wild. A tiger is an animal, but it is not tame. Therefore, a tiger is a wild animal. **47.** If anyone catches me red-handed at something, then I'll admit I did it. You caught me red-handed at something. Therefore, I'll admit I did it. **48.** It doesn't matter whether or not the truth is told to someone who won't believe what is said. You will not believe what I say. Therefore, it doesn't matter whether or not I tell you the truth. **49.** Everyone should pay his or her fair share of income tax. I do what I should do. (Therefore, I will pay my fair share of income tax.) Anyone who cheats on income tax does not pay his or her fair share. Therefore, I will not cheat on my income tax. **50.** I will not do anything my religion forbids. My religion forbids going dancing. So I will not go dancing. **51.** Whenever I have explained something thoroughly to someone, I expect that person to understand it. I have explained this thoroughly to you. Therefore I expect you to understand it now. **52.** I always do what I think it is my duty to do. I think it is my duty to report a crime I see being committed. Therefore, I will do so (report it). **53.** Along the equator, there is a lot of rainfall and the weather is hot. Such conditions are ideal for many plants. (Those two sentences can be consolidated to: Along the equator, conditions are ideal for many plants.) Any place which has conditions which are ideal for many plants also has jungles. Therefore, there are jungles along the equator. **54. a.** P: 1,2. C: 3 **b.** If all boys have purple teeth, and if Aloysius is a boy, then Aloysius has purple teeth. **55. a.** P: 2,3 C: 1 **b.** If no fruit is a vegetable, and if a tomato is a fruit, then a tomato can't be a vegetable. **56. a.** P: 1 C: 2 **b.** If you can join the club, then the members vote you in. **57. a.** P: 2 C: 1 **b.** If the homework is a course requirement, then I guess I'll do it. **58. a.** P: 1,3 C: 2 **b.** If you do your work well and you're also dependable and honest, then you'll probably get a promotion. **59. a.** proposition **b.** inverse **c.** converse **d-e.** contrapositive **f.** proposition **60. a.** converse **b.** proposition **c.** inverse **d.** converse **e-f.** inverse **g.** converse **h.** contrapositive **61. a.** contrapositive **b-c.** converse **d.** proposition **e.** inverse **f.** contrapositive **g.** none. **62. a.** If you'll help me with my spelling, then I'll help you with your math. **b.** If I'll help you with your math, then you'll help me with my spelling. **c.** If you won't help me with my spelling, then I won't help you with your math. **d.** If I won't help you with your math, then you won't help me with my spelling. **63. a.** If I'll go swimming today, then the water is calm. **b.** If the water is calm, then I'll go swimming today. **c.** If I won't go swimming today, then the water isn't calm. **d.** If the water isn't calm, then I won't go swimming today. **64. a.** If I need extra sleep, then I'll go to bed early tonight. **b.** If I'll go to bed early tonight, then I need extra sleep. **c.** If I don't need extra sleep, then I won't go to bed early tonight. **d.** If I won't go to bed early tonight, then I don't need extra sleep. **65.** false **66-67.** true **68.** false **69-75.** true (if the premise is false, the statement is true by definition) **76.** Bonita. To study law. **77.** Cary. Jerry. **78.** Not enough information. (We know only that we don't go on a picnic.) **79.** Green. Not enough information. **80-81.** Not enough information. **82.** Yes, a short one. **83.** B or G; B$\rightarrow$L; G$\rightarrow$A; ~A **84.** LT$\rightarrow$ BS; CT$\rightarrow$JS; LT or CT; ~BS **85.** P$\rightarrow$E; L$\rightarrow$N; ~E **86.** U$\rightarrow$G; ~U$\rightarrow$~P **87.** R$\rightarrow$LV; P$\rightarrow$~AV; ~P **88.** R$\rightarrow$LV; P$\rightarrow$~AV; ~(R or P) **89.** R$\rightarrow$LV; (~R and ~P)$\rightarrow$SV; P$\rightarrow$~AV; ~(R or P) **90.** Yes. The truth values of the two statements match each other in all cases. By definition, then, they are equivalent statements. (Notice that they are contrapositives of each other, and we already knew that a statement and its contrapositive are equivalent statements.)

91.

P	Q	~P	~Q	P$\rightarrow$Q	~P$\rightarrow$~Q
T	T	F	F	T	T
T	F	F	T	F	T
F	T	T	F	T	F
F	F	T	T	T	T

No. In some cases, the truth values of the two statements do not match. By definition, then, they are not equivalent statements. (Notice that they are inverses of each other, and we already knew that a proposition and its inverse are not equivalent statements.)

92.

P	Q	~P	P→Q	~P or Q
T	T	F	T	T
T	F	F	F	F
F	T	T	T	T
F	F	T	T	T

Yes, they are equivalent statements.

93.

P	Q	P and Q	(P and Q)→P
T	T	T	T
T	F	F	T
F	T	F	T
F	F	F	T

Yes, it is always true.

94. Equivalent statements: Group 1: a, d, f, h, j, m, o, s, u; Group 2: b, c, e, i, n, p, q, r, t; Statements not equivalent to any other statement: g, k, l.

Sec. 2.2 comments:

Stress that "if and only if" means "is equivalent to" and also means "can be substituted for." An "if and only if" sentence can be read from either direction. That is, "P if and only if Q" also can be read, "Q if and only if P." (That figures, since P and Q can be substituted for each other.) Also, "P if and only if Q" is claiming **two** things: (1) "P if Q," or "If Q, then P" and (2) "P only if Q," or "If P, then Q." Also stress that "iff" is not a typographical error—it means "if and only if," not merely "if."

Although the students may have a pretty good understanding of P ≡ Q and will readily accept that P ≡ Q is true whenever both P and Q are true, it will not be quite as obvious to them that P ≡ Q will also be true whenever both P and Q are false.

Problems 16 and 17 are designed to bring out the relative truth values of P and Q for the statement P ≡ Q, and you may have to spend some extra time on them with your students in order to make sure that everyone understands.

Sec. 2.2 answers:

1-7. yes **8.** No. The "only if" is true, but the "if" is false. **9.** yes **10.** No. She could be exactly 4 years old, so the "only if" is true, but the "if" is false. **11.** No. The "if" if true, but the "only if" is false. **12.** No. Both the "if" and "the "only if" are false. (Ann can (day)dream without being asleep, and she can sleep without dreaming.) **13.** My answer is "no," for my definition of "success" makes both the "if" and the "only if" false. This one might be good for a class discussion on what being "successful" means. **14. a.** Sure. That's what statements 10 and 11 in the "Summary" say. **b.** No. That would make each statement say that ~P is equivalent to Q, which would be false. **c.** Yes. When P and Q are equivalent, they have the same truth values under all conditions. Therefore, their negations (i.e., ~ P and ~Q) would also necessarily have the same truth values under all conditions and so would also be equivalent. **d.** Yes. This answer follows from answers **a** and **c** above. Another way to justify this answer is this: the exchange suggested in this problem merely results in asserting that the contrapositives of all the given statements are equivalent to each other [i.e., (P →Q) ≡ (~Q →~P)]. **15. a.** Yes. See statement 9 in the "Summary." **b.** Yes. See statements 9 through 12 in the "Summary." **c.** Yes. See statement 9 in the "Summary." **d.** Yes. See statements 9 through 12 in the "Summary." **16. a.** It will be false whenever the truth values of P and Q disagree. That is, it will be false when P is true and Q is false; and it will be false when P is false and Q is true. **b.** It is true. We can go back to the "↔" meaning of "≡" — that is, "is equivalent to" also means "if and only if." So "P ≡ Q" also means "P if and only if Q"— that is, "If P, then Q; and if Q, then P." Given that P and Q are both false, "If P then Q" is true, and so is "If Q then P." Since an "and" sentence is true whenever both parts are true, it follows that "P if and only if Q," and, consequently, "P ≡ Q," is true when P and Q are both false. **c.** It will be true whenever P and Q agree in truth value. That is, it will be true when both P and Q are true; and it will be true when both P and Q are false. **d.** Sure. Although we usually use capital block letters for complete simple thoughts, we sometimes (as in this case) use them for other things. The idea of "P ≡ Q" is that P and Q are equivalent statements, and a statement does not have to be a simple thought. **17. a.** It will never be false. Either both parts must be true, or both parts must be false (since P ≡ Q), and P →Q is true under either of these conditions. **b.** It will be false iff P is true. P ≡ Q, so a true P makes a true Q, which makes a false ~Q. **c.** It will be false iff P is false. The reasoning is the same as for **b** above. **d.** It

will be false iff P is false. **e.** It will be false iff P is false. **f.** It will never be false. If $\sim P$ is false, then P (and, therefore, Q) is true, and the sentence is true. If $\sim P$ is true, then the sentence is true. **g.** It will always be false. (Ask your students how come.) **18. a.** True. See the answer to problem 14c above. **b.** True. See statement 12 in the "Summary." **c.** True. $P \equiv Q$ means that both $P \rightarrow Q$ and $Q \rightarrow P$. **d.** True. See the answer to problem 17f above. **e.** False. This says that a proposition is equivalent to its converse. **f.** True. This says that a proposition is equivalent to its contrapositive.

Sec. 2.3 comments:

This section defines what is meant by valid and invalid arguments. It is possible for an argument to be valid and yet be a poor argument. One example is an argument which is circular. Such an argument is valid but not convincing. ("All grass is green." "What makes you think so?" "Because all grass is green." Valid, but poor.) Another example is an argument which has false premises. Again, it may be valid, but its false premises make it a poor argument. ("Everybody else pushes other people aside in order to get ahead. It's OK for me to do what everybody else does. So it's OK for me to push everybody else aside in order to get ahead." Valid, but poor, since at least the first premise is false.)

Despite the very explicit definitions for valid and invalid arguments given in this section, the students are unlikely to realize some of the implications of these definitions even when they can regurgitate the definitions perfectly for you. Even so, it is suggested that, as the first step toward realizing the implications of the definitions, you have each student repeat definition 2 aloud (after discussing the preliminary material with the class, of course) before the class starts on the problems. Problems 1-11 are designed to eliminate some of the misconceptions students usually have about the definitions, and you will probably want to be especially careful to ascertain that each student understands the answer to each of these problems.

Problems 12-17 give the students a chance to figure out how to apply the definitions to arguments. They will probably get some wrong answers here, and that's OK. The next section tells them how to simplify an argument (using symbols) and how to test it for validity or invalidity. If some students do not agree with the answers to problems 12-17 even after hearing the explanations, you might like to have them come back to these after completing the next section.

Section 2.3 answers:

1-2. No. See definition 3. **3.** No. See definition 1. (The form alone determines the argument's validity or invalidity. Since both have the same form, both must be valid or both must be invalid.) **4.** No. See definition 1. **5-7.** Not enough information. Whether or not the stated conditions are possible is immaterial in determining validity. From definition 2, we need to know whether or not it is possible for the argument's form to have true premises and a false conclusion. **8.** The argument is valid, from definitions 2 and 3. **9.** Since the premises are self-contradictory, it is not possible for them all to be true. Thus, it is not possible for the argument's form to have true premises and a false conclusion. Using definitions 2 and 3, then, the argument is valid. **10.** Since the conclusion cannot be false, the argument is valid (definitions 2 and 3). **11.** Not enough information. We still have to know whether or not the premises can be true. If they can be, then the argument is invalid. If they cannot be, then the argument is valid. **12-13.** Valid. The premises are self-contradictory. (See the answer to problem 9.) **14.** Invalid. It is possible for the premises to be true (Jim may not be rich) and the conclusion to be false. **15.** Valid. It is not possible for the premises to be true and the conclusion false. (Suppose the premises are true. Premise 1 guarantees us that Pedro will do one of two things, and premise 2 eliminates one of these things. Therefore, Pedro must do the other thing, which is what the conclusion says. So the conclusion cannot be false when the premises are true.) **16.** Valid. The second premise contradicts the first, so both cannot be true. **17.** Valid. It is not possible for the conclusion to be false.

Sec. 2.4 comments:

Two step-by-step examples of proofs are given here. Your students may get the idea that they have to write the argument once for each step in the proof. This, of course, is not true, for they will write the argument only once and then do the whole proof on that one argument. (The examples show the arguments written several times simply so that the students can see what was done at each point in the proof.)

Very few students will be ready to try the problems after seeing only the two examples given here, so you will probably want to give them several other examples before suggesting that they try the problems. Converting the words to symbols will be practically automatic for most students, so it is suggested that your additional examples start simply with symbolized arguments. You might like to give them these arguments as additional examples:

(3) $A \rightarrow B$
$\sim B$
$\therefore \sim A$
(valid)

(4) $A \rightarrow B$
$\sim A$
$\therefore \sim B$
(invalid)

(5) $A \rightarrow B$
$B \rightarrow C$
A
$\therefore C$
(valid)

(6) $A \rightarrow B$
A and $\sim B$
$\therefore C$
(valid)

(7) $A \rightarrow B$
$\sim A$ and $\sim B$
$\therefore C$
(invalid)

Assign only about half of the problems for the first time. Some students may be crazy about problems like this and go ahead and do all of them. But others may not get past the first two or three and need help and encouragement to understand them, in which case you will want some additional problems for them to practice on and can then assign the other problems. There are a great many arguments to prove valid or invalid throughout the rest of the chapter and in chapter 6, so the students will have ample opportunity for needed practice.

Sec. 2.4 answers:
1-2. valid **3.** invalid **4-5.** valid **6.** invalid **7-10.** valid **11.** invalid **12.** valid **13.** invalid **14.** valid **15.** invalid

Sec. 2.5 comments:
This section tells the students that they may start a proof of validity (or invalidity) by starting with either a premise or a conclusion. It stresses that wherever they start, they are to start with something which has a forced truth value. (For example, they can start with an "or" sentence in the conclusion, since there is only one way for an "or" sentence to be false; but they can't start with an "or" sentence in a premise, since there are three different ways for an "or" sentence to be true.)

A student may ask what should be done if there are no forced truth values in the argument. (For example, where should the starting point be if this were the argument?—$A \rightarrow B$. $C \rightarrow D$. A or C. $\therefore$ B and D.) The TEASERs in this section explore the question. It is suggested that you not answer the question until the students have had at least a week to work on the TEASERs. (I always allow extra credit to a student for solving a TEASER, and the solution is to be worked out on the student's own time.) By that time, someone will probably have figured out the answer and can then present it to the class. If not, and if the students ask again, then it should be OK to tell them. In any event, it is suggested that you not bring up the question yourself (unless you are teaching a class of gifted students), for it is likely to be confusing to those students who are just starting to feel confident about the proofs. That is, in a class of average students, there are some who will struggle to learn where to start on a proof. If you throw such a question at them just as they are starting to figure out where to start when the truth value is forced, the question is likely to make them forget what they've just learned, and they'll think there is no direct route for any proof of validity.

Once your students can prove an argument valid or invalid, it might be a good idea to point out to them that they do not have to understand all the words in an argument in order to determine whether or not the argument is valid. For example: "If this jix is a raq, then it is a gomper. This jix is a raq. Therefore, this jix is a

gomper." Practically no student will have trouble proving that argument valid. On the other hand, several students might have trouble with this one, which is exactly the same form as the first one: "If this embellishment is ostentatious, then it is odious. This embellishment is ostentatious. Therefore, this embellishment is odious." I'm not sure why some students have trouble with the second argument when they don't have trouble with the first one. I think it's because they know that "jix," "raq," and "gomper" are nonsense words which were made up just to give them a laugh, so they ignore them and concentrate on the form of the argument; but they suspect that "embellishment," "ostentatious," and "odious" mean something, and, remembering from previous teaching that they can't make sense out of something they don't understand, transfer the "something" they don't understand from the words to the argument, thereby thinking that they cannot tell whether or not the argument is valid unless they know what the words mean. Anyhow, it wouldn't hurt to give your students those two examples and see how the students react to them.

Section 2.5 answers:

1. invalid **2-8.** valid **9.** invalid **10.** valid **TEASER A:** No. You have not yet proved whether or not it is possible for the argument to have true premises and a false conclusion. All you've done so far is show that if both parts of the conclusion are false, then the premises are not all true. There are, however, two other ways for the conclusion to be false, and you will not have proved the argument valid until you try both of these other ways and get similar results. **TEASER B: a.** Yes. You have shown it is possible for the argument to have true premises and a false conclusion. By definition, then, the argument is invalid. **b.** The test for invalidity asks whether or not it is possible for the argument to have true premises and a false conclusion. In the case of TEASER A, the first trial did not answer this question, so the proof was not finished. In the case of TEASER B, the first trial answered the question, so the proof was finished. **TEASER C:** No. The explanation here is analogous to the explanation for TEASER A. **TEASER D: a.** Yes. You started with a premise which had only one way to be true. The truth values marked here were forced, rather than a matter of choice. In turn, these truth values forced the second premise to be false. You have proved that if the first premise is true, then the second premise is false. Consequently, you have proved that the argument cannot have all of its premises true. By definition, then, the argument is valid. **b.** In this case (TEASER D), the first trial showed that the second premise had to be false if the first premise was true. But in TEASER C, the first trial did not show that the second premise had to be false if the first premise was true. In TEASER C, all the first trial showed was that the second premise was false if the first premise were marked true in a certain way. Since there were other ways for the first premise to be true, this left open the possibility that the second premise might not be false if one of these other ways were tried. **TEASER E:** The argument is invalid. There are three ways for the premise to be true and there are only two ways for the conclusion to be false, so I'll start with the conclusion. (Your student might choose to start with the premise. That's OK, but that way may take three trials, whereas my way will take a maximum of only two.) The conclusion asserts that P and Q are equivalent statements, so it will be false whenever P and Q have different truth values. We can start by making P true and Q false (in the conclusion). Then this makes the premise true, and we are done. (Notice that we lucked out by choosing the conclusion to start with. That is, if we'd chosen to start by making Q true and P false in the conclusion, we'd still end up with a true premise, and we'd still be done in only one trial.) Note: Your students may run into a couple of problems here. First, they may think the conclusion will be false if both parts are false. (This will indicate, of course, that they have unclear ideas of what we mean by equivalent statements.) Second, they may think that the conclusion is a tautology and so think it cannot be false.)

Sec. 2.6 comments:

It is important that the students understand the difference between a tautology and a statement which says that two statements are equivalent. Whereas the former is always true, the latter is not. For example, "P or ~P" is a tautology, since it is always true, but "P $\equiv$ Q" is not a tautology, since it can be false. On the other hand, "(P $\rightarrow$ Q) $\equiv$ (~Q $\rightarrow$ ~P)" is both a tautology and a statement of equivalence. To summarize: A tautology may be, but is not necessarily, a statement of equivalence; and a statement of equivalence may be, but is not necessarily, a tautology.

An "if-then" statement can be tested to see whether or not it is a tautology. To do this, we use the "if" as the premises of an argument, and

we use the "then" as the conclusion of the argument. Then the statement is a tautology if and only if the argument is valid. The problems in this section suggest that the students use this method to see whether or not a statement is a tautology, if they can't tell just by looking at the statement.

Sec. 2.6 answers:
1-5. tautology **6.** not a tautology **7-11.** tautology **12.** not a tautology

Sec. 2.7 comments:

Although the other word substitutions listed in this section can be used automatically, be sure your students understand that they are to take some of the "if" and "then" substitutions with a grain of salt. Being careful about such substitutions was mentioned in section 2.1 (Review) and the students should be reminded again at this point. Somebody who tells us, "Betty broke her leg, so she couldn't go to the play," is not telling us that if Betty broke her leg, then she couldn't go to the play. Rather, the person is telling us that Betty couldn't go to the play and that Betty broke her leg, and there is no "if-then" about that information. The "if-then" comes into use when we try to determine whether or not Betty's broken leg is a good reason for her not being at the play. We can then translate the person's statement as, "If nobody with a broken leg could go to the play (missing premise), and if Betty broke her leg, then Betty couldn't go to the play." We might or might not agree that nobody with a broken leg could go to the play, and our agreement on that score would influence us in deciding whether or not Betty's broken leg was a good reason for her missing the play.

The statement about Betty and her broken leg was a "P, so Q" statement which turned out to be meant as "P and Q" rather than "If P then Q." On the other hand, here is "P, so Q" statement which is meant as "If P then Q": "You're not going to write to me, so I'm not going to write to you." Here the speaker evidently is not making an "and" statement of two facts but is instead saying, "If you're not going to write to me, then I'm not going to write to you."

Your students may ask, "But how can we tell for sure which way to take the statement?" That's a legitimate question, and I have no clear-cut answer to it. The best I can do is tell them to consider the context in which the statement was made and then to use common sense to decide which way to interpret the statement.

Sec. 2.7 answers:
1. If Tom doesn't start goofing off, he'll pass the course. **2.** I have something to say and I don't think you'll want to hear it. **3.** The play was good, and the music could have been better. **4.** Carmen cannot be hired or Helmut cannot be hired. **5.** Karen won't get a role in the play, and Karl won't get a role in the play. Or: Karen won't get a role in the play, and neither will Karl. **6.** If you don't prefer that I don't go with you, then I'll go with you. **7.** If you don't do the homework, then you won't pass. **8.** I'd like to have a dog, and a dog is a lot of trouble. **9.** You can have a dog or you can have a cat, and you cannot have a dog and a cat. **10.** Timmy disobeyed his mother and Timmy went across the street and Timmy didn't get hurt. **11.** If Mark can't find a ride with someone, then he can't get to work. **12.** $\sim BM \rightarrow \sim P$. $\sim LR \rightarrow \sim BM$. $\sim LR$. $\therefore \sim P$. Valid. **13.** $(\sim LD \rightarrow LS)$ and $(LD \rightarrow I)$. $\therefore I \rightarrow \sim LS$. Invalid. **14.** $(\sim LD \rightarrow LS)$ and $(LD \rightarrow I)$. $\therefore \sim LS \rightarrow I$. Valid. **15.** WH and $\sim P$. (WH and GA) $\rightarrow P$. $\therefore \sim GA$. Valid. **16.** $H \rightarrow (\sim FT \rightarrow \sim F)$. H and FT. $\therefore F$. Invalid. **17.** $(TC \rightarrow ST)$ and $(\sim TC \rightarrow SU)$. $\sim SU \rightarrow WU$. $\sim WU$. $\therefore TC$. Invalid. **18.** $(TC \rightarrow ST)$ and $(\sim TC \rightarrow SU)$. $\sim SU \rightarrow WU$. $\sim$(ST and SU). $\sim WU$. $\therefore TC$. Invalid.

Sec. 2.8 comments:

A negation, sometimes called a contradictory, is a term with a definite meaning in logic. The negation (or contradictory) of "P" is "not P," or "P is false." However, the word "opposite" has not, as far as I know, been defined by logicians—that is, it has no special significance in the study of logic. To me, the word "opposite" is, at best, kind of indefinite. I don't think every statement has an "opposite." (For example, what's the opposite of, "This figure is a triangle"?) And even when I think a statement probably has an opposite, I'm not sure of what the opposite is. For example, what's the opposite of, "Many people were at the party"? Is it, "Only a few people were at the party"? Is it, "Nobody was at the party"? Is it, "There wasn't any party"? Or what?)

Going along with the statements above, I wasn't sure of what the opposite was of the statement in Example 2. I had, "This dog is not trained at all," but then changed it to, "This dog is poorly trained." If your students want to use the original version, it's OK with me, since it's obvious that I'm on shaky ground here.

By this time, you're probably wondering why

the section was included in the first place. The reason is that my own classes have been uniformly consistent in their automatic readiness to assume that "opposite" and "negation" mean the same thing. It wouldn't be so bad if they always took the negation and assumed it was the opposite. But, being as I suppose students are everywhere, they sometimes want to take an opposite and assume it's a negation. (See Example 1, for instance.) Because of this, I thought it would be a good idea to point out that two statements which disagree with each other are not necessarily negations of each other. Because my own students have been so consistent in their use of the word "opposite" as a substitution for "negation," I chose to use the word "opposite" in this section. Luckily, none of my students has ever asked for a definition of "opposite." (The closest they've come is to ask why an opposite isn't a negation.) If one of your students asks you what an "opposite" is, you're on your own.

Sec. 2.8 answers:

1. N: Andrea did not come in first in the race. O: Andrea came in last in the race. **2.** N: Jacob did not have the best paper in the class. O: Jacob had the worst paper in the class. **3.** N: She is not beautiful. O: She is ugly. **4.** Angelo is not a good sport. O: Angelo is a poor sport. **5.** N: Ruby is not taller than Jennifer. O: Ruby is shorter than Jennifer. **6.** N: This is not a flower. O: This is a weed. **7.** N: That dog does not bark a lot. O: That dog barks only a little. Or: O: That dog doesn't bark at all. (?) **8.** N: Big City is not a long way from Midville. O: Big City is a short way from (or right next to?) Midville. **9.** N: It is false that Marty and Sandy always fight with each other. Or: N: Marty and Sandy do not always fight with each other. O: Marty and Sandy never fight with each other. **10.** N: It is false that you never let me do what I want to do. Or: N: At least sometimes you let me do what I want to do. O: You always let me do what I want to do. **11. a.** opposite **b.** negation **c.** neither **12. a.** opposite **b.** neither **c.** negation **13. a.** neither **b.** opposite **c.** negation **14. a.** neither **b.** neither **c.** opposite **d.** negation **15. a.** negation **b.** opposite **c.** neither **d.** negation **e.** neither

Sec. 2.9 answers:

1. a-d. yes **e.** no **f.** yes **g-h.** no **i-j.** yes **k.** no **l-m.** yes **n-o.** no **p-y.** yes **2. a-c.** no **d-e.** yes **f.** no **g-h.** yes **i.** no **j.** yes **3. a.** Yes. If you can find a way to do this, then it is possible to do this, so (by definition) the argument is invalid. **b.** No. This does not prove that it is not possible to have true premises and a false conclusion. For example, "A→T. T. So A," is an invalid argument. Yet, it is possible to have a false conclusion and a false premise. **c.** No. Again, this does not prove that it is not possible to have true premises and a false conclusion. The example used for the answer to part "b" above works here, too. **d.** No, for the same reason as in parts "b" and "c" above. An example of this is, "(A or B)→T. A or C. So T," which is invalid. We can make A true in the second premise, which makes the second premise true. In turn, this forces T in the first premise to be true. So we have true premises and a true conclusion. **e.** Yes. This follows from the definitions: An argument is invalid iff it is possible for it to have true premises and a false conclusion. So it is not invalid iff it is not possible for it to have true premises and a false conclusion. By definition, it is valid iff it is not invalid. **f.** Yes. This amounts to the same thing as finding a way to make the conclusion false and the premises true. **g.** Not necessarily. The question is whether or not it is possible to make the premises true and the conclusion false. The fact that you are unable to do it does not mean it's valid. Note: If your students object to this as a "trick" problem, tell them that it was not meant to be. Give them this example: The following argument is invalid. Can the students who called question "g" a trick problem figure out how to prove it? (With luck, they won't want to admit they were wrong about calling it a trick problem, and they'll work like mad to show that they can prove the argument invaid. Give it to them as an extra credit problem. If nobody gets it within a day or two, let them stew about it for a while. If they finally insist on knowing how to prove it invalid, tell them that one way it can be done is by making H, S, and Q true and by making B and P false.) Here is the problem:

$$\begin{array}{l} \sim(A \text{ or } N) \text{ or } (\sim P \rightarrow \sim B) \\ \sim(P \text{ or } \sim B) \rightarrow [(Q \rightarrow R) \text{ or } C] \\ \{(\sim Q \text{ or } R) \rightarrow [(S \text{ or } T) \text{ and } H]\} \\ \quad \text{and } (\{Q \text{ or } [\sim(C \text{ and } \sim R) \rightarrow (\sim Q \rightarrow C)]\} \\ \quad \text{and } \{R \rightarrow [(C \text{ and } \sim R) \text{ or } (Q \text{ or } C)]\}) \\ \underline{[(\sim A \text{ or } \sim P) \text{ and } (\sim N \text{ or } \sim P)]} \\ \quad \underline{\text{and } [(\sim A \text{ or } \sim B) \text{ and } (\sim N \text{ or } \sim B)]} \\ \therefore (\sim S \text{ or } \sim H) \text{ and } (\sim T \text{ or } \sim H) \end{array}$$

4. A tautology is a statement which is always true. **5. a-c.** yes **6.** Equivalent statements are two statements which always

have the same truth value, whereas a tautology is a statement which is always true. **7.** Make two arguments. Use P as the premise and Q as the conclusion in one argument. Use P as the conclusion and Q as the premise in the other argument. If "P ≡ Q" is true, both arguments will be valid. If "P ≡ Q" is false, at least one of the arguments will be invalid. **8.** For statements of equivalence, see the answer to problem 7 above to see how to prove them. For "if-then" statements, use the "if" parts as premises and the "then" part as a conclusion, and prove the argument valid.

9. Begin: (A and B) or C
b: C or (A and B)
p: (C or A) and (C or B)
b: (A or C) and (B or C)

10. Begin: (~B→~A) and (~C→~B)
a: (A→B) and (B→C)
j: A→C

11. Begin: ~(A→B)
v: ~(~A or B)
m: ~~A and ~B
double negation: A and ~B

12. Begin: ~(A and B)
n: ~A or ~B
v: A→~B

13. Begin: A→(B→C)
o: (A and B)→C
v: ~(A and B) or C
n: (~A or ~B) or C

14. a: 2, 3, 7, 10, 13, 15, 16, 18, 23
b: 6, 8, 14, 19, 21, 24, 26
c: 1, 4, 5, 9, 20, 22, 25
d: 11
e: 12, 17

TEASER: The question makes the false supposition that "true" for an "if-then" sentence means the same thing as "valid" for an argument. In fact, the two concepts are defined differently. By definition, an "if-then" sentence will be true whenever it has either a false "if" or a true "then," and to determine this, we refer to facts as they are in our world. On the other hand, an argument is defined as valid iff its <u>form</u> is valid, and to test this, we try to create a world in which it is possible that the form is not valid. That is, we try to create a world in which it is possible that the premises are true and the conclusion is false. For the example in the TEASER, then, it is possible in our created world that all animals <u>are</u> tigers and that we are looking at a tiger. But this isn't enough to make the tiger an animal.

CHAPTER 3

General Comments:

It was hard to decide which reasoning fallacies to include in this chapter, which ones to include in other chapters, and which ones to omit entirely. The decision to omit certain fallacies was, for the most part, based on whether or not the fallacy would be recognized as such without being pointed out to the students. Following are examples of such omissions:

<u>Wishful Thinking</u>: "I'm going to enter this contest, because I just <u>know</u> I'll win it. Just think of what I can do with all that money!" Students know without being told that this reasoning is faulty.

<u>Stereotyping</u>: "Italians are a good-natured, easy-going, fun-loving people. I hope we get Italians as our new neighbors." Or the reverse reasoning: "I lived in an Italian neighborhood for a while. It was very pleasant and a lot of fun. Italians must be a good-natured, easy-going, fun-loving people." In both cases, other fallacies are discussed which the students can apply—"whole to part" for the first case, and "proof" by selected instances for the second.

This chapter reviews the eight reasoning fallacies discussed in CTB1 and introduces twelve new reasoning fallacies. That's a lot of fallacies to remember by their special names, and I'm not convinced that students at the secondary level should be expected to remember all the names. However, I do think it important that they recognize a fallacy as a fallacy. If they can attach the proper name to it from memory, so much the better.

The preceding paragraph does not imply that I think students should not be expected to learn to distinguish among the various fallacies. When they have their books in front of them and so can refer to the names and descriptions of the fallacies, they should be able to decide which fallacies are being used.

You will not want to start this chapter with your students until the class has done chapter 2 (Logic without Quantified Statements), since chapter 3 assumes that they know the material from chapter 2.

Nearly all fallacies discussed here are also useful propaganda techniques, and many will show up in the next chapter in a propaganda context.

Sec. 3.1 comments:

You'll notice that the definition of "proof" by selected instances is different than in CTB1. In CTB1, we said that PSI was being used whenever the thinker went from "all cases observed" to "all cases." Consistent with the goals of CTB2, we are now extending that definition to cover cases where the thinker goes either from "all cases observed" to "most cases" or from "most cases observed" to "most cases." (In section 3.2, we will also eliminate certain kinds of such reasoning from the "'proof' by selected instances" category.)

Sec. 3.1 answers:

1. FAC **2.** SCP **3.** none **4.** PFFC. Notice that the context makes it clear that the speaker thinks the gismo has not been invented yet. **5.** PSI **6.** SIP **7.** AQ **8.** CR **9.** SP

Sec. 3.2 comments:

In this section, reasoning which goes from "all observed" to "all" or from "most observed" to "most" is broken into two categories. We continue to call such reasoning PSI if, based on what is given, the conclusion does not seem reasonable; and we will no longer call it PSI if, based on what is given, the conclusion does seem reasonable.

The word "reasonable," however, is not defined here. Before discussing the problems, make sure your students realize that what is reasonable to one person may not be reasonable to another. Ask them to set some ground rules for deciding whether or not a potential PSI conclusion is reasonable. Allow quite a bit of time for them to agree on such ground rules. Hopefully, they will at least come up with the following:

A conclusion is not reasonable if

(1) it uses "most P's seen are Q's" to say "all P's are Q's"; or
(2) there is no apparent reason for the P's to be Q's; or
(3) the cases observed are probably not representative of the general population; or
(4) there is no good basis for thinking that the cases observed are representative of the general population; or
(5) it is based on relatively few observations and (2) holds.

Notice that I'm avoiding the question of what a "reasonable conclusion" is. I can't decide how to define it, for there seem to be exceptions to the rules I think of. For example, is a conclusion reasonable if it uses "all P's seen are Q's" to say, "it's probably true that all P's are Q's"? Sometimes it is, and sometimes it isn't. I'll be happy if my own students come up with some good ground rules which allow them to decide that certain conclusions are definitely not reasonable. Such ground rules will at least eliminate discussion of many trivial points.

Sec. 3.2 answers:

1. yes **2-3.** no **4.** No. (We assume that her patient was a heart patient, since she is a heart surgeon. We also assume that the patient's heart condition was a common one.) Notice that she did not conclude that the new method would save, or even that it would probably save, many people. Her conclusion was simply that it had definite possibilities for saving lives. **5.** Yes. Being male or female does not determine whether or not a teacher is crabby. Furthermore. to use only 14 examples to reach a general conclusion like this one about over a million people is unreasonable.

Sec. 3.3 comments:

As used in this section, the false cause fallacy is, in Latin, called "non causa pro causa"—i.e., the thinker observes an effect and infers that something caused it which did not in fact cause it.

The fallacy of false cause can assume various forms:

(1) Mistaking almost simultaneous events for cause and effect. (I had a bad cold, so I stayed in bed for a week, and the cold got better. Therefore, staying in bed will cure a cold.)
(2) Mistaking a cause for an effect or an effect for a cause. (Every city which has crime has a police force. So if we'd get rid of our police forces, we'd abolish crime.)
(3) Mistaking coincidence for cause and effect. (I walked under a ladder, and five minutes later I almost got hit by a car. So walking under a ladder causes bad luck.)
(4) Mistaking sequential events for cause and effect. (I heard tires screeching. I looked up and two cars hit each other. So screeching tires cause car accidents.) This kind of false cause reasoning has the Latin name "post hoc ergo propter hoc."
(5) Mistaking related events for cause and effect. (I saw Canada geese flying northward. Within a week, my daffodils bloomed. Therefore, the geese caused the daffodils to bloom.)

For more problems about cause and effect, see *Cause and Effect,* a booklet in the Inductive

Thinking Skills series published by Midwest Publications Co., Inc.

The fallacy which this section calls "assumption contrary to fact" is also known as "hypothesis contrary to (or contradicting) fact." In this case, "hypothesis" is synonymous with "antecedent"—i.e., the "if" part of an "if-then" sentence. It was decided not to use "hypothesis" here for two reasons: first, most students would not recognize the word but would recognize "assumption"; second, "hypothesis" in mathematics and logic refers to information already known, while "hypothesis" in science refers to a tentative explanation for observed phenomena.

We can take a closer look at Example 3 in this section. As it stands, the speaker is not saying that looking at the full moon caused Jones to break his arm. (This would be LFM → BA, which is the inverse of the speaker's statement, ~ LFM → ~ BA.) Yet, in a context like this it is clear that the speaker thinks that looking at the full moon was at least partly the cause of the broken arm. It is suggested that you not go into this if your students don't bring it up. Chapter 6 contains a section on using common sense with logic, at which point the students are cautioned not to be robot-like in their application of logic—i.e., to consider the context in deciding what the sentences mean.

Sec. 3.3 answers:

1. False cause. **2.** Assumption contrary to fact. **3.** None. **4.** Assumption contrary to fact. (Judging from the usual meaning of a sentence like this, Rita did, in fact, come to school yesterday.) **5.** SIP. (The statement made, S → C, was interpreted as ~ S → ~ C.) **6.** False cause or assumption contrary to fact, depending on whether the speaker is thinking, "Breaking the mirror caused the bad luck" or, "If he hadn't broken the mirror, then he wouldn't have had the bad luck." **7.** False cause. **8.** Assumption contrary to fact. (Ask your students if their answer would be the same if we changed "didn't have" to "would eliminate." My answer to this is no, it would then be false cause reasoning. I assume the students agree that it's one or the other, and it can't very well be assumption contrary to fact, since the speculation depends on a possible future action which would alter the present facts. **9.** Assumption contrary to fact. **10.** False cause.

Sec. 3.4 comments:

Stress to your students that a person who rationalizes really believes what he is saying. He may suspect that other factors are present but, basically, he believes the rationalization.

Even a critical thinker rationalizes at times. But when someone says to him, "No, I don't believe that. I think you're just rationalizing," the critical thinker at least asks what the other person thinks the real reason was. And when he hears it, he thinks about it.

Sec. 3.4 answers:

1. Rationalization, along with assumption contrary to fact. (If the student had already been doing the work, the teacher wouldn't have been nagging in the first place.) **2-3.** Rationalization. **4.** None, if the person is not good-looking enough. Probably rationalization if the person is good-looking enough. **5.** Rationalization, most likely. (Here it is unlikely that everybody but the speaker "got the breaks.") **6.** Assumption contrary to fact, if the speaker is stupid. (In that case, there is no rationalization, since it's true that a stupid person can't be a genius.) Rationalization, if the speaker is not stupid but lazy. **7.** Rationalization. **8.** PFFC

Sec. 3.5 comments:

The name "whole to part" is a name I made up. The fallacy is often called "sweeping generalization." I decided against using the common name for it because the name makes me think of making a sweeping generalization—i.e., "proof" by selected instances—rather than what the fallacy really is—i.e., starting with a sweeping generalization and then trying to apply it to individual cases.

I also made up the name "part to whole." I've seen it called "tree-forest" and "composition," but it seems that many authors of books on reasoning do not discuss it at all. The text explains the difference between "part to whole" and "proof" by selected instances. The students will probably understand the difference quite well at the time it is explained, but I suspect that, as the days go by, they will need additional examples to keep the two separated in their minds. Here are additional examples you might like to use:

(1) I can tear one page of this book in half, so
P to W: I can tear the whole book in half.
PSI: I can tear all the pages of it in half. Or: I can tear a page of any book in half. (Notice that the first PSI example here is one of the cases we have agreed to quit calling PSI, but it will nevertheless give your students

the idea of the difference between PSI and P to W.)

(2) Laura is a below-average student, so
P to W: this school must be a below-average school.
PSI: all the students here must be below-average students.

(3) I have always been successful in my school subjects, so
P to W: I will be a successful person in life.
PSI: I will be successful in whatever I try to learn.

(4) Juanita is above average at tennis, so
P to W: she must be an above-average person.
PSI: she must be good at all sports. Or: she must be good at everything.

(5) Gerry always dresses in a sloppy and disorganized way when she comes to school, so
P to W: Gerry must be a sloppy and disorganized person.
PSI: Gerry's clothing must be sloppy and disorganized wherever she goes.

(6) Vitamin D is good for you, so
P to W: if you take a lot of vitamin D, you'll be sure to be healthy. (If you use this example, remember to warn your students that excessive doses of vitamins can cause severe health problems.)
PSI: all vitamins are good for you. (Again, this is not a PSI under our new rules, but it will help illustrate the difference betwen P to W and PSI.)

Sec. 3.5 answers:

1. None. **2.** Part to whole. **3.** PSI **4.** Part to whole. **5.** Whole to part. **6.** PSI **7.** Part to whole. **8.** Whole to part. **9.** Assumption contrary to fact. **10.** Whole to part.

Sec. 3.6 comments:

Your students should enjoy this section. Example 1 and the problems are humorous. And many of the students will have had a personal experience like Pat's in Example 2. Once this kind of circular reasoning is pointed out to them, the students have more appreciation for the name "circular reasoning."

Ask your students to make up their own examples, or to bring in actual examples observed, of this kind of circular reasoning.

Sec. 3.6 answers:

1-2. Yes. **3.** Yes. Notice that the King has also turned the Knave's own argument against him— an especially effective arguing technique. **4.** Yes. **5.** Yes. (We see that the Mock Turtle is trying to establish that his school was better than Alice's. He uses "victory by definition"—i.e., he finds a subject taught in his school but not taught in Alice's and uses that fact as part of his definition, thus showing that his school was better.) **6.** Yes.

Sec. 3.7 comments:

Stress to your students that the either-or fallacy occurs only when there are more than two reasonable possibilities. For example, "You'll either get your hair cut or you won't," is not either-or reasoning. But, "You'll either get your hair cut short or you'll leave it long, like it is now," is either-or reasoning.

Either-or reasoning is very common, and your students should be able to bring in several examples of it for the class to discuss. It is also used extensively in propaganda, and we will see more of this reasoning in chapter 4.

Not drawing the line is often difficult to recognize for two reasons: first, not everyone agrees on whether or not a line should be drawn in some situations; second, even if everyone does agree that a line is needed, not everyone agrees on where it should be drawn. For example, a 10:00 p.m. curfew set by parents for their 14-year-old seems reasonable to me, and if the 14-year-old replied, "Aw, mom! Aw, dad! Make it at least 11:00 or 11:30, huh?" then I'd say the kid was guilty of using the fallacy of not drawing the line. Similarly, if the kid was 18 instead of 14, then I'd say the parents were guilty of the fallacy. But 14-year-olds might disagree with me in the first case, and parents might disagree with me in the second case. In other words, we would not agree on whether or not the place the line was drawn was reasonable. It would be interesting to see what kinds of examples your students can come up with to illustrate this kind of reasoning.

Sec. 3.7 answers:

1. Not drawing the line. **2.** Either-or, and SIP. **3.** None. **4.** This is probably rationalization. It is also assumption contrary to fact if, in reality, his teachers did not treat the speaker the same as the other kids. **5.** None. (Not the either-or fallacy, since there do not appear to be other reasonable choices available to the student.) **6.** Not drawing the line. **7.** Either-or, since there are other reasonable choices between being "really strict" and letting the kids "run all over you." Ask your students whether or not this is also SIP. [It

isn't. The speaker is saying, "We know for sure what will happen if we're not really strict. We don't know for sure what will happen if we are really strict. (But at least we have the chance that it'll be something better.)"]

Sec. 3.8 comments:

Your students will probably find the sophistical formula fallacy the easiest one to recognize, even if they can't always remember the name. ("I can't remember what it's called, but—you know—it's that one where some old saying is quoted to shut the other guy up.")

In a way, the sophistical formula fallacy is like the "whole to part" fallacy. Both take a thing which is meant to apply generally and then try to apply this truth to specific individuals. I think the sophistical formula fallacy is a worse reasoning fault than the "whole to part" fallacy, however. In the "whole to part" fallacy, at least the premise —i.e., the statement that some property is true of the whole thing—is usually true. But it appears that sophistical formulas, although they might look good at first glance, are as often false as true. (In Examples 1, see items a and b, items c and d. And, of course, the sophistical formula in opposition to Example le is, "Beware of Greeks bearing gifts." Incidentally, this last one was omitted from the text because it would sound like some kind of prejudice against Greeks if the students didn't know how the saying originated, and I didn't think that most of them would be familiar with the story of the Trojan horse.) In other words, I object particularly to the sophistical formula fallacy because it uses something which sounds good (but is false) to prove a point. It seems to me to be more deliberately deceitful than most other reasoning fallacies.

Sec. 3.8 answers:

1-2. Sophistical formula. **3.** Use of sophistical formula by both speakers. Use of rationalization by the second. **4.** First speaker: Part to whole or PSI (I'm not sure which) for the first two sentences. PSI for the first three sentences. Part to whole for sentences 1, 2, and 4. Second speaker: Sophistical formula. **5.** Sophistical formula by Ekland.

Sec. 3.9 comments:

The name non sequitur is so widely used for this kind of fallacy (even on TV once in a while) that I decided to use it, too, rather than think up a simpler name. As stated in the second sentence of this section, non sequitur reasoning is used in practically every reasoning error we've studied. Stress this to your students. Otherwise, they're likely to get the idea that other reasoning fallacies do not also use non sequitur reasoning. (You know the strange ideas kids get.)

When you discuss Example 2 with your class, ask why it is unlikely that the speaker can run the 200-meter race in 24 seconds if he took 12 seconds for the 100-meter race. In a situation like this, some people automatically try to apply simple arithmetic without considering the human factor. An answer from your students such as, "Maybe he won't run as well tomorrow as he did today," is true but does not explain why the example shows "part to whole" reasoning. In other words, an answer like this shows that the students are still trying to multiply both 100 and 12 by 2 to get answers of 200 and 24. If they don't come up with the answer, ask them something extreme, like, "Suppose you can walk 4 miles in an hour. Now suppose you start out right now for a walking trip of 1000 miles. Would you finish the trip 250 hours from now?" If they answer yes, ask them what they're going to do for food and rest during the 10½ days. Eventually, they should realize that going at top speed for one distance does not mean that the same speed can be maintained for a longer distance.

Sec. 3.9 answers:

1. First, it is possible that the 23-year-olds were taught (and learned) more arithmetic in school than the 17-year-olds and have not learned any arithmetic since being out of school. Second, even if the 23-year-olds know more now than they did in school, it does not follow that the amount they learned since leaving school outweighs the amount they learned while in school. **2. a.** Two things are wrong here. First, the slave-owners may have lied about the way they treated their slaves. (After all, many people will not admit that they have been unfair.) Second, what the slave-owner considered to be "fair treatment" may not be considered as such by us. (The slave-owner may have thought it fair to insist only upon 18-hour work days and to beat each slave only once a day.) **b.** Even if the slave-owners interviewed told the truth and we agreed that the 80% did, in fact, treat their slaves fairly, the other 20% may have owned most of the slaves. **3.** None. (There is no argument here. The speaker is simply expressing an opinion and has made no attempt to back it up.) **4.** PFFC **5.** PSI **6.** FAC **7.** None. **8.** Whole to part. (Make sure your students realize that "Mueller" is a German

name.) **9-11.** Non sequitur. **12.** Non sequitur. (An average of 88 for the "B" and 0 for the goofing off is a semester average of 44, which is certainly not passing.)

Sec. 3.10 comments:

Academic detachment (fence-sitting) is good up to a point, for it allows us to see both sides of a question unemotionally. But it becomes a fallacy when a situation calls for a decision and when, after getting all the information needed for a reasonable decision, we refuse to make a decision. Again, it is nice to be able to remain neutral, to be able to be objective and unemotional, to be able to see that both sides have good points and bad points. But when a decision is required, we can no longer sit back and pretend a decision is not required. We must decide which side has the greater weight of evidence in favor of its position.

Faulty analogy is a fallacy which is exactly what the name says. We know that faults can be found in any analogy, since an analogy compares similarities between two different things. But stress to your students that the question is whether or not these faults are enough to make the analogy inappropriate for its intended purpose. For example, the analogy used in the footnote in this section is imperfect, since the steps taken backwards may not be the same size as the steps taken forward, but a -3 on the number line is the same distance from 0 as a +3 is. Despite this imperfection, however, the two situations are similar enough to make the analogy appropriate.

If your students need more examples of the difference between faking a connection (FAC) and faulty analogy (FA), you could give them some of these:

(1) Like a cat, a dog is an animal. So,
FAC: a dog is a cat.
FA: like a cat, a dog meows.

(2) Like bananas, carrots are long. So,
FAC: carrots are bananas.
FA: like bananas, carrots grow on trees.

(3) Like TV, radio can be entertaining. And like TV, radio can be educational. And like TV, radio can have offensive commercials. And like TV, radio has news programs. So,
FAC: radio and TV are the same thing.
FA: like TV, radio shows movies.

If your students are weak in recognizing analogies, you might like to give them problems from *Reasoning by Analogy,* one of the booklets in the Inductive Thinking Skills series published by Midwest Publications Co., Inc.

Sec. 3.10 answers:

1. Inconceivability. **2.** This sounds to me like fence-sitting, but the students might be able to talk me out of it. **3.** None. **4.** Academic detachment (fence-sitting). **5.** Faulty analogy. **6.** Faulty analogy and sophistical formula. **7.** Academic detachment (fence-sitting).

Sec. 3.11 answers:

1. Few slaves were taught to read and write. Those who were so taught were sometimes treated almost as family members rather than as slaves. Since their experiences were not representative of the experiences of the great majority of slaves, the conclusion is unwarranted. **2.** Either-or. (Either we keep using this approach, or we think of a whole new deal. The reasoner overlooks the possibility of using some of the present ideas in the new approach.) **3.** Academic detachment (fence-sitting). **4.** PFFC. (Notice that the argument happens to be valid.) **5.** Avoiding the question. **6.** None. **7.** Non sequitur. The fact that Governor Y claims to be a Christian does not imply that he should talk to X's mother about a stay of execution. (We might feel differently if he had not already become so familiar with the case or if X's mother said she had new evidence to offer.) **8.** Substitution of converse of proposition for the proposition. **9.** None. **10.** Rationalization. **11.** Special pleading. (Ask your students why this is special pleading.) **12.** Avoiding the question by both X and Y. **13.** Non sequitur. **14.** Either-or reasoning by the husband. ("Either I fill it too full, or I don't do it at all.") **15.** Part to whole. (The author may write in an interesting way and yet be personally dull. Also, the author may not practice what he or she advocates in the book.) **16.** Substitution of converse or inverse of proposition for the proposition. "Poverty causes crime" can be symbolized as $P \rightarrow C$. The sentence can be proved false only by showing that there is poverty without crime, but the speaker has not done this. Instead the speaker has shown that there is crime without poverty. In other words, both $C \rightarrow P$ and $\sim P \rightarrow \sim C$—the converse and inverse of the proposition—have been proved false. (Accept either SCP or SIP from your students on this one. I can't tell from what's given just which way the speaker was thinking. I got SIP the first time I did it, SCP the next, SIP the third time, and SCP the fourth time.) **17.** Non sequitur. Being under tight security but out of prison surely beats

being under tight security while in prison. So the conclusion (A's first statement) does not follow. Speaker A also partly avoided the question. His conclusion involved "many ways," but his premise mentioned only one way (and we disagree even with that one way mentioned). **18.** Special pleading. The speaker thinks other people should change their ways to improve their health, but he shouldn't change his own ways to improve his own health. (Make sure your students know that gross obesity causes many health problems. Otherwise, they won't understand this answer.) **19.** Faking a connection. **20.** Circular reasoning. **21.** Avoiding the question. ("We sure need to do something" does not imply that the speaker favors a math exit test.) **22.** Whole to part. **23.** "Proof" by selected instances. **24.** Assumption contrary to fact. **25.** False cause. The context makes it clear that the speaker suspects that wearing or not wearing the blue slacks causes the team to win or lose. **26.** None. **27.** Whole to part. **28.** "Proof" by failure to find a counterexample. **29.** None. **30.** Circular reasoning. (Victory by definition. Each time B disagrees, A tightens up the definition a little.) **31.** "Proof" by selected instances. **32.** Avoiding the question. **33.** Faulty analogy. **34.** Part to whole. ("I can't understand the first page, so I won't be able to understand the book as a whole.") **35.** Assumption contrary to fact. **36.** Part to whole. **37.** Academic detachment (fence-sitting). **38.** Inconceivability. **39.** Not drawing the line. **40.** Either-or. **41.** Not drawing the line. **42.** Assumption contrary to fact, sophistical formula, and probably rationalization. **43.** False cause (first two sentences) and assumption contrary to fact (last sentence), and probably rationalization. **44.** Faulty analogy. **45.** Whole to part. (On the whole, jogging is good for people. But there are individual exceptions, such as Edwards, people with broken legs, and people with mononucleosis.) **46.** Part to whole. **47.** Academic detachment (fence-sitting). (The important point here is that both parties agree that religious training is important. If they were indifferent about it, or if they were against it, then their decision would not be faulty reasoning. As it is, however, a decision is called for and they have refused to make it.) **48.** Substitution of inverse of a proposition for the proposition. **49.** Avoiding the question by all five of the answerers. C's answer is probably also using inconceivability, but that would depend on why he thinks it wouldn't work at his job. **50.** None. **51.** Academic detachment (fence-sitting). **52.** Assumption contrary to fact for both statements. The second statement says, "I'm now a better person that I'd have been if I'd won," or, "If I'd won, I wouldn't be as good a person as I am." And the first statement (taking the second into account) says, "If I'd won, I would be as good a person as I am." (Ask your students if they think the athlete's two statements are inconsistent with each other.)

CHAPTER 4

General Comments:

Your students may have the idea that techniques of propaganda and argument are somehow sneaky and that they fall into the "dirty tricks" category. Although some techniques do (ad hominem, for example), many (perhaps even most) do not. After all, it makes good sense to try to convince someone that he wants what you are selling (an idea, a product, a service, whatever) instead of just saying, "I think so-and-so. Do you agree?" Stress to your students that we teach them about these techniques not with the idea that such devices are necessarily bad, but simply so that the students will watch for them and thus be more likely to judge arguments on their basic merits rather than by the clever ways they may be presented.

Throughout this chapter, look for reasoning errors as well as techniques of propaganda and argument. Encourage discussion of all problems, for your students may often see reasoning errors or techniques not included in my answers. As long as the students can back up what they're saying, their answers should be accepted.

Sec. 4.1 comments:

This section is a review of the propaganda techniques discussed in CTB1. It also tells the students that propaganda techniques and techniques of argument are the same thing.

Sec. 4.1 answers:

1. Bargain. **2.** Just plain folks. **3.** Exigency. (Notice that at a price of $250, it is definitely not "bargain.") **4.** Glittering generalities. **5.** Flag-waving, name-calling, emotionally loaded. **6.** Bandwagon. **7.** Repetition (old favorites, oldies-but-goodies, songs of

your younger days, bring back memories, recall former times, reminisce). **8.** Oversimplifying. **9.** Name-calling (and emotionally loaded words). **10.** Card-stacking and glittering generalities. **11.** Snob. **12.** Free. **13.** Transfer. **14.** Testimonial. **15.** Innuendo.

Sec. 4.2 comments:

The students will probably appreciate the first example in this section, since they will recognize it as a technique they themselves often use.

When "red herring" takes the form of disproving a minor point, the speaker generally attacks this minor point with the thought of convincing the audience that the argument as a whole can be discounted, since the minor point has been proved wrong. This kind of attack generally takes one of two routes: (1) in a complex plan, it takes one or more minor points and argues that they are unworkable and thus the basic plan is unworkable; or (2) for a plan in which not every detail has been worked out, the attack is on one or more of the omitted details and the claim is then made that these details present complications which make the basic plan unworkable.

In some cases, the claim made in case (2) is valid, of course, and the attack is then not "red herring," since it turns out to be, indeed, an attack on the basic plan. For example, someone might say, "I have the answer to the teacher surplus. Simply close all the education colleges for ten years. Then as present teachers leave teaching, the new teachers who can't get jobs now will replace them, and we won't have more new teachers who can't get jobs." Two obvious "details" which this plan doesn't consider are: (1) There are still shortages of teachers in some fields. Closing all education colleges would make the situation even worse. (2) What about the people who graduated, say, five or more years ago? By this time, most have jobs in other fields which they like, and it is doubtful that they would leave these jobs to go into teaching. The fact that there is a surplus of teachers for a number of years does not mean that all of these people are still available for teaching positions.

The students may object to the third example in this section, "But if last year's conclusions were wrong, maybe Famous was just as careless about this year's conclusions, too." True. Maybe they were. But each year's conclusions should be judged on their own merits. We cannot automatically assume that this year's conclusions are invalid simply because last year's were. If the speaker had omitted his or her last statement and said instead, "I think we ought to investigate this year's conclusions before we decide they are valid," then the argument would not be "red herring."

Incidentally, if the students do bring up the objection above to Example 3, it is a good opportunity for a discussion with them about reputations. ("You're saying, then, that the wrong conclusions last year more or less makes you doubt this year's conclusions, too? You're not quite as ready to trust them as you would be if their conclusions had always stood up to inspection? Is it that way with people, too? I mean, if you find out that someone lied to you about something, are you more on your guard about other things they tell you? If someone has a reputation for stealing, do you kind of automatically wonder if you can trust that person not to steal from you, too? Suppose you know someone who was told a secret once and then spread it all around? Are you going to tell that person a secret you don't want known generally? What are some other examples of how a person's reputation affects the way other people feel about him or her?")

Sec. 4.2 answers:

1. "Red herring" (via disproving a minor point). **2.** "Red herring" and avoiding the question. **3.** "Red herring" and non sequitur. (The Christmas spirit does not imply the outer trappings of Christmas which the speaker is attacking.) **4.** "Red herring." **5.** "Red herring" and avoiding the question. **6.** First, the fact that she might be kind, good, and compassionate has nothing to do with whether or not she was, in fact, guilty of the possession of deadly weapons. Second, the fact that she might be very kind to animals has no bearing on whether or not she regards human beings with the same kindness.

Sec. 4.3 comments:

As implied here, ad hominem is a form of "red herring." To say something like, "My opponent is mistaken in his argument, because . . .," and go on to list points against the argument is not an ad hominem argument.

An ad hominem argument can include other reasoning errors, as well as propaganda techniques. Examples 1 and 2 both use innuendo. Example 3 uses non sequitur reasoning. (A teacher may be successful with large classes and believe he or she would have been even more successful with small classes.)

Ask the students to watch for and bring to class examples of the techniques discussed in this chapter. They probably encounter many ex-

amples of "red herring" and ad hominem in their daily lives and, as they start to look for examples of these and other techniques, you should be able to get a good-sized file of examples built up.

Sec. 4.3 answers:

1. Ad hominem. **2.** Ad hominem and "whole to part" reasoning. **3.** Ad hominem and "red herring." **4.** None. **5.** Ad hominem and "either-or" reasoning. **6. (1)** The critics couldn't do what the rock band does, so they shouldn't criticize the rock band. **(2)** Sure. They're supposed to know how to make the repairs and to do it. When they don't do what they lead you to believe they've done, there is cause for complaint. **(3)** You don't claim to know how to repair your refrigerator. (Chances are you wouldn't have called the repair service if you thought you could do it yourself.) But the repair service does claim to know how to repair it. The argument would be good only if neither you nor the repair service claimed to know how to repair it, or if you also had claimed you knew how, tried it, and weren't able to do it. (The friend's argument is also a form of ad hominem.) **(4)** It's the same argument. The rock band, by getting up on the stage and playing, are saying that they are good enough to do it, and thus they open themselves to criticism. The critics are not claiming they (the critics themselves) are good enough to do it. They are simply saying that the rock band isn't good enough, either. **(5)** The question was whether or not the critics were, in fact, unfair to the rock band. Instead of sticking with this question, the singer attacked the critics. In other words, the singer attacked the critics themselves rather than the critics' arguments. **(6)** Examples abound, and answers will vary. For instance, an auto mechanic who doesn't fix your car; a typist who makes numerous typing errors; an accountant who can't balance the books; a singer who sings off-key.

Sec. 4.4 comments:

This is a much used technique of argument. (I don't recall having seen it discussed in other books, so I don't know whether or not it has a standard name.) "How come I punched you in the eye? You should be glad I didn't break your nose." "How come I didn't finish the homework? You should be glad I did any of it at all." "How come I drank too much at the party tonight? You're lucky I don't come home drunk every night like some of the other guys I know." "How come I was drinking beer in the school parking lot during lunch hour? At least I'm not on dope like a lot of the other kids are."

We see that the "other things are worse" technique is a way of avoiding the question and is also, of course, a form of "red herring." The fact that other things may be worse has no bearing whatsoever on whether or not the questioned action is justified, but it is often an effective way to divert the argument and, in some cases, stop it completely.

Sec. 4.4 answers:

1. "Other things are worse," avoiding the question, and either-or reasoning. **2.** "Other things are worse." **3.** "Other things are worse" and rationalization. **4.** Either-or reasoning. **5.** "Other things are worse." **6.** "Other things are worse." **7. (1)** a, b, c, h **(2)** Yes, as far as the mayor's statements went. This is evidenced by "And they are" in the first paragraph and by the lack of denial ("proof" by failure to find a counterexample on my part, but I think the editor would have said so if he'd disagreed) in the last paragraph. **(3)** It was to point out that, although some improvements have been made, there are many other problems to cope with, and we shouldn't think everything is rosy just because some things look good. **(4)** In the last paragraph. In effect, the mayor was saying that Big City is in good shape because other cities (the four named) have problems that Big City doesn't have.

Sec. 4.5 comments:

As shown in the many examples given, the use of authority can take many forms, some of which do, in fact, stregthen the argument and some of which just sound good (but don't really do anything for the argument itself).

The sound of authority (as in Example a) is a useful catch-all to describe someone who sounds like he or she knows what's going on but doesn't use any of the other "use of authority" methods. Stress to your students that the sound of authority can include the statement of opinion as though it were fact. For example, "I think that never before in history have teenagers been so pampered," is not the use of authority. But, "Never before in history have teenagers been so pampered," is the use of authority, simply because it sounds as though the speaker has good reason to believe what she or he says. (Section 7.4 is devoted to distinguishing between fact and opinion.)

Section 4.5 answers:

1. Use of authority. **2.** Use of authority and

inconceivability. **3.** Use of authority and non sequitur reasoning. (There is possibly a faulty analogy here, too, depending on various factors about the companies researched and the speaker's company.) **4.** Use of authority. **5.** Use of authority. (Possibly non sequitur reasoning, depending on the topic.) **6.** Use of authority and exigency. (Possibly either-or reasoning, depending on the circumstances.)

Sec. 4.6 comments:

At this point, you may want to return to sections 1.2 and 1.3 for a brief review of emotionally loaded words and words which can be used for different shades of meaning.

After going through the examples in this section with your students, go back and ask them to put the examples into two categories—those which use emotionally loaded words, and those which do not. Point out to them that an emotional appeal does not necessarily use emotionally loaded words.

Stress the ideas in the last paragraph of this section. It makes a lot more sense to make an emotional appeal on some issues that to appeal on the basis of logic. For example, it would be a lot harder to have an abused child moved from a cruel home if we said, "This child's parents are treating him badly and he should be taken away from them," than if we described how the child had been tortured with cigaret burns and has been beaten so badly that hospitalization has been required seven times.

Sec. 4.6 answers:

1. Emotional appeal. **2.** Emotional appeal and non sequitur reasoning. **3.** Emotional appeal and either-or reasoning. **4.** Emotional appeal. **5.** Emotional appeal (name-calling). **6.** Emotional appeal and innuendo.

Sec. 4.7 comments:

The appeal to radicalism is usually made in one of two ways, both of which appeal to us to make a change: (1) The old ways are no good. Throw them away completely, and try this new idea. (Notice this is a form of either-or reasoning—either throw everything out and try this new way, or keep everything the way it is. No compromises are suggested.) (2) Try this new idea just because it is new.

The appeal to conservatism takes the opposite approaches: (1) New ideas are no good. Ignore them completely and stick with the old ways. (This, too, is a form of either-or reasoning, with no compromises suggested.) (2) Keep this idea just because it has been used before.

Neither appeal is necessarily bad. There are times when we should support radical changes, and there are times when we should support sticking with the old ways. More often, however, are the times we should be moderate—i.e., look carefully at the old ways and the new ideas, and take some of each to make a good, workable solution. In other words, the fact that one side supports a radical change and the other side supports a conservative no-change doesn't mean that we are stuck with an either-or choice. It might be possible to take the best points of each to reach a compromise which is better than either of the two extreme positions. Stress this to the students.

Sec. 4.7 answers:

1. Appeal to radicalism. **2.** None. **3.** A mild appeal to radicalism. (Let's do it just because it's new.) **4.** Appeal to conservatism. **5.** Appeal to conservatism, and a little "red herring."

Sec. 4.8 comments:

Moreso than in the problems for the other sections, this section's problems tend to illustrate combinations of propaganda techniques and reasoning errors. Again, the students may find techniques or errors which I missed, and their answers should be accepted if they can back them up.

It would probably be a good idea to save some of these exercises for review each week or two while the class is studying other sections. When you are through with them for the time being, try going back to the problems in each section of this chapter to see if the students can find other techniques or reasoning errors not caught the first time around. (It is possible that a problem in an earlier section has a technique not discussed until a later section.)

Again, ask your students to watch for examples of techniques of propaganda and argument outside of your classroom. Good sources are newspaper and magazine articles and letters to the editors; advertising; political speeches, especially campaign rhetoric; TV programs; family arguments; incidents in other classrooms; incidents with friends. Scattered throughout the rest of this book will be questions about propaganda techniques and reasoning errors, and the students will recognize them much more easily if they are in the habit of looking for examples in their own lives.

Sec. 4.8 answers:

1. "Other things are worse" and avoiding the question. **2.** First sentence, part to whole reasoning; second sentence, assumption contrary to fact; third sentence, emotional appeal, either-or reasoning, and false cause reasoning. **3.** Student: emotional appeal and bandwagon (and probably "proof" by selected instances, since it is doubtful that everyone in the class is as excited about the game as the speaker is). Teacher: use of authority, either-or reasoning, and "other things are worse." **4.** Ad hominem. **5.** Exigency. **6.** Apparently the writer's main point is that Senator M can't be much of a senator. With this in mind, then, the writer has used ad hominem, innuendo, "red herring," and emotional appeal. **7.** "Snob," "bargain," and exigency. **8.** Glittering generalities. **9.** Use of authority, emotional appeal, repetition, glittering generalities. **10.** Bargain, glittering generalities, exigency. **11.** Bargain, snob, glittering generalities, emotional appeal. **12.** Emotional appeal. **13.** Either-or reasoning, use of authority, flag-waving, emotional appeal, appeal to radicalism, glittering generalities. **14.** Glittering generalities, just plain folks, use of authority, emotional appeal, non sequitur. **15.** The initial letter was a combination of "free," emotional appeal, and glittering generalities. It turned out not to deliver what it promised, however, and so was misleading. (Midstate's attorney general issued a cease-and-desist order after receiving citizens' complaints.) **16.** Ad hominem, appeal to conservatism. **17.** Steve: ad hominem and "red herring." Tom: circular reasoning (via "victory by definition"). **18.** Harriett: circular reasoning. **19.** Emotional appeal, whole to part reasoning. **20.** Use of authority, circular reasoning. **21.** Emotional appeal, appeal to conservatism. **22.** Not drawing the line, "red herring," and a touch of ad hominem. **23.** Use of authority, exigency, either-or reasoning, emotional appeal (flag-waving). **24.** Repetition, "other things are worse," appeal to radicalism, emotional appeal, either-or reasoning, "red herring." **25.** Circular reasoning by Horner. (Point out that Horner and Tyler are using different definitions of what "a good teacher" is. Horner is using "victory by definition," a form of circular reasoning.) **26. (1)** Answers will vary. My guess is that she would find some other reason to be allowed to smoke there. **(2)** I do. **(3)** Avoiding the question by the use of "red herring" is one error contained in the letter. (She avoids the question of her own offense — smoking—by attacking others who offend her.) She also uses a form of "other things are worse." (She doesn't say or imply that these other offenders are the very people whom she herself offends, but she says, in effect, "Be glad that smoking is all I do to offend you. I could be like these other people, to whom you don't seem to object at all." In this respect, she also uses a form of "proof" by failure to find a counter-example by assuming that the people who object to her smoking must not object to these other offenses, too, simply because they didn't mention them.) **27. (1)** Against. By saying that this would take Midstate "back to the minus 20th century," he is saying that such a law would be an undesirable step backward. (Also see the answer to (2) here.) **(2)** Against. By saying "such people" and "these people" and "you who support," he is implying that he is not one of them. Also, by including these paragraphs in his letter against capital punishment, he implies he is also against the laws cited in these paragraphs. **(3)** An appeal to radicalism often says, "The old ways are no good just because they're old!" In effect, this is one of Mr. X's arguments against capital punishment. **(4)** Mr. X's main point here is that Midstate should not bring back capital punishment. But instead of arguing this, he argues that the law code which included this also included punishments we (presumably) would not want reinstated. He throws us off the track of the capital punishment argument by arguing against other laws. **(5)** Laws we would not want now were part of the law code 4,000 years ago. Capital punishment was part of the law code of 4,000 years ago. Therefore, capital punishment is a law we would not want now. **(6)** We would not want to adopt the entire code of laws of 4,000 years ago. Therefore, we would not want to adopt any individual law (capital punishment) of 4,000 years ago.

CHAPTER 5

General comments:

Although this chapter is one of the shortest in the book, the students may take longer to complete it than most of the other chapters. Allow as much time as they need to thresh things out. The decisions will be quite difficult for most of them, and they may get discouraged. Furthermore, they may reach the point where

they are simply unable to think clearly enough to make the decisions required. If this happens, you might consider abandoning the chapter for a week or so and then returning to it when the students' thinking has cleared up a little.

It was with this possibility in mind that the second logic chapter was placed after this one. The answers there are less subject to interpretation and argument (and so are easier on the thinking processes) than the answers here, and the security of pretty well knowing what the answers are should help restore the students' self-confidence. You can then interrupt that chapter for a day or two at a time to return to this one and tackle another problem in it.

Because it is felt that the students will probably reach the saturation point before all the problems are done, and because each section automatically reviews the previous section(s), there is no Chapter Review section for this chapter.

Section 5.1 comments:

For this section, we return to nit-picking. (Tell the students this.) The students will probably go through these problems rather rapidly.

Section 5.1 answers:

1. (1) No. **(2)** Yes. **(3)** No. (She could have been approaching from the side.) **(4)** No. **(5)** No. (Jane might have been standing still.) **2. (1)- (3)** Yes. **(4)** No. ("Small" simply indicates smaller than average. It may have been compact, subcompact, or minicompact.) **(5)-(7)** No. **(8)** No. (The driver may have been flustered and jerked the wheel in the direction of the child instead of away from the child.) **(9)** Yes. (The child "had run out . . . in front of the car," which was in the path of the car.) **(10)** Yes. **3. (1)** Yes. **(2)** No. **(3)** No. (Margaret may have been walking or skating backwards.) **4. (1)-(3)** Yes. **(4)-(7)** No. **(8)** Yes. **5. (1)** ?. Maybe he has four teenagers who use the car all the time. **(2)** ?. Maybe the car is only a month old. Maybe it gets poor gas mileage. **(3)** ?. Maybe he uses it mostly for company business, and the company pays for the gas. **(4)** ?. Maybe it has a very small gas tank. **(5)** ?. Maybe the car is driven 2,000 miles a week. **(6)** ?. We are not told that he fills the tank only four times a week. Your students may not understand this answer at first and they may want to vote "F" on this one. Ask them why they want "F" on it. Chances are they'll answer something like, "It only says that he fills it four times a week." You ask, "Does it say he fills it only four times a week?" It does not, of course, say this. If they say yes, then ask them to show where it says that. To help them accept this kind of reasoning, draw a five-pointed star on the board. Ask them if the star has a point. When they agree, then ask if it has two points. And so on. **(7)** T. **6. (1)-(2)** T. **(3)** T. Even if Towers believes that Midstate was moving sideways, this is still the "wrong" direction. **(4)** ?. (To "re-establish priorities" could mean exactly that—to reaffirm that priorities which already exist are good ones.) **(5)-(6)** T. **(7)** ?. **(8)** ?. (The statement in the story can be symbolized as PI $\rightarrow$ LS. The statement in this problem can be symbolized as $\sim$PI $\rightarrow$ $\sim$LS, which is the inverse of the statement in the story. Accuse your students of substituting the inverse of a proposition for the proposition if they voted "T" on this one.) **(9)** F. **(10)** T. **(11)** ?. **(12)** T. **(13)** T. (This is true because of the last sentence, not because of the third sentence.) **(14)** F. (Again, this is false because of the last sentence, not because of the third sentence.) **7. (1)** T. **(2)** F. (Humans can hear sounds softer than a whisper, and this should be common knowledge.) **(3)** F. **(4)** T, per the last sentence. **(5)** ?, on the basis of the paragraphs, since we don't know what the author means by "prolonged." In fact, however, there seems to be evidence which indicates that the statement is false when the daily sessions run over several months. **(6)** ? until we define "noisy." If we define it as being 60 decibels or more, then it is true; otherwise, it is still ?. Note: If your students are unusually sharp, they may argue the statement is ? regardless of definition, using the following reasoning: "The second paragraph says that 'prolonged exposure . . . usually makes people irritable.' It is unclear as to whether 'usually' is meant as 'all people most of the time' or 'most people all of the time' or 'most people most of the time.' If 'all people most of the time' is not meant, then we cannot say whether or not any particular person who works in a noisy place is likely to be crabby at the end of the day." **8. (1)** ?. The given sentence tells us what happens if you do watch it every day, but it doesn't say what happens if you don't watch it every day. **(2)** T. You were told to assume that you are one of the people affected by regular TV watching. **(3)** ?. The given sentence doesn't say what happens unless you watch it for more than 2 hours a day. **(4)** T. Same reason as (2) above. **(5)** ?, for the same reason as (3) above. **(6)** ?. This statement has nothing to do with the given sentence.

Section 5.2 comments:

It is here that you can expect the students to run into trouble. Expect them to challenge each other with comments like, "You said PT. How do you know whether it's more likely than not? How do you know what could be going on that you're not told about in the story?" I don't have decent answers to these questions. I make my own judgments based on my past experiences and observations. But different people have different experiences, and even people with practically the same experiences may observe them differently. As usual, then, my answers are certainly not infallible, and it is reasonable to assume that the students, having had less experience (and different experiences and observations), will disagree with some of my answers.

The important thing, however, is to keep hounding them with insistence that they distinguish between something which is merely a possibility and something which is more likely than not. They will have a tendency to use the reasoning fallacy of "not drawing the line"—i.e., they will be willing to discuss all kinds of possibilities and will be unwilling to decide on even the most obvious "probably true" or "probably false" statement. Here is an example of the kind of thing you may run into.

Example 1:

There was a steady stream of traffic going through the light. The light changed color. The traffic came to a halt. (1) The light facing the halted traffic had turned yellow or red. Now to me, that one obviously has an answer of "probably true." But the students may come up with something like this: "Maybe there was a traffic accident just then and it blocked all the traffic. That happens a lot." "Or maybe a mother duck and her ducklings decided to cross the street just then." "Or maybe all the drivers were color blind." "Or maybe some catastrophe was announced on the radio just then and everyone stopped to listen to it." "So if the light didn't turn yellow or red, how come all the traffic was going through it before it turned color, and then the traffic stopped after it turned color?" "Maybe the sun was in everybody's eyes and they thought it was a green light when it was really red." "Or maybe it's a whole city full of color-blind people." "Or maybe the traffic which had been moving through it was a funeral procession."

Anyhow, you get the idea. They will maintain that you can't say the light probably turned yellow or red when there are so many other possible reasons for the traffic to stop. It is up to you to convince them that even if they combine all of the other possibilities into one big possibility, the most likely explanation for the halted traffic is that the light turned yellow or red. Under these circumstances, "most likely" means "probable," since we said we would combine all other possibilities and weigh them against the one possibility that the light turned yellow or red.

But "most likely" does not always mean "probable," as is shown by this example:

Example 2:

You have 31 socks in a drawer. 10 are white, 10 are black, and 11 are green. You take out one sock without looking to see what you're getting. (1) The sock is green. We may agree here that green is the color you will most likely get, since there are more green socks than white or black socks, but the answer here is PF, not PT. This is because there are 20 socks which are not green and only 11 which are green, so you will probably pull out one of the 20 rather than one of the 11.

Go over the Example in this section rather carefully with the class before starting on the problems. Once they start on the problems, be patient. Again, let them thresh things out themselves, but keep bugging them to make appropriate decisions when they use "not drawing the line" (and tell them you think they're using "not drawing the line").

Sec. 5.2 answers:

1. (1)-(2) AT. **(3)** PT. (I could be talked into "?" on this one, since the biography is so brief that we can't really tell whether or not the author would have mentioned this if Galois had been noted for such work.) **(4)** AF. **(5)** ?. **(6)** PT. **(7)** AT. **(8)** ?. **(9)** AT. (Most people find third year algebra hard to understand, let alone the graduate level of mathematics in college.) **(10)** AT. **2. (1)-(2)** ?. **(3)** PF. **(4)** ?. **(5)** PT. **(6)** PF. **(7)** PF. (I could be talked into "?" on this one, I think.) **(8)** PT. **3. (1)** AT. **(2)** ?. (The Court might have decided that the games were both an educational activity and a commercial amusement and, since the tax applied to commercial amusements, said the tax applied.) **(3)** PT. (We don't know for sure whether or not the college was making money on the games, but it is more likely than not that the legal definition of "commercial amusement" included the idea of profit on the activity and that the college was making money on the games.) **(4)** PF. (If the Court were going to base its decision on this kind of reasoning,

there'd have been no point in taking it to the Court in the first place.) **(5)** PF. (Since so many people regard it as an amusement, it would be rather foolish to claim it wasn't. The fact that they claimed it was not a commercial amusement does not imply that also claimed it wasn't any kind of amusement at all.) **(6)** AF. **(7)** PF. (The IRS does not usually operate this way.) **(8)** PT. (I've never heard of such a tax on educational activities, but there may have been. The first statement in the second paragraph of the story does not imply that this answer is AT, for the tax on an educational activity may have been lower than the tax on a commercial amusement, in which case the college would try to get the lower tax rate.) **(9)** ? (The part of the decision we were told about gives no clue as to where the sympathies of the Court were.) **(10)** PF. (Once the Supreme Court has made a ruling about a point of law, it is unlikely that another case on exactly the same point would be taken to court, especially when we know that the other colleges must have been aware of the Court's ruling.) **(11)** PT. (To say "sixteen of these colleges" instead of "they" or "these colleges" hints, but doesn't guarantee, that there were more than sixteen.) **(12)** AF. **4. (1)-(3)** PF. **(4)** PT. **(5)** PF. (The probability that the statement is true is 50/203, leaving a probability of 153/203 that the statement is false.) **(6)** AT. **5. (1)** PF. **(2)** ?. **(3)** ?. (His teaching method may be to throw out challenging questions to the students and then let them figure out the answers among themselves.) **(4)** ? **(5)** PT from what we know about schools, but they may be team-teaching. **(6)** AF. (Hard to believe they don't, but we're told in section 5.1 to accept the story as true.)

Sec. 5.3 comments:

The students will probably have great difficulty in deciding when something is TBRD (true beyond a reasonable doubt) or FBRD (false beyond a reasonable doubt). It was bad enough in section 5.2 to ask them to distinguish between "?" and "PT" or "PF." Now that we will ask them to distinguish between "PT" and "TBRD" and between "PF" and "FBRD" they may become totally frustrated. If they do reach that point, it is suggested that you drop the chapter temporarily and go ahead to the next chapter for a few days. Then return to this chapter long enough to do another problem. Then go back to the next chapter. Then return to this chapter again. And so on. The breaks will give them chances to get their thinking straightened out and they are likely to do better after a break than if you just kept plugging away at it.

Because the thinking demanded here is such hard work, the students may be reluctant to return to this chapter. But they should return to it anyhow. Too many of life's decisions depend on our abilities to distinguish between "probably true (or false)" and "true (or false) beyond a reasonable doubt."

Examples:

(1) When we buy a new car, do we buy one we think we'll probably be satisfied with, or do we buy one we think will, beyond a reasonable doubt, satisfy us?

(2) When we decide to get married to someone, is it enough to think that the person will probably make a good marriage partner for us, or do we want to be sure beyond a reasonable doubt?

(3) When we buy a house to live in, do we look for one we'll like living in beyond a reasonable doubt, or do we merely look for one we'll probably like living in?

(4) Suppose we know we have to pass a test in order to graduate. And suppose we can understand the subject but have forgotten a lot. Do we study enough so we will probably pass it, or do we study enough to be sure beyond a reasonable doubt that we'll pass it?

(5) When serving as a juror in a criminal trial, do we vote "guilty" if we think the accused probably committed the crime, or do we vote "guilty" only if we are sure beyond a reasonable doubt that the accused committed the crime?

The idea, of course, is that we are required in everyday life to distinguish between "probably" and "beyond a reasonable doubt." Yes, we may make mistakes. And yes, people may disagree about what "a reasonable doubt" is in many cases. But we must be willing to try to stop using the reasoning fallacy of "not drawing the line." We must be willing to try to distinguish between a remote possibility and a reasonable doubt.

Although the students themselves use irony in their conversations, the "story" in problem 10 in this section may not be recognized by them as irony. My answer to item (1)—FBRD—is a contradiction of the story's first statement, and your students may object heartily on the grounds that "we have to accept the story as true." Ask the students if they've ever said to a friend "Great!" when they meant "Terrible!" Ask if the friend knew that "terrible," not "great," was meant. (Hopefully, the answers to both questions will be

yes.) Ask if the one who said "great" thought he was lying when he said it. (No.) How come? (Because he took for granted that his friend would know he meant the opposite.) Explain that ironic writing is the same way. Statements which are the opposite of what is meant are made, and the writer takes for granted that the reader will recognize this from what else is said.

Sec. 5.3 answers:

1. AT and AF; TBRD and FBRD; PT and PF;?. **2-3.** F. **4.** T. **5.** No. Beyond a reasonable doubt, the office was not open at 11:00 p.m. or 11:30 p.m. The answer of "any time" meant "any time we are open to the public," which was probably from about 8 a.m. or 9 a.m. to somewhere between 4 p.m. and 6 p.m. **6. (1)** FBRD. **(2)** TBRD. **7. (1)** TBRD. **(2)** PT. **(3)** AT. **(4)** PF, but I could be talked into FBRD on this one. **(5)** ?, because we're using an assumption contrary to fact. As it stands, the sentence is really true, since the "if" part is false. But the intent of the statement here is to say, "Suppose for the sake of argument that the woman had appeared on her April court date. Then . . .." **(6)-(7)** TBRD. **(8)** ?. (We know what she said, but was she telling the truth?) **(9)** PT, but I could be talked into ? on this one. **(10)** AT. **(11)** TBRD. **(12.)** PT. (We go by the nature of the judge's comments in the fourth and last paragraphs.) **(13)-(14)** AT. **(15)** FBRD. **(16)** PT, but I might be talked into TBRD. **(17)** AF.**(18)** TBRD. (She may have been lying about the way the police treated her. But since her other words indicated anger, it is very doubtful she would lie (in favor of the police) about the way she was treated by the police.) **(19)** TBRD. (I'm judging from what he said and the way he said it.) **(20)** PF. (Such an order is usually executed immediately.) **8. (1)** FBRD. (Maybe Ms. White marked on a class curve for the 79% test and Bill got an A on that one. A student can get an A on one test and still be considered to be "a very poor student all semester.") **(2)** FBRD. **(3)** TBRD. (We know he ignored her suggestions, but maybe he came in once on his own.) **(4)** FBRD. (Otherwise, why would he score so poorly on the new final exam?) **(5)** PF. (Since Bill knew that Ms. White was trying to be so fair to him, it is unlikely that he wouldn't tell her if he was feeling ill. And if he did tell her, it is unlikely that she would not postpone his taking the new exam. I could be talked into FBRD.) **(6)** PT (or TBRD). **(7)** AF. **(8)** FBRD. **(9)** FBRD. (Since he picked his own day and time for the new exam and so was able to study for it, there would seem to be little reason for his forgetting the material.) **(10)** TBRD. **9. (1)** TBRD. Although we are not told that soybeans do not grow best wherever corn does not grow best (the inverse of the last statement in the paragraph), we consider the apparent purpose of the paragraph—i.e., to give us some of the more important information about soybeans. Having given us the information that soybeans grow best wherever corn does, it seems more than likely that the writer would have added "as well as in cold climates" if soybeans do, in fact, also grow at their best in cold climates. **(2)** PT. **(3)-(4)** AT. **(5)** ?. (Although we know it is used for plastic, we do not know what kinds of plastics.) **(6)** TBRD. ("Soybeans are a profitable crop" means they are a money-maker.) **(7)** TBRD. (We assume this is what the second sentence means, rather than five pounds of soybeans against one steak, for instance.) **(8)** TBRD. (See the fifth sentence.) **(9)** AT. **(10)** ?. (This is similar to item (5) above.) **(11)** PF. **(12)** ? (True, but not reasonably inferrable from the paragraph.) **(13)** ?. (Where does it get all its minerals, if not from the soil? On the other hand, when the beans are removed and the plant is plowed under, is the mineral content of the soil replenished? I don't know enough about farming to know.) **(14)** FBRD. **(15)** AT. **10. (1)-(2)** FBRD. **(3)-(6)** TBRD. **(7)-(8)** FBRD. **(9)** TBRD. **(10)** ?. (The paragraph says nothing about prescribed pot-smoking. It talks about the side effects but gives no indication of how the writer weighs these side effects against the blindness which can result from glaucoma.) **11. (1)** TBRD. **(2)** AF. **(3)** TBRD. **(4)** ?. The problem gives us no figures on total population and number of adults over 25. It is reasonable to wonder if the 1910 percentage of adults over 25 was about the same as the 1970 percentage. If the two percentages were about the same—i.e., about 55% (and this 55% has nothing to do with the 55% shown in the chart given in the problem)—then statement (4) is false. Here are approximate figures:

Year	Total Popul.	% over 25	# over 25	% of non-grad	# of non-grad
1910	91,972,000	55	50,585,000	86	43,503,000
1970	211,390,000	55	116,265,000	45	52,319,000

I realize the problem did not give the students these figures. But I didn't have them, either, when I thought of the answer to statement (4), and my answer then ("?") was the same. At that point, the students had the same information I did—i.e., the 1970 U.S. population was much larger than the 1910 U.S. population, which is

general knowledge. It was then reasonable to wonder if the larger number of people in 1970 would result in more nongraduates despite the big drop in the percentage of nongraduates. **(5)** PF. **(6)** TBRD. (Three factors of general knowledge confirm this—inflation, more population, and a higher percentage of people attending school.) **(7)** FBRD. There are several reasons: (1) On the whole, teachers today have more buying power than teachers had in 1910, so they are being paid more today than in 1910. (2) Schools today are more elaborate, so they cost more to build and maintain. (3) In 1910, many teachers were, to a large extent, also the custodians for their classrooms, whereas special custodians are hired for today's teachers. (4) Books, supplies, and supplementary materials are more extensive in today's classrooms. (5) A great many subjects are taught today which were not taught at this level in 1910—advanced math, advanced science, great varieties of English and social studies courses, a great variety of vocational education courses. (Ask your students to think of other factors.) **12. (1)** TBRD. **(2)** FBRD. **(3)** TBRD. (Notice that the critics said they "don't even teach the kids the basics.") **(4)** TBRD. (Notice the fourth statement.) **(5)** TBRD. **(6)** TBRD. (Notice the last sentence in the second paragraph.) **(7)** ?. **(8)** FBRD. (In this context, the word "schools" includes the teachers, of course.) **(9)** ?. (The fact that they obviously want them out of regular classrooms does not imply that they want them out of school. They may favor a special room or a special school for the troublemakers.) **(10)** TBRD. **(11)** PF. **(12)** TBRD. (Otherwise, why the statement that the old-time teachers were dedicated—in this context, insinuating that today's teachers are not—and why the statement that the old-time teachers "really cared about teaching the kids something"—insinuating that today's teachers do not?) **(13)** TBRD. **(14)** FBRD. **(15)** ?. (The comment that "we're stuck with them and are expected to teach them" is ambiguous. It might mean, "It is not possible to teach them under these conditions, so the graduation standards have been lowered to allow them to graduate." Or it might mean, "We're stuck with them year after year until they finally learn enough to graduate.") **13. (1)** AT. **(2)** AT. (Otherwise, Methods A and B would not have "been about evenly distributed among these . . . classes.") **(3)** AF. **(4)** TBRD. **(5)** ?. (Although this statement is generally true at a coeducational school, we have no indication that at least some of the math classes were not in an all-female school.) **(6)** AT. **(7)-(8)** AF. **(9)** AT. **(10)** FBRD. **(11)** AF. **(12)** TBRD. **(13)** PT. (I'm in some doubt about this one and can't decide which way to go. On the one hand, it's hard to imagine any one method being effective for **all** college subjects, so I lean toward PF. On the other hand, it's hard to imagine that ten college professors would agree unanimously to recommend that all college professors use the method if the method were not adaptable to all college subjects, so I lean toward TBRD.) **(14)** AF. **(15)** ?. **(16)** PT. **(17)** AF. **(18)** TBRD. **(19)** AT. **(20)** ?. **(21)** AF **(22)** AF

CHAPTER 6

General Comments:

See "General Comments" for chapter 2.

Sec. 6.1 comments:

Most students will have little or no trouble with this section. They seem intuitively to grasp whether or not a statement allows exceptions. There are, however, some kinds of statements which may cause some temporary difficulty:

(1) A tiger is a cat.
A student may object that only a tiger—i.e., a particular tiger—is meant here and give an example such as, "If I say, 'A man came to see me yesterday,' am I saying that all men came to see me yesterday? Of course not!"

(2) Tigers are cats.
The same student objects, "I can say, 'Plumbers came to my house yesterday,' but that doesn't mean I'm claiming that all the plumbers in the world showed up."

In each of the student's examples, the context clearly indicated that "all" was not meant. However, in the absence of evidence (such as context) to the contrary, we assume that "all" is meant.

(3) Birds which are not ostriches are not fast runners.
The same student again: "This can't be a universal generalization, because it makes an exception for ostriches. It isn't talking about all birds."

But it is talking about all birds which aren't ostriches, so it is a universal generalization about all of those birds.

The students may question whether a statement such as "All tigers are animals which do not fly," is positive (because "all are") or negative (because "do not fly"). The form, rather than the thought, is what determines whether the statement is positive or negative. A statement which starts with "all" is positive; a statement which starts with "no" is negative. In this case, we could express the statement in either form: "All tigers are animals which do not fly" (positive), or, "No tiger is an animal which flies" (negative). Both statements mean the same thing.

Sec. 6.1 answers:
Note for answers 1-10: Each could be expressed in the opposite form. For example, the answer to problem 1, "All teenagers are people who like pizza," could also be expressed as, "No teenager is a person who does not like pizza."
1. All teenagers are people who like pizza. **2.** All people are likers of homework. **3.** No person is someone who likes a smart aleck. **4.** All carpenters are people who work with wood. **5.** No horse is something which can fly. **6.** All birds are things which lay eggs. **7.** All people are unpredictable. **8.** No person is someone who does what you expect her or him to do. **9.** All people who are not adults are people who know what the score is. **10.** No person is someone who should go on a vacation alone. **11.** yes; positive **12.** no **13.** yes; negative **14-15.** no **16.** yes; negative **17.** no **18.** yes; positive **19.** yes; negative **20.** no

Sec. 6.2 comments:
This section mentions that "Some P are Q" and "Some P are not Q" are not negations of each other, but it puts off a discussion of negations of these statements until section 6.5, when the students will have more background and so will more readily agree on the negations of these statements.

Students will agree that an existentially quantified statement can be written as a "some" statement. (If it is true that many people are poor, then it is also true that some people are poor.) Occasionally a student will become confused, however, and think we are saying that "many people" and "some people" mean the same thing. In this case, the student thinks we are saying "many people" ≡ "some people," whereas we are saying only, "many people" → "some people," and we do not claim that "some people" → "many people."

The point of doing this, of course, is so that we will have the power to examine many arguments for validity or invalidity which would otherwise be beyond our reach. Some arguments will remain beyond our reach in this book, but by making the translations where we can, the number beyond our reach becomes much smaller.

Sec. 6.2 answers:
1. No. **2.** No. (Make sure the students realize that problem 2 is exactly the same as problem 1.) **3.** No. **4.** No. (Make sure your students realize that problems 3 and 4 are the same.) **5.** No. **6.** No. (Make sure your students realize that problems 5 and 6 are the same.) **7.** Negative. **8-9.** Positive. **10-12.** Negative. **13-14.** Positive. **15.** Negative. **16.** Positive. **17.** All people are winners. **18.** Some people are not winners. **19.** No person is a winner. **20.** Some people are not winners. **21.** All people are things which understand me. **22.** Some people are things which understand me. **23.** All people are things which do not understand me. Or: No person is someone who understands me. **24.** Some people are things which understand me. **25.** All police officers are nice. **26.** Some police officers are not nice. **27.** Some police officers are nice **28.** Some police officers are not nice.

Sec. 6.3 comments:
It is imperative that the students understand that sentences of the first two standard forms do not promise existence, and sentences of the other two standard forms do promise existence. The promise (or lack of it) of existence plays a vital part in determining whether or not certain arguments are valid.

For example: "All tigers are cats. All cats are animals. So all tigers are animals." is a valid argument. But "All tigers are cats. All cats are animals. So some tigers are animals." is not a valid argument. At first glance, we would think that the statement, "All tigers are animals," is much stronger than the statement, "Some tigers are animals." In our world this is true, since we know that tigers do exist. But from the logician's viewpoint, the first conclusion does not promise existence, but the second one does. From the logician's viewpoint, the second argument translates to, "If anything exists which is a tiger, then this thing is also a cat. If anything exists which is a cat, then this thing is also an animal. So at least one thing exists which is both a tiger and an animal." In simplified form, this second argument

becomes, "If A exists, then so does B. If B exists, then so does C. So both A and C exist." We see that the argument is obviously invalid.

You may wonder why I chose not to use the standard A, E, I, and O designations, rather than (1), (2), (3), and (4) for the four standard statement forms. The answer is that I could see no point in using the letters. Except for the "A," which reminds me of "all," the letter designations tell me nothing about the properties of the statements unless I stop and think about them. They are said to have come from the Latin words "Affirmo" ("I affirm") and 'nEgO" ("I deny"), so that the A and I statements (positive) and the E and O statements (negative) tie in nicely with the Latin words. If the letters had been A, N, S, and SN, then their connections with their corresponding statements would have been obvious, and I would have used them. On the other hand, I didn't want to use the letters A, N, S, and SN in this text, since switching from these to A, E, I, and O would be more confusing than switching from (1), (2), (3), and (4) when the students decide to take a regular logic course.

Sec. 6.3 answers:

Note for all "a" and "b" answers: Students' answers may be phrased differently, but the basic form (of the four standard forms) and meaning should be the same.

1. a. All bats are mammals. **b.** If something is a bat, then it is a mammal. **c.** positive **d.** no **2. a.** Some movie stars are famous. **b.** There is a movie star, and this movie star is famous. **c.** positive **d.** yes **3. a.** No firefighter is a coward. **b.** If someone is a firefighter, then he or she is not a coward. **c.** negative **d.** no **4. a.** Some birds are things which make their nests in meadows. **b.** There is a bird, and this bird makes its nest in a meadow. **c.** positive **d.** yes **5. a.** Some birds are things which do not sleep at night. **b.** There is a bird, and this bird does not sleep at night. **c.** negative **d.** yes **6. a.** No person is perfect. **b.** If something is a person, then it is not perfect. **c.** negative **d.** no **7. a.** All tenants are people who may use the front door. **b.** If someone is a tenant, then she or he may use the front door. **c.** positive **d.** no **8. a.** All employees are people who must use the back door. **b.** If someone is an employee, then he or she must use the back door. **c.** positive **d.** no **9. a.** All employees are people who must not use the front door. **b.** If someone is an employee, then he or she must not use the front door. **c.** positive **d.** no Or: **a.** No employee may use the front door. **b.** If someone is an employee, then he or she must not use the front door. **c.** negative **d.** no. (Note: Ask your students about these two versions. Do they agree that the statement can be expressed either as an "all" (positive) or as a "no" (negative) statement? Do they see why "must" was changed to "may" for the negative version? Do they see that substituting "may not" in the "b" answer will result in ambiguity of meaning?) **10. a.** All trespassers are people who will be prosecuted. **b.** If someone is a trespasser, then he or she will be prosecuted. **c.** positive **d.** no **11. a.** All animals which are leopards are cats. **b.** If an animal is a leopard, then it is a cat. **c.** positive **d.** no. **12. a.** All candies are bad for your teeth. **b.** If something is candy, then it is bad for your teeth. **c.** positive **d.** no **13. a.** All actions called "smoking" are actions which are bad for your health. **b.** If you smoke, then your action is bad for your health. **c.** positive **d.** no **14. a.** All people who are smart are people who use GLEAMO cleaner. **b.** If someone is smart, then she or he uses GLEAMO cleaner. **c.** positive **d.** no **15. a.** No canary is a bird which sings in the dark. **b.** If a bird is a canary, then it does not sing in the dark. **c.** negative **d.** no **16. a.** Some times are times that I think you're horrid. **b.** There is a certain time, and it is a time that I think you're horrid. **c.** positive **d.** yes **17. a.** Some schools are things which have dress codes. **b.** There is a school, and it is something which has a dress code. **c.** positive **d.** yes **18. a.** Some schools are things which do not have dress codes. **b.** There is a school, and it is something which does not have a dress code. **c.** positive **d.** yes Or: **a.** Some schools are not things which have dress codes. **b.** There is a school, and it is not something which has a dress code. **c.** negative **d.** yes **19. a.** Some people are not early risers. **b.** There is a person, and this person is not an early riser. **c.** negative **d.** yes **20. a.** Some doctors are not makers of house calls. **b.** There is a doctor, and he or she is not a maker of house calls. **c.** negative **d.** yes

Sec. 6.4 comments:

The students will understand the concepts of universal and existential quantifiers and will be able to tell you which words indicate that everything is included (universal quantifier) and which words indicate that some, but not necessarily all, things are included (existential quantifier). (Why not? They could do that much back in sections 6.1 and 6.2) But some students may have trouble with the words "universal quantifier" and exis-

tential quantifier." (After all, these are not words that the average secondary school student has heard often, if ever, before.)

Drill the students in the use of the words and their meanings by asking questions such as, "How about 'a few'? Is that a universal quantifier, or an existential quantifier?" (The student's answer is to use the words you're drilling for: "That's (or "'a few' is") an existential quantifier.") "Does the word 'many' promise existence, or not?" (Answer: "Yes, 'many' promises existence.") "Is a 'many' statement universally, or existentially, quantified?" (Answer: "It's existentially quantified.") "Which one promises existence—a universal quantifier, or an existential quantifier?" (Answer: "The existential quantifier promises existence.") "Then what about the universal quantifier? Does it say that the thing talked about doesn't exist?" (Answer: "No, the universal quantifier doesn't say either that the thing exists or that it doesn't. It just says that if it exists, then something is so.")

Sec. 6.4 answers:

1. a. universal **b.** positive **c.** If anyone is a Student Council member, then he or she was elected by the student body. **2. a.** universal **b.** negative **c.** If anyone is a teacher, then he or she may not scream at students more than five times in one day. **3. a.** universal **b.** negative **c.** If anyone is a student, then she or he may not scream at any one teacher more than twice a day. **4. a.** existential **b.** negative **c.** There is a student, and he or she is a hard worker. **5. a.** existential **b.** positive **c.** There is a TV program, and it is funny. **6. a.** existential **b.** positive **c.** There is some child, and this child is both under the age of 3 and a reader. Or: There is a child younger than 3, and this child can read. **7. a.** existential **b.** negative **c.** There is a zoo, and it does not have a tiger. **8. a.** universal **b.** negative **c.** If anything is a funeral parlor, then it is not a noisy place. **9. a.** universal **b.** positive **c.** If anything (or "a store") is a drug store, then it sells medicines. **10. a.** existential **b.** positive **c.** There is a drug store near my house, and it sells hats. Or: There is a drug store, and this drug store is near my house and it sells hats. Note: Make sure your students understand why problem 9 is universally quantified but problem 10 is existentially quantified, even though both statements start with "a drug store."

Sec. 6.5 comments:

Stress again to the students that two statements which disagree with each other are not necessarily negations of each other. For example, "Parker is very rich," and "Parker is very poor," disagree, but they are not negations of each other, since both statements might be false.

The negation of P is always ~P ("not P" ≡ "P is false"). It follows that the negations of the four standard forms are:

(1) Statement: All P are Q. Negation: Not all P are Q.
(2) Statement: No P is Q. Negation: It is false that no P is Q.
(3) Statement: Some P are Q. Negation: It is false that some P are Q.
(4) Statement: Some P are not Q. Negation: It is false that some P are not Q.

This section explores these negations in order to express them in more usable forms.

As will be brought out by some of the problems in section 6.12, many people say, "All P are not Q," when they really mean, "Not all P are Q." For example, a person says, "All politicians are not crooks," but means, "Not all politicians are crooks." In logic, however, when we say, "All P are ~Q," we mean exactly that—i.e., "No P is Q." For example, we can say, "All animals are not minerals," which is equivalent to saying, "No animal is a mineral." This is made more apparent by considering the "if-then" forms of "All P are ~Q" ("If something is P, then it is not Q"), and "No P is Q" ("If something is P, then it is not Q").

A quantified statement has both quantity (all, no, or some) and quality (what the statement claims, aside from the quantifier). The negation of a quantified statement must disagree both in quantity and in quality. Using this criterion, we get these negations (S = statement, N = negation), where the quantity and quality of each are underlined:

(1) S: All P are Q. N: Some P are ~Q.
(2) S: No P is Q. Or: S: All P is ~Q.
N: Some P is Q.
(3) S: Some P are Q. N: All P are ~Q.
Or: N: No P is Q.
(4) S. Some P are ~Q. N: All P are Q.

At the point in this section where the text states, "Statements (1) and (4) are negations of each other. Statements (2) and (3) are negations of each other" (just above Examples a-d), ask your students whether or not other pairings of the four statements might be negations of each other. Encourage discussion and exploration of this question. (The answer is "no." Other possible pairings are : (1) and (2)—no, since both will be true at the same time if P does not exist; (1)

and (3)—no, since both can be true at the same time if P exists; (2) and (4)—no, since both will be false at the same time if P and Q are both true; (3) and (4)—no, since both can be true at the same time, as in this case, for example: "Some plants are trees," and, "Some plants are not trees.")

Sec. 6.5 answers:

1. yes **2.** no **3.** yes **4.** yes **5.** No. (Both could be false.) **6-10.** no **11.** Some babies are not born with blue eyes. **12.** Some idealists are realistic. **13.** No plant is a tree. **14.** All tires are made of rubber. **15.** All men are noble. (The given sentence can be stated as, "Some men are not noble.") **16.** Some children should watch violent TV shows. **17.** There are some Sundays when the Mortons do not go for a walk. **18.** Some men are not adults. (The given sentence can be stated as, "All men are adults.") **19.** Some paper is not used for writing. **20.** You can judge some books by their covers. (The given sentence can be stated as, "No book is something which you can judge by its cover." Its negation is, "Some books are things which you can judge by their covers." Or the statement might be interpreted as, "All books are things which you cannot judge by their covers," in which case the negation is still the same as before.) **21-22.** yes **23.** no **24.** No. Statement "b" says, "All candles are red," which is not the equivalent of statement "a." **25.** No. Statement "b" says, "No music is restful," which is not the equivalent of statement "a."

Sec. 6.6 comments:

The following information is included here in order to provide you with more background, but it was not included in the text because it was felt that it would be confusing to the average student.

In some cases, to ask if a statement is reversible is to ask if the statement and its converse have the same truth value. For example, "All P are Q" has the converse "All Q are P." To show this, we can translate the statement (All P are Q) into its "if-then" form ($P \rightarrow Q$), take the converse of this translated statement ($Q \rightarrow P$), and then translate this converse to its "all" form (All Q are P). In this case, everything is fine.

But when we try this technique with "No P is Q," we run into trouble. Copi *(Introduction to Logic,* The MacMillan Company, New York, 1961, p. 147) asserts that the converse of "No P is Q" is "No Q is P." In "if-then" form, the first statement becomes $P \rightarrow \sim Q$. And in "if-then" form, Copi's converse becomes $Q \rightarrow \sim P$. But these two "if-then" statements are contrapositives, not converses, of each other. Rather than point out this difference in logicians' opinions of what a converse of a statement is, I elected to use the word "reversible," thus avoiding the use of "converse" in this section.

Sec. 6.6 answers:

1. No. (See Example a just above the Summary in this section.) When we say a sentence is not reversible, we are simply saying that the sentence does not imply that its reverse is true. We are not saying that the reverse cannot be true. **2.** Yes. We proved they are equivalent sentences, and equivalent sentences always agree in truth value. **3.** Her second statement is false, for she did not switch the "P" and the "Q." If we put the original sentence into the form "Some P are Q," we get, "Some carpenters are things which uses horses." Now when we switch, we get, "Some things which use horses are carpenters," which is true. Gwen's reasoning showed that the statement "Some P use Q" is not reversible, but it did not show that the statement "Some P are Q" is not reversible. **4.** No. It's true that some people have musical talent, but it doesn't make sense to say that some musical talent(s) have people. **5.** No. Mary may be the sister of John, but John is not the sister of Mary. **6.** Yes. By definition, "$P \equiv Q$" means "$P \rightarrow Q$ and $Q \rightarrow P$." Switching the P and the Q, we get "$Q \rightarrow P$ and $P \rightarrow Q$," which is the same thing in different order. **7.** Yes. The given statement is the negation of "No P is Q," which is "Some P are Q." "Some P are Q" is a reversible statement. **8.** No. The given statement is "All P are Q," which is not reversible. **9.** No. Although the reverse ("Some tall people are not boys.") is true, the given sentence does not imply its reverse and it is, therefore, not reversible. **10.** Yes. This is a "No P is Q" sentence, which is reversible. **11.** No. See item 3 in the Summary for this section. The given sentence is of the form "All P are Q," which is not reversible. **12.** Yes. This can be stated as "No P is Q," which is reversible.

Sec. 6.7 comments:

There are no special problems here. The technique for proving such arguments valid or invalid is straightforward: simply convert all statements to "if-then" form, and then use the techniques which were used in section 2.4.

In this current section, your students are asked to prove six arguments valid or invalid. Arguments (1) and (5) are valid. The others are invalid. When your students come up with "invalid" for arguments (3) and (4), ask them whether or not they think all arguments comprised only of "no" statements are invalid. Encourage discussion and exploration of this question. With a little time for experimentation, the students should be able to come up with something like this: No flower is an animal. No non-animal is a zebra. (Or: Nothing which is not an animal is a zebra.) So no flower is a zebra. Using F, A, and Z, we get this:

$$\begin{array}{l} F \rightarrow \sim A \\ \sim A \rightarrow \sim Z \\ \hline \therefore F \rightarrow \sim Z \end{array}$$

This, of course, is a valid argument.

Sec. 6.7 answers:

1. Invalid. **2.** Valid. Note: Make sure your students do not use the same symbol both for "this thing has a wife" (HSW) and "this thing is a wife" (W). **3.** Invalid. **4.** Valid. **5.** Invalid. **6-7.** Valid. **8.** Invalid. **9-10.** Valid. **11.** Invalid. **12.** Valid.

Sec. 6.8 comments:

Although the students are told explicitly that arguments which use only "some" statements do not lead to any nontrivial conclusions, the students might wish to experiment with various "some" combinations in order to see whether or not they want to agree with this. Let them do so. And be prepared for them to discover something not discussed in this book: once the idea of symbolizing the statements occurs to them, they are likely to come up with what are apparently valid arguments, when they know the arguments are really invalid. For example:

Some tigers are animals.	T and A
Some lions are animals.	L and A
So some lions are tigers.	∴ L and T

(Although the argument itself is invalid, the symbolized argument is valid.)

Ask a lot of questions when this happens: "What happened? How can this be? If the symbolized form really represents the original argument, then we can't very well have one form valid and the other form invalid, can we? Are you sure you symbolized each statement in the argument correctly?" Given enough time to think about it, some student will probably realize that the first two sentences are talking about different things, whereas the third sentence is stating that the different things are the same thing: "T and A" = "There is something which is a tiger, and this same thing (which is a tiger) is an animal." "L and A" = "There is something which is a lion, and this same thing (which is a lion) is an animal." Obviously, the "something" and the "this same thing" in the two sentences are different. Yet, the conclusion, "L and T" = "There is something which is a lion, and this same thing (which is a lion) is a tiger," tries to connect the two different things mentioned in the two premises.

The question then arises of how to symbolize the argument so that the difference is obvious. The usual way is to use small letters near the beginning of the alphabet (a, b, c, etc.) as part of the symbolization, using a different letter for each different thing:

Some tigers are animals.	Ta and Aa
Some lions are animals.	Lb and Ab
So some lions are tigers.	∴ Lc and Tc

Here, the "c" in the conclusion doesn't mean that the thing described is neither "a" nor "b," but it means that whatever it is, it has to apply both to L and to T in the conclusion (since both terms are designated by the same letter, c). Now we can try to prove whether or not the argument is valid. Since the best we can do in the conclusion is "Lb and Ta," the argument is invalid. (If we could get "Lb and Tb" or "La and Ta" for the conclusion, the argument would be valid.)

The method of appending small letters to the main symbols for existentially quantified statements gets considerably more complex when the premises of the argument contain existential quantifiers and more than one universal quantifier, or when the premises contain at least one of each kind of quantifier but the conclusion has a universal quantifier. Aside from carefully selected arguments in section 6.11, such arguments are entirely avoided in this text.

Sec. 6.8 answers:

Note: Argument numbers in these answers refer to the six arguments listed in this section.

1. Not valid. This is the argument (3) form.
2. Not valid. This is the argument (3) form, where R = this thing is not large.
3. Not valid. This is the argument (4) form.
4. Not valid. This is the argument (5) form.
5. Not valid. This is the argument (6) form.
6. Not valid. This is the argument (2) form.
7. Not valid. This is the argument (3) form.
8. Not valid. This is the argument (2) form.

Sec. 6.9 comments:

In this section, symbolizing the arguments and proving them valid or invalid is a straightforward mechanical process. Although none of the four

examples here uses a "no" statement, an argument with a "no" statement is done the same way as the examples shown—i.e., translate the "no" statement to an "if-then" statement and then proceed as usual.

The students probably will not need more examples before they try the problems. (Examples 1 and 3 are valid arguments. Examples 2 and 4 are invalid arguments.) If they do, however, you could take the first few problems as additional examples, since there are more than enough problems here for practice.

Sec. 6.9 answers:

1. Invalid. **2-3.** Valid. **4.** Invalid. S → E. U → ~ S. ∴ U → ~ E. **5.** Valid. **6.** Invalid. **7.** Valid. **8-10.** Invalid. **11.** Valid. CS → SP. CS and ~ SH. ∴ SP and ~ SH. **12-14.** Invalid. **15-16.** Valid. **17.** Invalid. GP → ~ I. I ≡ ~ E. L and E. ∴ L and GP. **18.** Invalid.

Sec. 6.10 comments:

The purpose of this section is to show the students how to use Euler circles to make a picture of a quantified statement. This information, together with the information in the next section, will allow them to use Euler circles to prove arguments valid or invalid.

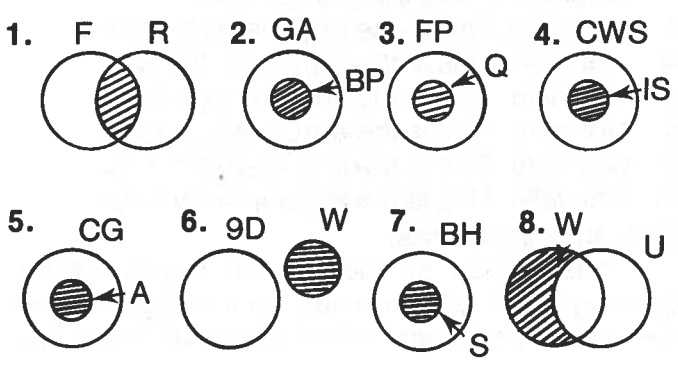
The students may want more examples before they try the problems. It is suggested you give them two or three sets of examples using the same P and Q for any one set. For instance:

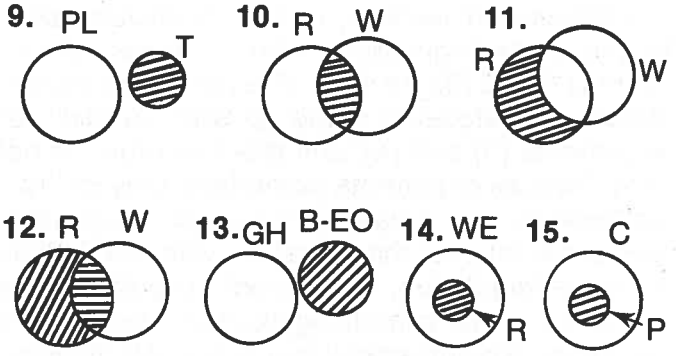
Set 1: All roses are flowers. No rose is a flower. Some roses are flowers. Some flowers are roses. Some roses are not flowers. Some flowers are not roses.

Set 2: All men are honest people. No man is an honest person. Some men are honest people. Some honest people are men. Some men are not honest people. Some honest people are not men.

In each of those sets, the third and fourth sentences will have identical Euler circles.

Sec. 6.10 answers:



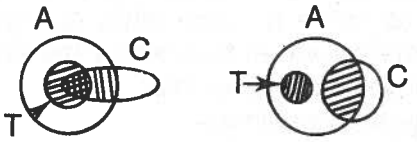


Sec. 6.11 comments:

Building on the student's ability to picture a statement with Euler circles, this section shows the student how to picture all premises of an argument simultaneously.

Stress to the students that the object is to see if the circles can be drawn so that the premises are true but so that the conclusion does not have to follow. In many arguments, it is possible to draw the circles either way—i.e., either so that the conclusion appears to follow, or so that the conclusion does not necessarily follow. Of course, the test of validity for an argument says the argument is valid if the conclusion must follow from the premises. So the idea here is to see if the circles can be drawn so that the conclusion does not have to follow. If this can be done, the argument is invalid. If it cannot be done, then the conclusion must follow from the premises, and the argument is valid.

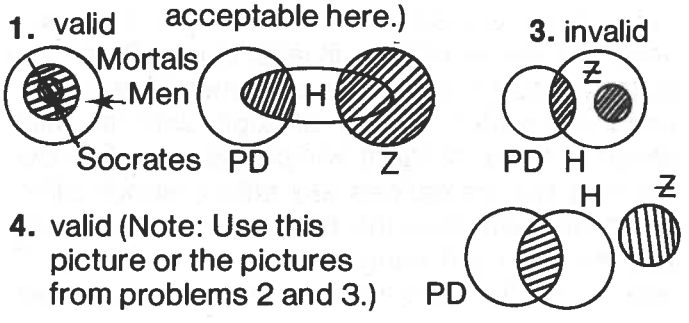
For example, the following invalid argument can be drawn either of two ways: All tigers are animals. Some animals are cats. So some tigers are cats.



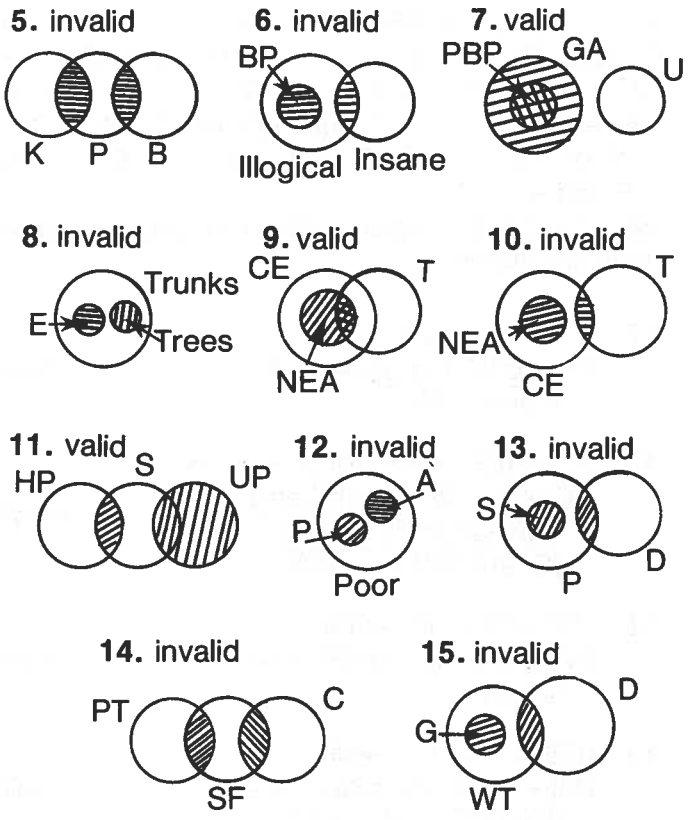
Whereas the first figure makes it appear that the conclusion follows, the second figure makes it obvious that the conclusion does not follow.

Sec. 6.11 answers:

2. invalid (The figure for problem 3 would also be acceptable here.)



4. valid (Note: Use this picture or the pictures from problems 2 and 3.)



Sec. 6.12 comments:

This whole chapter is intended to increase the student's knowledge, not to decrease her or his ability to understand what other people are saying. Yet, without any advice to the contrary, the student might well misunderstand and think that the rules in this chapter are to be applied without exception, regardless of context or intended meaning of a sentence. In anticipation of this possibility, this section cautions the student not to be pedantic in applying the rules of logic to statements as they stand but, instead, first be sure of the meaning intended by the statement and then apply the rules of logic.

Sec. 6.12 answers:

1. Not all people are tall. Or: Some people are not tall. **2.** Whenever the school band plays, it plays too loudly. **3.** Not all credit cards are alike. Or: Some credit cards are different from others. **4.** Whenever Russia competes in the Olympics, some of its athletes win gold medals. **5.** This is ambiguous. Certainly, the speaker does not mean, "If a person is brave, then he or she gets killed in a war." Nor does the speaker mean, "Whenever there is a war, then all people who are brave get killed in it." The ambiguity enters when we try to decide whether the speaker is saying, "There are some people who are brave and who get killed in wars," or whether the speaker means, "If there is a war, then some brave people get killed in it." (The first case promises existence, whereas the second does not, so the two sentences are not equivalent.) **6.** This is another ambiguous one. The true meaning would have to be determined from context, which we aren't given here. It probably means, "Everyone you can think of who should have been at the party was at the party." Certainly, it doesn't mean, "Every person in the world was at the party." **7.** Whenever a question of fairness between us is involved, you are unfair to me. **8.** Whenever Porter plays cards, he (or she) loses. **9.** Not everything is what it seems to be. Or: Some things are not what they seem to be. **10.** Whenever some people communicate with me (talk, write, make signs), they tell me what to do. (Stress that two words—"everyone" and "always" are used improperly in the given sentence.) **11.** Some thieves broke into our office building last night. **12.** I'll do something nice for you, and you did something nice for me. **13.** He hit me first, and I'm going to hit him. **14.** I know you're not mad at me, and you smiled at me. **15.** Sue thinks she's smart, and she fooled me once, and she won't fool me again. **16.** I know Tom better than to believe he said that, and you can't make me believe that he said that. **17.** (Here we have two exaggerations. First, we may assume that not every neighbor—including all men, women, and children—mows the lawn. Second, we know that each neighbor who mows a lawn is not **always** doing so.) Some of my neighbors mow their lawns often. **18.** The food you eat determines whether or not you are healthy. **19.** Everybody that I know picks on me. (Or, since it is unlikely that the speaker means "everybody that I know," the more probable meaning is, "Some people pick on me.") **20.** (It is unlikely that the speaker wishes to include prescribed medications.) Some drugs are bad for your health.

Sec. 6.13 comments:

Point out to the students the need for parentheses to avoid ambiguity in some sentences. In Example 1e, the sentence with parentheses reads, "If something is a person and is smart, then this thing likes to read books." Without the parentheses, we wouldn't know whether to read it that same way or whether simply to read from left to right: "Something is a person, and if this thing is smart, then it likes to read books."

On the other hand, the correct symbolization of Examples 1a, b, and f would have the last two

terms parenthesized, but the parentheses were omitted because nothing was gained by including them and nothing was lost by excluding them, since "and" and "or" sentences are associative —i.e., (A and B) and C $\equiv$ A and (B and C); (A or B) or C $\equiv$ A or (B or C). (Strictly speaking, determining the truth value of any sentence with two or more terms is a binary operation—i.e., we operate on only two terms at a time—and so a logician might object to the omission of the parentheses, since this results in trying to apply a binary operation to three terms. At the secondary level, however, the average student will not see the value of parentheses in "and" and "or" sentences and will automatically operate on two of the terms and then operate on the third term.)

Although "and" and "or" are associative, most operators and mixtures of operators are not associative and must have parentheses in order to determine meaning. Examples are these:

$(P \rightarrow Q) \rightarrow R \not\equiv P \rightarrow (Q \rightarrow R)$
(P or Q)$\rightarrow$R $\not\equiv$ P or (Q$\rightarrow$R)
P$\rightarrow$(Q and R) $\not\equiv$ (P$\rightarrow$Q) and R
P and (Q$\rightarrow$R) $\not\equiv$ (P and Q)$\rightarrow$R
P and (Q or R) $\not\equiv$ (P and Q) or R

Notice the last example above in particular. Although "and" is associative and "or" is associative, a mixture of "and" and "or" is <u>not</u> associative.

Students may find that there are two different ways to interpret a sentence. Take Example 1e, for instance: "People who are smart like to read books." One student may interpret this as, "If something is a person and is smart, then this thing likes to read books." That is, (P and S)$\rightarrow$LRB. Another student may interpret the sentence as, "If something is a person, then if it is smart it likes to read books." That is, P$\rightarrow$(S$\rightarrow$LRB). When two students do have different interpretations, and so different symbolizations, ask them to see whether or not the two interpretations are equivalent. If they are equivalent (as in the example given above), then they are equally correct (or incorrect). If they are not equivalent, then at least one of the interpretations is wrong, and the students should figure out which one is wrong (or maybe both are wrong).

Sec. 6.13 answers:

Note: For some problems, other symbolizations can be correct, too. **1.** T$\rightarrow$(A and C) **2.** PS $\rightarrow$ (SL and U) **3.** PLM $\rightarrow$ (GR or GN) **4.** (P and LM $\rightarrow$(GR or GN) **5.** (F or B)$\rightarrow$S **6.** ~SL$\rightarrow$(C$\rightarrow$~GC) **7.** [D and (C or I)]$\rightarrow$(L and FDS) **8.** (SC or FM)$\rightarrow$PS **9.** S$\rightarrow$(PSC and PFM) **10.** (K and G and P) $\rightarrow$ GF **11.** (KP and GP) $\rightarrow$ GF **12.** (KP or GP) $\rightarrow$ GF **13.** (CO or CA) $\rightarrow$BT **14.** T and ~(S and I). Or: T and (~S or ~I) **15.** T and ~(S or I). Or: T and ~S and ~I.

<u>Note for 16-27:</u> Again, other correct symbolizations are possible.

16. P and W and S
<u>(P and W and S)$\rightarrow$~EM</u>
$\therefore$ P and ~EM — Valid

17. [C$\rightarrow$(GP or PP)] or (C$\rightarrow$~W)
<u>[(C and ~W)$\rightarrow$WM] and
[(C and PP)$\rightarrow$WM]</u>
$\therefore$ (C and GP)$\rightarrow$~WM — Invalid

18. (RS or E or M)$\rightarrow$MI
<u>(MI and GM) and (GM$\rightarrow$~I)</u>
$\therefore$ RS and ~I — Invalid

19. (RS or E or M)$\rightarrow$MI
<u>(MI$\rightarrow$GM) and (GM$\rightarrow$~I)</u>
$\therefore$ (RS or E or M)$\rightarrow$~I — Valid

20. <u>(G$\rightarrow$FR) and (C$\rightarrow$~FR)</u>
$\therefore$ C$\rightarrow$~G — Valid

21. <u>(G$\rightarrow$FR) and (C$\rightarrow$~FR)</u>
$\therefore$ G$\rightarrow$~C — Valid

22. [P and (~A or ~PI)]$\rightarrow$~C
<u>(P and A and PI)$\rightarrow$D</u>
$\therefore$ P$\rightarrow$(~C or D) — Valid

23. (CP or LT)$\rightarrow$(P and R)
<u>[(P and ~R)$\equiv$~DR] and
[(R and ~P)$\equiv$~NR]</u>
$\therefore$ (CP or LT)$\rightarrow$(NR and DR) — Valid

24. (P and MJ)$\rightarrow$(I or S)
(P and I)$\rightarrow$S
<u>P$\rightarrow$MJ</u>
$\therefore$ P$\rightarrow$S — Valid

25. [(C and D)$\rightarrow$A] and [A$\rightarrow$PIR]
<u>C $\equiv$ D</u>
$\therefore$ (C and ~D)$\rightarrow$~A — Valid

26. T$\rightarrow$A
<u>(A and ~T)$\rightarrow$L</u>
$\therefore$ A and L — Invalid

27. T$\rightarrow$A
(A and ~T)$\rightarrow$L
<u>A and ~T</u>
$\therefore$ A and L — Valid

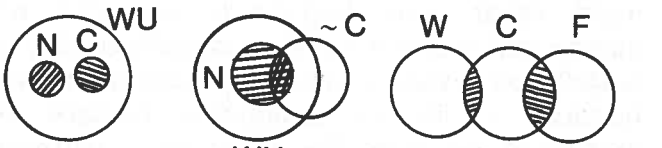
Sec. 6.14 comments:

Some students really enjoy proving arguments valid or invalid and can't seem to get enough of them to work on. If you have students like this, you might like to order the booklet of problems *Arguments to Prove Valid or Invalid* (also available in duplicator masters) from Midwest Publications Co., Inc.

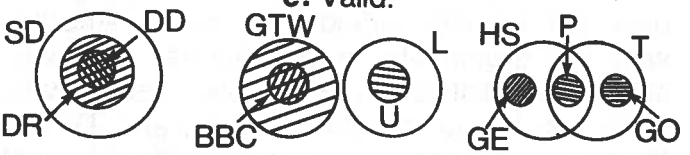
Sec. 6.14 answers:

1. No. Some grass is not green. **2.** No. No cats are dogs. **3.** No. Some people don't like pizza. **4.** Yes. **5.** No. Some prizes will be given to losers. **6. a.** No book is hard to understand. **b.** All words are hard to spell. **c.** Some pencils should be sold without erasers. **d.** Some vacations are not fun. **e.** All movies are good ones. **f.** No tiger is an animal. **7.** A statement and its negation can never have the same truth value; but a statement and its opposite can have the same truth value. **8.** It is a statement about all things of a certain kind. **9. a.** It is a word which indicates that the statement it appears in is a universal generalization—i.e., that the statement has no exceptions. **b.** all, every, each, a, without exception. **10. a.** It is a word which indicates that the statement it appears in is not a universal generalization—i.e., that the statement has exceptions. **b.** some, many, most, a few, at least. **11. a.** No. For example, the statement "All P are Q" does not say that there are any P's. It says, "If there is any P, then this P is Q." **b.** Yes. For example, the statement "Some P are Q" says, "There is at least one P, and this P is Q." **12.** It is a statement which relates P and Q and whose truth implies the truth of another statement which is exactly like the first statement except that the P and the Q of the first have become the Q and the P of the second. **13.** Not necessarily. Even if the converse is true, the statement does not necessarily imply that the converse is true. For example, all lawyers are attorneys, and all attorneys are lawyers. So the statement and its converse are true. But suppose someone didn't know English well enough to know that an attorney is the same thing as a lawyer. Then the statement alone is not enough to imply that its converse is also true. On the other hand, that same person would have no doubt that the statement, "Someone is an attorney if and only if the person is a lawyer," is reversible, for this statement implies that its converse is true regardless of what "attorney" and "lawyer" mean. **14. a.** yes **b-d.** no **e.** yes **f.** no **g.** yes **h.** no **15.** No. By definition, if a statement is reversible, then the statement and its reverse imply each other. They are, therefore, equivalent statements. Since they are equivalent statements, they always agree in truth value (either both true, or both false). Consequently, the substitution does not affect the truth value of the statement used and so does not affect the validity of the argument. **16.** (Note: There are also other correct ways to symbolize the statements. Where two ways are shown, the two statements are equivalent.) **a.** $\sim V \rightarrow \sim M$ **b.** YL and $\sim$ IL **c.** $(T \rightarrow A)$ and $\sim (A \rightarrow T)$. Or: $(T \rightarrow A)$ and $(A$ and $\sim T)$. **d.** (LM or PD) $\rightarrow$ BH **e.** HVW $\rightarrow$ (U and K) **f.** (U or K $\rightarrow$ HVW **g.** $(C \rightarrow \sim T)$ and $(L \rightarrow \sim T)$. Or: (C or L) $\rightarrow \sim T$. **h.** (JH and GCR) $\rightarrow$ GL. Or: JH $\rightarrow$ (GCR $\rightarrow$ GL) **i.** ARP $\rightarrow$ [(T and PS and M) $\rightarrow$ ALCP]. Or: (T and PS and M) $\rightarrow$ (ARP $\rightarrow$ ALCP) **j.** WAAP $\rightarrow$ (C and EHM). (Notice here and in problem k below, we apply common sense rather than using the literal translation.) **k.** (W and AAP) $\rightarrow$ (C and EHM). **17. a.** False. The question is whether or not the circles could have been drawn so that the premises are true and the conclusion is false. **b.** True. This follows from the definition of an invalid argument. **c.** Same answer as "b" above. **d-e.** Same answer as "a" above. **f.** Same answer as "b" above.

18. a. Invalid. **b.** Valid **c.** Invalid.



d. Valid. **e.** Valid. **f.** Valid.



19. a. Valid. **b-c.** Invalid. **20. a-c.** Valid. **21. a-d.** Valid. **22. a.** Valid. **b.** Invalid. **c.** Valid. **23. a.** Invalid. **b.** Valid. **c-e.** Invalid. **24. a-d.** All arguments are valid. The premises can be symbolized like this:

$JH \rightarrow GL$
$\sim JH \rightarrow \sim GL$
$JH \rightarrow \sim NL$
$\sim NL \rightarrow \sim AL$
$\sim AL \rightarrow \sim GL$

The conclusions can be symbolized like this: **a.** $\sim GL$ **b.** $JH \rightarrow \sim GL$ **c.** $JH \rightarrow \sim GCR$ **d.** $GL \rightarrow \sim GCR$

CHAPTER 7

General Comments:

In this chapter, we look at four characteristics of arguments: (1) Is the argument strong, or is it weak? (2) Which side of the issue does it favor? (3) What are some of the hidden assumptions the arguer is probably making? (4) Is the arguer stating a fact, or is the statement merely an opinion?

Like chapter 5, the students may find this material relatively difficult—not because it is hard to understand, but simply because there are decisions to be made which exclude nit-picking exceptions.

As usual, my answers to the problems are not infallible.

Sec. 7.1 comments:

In this section, watch for these things:
(1) The students are likely to say an argument is strong just because they agree with what it says (or say it's weak because they disagree with it).
(2) The students are likely to say an argument is strong just because it states an important fact, even though that fact has little do to with the basic question.

For example, consider the question, "Should we brush our teeth daily?" I consider it a weak argument to say, "Yes. It helps sell toothpaste." A student might argue, "That's a strong argument. What would happen to everyone who makes toothpaste if we all stopped brushing our teeth? You'd have all kinds of people out of work because of it—the toothpaste makers, the makers of the tubes, the advertising companies who think up the commercials. And people all over the country would lose money—people who sell toothpaste to distributors, to wholesalers, to retailers, to the public, people who carry ads for toothpaste like radio and TV stations, newspapers and magazines. You'd upset a good-sized portion of our national economy." But there is nothing in the question to imply that brushing our teeth daily implies the use of toothpaste. We might choose to brush them with baking soda or just plain water, and the basic question still remains— should we brush them daily, or not? With this thought in mind, then, we might ask the student if he or she thinks we should buy toothpaste whether or not we use it, for the student seems to be arguing that we should buy toothpaste, not that we should brush our teeth daily. In other words, such an argument appears to be a form of "red herring,"

The students, however, may have a good deal of difficulty in accepting such reasoning. They will probably tend to think that because it is important that people not be thrown out of work, the argument saying they will be thrown out of work is therefore important to the question being argued and so is a strong argument. You may find that a good deal of class discussion is necessary for the students to agree on answers to some of these problems.

Sec. 7.1 answers:

1. (1) S. **(2)** W. To say that one atmosphere is **more** relaxed than another is not to deny that the second is also relaxed. **(3)-(4)** S. **(5)** S or W, depending on your viewpoint. S, if you think that students should learn as much as they can in school. W, if you think they should be sure to learn what is emphasized, and it's nice if they happen to learn more. In this latter case, the argument is similar to argument (2) above: to say that they would learn more with a dress code is not to say that they don't learn what's emphasized without having a dress code. **(6)** W. It is not the "reasonable" dress, but the "unreasonable" dress, which is in question. Furthermore, the fact that the student leaves home dressed a certain way does not guarantee that the same outfit will be worn in classrooms. **(7)** W. Another way to teach them this is to give them a home environment where the adults act accordingly, but this doesn't mean that children should be taken from their parents and placed with legal guardians when the parents act as though school isn't important. **(8)-(9)** S. **2. (1)** S. **(2)** W. The rate of additional wear on the enamel is minimal. But the rate of decay from not brushing is relatively rapid. **(3)-(4)** W. **(5)-(6)** S. **(7)-(8)** W. **3. (1)** S. **(2)-(3)** W. **(4)** W. This argues the question, "Is typing a necessary skill for everyone?" rather than the question asked. As a response to the question asked, it can be compared to a response of, "No. Most people don't, and they get along well without it," to the question, "Should everyone learn how to reason well?" **(5)** S. **(6)-(7)** W. **(8)** S. **4. (1)** W. **(2)** W from my viewpoint, but your students may dispute this. **(3)** S. **(4)** W. Practically all teenagers feel self-conscious, whether or not they wear glasses. **(5)** S. **(6)** S, if "OK" means "very well"; W, if "OK" means only "they don't bump into walls." **(7)** W. The fact that many people look better with glasses is a weak support for saying that all teenagers who need them should wear them. **(8)** S, for the times the teenagers are goofing around; W, for other times. **(9)** W. **(10)**

W. They'll lose the eyeglasses only when they're not wearing them. **(11)** S or W, depending on how poor the eyesight is without glasses. If the eyesight is quite good even without glasses, then the "may" in the argument becomes extremely tenuous and makes the argument weak. **(12)** W. The question is about teenagers who need glasses, whereas this argument is about people who don't need glasses. **5. (1)** Grading standards in high schools have been declining steadily in the past ten years. **(2)** Not strong. First, last year's college freshmen can be presumed, for the most part, to be recent high school graduates. (And if not, how would they know how to answer the question?) Thus, by what criteria would they judge whether or not grading in high schools was easier than 10 years ago (when they were not in high school)? Second, suppose a freshman thought, "Well, I think the grading scale in my own high school is about the same as it's always been, but I think generally standards are declining, so I'll answer "yes." (By what criteria would the person judge whether or not other high schools had lowered grading standards?) **(3)** There is nothing in the article to indicate that the actual high school averages of the answerers were checked. That is, we are led to believe that the averages quoted may have been taken from whatever the students surveyed answered on the surveys. My own classroom experience has shown that average and weak students tend to overstate their grade point averages. The article mentioned nothing about comparative numbers of B-average students. It is possible that many C-average students wrote "B" for their answers, and some B-average students wrote "A" for their answers. **(4)** Despite my answers to (2) and (3) above, I tend to think that the director's conclusion was probably justified, if the college admission tests are the same as they were ten years ago, and if the high school grade averages of the freshmen were computed the same way ten years ago as they were in this survey. Then we will have held both factors constant and we will have the combined result of lower admission scores with higher grade averages. I find it hard to think of a suitable explanation for this if I reject the director's conclusion.

Sec. 7.2 comments:

You may find that some students will argue that a statement favors the side opposite the side you think it favors. Encourage the students to stay away from nit-picking in these arguments. Ask, "And which side do you think it probably is meant to favor?"

This section tends to sidestep the question of whether or not a statement supports a particular side of an issue. (The word "favors," rather than "supports," is used at this point.) For the time being, we want the student simply to be able to recognize which side of the issue the arguer thinks he or she is supporting. In section 8.1 (Recognizing Supporting Statements), we'll get into more detail about whether or not a given statement does, in fact, support a viewpoint.

For example, someone might say more information is needed in order to answer the question, "Should the federal government grant loans to help private businesses?" The person might follow this up by saying, "I'd have to know the heights and weights of the people who would be deciding before I could say whether or not it's a good idea." Now apparently the arguer thinks he or she is supporting the "need more information" position, but it is obvious that such information has nothing to do with the question. If such a statement were made in this section (section 7.2), we would say it "favors" the "need more information" position. But the same statement in section 8.1 would get a "does not support any of the above positions" vote.

Again, then, for the time being, we are interested in the side which the speaker probably thinks she or he is supporting, and in section 8.1 we'll discuss the question of whether or not an argument does, in fact, support a position.

Sec. 7.2 answers:

1. (1) No. **(2)-(3)** Yes. **(4)** No. **(5)** Yes. **(6)** No. **2. (1)** Yes. **(2)** No. **(3)** Yes. **(4)-(8)** No. **(9)** Yes. **3. (1)** No. **(2)** Yes. **(3)-(4)** No. **(5)** Yes. **4. (1)** Strong. **(2)-(3)** Weak. As stated in argument (1), some people have values which would hurt other people. **(4)** Strong. **(5)** Weak, for the same reason as arguments (2) and (3). **(6)** Strong. **5.** Note: You and your students may disagree with my ideas of what is "fair" and what isn't, and so your answers may disagree with mine. **(1)** Weak. The second statement is false. **(2)-(5)** Strong. **(6)** Strong for students who are college bound, but weak for the ones who aren't. **(7)** Strong. **(8)** Weak, since I tend to think the statement is probably false. That is, it may be true in some cases, but I think the majority who graduate without knowing the basics did not try to learn them. So for them, it wouldn't be true that they were passed on an effort grade. **(9)** Strong. **6. (1)** Strong. **(2)** Weak, since it's not always true. **(3)** Strong for areas with snowy winters; weak for other areas. **(4)**

Strong. **(5)** Weak, since it is untrue.

Sec. 7.3 comments:

The problems here are a kind of extension of the problems in chapter 5. In chapter 5, the students were given a situation and were asked to draw conclusions about the facts given or the statements made. Here, they are asked to draw conclusions about the reasoning (assumptions) behind the statements made.

Again, the students may resort to nit-picking in order to avoid committing themselves to saying that the speaker assumed something to be true. Stress that we are not asking them to be absolutely sure of the assumptions behind the statements. But we do expect them to use common sense to determine that certain things pretty well had to be assumed by a speaker in order for the speaker to say the things she or he did.

You may also find the students sometimes trying to answer according to whether they think the statement is true or false, rather than according to whether or not the author of the quotation probably assumed the statement to be true. Watch for this and get the students back on the right track when you see it happening.

Sec. 7.3 answers:

1. (1)-(3) No. **(4)-(11)** Yes. **2. (1)-(4)** Yes. **(5)** No. **(6)** Yes? **3. (1)-(4)** Yes. **(5)** No. (Otherwise, there would seem to be little point in specifying conditions sufficient for being saved.) **(6)-(7)** No. (There is nothing in this passage to indicate that the writer thought this.) **4. (1)-(7)** Yes. **(8)** No. **5. (1)** He sounds angry and disgusted. **(2)** Male. **(3)** Nothing. **(4)** To complain about the use of profanity on TV. **(5)** Probably to show that they are normal people and not just some kind of nuts. **(6)** The standard answer to anyone who doesn't like profanity (or whatever) on TV is, "You can always turn it off, you know." This (second sentence) shows that they've heard that answer before. **(7)** The writer is referring to the last sentence of the previous part quoted. **(8)** The writer believes that profanity on TV, along with his objection to it, is a problem. **(9)** No. See the first sentence of this current part of the letter. **(10)** Yes. Although his last sentence says "we" (referring to his wife and him), there is nothing here to indicate special pleading, and he probably assumes that everyone else should also be able to enjoy TV. **(11)** Not if there were various other programs which didn't have profanity. His objection is twofold: first, he doesn't want to watch programs which have profanity; second, he wants to watch a variety of programs. **(12)** This is an answer to people who would say that the program wouldn't be as good without profanity or that profanity is necessary to the program. **(13)** The writer and his wife. **(14)** Probably the viewing public in general. **(15)** Yes. This is what is implied by the expression "cleansed entirely of profanity." **(16)** No. See the last sentence. **(17)** No. Anyone has the right to complain about something which is offensive to him or her. Also, the writer has offered alternatives to solve the problem. **(18)** Either ban profanity from TV or notify the public of which programs contain profanity. **(19)-(20)** Answers will vary. **6. (1)** It is a person who is a "radical"—i.e., who wants to change established things (or ways of doing them)—and who protests these things (or ways of doing them) in such a way that he or she is noticed. (Note: Don't be surprised if your students think a "radical protestor" is a person who protests radicals.) **(2)** Certainly upset, probably disgusted as well. **(3)** We can't tell yet. **(4)** The radical protestors. **(5)** It gives examples of the hypocritical actions of the radical protestors. **(6)** Yes. If they really wanted free speech for everyone, then they would want it for speakers they don't like, too. **(7)** Yes. A person who really favors love and peace does not throw rocks at other people or bomb buildings. **(8)** Yes. If they really favored cleaner environments, they, too, would help keep the environment clean. **(9)** Yes. A person who wants freedom and democracy will not try to bring about a dictatorship. **(10)** The first three sentences each say, "The protestors say we should have some general thing, but they do this specific thing which you can see contradicts what they say." The fourth sentence doesn't do this. If the first sentence were written in the same way as the fourth sentence, it would read, "They demand free speech for everyone, but they are trying to destroy free speech." Although the statement would still show a hypocritical action from the writer's viewpoint, we would wonder if we would agree that what they do is really "trying to destroy free speech." By telling us instead that they "shout down speakers they don't like," we judge for ourselves that this contradicts the idea of "free speech for everyone." In the fourth sentence, however, we don't have a specific example like this, so we cannot tell if we would agree that the protestors' actions are examples of "doing everything possible to destroy democracy . . .." **(11)** He says that the radicals will take over otherwise. **(12)** Many of the radical

protestors used the peace symbol. Hitler used the swastika. The writer is saying that instead of Hitler's swastika as the symbol of dictatorship, we will have the peace symbol as the symbol of dictatorship. **(13)** In the last sentence. **(14)** It is backed up by the next four statements (the second part quoted). **(15)** I don't think the first through third of these need to be backed up, since these things are common knowledge. I think the fourth one should have been backed up with at least one specific example. As it stands, it is simply a statement which shows the writer is upset and worried but which stands in such contrast to the earlier specific examples given that it makes me wonder if the writer can support it. **(16)** It is not backed up. **(17)** No. As pointed out in the answer to question (13) above, the sentence uses either-or reasoning. Since other choices are available, we do not have to settle for one or the other. **(18)** Not at all. The writer is obviously against hypocritical protestors but gives no indications that he or she objects to other kinds of protestors.

Sec. 7.4 comments:

This will probably be a difficult section for the students. We all have limited knowledge, so how do we know whether certain statements are facts or opinions? The answer is that we don't know. Make sure the students understand that knowing whether something is a fact or an opinion is less important than questioning a statement when they don't know. That is, too many of us tend to take for granted that statements made with the sound of authority are facts and, consequently, we tend to accept them without question. In reality, such statements may very well be nothing more than opinions firmly held by the speaker.

Since different students have different amounts of knowledge, expect their answers to the problem 2 statements to disagree with each other. However, watch for cases where some say a statement is fact and others say it is opinion, for this indicates that one group or the other does not understand the difference between fact and opinion. For example, if something has been proved (and so is a fact), then the group saying it is an opinion is wrong for not answering "can't tell." That is, they should recognize that they don't know whether or not the statement has been proved.

Sec. 7.4 answers:

1. Arguments are no better than their supporting statements and their underlying assumptions. If these statements and assumptions are facts, then we are forced to accept any conclusion which logically follows from them. But if these statements and assumptions are merely opinions, then we do not have to accept conclusions which follow logically from them, since the opinions themselves are subject to question. **2. a.** Opinion. **b.** Opinion. (So how come you know about it, since they're keeping it from the public?) **c.** I can't tell, but I suspect it is a fact. **d.** Opinion. (There were always good workers and goof-offs, and there still are.) **e.** Fact. **f.** Statement contrary to fact. **g-h.** Opinion. **3. (1)** One point is that there are no jobs available for teenagers. I'm not sure, but 15 also seems to be saying that this is the cause of at least some juvenile delinquency. **(2)** Opinion. **(3)** I think it means 15 understands why everyone's always talking about juvenile delinquency—i.e., because there is a lot of it, and 15 can understand why. **(4)** Opinion. **(5)** It suggests to me that teenagers should be able to sit back and wait for a job to come rolling along and ask them, "Do you want me for a job?" It seems to be an attitude of, "Teenagers should be able to find work without trying. But they can't find work even when they try." **(6) a.** Not finding work after trying to find it practically forces a teenager to steal. **b.** I don't. **(7)** Opinion. **(8)** Yes. The seventh sentence implies that his or her parents are willing to provide. **(9)** I give up. **(10)** No. The seventh sentence indicates that the parents will provide the money if they are asked for it. **(11)** Fact. **(12)** Opinion. **(13) a.** Since employers think teenagers are bad, teenagers might as well be bad. **b.** Worse. If employers do, in fact, think badly of teenagers, this attitude will give them concrete evidence that their thinking was correct. **(14)** No. Most people seem pleased when they find out that someone is not as bad as they thought. **(15)** It is partially backed up by the third sentence, but that's all. (The ninth sentence expands on, rather than backs up, the third sentence.) **(16)-(17)** It isn't backed up. **(18)** In the third and fourth sentences. "I looked for a job all summer and couldn't find one. Therefore, nobody wants any teenager." **(19)** In the fifth sentence. It says, in effect, "Either teenagers can find work when they try, or they can be excused for stealing." **(20)** Implied in the sixth sentence: "I want certain things. Thus, I need them." Implied in the ninth sentence and the preceding context: "I couldn't get a job. Therefore, employers think teens are all bad." Implied in the ninth and tenth sentences: "Employers think teens are all bad.

Therefore, we might as well be bad." **(21)** This is implied in the fifth through seventh sentences: "It's OK to steal if you can't find work when you try and you would like some luxuries and you don't want to ask your parents for them." It is also implied in the ninth and tenth sentences: "As long as people already think we're bad, it's OK to go ahead and be bad." **(22)** I get the impression of someone willing to work. But I also get the impression of someone who doesn't know the difference between luxuries and necessities, who may think that potential employers owe him or her a job, and who jumps to conclusions. **(23)** Poor. Opinions are not backed up. Various reasoning errors are present. Statements contrary to fact are made and implied (fourth, sixth, ninth, and last sentences).

Sec. 7.5 answers:

1. (1)-(2) Weak. **(3)-(5)** Strong. **(6)** Weak. The breaks can be constructive ones. They don't have to be troublesome. **(7)** Weak. Hanging them by their thumbs would teach them this, too, but that doesn't mean it should be done. **(8)** Weak. The reason the kid was sent to the special room in the first place is because he or she hasn't learned how to act in a regular classroom. Putting the student in a special room accomplishes two things: First, it teaches the student that he or she overstepped the limits allowed in a regular classroom. Second, it teaches the student that these limits are somewhere between what the student did in the regular classroom and what the student is allowed to do in the special room. **(9)** Strong. **(10)** Weak. This points out a possible misuse of the special room, but it doesn't argue against it for the majority of intended cases—i.e., the cases where the teacher has just cause for having the student removed from the regular classroom. Point out the use of "red herring" here. **(11)** Strong? **(12)** Weak. See the answer to items (10) and (12): it argues for the special room (even) in cases of misuse, rather than arguing for it for the majority of intended cases. **(14)** Weak. (1) Getting a troublemaker out of the regular classroom would make room for another student on the days he or she is gone. (2) Given two classes, one in which there are no persistent troublemakers and another where there are, more students can be effectively taught in the first than in the second. **(15)** Weak. **(16)** Weak. This argument ignores the "no talking" condition of the special room. **2. (1)** No. **(2)-(3)** Yes. **(4)-(5)** No. **(6)** Yes and no. **(7)** Neither. ("Red herring.") **(8)** Yes. **(9)** No. **(10)** Neither. ("Red herring.") **3. (1)** Weak, since the argument is false. **(2)-(3)** Strong. **(4)** Weak. This doesn't tell why homework should not be assigned. **(5)** Weak, since the argument is false. **(6)-(7)** No answer required. **(8)** Weak. The students have this chance without having homework assigned. **(9)** Strong if the argument is true; weak if it isn't. **(10)** No answer required. **4. (1)-(3)** Yes. **(4)** No. Jefferson owned slaves at the time. Many people felt that slaves were not "men," so they could talk freely about the rights of "men" and still believe that these rights did not apply to slaves. Point out to the students the use of rationalization here. **(5)** No. (It would be "yes" if we omitted the last three words.) **(6)-(7)** Yes. **(8)-(9)** No. In those days, governments ruled men, and men were supposed to rule their families, including the women and children.) **(10)** No. The second sentence refers to collective assent rather than individual assent. **(11)** Yes. **(12)** No. The reference to "created equal" was with respect to the "certain unalienable Rights." **5. (1)** It is apparently a letter which was published by the newspaper shortly before this one appeared. **(2)** No. The writer tells us this by using the words "contrary to." **(3)** The age at which alcoholic beverages can be legally consumed. **(4)** We can't tell, except that it is lower than 21. **(5)** No. The writer says this "is not the answer." **(6)** It probably said that there were too many car accidents involving intoxicated people under 21, and the drinking age should be raised to 21 to solve the problem. **(7)** Yes. The writer speaks of "an answer" and proposes "stiffer penalties." **(8)** Apparently it is a bill in the legislature to raise the drinking age to 21. **(9)** We can't tell. It is reasonable to infer, however, that the writer thinks alcohol is a substitute for other drugs, and if alcohol is cut off, then use of other drugs will increase. **(10)** Marijuana. **(11)** Apparently not. Otherwise, to say "drug and pot" is redundant. **(12)** The young adults are not there now but will be if the bill passes. **(13)** I have no idea. **(14)** In the first paragraph, the writer apparently agrees there is a problem with the young adult as a drinking driver. Yet in this paragraph, the writer says the bill would chase them back into their cars, implying that they do not drive now. **(15)** We can only guess at this one. Apparently the writer believes that depriving them of alcohol would drive them to drugs and that drug users on the streets and in cars are harmful to the community. **(16)** Yes. Otherwise, there would

seem to be no point of mentioning "where they would be harmful to the community." **(17)** Apparently it means the problem of young adults who drive after drinking. **(18)** Apparently it means the use of drugs and being "harmful to the community." **(19)** Apparently the writer means the drinking driver. **(20)** They will start using drugs, they will go "back onto the streets and into their cars," and "they would be harmful to the community." **(21)** I give up. **(22)** Driving after drinking is only a minor problem, since using drugs is worse. **(23)-(28)** It is not backed up. **(29)** The statement is backed up (by implication) in the statements examined in questions (25)-(27) above. However, since we question whether or not those statements themselves are true, the result is that this statement is not backed up, either. **(30)** It is very poor. Statements and implications are made but not backed up, and the reasoning is inconsistent.

6. a. Fact (by definition). **b-d.** Opinion. **e.** Statement contrary to fact. **f.** Fact. **g.** Can't tell. **h.** Opinion.

7. (1) To tell Advice Giver why the writer thinks Advice Giver was unfair in the reply given to Wondering. **(2)** Opinion. **(3)** Disagrees. **(4)** To reassure Wondering that her children will get hurt while playing whether or not they are under constant supervision. **(5)** Opinion. **(6)** There are obvious exceptions to the statement, such as severely handicapped children, so ask the students not to consider such exceptions in their answers—i.e., consider only normal healthy children. **(7)** No. She probably meant to say "not more than" rather than "not less than." As it stands, she and her husband could have been 50 feet away when their children got hurt, and this doesn't support her statement that children will "get bumped and bruised . . . regardless of how well they are watched." **(8)** It seems to say, "Your children will get hurt whether or not you watch them, so there's no point in watching them." That is, it gives an excuse for not supervising the children, ignoring the fact that they are likely to be more seriously hurt if not supervised than if supervised. **(9)** It says, in effect, that because supervision is not always effective, there is no point in having any supervision. In other words, the matter of supervising children needs some kind of line drawn (on this side of the line, they need supervision, while on the other side of the line, it is probably OK for them not to be supervised), but the writer implies that we might as well forget about all supervision, since the supervision we give does not always do the job it should. **(10)** Weak. The first sentence is false, and the other two sentences seem to be immaterial. **(11)** Opinion. **(12)** The "one woman in every neighborhood who considers herself an expert . . .." **(13)** Opinion. **(14)** Apparently she is referring to the "expert"'s methods of raising children. **(15)** She insinuates that these "experts" are wrong themselves. **(16)** No. The phrase "who considers herself an expert," as well as the second sentence, tell us she disagrees. **(17)** She does it by saying, in effect, "There is one woman in every neighborhood who tries to make others think she's a better mother than she really is." **(18)** From what we know so far, the question apparently is whether or not Wondering's neighbor was correct in saying that Wondering's children should have better supervision while playing. This paragraph attacks the neighbor rather than sticking to the question of whether or not the neighbor happened to be right this time. **(19)** Because there is "at least one woman in every neighborhood . . ." (whole), Wondering's neighbor (part) must also be like this. **(20)** Weak. It avoids the question by using ad hominem. **(21)** Wondering probably said or at least implied in her letter that she was unhappy because of the neighbor's criticism. **(22)** Opinion. **(23)** I don't have enough information to be able to agree or disagree with it. **(24)** Opinion. **(25)** I don't, since "their best" may include having very short tempers and abusing their children. **(26)** Weak. The second statement is false. **(27)** She probably said her children have received at least one invitation to a party which she didn't let them attend. The second sentence indicates that the invitation was probably from the critical neighbor; otherwise, not letting the children attend a party doesn't fit in with the rest of what we know. **(28)** Opinion. **(29)** They both use basically the same reasoning: "If someone already thinks badly of you, don't bother to try to change the person's mind." They are different in that this writer leaves it at that, whereas 15 and Disgusted goes a step further and advocates proving that the person is right for thinking badly of you. **(30)** It means, "Think about what you hear. Don't accept it without question." **(31)** I think she'd get upset. **(32)** Although the rest of the letter did not imply that the neighbor's advice was not constructive, the rest of the letter did imply that the neighbor's advice should be ignored. Now the last sentence says that the neighbor's advice should be taken if it's constructive. **(33)** She probably said that if the neighbor was concerned enough to speak to her

about her children, maybe the neighbor had some good points, and Wondering should pay attention to her and think about what she said. **(34)** Other than giving (an erroneous) example about her own three children, she didn't. **(35)-(38)** She didn't. **(39)** Aside from the first paragraph and the question, "Why punish them for adults' misbehavior?" it is employed throughout the letter via the sound of authority and (in the last sentence of the second paragraph) the authority of personal experience. **(40)** I think it's very poor. Her opinions are unsupported, she uses various reasoning errors and inappropriate argument techniques, and her last statement appears to be inconsistent with the rest of the letter.

CHAPTER 8

General Comments:

We want the students to start tying together everything they know so far about critical thinking. Every decision in life is based on some kind of argument.

Examples are: (1) These green- and orange-striped slacks are of good quality and are a cheap price. But I won't buy them, because I think that's a horrendous pattern, and I wouldn't feel comfortable wearing them. (2) He's asked me to go out with him. He has a bad reputation. But I don't think someone should be judged on hearsay evidence, so I'll go. (3) X is running for President. X says that the government is spending too much money, that we need better housing, better schools, and reform of welfare laws. I agree with all of that. So I'm going to vote for X.

Our goal is to teach our students how to analyze arguments. Arguments which sound good at first sometimes turn out to be poor arguments. Statements which sound like they support a conclusion may be very weak or even not a support at all. Statements which sound authoritative may be nothing more than a personal opinion. Sometimes a series of statements in support of a conclusion may be made, but the statements themselves are not backed up, and so the conclusion remains unsupported.

It is hoped that the large variety of everyday problems presented in this chapter will encourage the students to be more thoughtful about the decisions they make in their lives.

Sec. 8.1 comments:

We started on this subject in section 7.2 (Which Side of the Fence?). Now we want to explore it more thoroughly. Too often, someone will make statements and take for granted that others know which conclusion they support, while the listeners will have various ideas about the conclusion being supported. Or someone will make a statement thinking that it supports a conclusion, whereas the statement does not support it. Or someone will ignore the point under discussion and take off on a tangent. (How often have you heard something like the following at a faculty departmental meeting? Chair: "The administration is unhappy about having so many changes in students' schedules after a semester starts. We've been asked to discuss ways of minimizing such changes." Other department member: "Why should the administration be unhappy? We're just trying to get the students in the most suitable classes. What good is it to leave a student in a class he or she can't handle?" Another department member: "You can't always avoid changes. There will always be some students who will be misscheduled." And so on, completely ignoring the question, "What can be done to minimize schedule changes?")

Despite the fact that the students have a fairly good background in critical thinking by now, they will probably have trouble with some of the statements in the problems in this section. Don't be dismayed. And, as usual, don't accept my answers without question. For example, in some cases, my answers to "We need to know such-and-such" are "Does not support any conclusion, since such-and-such has no bearing on the case." Your students may disagree with this, arguing that it supports the "need more information" conclusion, even if it is a very poor support.

For more practice in recognizing relevant and irrelevant statements, you may wish to give the students some problems from the booklet *Relevant Information* in Midwest Publishing Co., Inc.'s series "Inductive Thinking Skills."

Sec. 8.1 answers:

1. (1) B. **(2)** A. **(3)** B. **(4)** D. The only place this phrase appears is with "at the time of the adoption of this Constitution," so it has no bearing on A, B, or C. (The fact that someone **says** he or she needs to know something in order to make a decision does not mean that such information is pertinent to the decision. For example, someone might say he or she has to know the color of Mr. Boldwater's hair in order to

decide, but since such information has no bearing on the question, we cannot say it supports the "C" category.) **(5)-(6)** D. **(7)** A. **(8)** D. (This is similar to item (4) above.) **(9)** D. **(10)-(12)** A. **(13)** C. **(14)** B. **(15)** D. (From the given facts, we know he is at least 35, so we don't need to know his exact age in order to decide.) **2. I (1)** D. **(2)** C. (The students may wish to argue for B on this one. If so, point out that the statement implies an argument for A, too, since to say that the farmer may still be guilty includes the possibility that he may not be guilty, too.) **(3)** A. **(4)** D. (Discuss the question of whether or not this statement is a way of avoiding the question of whether or not Midstate should pay him for the losses he suffered.) **(5)** C or D. **(6)** D. (This does not support C but instead simply repeats C —circular reasoning.) **(7)** B. **(8)** D. **(9)-(10)** B. **(11)** A. **(12)** D. (This statement avoids the question. So if he sues in court, then what? Should Midstate pay him, or not?) **(13)** A. **(14)** C. (Same as item (2) above.) **(15)** B. **II (2)** Weak. Our system of justice found the farmer not guilty and precludes him from being tried for the same offense again. Since he is now legally not guilty (and will remain so) and has suffered losses as a result of Midstate's treatment of him, the statement avoids the question of whether or not Midstate should reimburse him. **(3)** Strong. **(5)** Weak, since the legal definition of "arson" appears to have nothing to do with the question. **(7)** Weak. A jury is part of our system of government, so the statement says, in effect, "A government cannot be held responsible for its actions," which should be a false statement. **(9)** Strong if the students believe that the circumstances imply a fair trial; weak otherwise. (Ask whether or not a trial is fair if the government's case is flimsy. If the students say "no," ask why not, since the jury should be able to see that the case is flimsy.) **(10)** Weak, for the same reason as item (7). **(11)** Strong, providing the "as far as possible" is within the limits implied by this problem, and providing the students feel that the actions were taken unjustly. (Ask whether or not "as far as possible" should include a $1 billion settlement to compensate the farmer for being unable to find work. Encourage the students to try to draw a line for "as far as possible." If they settle on something like "within reasonable limits," push for a definition of this.) Weak if the students feel the actions were taken justly. **(13)** Strong or weak, depending on whether or not the students agree (in the farmer's case) with the last part of the statement, "and this is wrong." (Ask whether or not such actions would be wrong in every case.) **(14)** Weak for the same reason as item (2) above. (I could be convinced to change my mind, I think.) **(15)** Weak. First, there is no evidence to show that his original attorney was not competent. Second, if the original attorney was not competent, the statement uses the reasoning error of assumption contrary to fact. Third, he'd have lost money from legal fees by hiring a competent attorney, so there is still the question of reimbursing him at least for this. Fourth, the second sentence in item (15) is questionable— i.e., if the case really was flimsy, was it his fault, not the state's? **3. (1) a-d.** No. **(2) a.** It was to determine who was right in his political opinion. **b.** I don't see how. **4. (1)** For what was the "medicine" in BRAND X recommended by the doctors? (If not for headache relief, then the statement is irrelevant to the ad.) **(2)** The advertisers hope the statement quoted will be taken as a supporting statement for the conclusion, "I should use BRAND X for headache relief." We're asking whether or not the quoted statement supports that conclusion. **5. (1)-(2)** No. **6. (1)** No. The amount of interest a bank may pay on a savings account is regulated by the federal government. All the ad is saying is that no other bank pays more than Big City National Bank pays. In a large city, competition between banks is keen, and chances are good that all other banks in Big City are paying the same amount of interest on savings accounts as Big City National Bank is paying. **(2)** No. It supports the idea that you are as smart to put your money in Big City National Bank as in any other bank, but it gives no reason for thinking it's smart to put your money in some bank (instead of somewhere else) in the first place.

Sec. 8.2 comments:

Now that the students have a reasonably good background in most of the basic skills in critical thinking, we want them above all else to ask questions about what they hear and read. Too often, an argument which sounds good at first will prove to be a poor argument when we start asking such things as, "Is this statement fact, or opinion? Where is this statement backed up? Even if we go along with what the writer says, does the conclusion necessarily follow? Does this statement support the conclusion? Are the writer's statements inconsistent? What reasoning errors does the writer use? What propaganda techniques does the writer use? The writer says

this statement is a rebuttal of the opponent's statement, but is it?"

It should be stressed again that we are not looking for ways to be nit-picking. For example, we do not expect the statement, "The U.S. has a great many natural resources," to be backed up, since the statement is a matter of common knowledge. But we do expect such statements as, "The A.M.A. has known for years about many cures for diseases, but they keep this from the public so that the doctors can make more money," and, "This vacuum cleaner is the best on the market," to be backed up. We would label the last two statements as unsupported if they were not backed up. But we would not label the first as unsupported whether or not it was backed up, simply because we believe it to be common knowledge.

In this respect, also stress to the students that a statement may need backing even though we happen to agree with it. That is, the test for concluding that a statement does not need support is a "yes" answer to both of the questions, "Is it a fact, not just a commonly held opinion?" and, "Is it verifiable?" For example, I've heard various people make the statement about the A.M.A. (in the paragraph above), so some students may consider it to be common knowledge and tend to think it needs no backing. However, it appears to me to be a commonly held opinion rather than fact, and I've never seen any verification of it. Until I do, I will continue to ask the speaker to back up the statement.

Sec. 8.2 answers:

1. First, the legal, not a dictionary, definition of "automobile" is needed. Second, even if we use a dictionary, a word made up of two separate words does not always have the meaning the two separate words would indicate. (Examples are streamlined, mandrake, pesthouse, and starboard.) Since the pilot's argument falsely assumes that a "two-word" word necessarily has the combined meaning of the two words, his argument falls apart. **2.** (Note: The bill described in the problem is fictitious.) **(1) a.** She is protesting the passage of the citizens' rights bill. She is also protesting some of the decisions of the Supreme Court. **b.** Answers will vary. **(2) a.** No. **b.** It's hard to say. The other three paragraphs of the letter tie together, so it's reasonable to suppose that the Court decisions are also tied in with the citizens' rights bill. Since she is against the bill, the decisions must have been supportive of the measures in the bill. **(3)** She doesn't. **(4)** She says Big City's newspaper has made unfair attacks on senators who voted against the citizens' rights bill and that she will stop taking the paper if such attacks continue. **(5)** It isn't. **(6) a.** The newspaper's vicious attacks. **b.** We can't tell from her letter, but we might consider these possibilities: (1) She thinks any vicious attack is an unfair thing. (2) She thinks vicious attacks are unfair if they are directed against people she favors. (3) The attacks were vicious in the sense of being exaggerated and slanted and so were inherently unfair. (4) The "vicious attacks" were not vicious attacks at all but were simply objective statements of facts uncomplimentary to people Mrs. X favors, and she thinks it is unfair to print the truth about these people. **c.** We will stop buying and reading your paper. **(7)** When someone says "so-called," it implies that the speaker believes something to be inappropriately named. For example a "so-called hero" is implied to be called a hero but to be not really a hero at all. Mrs. X apparently believes that the citizens' rights bill is not a citizens' rights bill at all. In view of the antagonism she shows the bill in the rest of her letter, she also apparently believes that the bill takes away, rather than grants, citizens' rights. **(8) a.** No. **b.** Silverlake and Hempten, against; Camford and Lightwood, for. **(9) a.** Some congressmen lack the courage to vote for what they think is best for the country, and they allow themselves to be led around by people who do not have the country's best interests at heart. **b.** She doesn't. **c.** Answers will vary. **(10)** Apparently she means people who favored passage of the citizens' rights bill. **(11) a.** The citizens' rights bill. **b.** We can't tell from the letter. **c.** Answers will vary. **(12)** She doesn't tell us. Judging from the rest of the letter, however, Hempton voted against the bill and Mrs. X thinks he is a fine man because of this. **(13)** "terrible and frightening decisions"; "vicious attacks"; "so-called"; "have the courage to vote for what they think is best"; "not be led around"; "and his kind"; "disgusted"; "making a deal"; "fine men." **(14)** Very poor. Not one statement, implication, or insinuation is backed up. The writer just seems to be blowing off steam by making a series of angry statements with no attempt (other than emotionally loaded statements) to convince us that she knows what she is talking about. **3. (1)** Johnson Township is a wonderful place to live because there is so much freedom to do as you please. **(2)** Johnson Township is a poor place to live because

ordinances and laws are not enforced. **(3) a-d.** All are in Johnson Township. This is implied by "we have" in the third paragraph. (If Midstate Avenue and the sheriff's office weren't also in Johnson Township, there would be no point in mentioning them in the context of conditions in Johnson Township.) **(4)** Displeasure. The second paragraph describes a neighborhood where people don't care to make it look nice or to be considerate of others. The third paragraph describes unsafe conditions. It is doubtful that the writer would approve of these things. (Don't be surprised if some of your students don't recognize the irony in this letter. Several will probably think the writer is serious about being pleased with the conditions described.) **(5)** Answers will vary. **(6)** Good. The basic statement is backed up by seven good examples of ordinances and laws which I think should be enforced but aren't. **4. (1) a.** Apparently Mr. A wrote a letter to the editor of the Midvale newspaper, and Ms. T's letter is a response to his letter. **b.** Pornographic books and magazines were displayed openly where children shopped. Citizens protested. The Midvale City Council proposed an ordinance against such open displays. Citizens attended a Council meeting about the ordinance. The ordinance was passed. Mr. A wrote to the Midvale newspaper. **(2)** d. **(3) a.** Yes. **b.** No. **(4)** Answers will vary. **(5) a.** She means the first line of Mr. A's letter. **b.** (Make sure the students don't take this literally.) She meant she already suspected that the letter would be the kind of letter it was. **(6)** No. She meant that she had read many similar letters—letters which use emotionally loaded words and flag-waving to support an otherwise weak argument. **(7)** The quotation marks show that these are the phrases used by Mr. A in his letter. **(8)** All of the phrases enclosed in quotation marks in Ms. T's letter. **(9)** poor, ignorant, misguided souls; obscene literature; printed filth; my child is at the mercy of; sadistic, sex-saturated magazines; my rights to protection from the community; protecting children. **(10)** She means that letters such as Mr. A's need emotionally loaded phrases (such as the ones she quoted) to support them. **(11)** The "certain phrases." **(12)** She is saying that Mr. A's letter and many others like it which she's read before are designed to appeal to emotions, not reason, and she was upset about it. **(13)** The room in which the city council of Midvale held its meeting. **(14)** In this context, "poor" goes along with "ignorant" and "misguided" rather than with lack of money—i.e., it implies we should feel sorry for such people for being ignorant and misguided. So if Ms. T shows that she is not ignorant or misguided, she has automatically shown she is not "poor" in the sense of this context. She shows she is not ignorant by her well-written letter and by her apparent knowledge of the facts surrounding the ordinance. She shows she is not misguided by agreeing with Mr. A that parents should accept their responsibilities to protect their children from obscene literature. **(15)** Yes. (Make sure the students realize that both questions are examples of innuendo.) The first question insinuates that Mr. A did not attend the Council hearing and so has no basis for thinking the supporters of the ordinance are "poor, ignorant, misguided souls." The second question follows through by insinuating that even if Mr. A did attend the meeting, he still has no basis for such thinking. **(16)** She meant the quoted phrases in the first and second paragraphs of her letter. **(17)** d. **(18) a.** No. She agrees that parental duty should not be abdicated, but she disagrees on what "abdication of parental duty" means. **b.** Yes. **c.** No. **d.** Both seem to think that parents who think their children should not be exposed to obscene literature should keep their children away from it. **e.** Mr. A seems to think that parents should keep their children away from stores which display obscene literature, while Ms. T thinks (1) this is not always possible, and (2) even if possible, other parents will not always do it, and her children will be subjected to perverted viewpoints by other children (and teenagers). **f.** She refutes it with the third and subsequent statements in her fourth paragraph. **(19)** She refutes them all in her last paragraph. She also refutes "infringing rights" and "erosion of liberty" in her fourth paragraph by showing that not having the ordinance is a greater infringement of rights and erosion of liberty than having it is. **(20)** Excellent. She refutes all arguments of the opposition, and she supports her own arguments. **5. (1)** Yes. It's one thing to think an independent group is saying it has found lower prices at a given supermarket chain; it's a different thing to think that employees of the chain are saying that they have found lower prices there. My guess is that the chain (call it SUPERCHAIN) meant to capitalize on this mental difference. Otherwise, why not call the group something like "The SUPERCHAIN Food Council" instead of the "The Consumer Food Council"? With an independent group, we tend to

accept the findings with a minimum of questions; but with a company-sponsored group, we tend to be more skeptical of the findings. **(2)** No. The simple fact that they were not backed up does not make them misleading. Nor would being unable to find evidence to back them up make them misleading. To make them misleading in this respect, one would have to find evidence to show that the SUPERCHAIN prices were not in fact lower than the prices at other supermarkets. **6.** First, we don't know how the 6% is computed. If by pieces of litter, it would equate a throwaway bottle with, say, a 1-inch square scrap of paper, and so is misleading. Regardless of this, however, it says, "We should not take any step toward solving this problem unless we can solve the whole problem at once." This doesn't make good sense to me. It is like saying, "Don't crack down on drunk drivers, since they are not the only cause of accidents." Or, "Don't object if one of your kid's teachers uses vulgar words in the classroom, since that isn't the only place your kid will ever hear such words." **7. (1)** "Publishing too many letters from." **(2)** People who live in the suburbs who write letters to the editor of the Big City newspaper. **(3)** "angered me" **(4)** She seems to intend it to be a rebuttal to the statement made by the other writer whom she quotes in the first paragraph, but it has nothing to do with the other writer's statement. That is, the other writer said that people who have children without being able to support them are responsible for the welfare rolls. Mrs. X wants to refute this by saying that people who have children and are able to support them are not responsible for the welfare rolls. There is nothing in Mrs. X's statement which disagrees with the statement made by the other writer. Mrs. X's statement is an inverse of the other writer's statement and so the two may both be true at the same time. **(5)** It appears to be a combination of "red herring" and "other things are worse." To say that the government spends too much money on other things does not refute the claim that too much is spent on welfare.

Sec. 8.3 comments:

In this section, we ask the students to find arguments in favor of both sides of a question. We also ask them to refute the arguments of both sides. We sometimes even ask them to find arguments and then refute their own arguments.

You may find in this latter case that some students will tend to come up with weak arguments just so that the arguments are easily refutable. Encourage the students to think up the best arguments they can, leaving the arguments for their classmates to refute if they themselves can't think of refutations. It is important that they do this in order to realize that sometimes even the strongest-sounding argument may have an important weak spot. To stick only with weak arguments defeats this objective.

Problem 7 in this section makes an excellent test problem, for there are strong arguments for all three positions.

Sec. 8.3 answers:

Note: Answers given here are only some of the many possible. Encourage the students to find refutations of refutations of refutations of . . ..
1. a. Maybe they sleep from 2 to 6 and then go out after that. Then they don't need to be home by 10:00 p.m. to get enough sleep for school. **b.** And maybe they don't sleep from 2 to 6. In fact, it would be unusual to find someone of that age who does. So the great majority still need to be home by 10:00 p.m. to get enough sleep. **2. a.** Most states don't allow kids under 16 to work that late, so your argument falls through. Even if they did, kids that age shouldn't have that kind of responsibility. **b.** You're ignoring the cases of the states which do allow kids that age to work that late, so my argument stands. And saying that these kids shouldn't have such responsibilities doesn't mean they don't have them. Until you can show me a way to relieve these kids of such responsibilities, my argument stands. **3. a.** (1) Such a curfew would cut down on juvenile crime. (2) Such a curfew would help parents have better control over their kids. **b.** (1) You're talking about maybe 5% of the kids this age, so you're willing to penalize 95% because of the actions of 5%. This isn't fair. (2) You're saying the law should take over the parents' responsibility to control their kids. If we follow this to its logical conclusion, children should be taken from their parents and be raised by the government. **4. a.** (1) If kids want to stay out past the curfew, they will. Such a curfew will only encourage them to break the law. (2) Kids sometimes go to their friends' houses to watch a 9:00 p.m. TV program which isn't over until 10:00 p.m. They wouldn't be able to beat the curfew. **b.** (1) Your first statement is true about any law: people who want to break it will do so. But many more people obey it than break it, and it helps society, which is the purpose of the law in the first place. To say that having a law encourages people to break it is ridiculous. For example, people may drive over the posted

speed limit, but posting the speed limit does not encourage them to drive fast. On the contrary, they'd drive even faster if there were no speed limit. (2) So what? Let the kids stay home to watch TV. Or let them spend the night at their friend's house. **5.** Answers will vary. **6.** **(1)** (a) Since Joe is a Council member, both students and outsiders think that other Corbett students are like Joe. (Notice that the petition said Joe was "representative of," not "a representative of.") (b) Both students and outsiders believe that Corbett students think highly of Joe. (c) Any Council member who intentionally breaks the law creates a poor image of both the Council and the School. (d) In view of arguments (a) and (b) above, the poor image is projected onto all of the Corbett students. (e) Having a poor image is detrimental to the welfare of both the Council and the School. **(2)** (a) A Council member is thought to reflect other students' opinions about school affairs, and my reckless driving tickets did not involve opinions about school affairs. (b) A Council member is not thought to reflect other students' attitudes toward life in general. (c) My reckless driving tickets did not and will not keep either the Council or the School from operating. (d) Any action which does not keep the Council or the School from operating cannot be detrimental to their welfare. **(3)** (a) This is a false statement and is refuted by the first part of Joe's argument in (2)(a) above. (b) It is probably true that outsiders and some students believe that Joe is "thought highly of" in a broad sense, but most students would probably vote for Joe either because they "thought highly of" his ability to get things done for them in the Council (rather than because they "thought highly of" him in a broad sense), or because he was popular. (Ask your students if someone can be popular and yet not be thought highly of.) (c) As far as outsiders are concerned, this statement is probably true and so is irrefutable. That is, they tend to think of Council members as "ideal" students, so when such a student does something of which they disapprove, it does, indeed, create a poor image of both the Council and the School. The students, however, are more likely to separate Joe's personal life from his school and council life and, at worst, to consider him some kind of jerk outside school for driving recklessly enough to get two tickets in six months, while at the same time holding no grudge as long as his Council acitivites remain satisfactory. (We have, then, only a partial refutation of the argument given.) (d) Again, a partial refutation exists. Outsiders are likely to believe the statement. But most students would tend to separate Joe's personal life from his school and council life and so would not consider his reckless driving to reflect either on the Council or the School. (e) I see no refutation to this statement. **(4)** (a) I see no refutation to this statement. (b) The question is not about Joe's attitude toward life in general, but his attitude about obeying the law and his attitude toward the safety of others. Such basic tenets as, "You should obey laws," and, "You should consider the safety of others when you do something," should be respected by all citizens, and it is reasonable to suppose that a Council member in particular would respect such tenets. (c) The argument is irrelevant to the discussion. ("Red herring.") (d) The statement is false. Schools are supported by taxes, and when a school has a poor image, taxpayers are less likely to support it. Thus, anything which gives a school a poor image is detrimental to its welfare. **(5)** (Answers will vary.) He should have been dropped from the Council. Since Joe's reply gave no indication that the two tickets were undeserved, I assume that they were deserved. Also, Joe's reply gave no indication that his driving habits had changed as a result of the tickets or that he regretted the actions which led to the tickets. On the contrary, his statement about "any tickets I get" leads me to infer that he will not be surprised to get more tickets and his driving habits have not changed. With such driving habits, it is probably only a matter of time until Joe's driving habits lead to a serious accident and bad publicity about a Corbett High Council member, and it is only luck that his two tickets in six months have not already led to such publicity (if they, indeed, have not already). Whether it is fair or not, such actions do give the Council and the School a bad image and so are detrimental to the welfare of both the Council and the School. Since the Council Constitution specifically provides for removal from the Council in such cases, Joe should be removed. **7.** The average student will probably write answers something like these: A. He should have been dropped. He was always complaining, and you can't get anywhere with someone who does nothing but complain. He shouldn't be on the Council if he isn't willing to help solve the problems. He's just making more problems by all of his complaining, and his attitude is detrimental to the welfare. B. He shouldn't have been dropped. If nobody com-

plains about anything, you can't get anywhere because you start thinking that everything is OK the way it is, and then you never do anything about it. His attitude was good for the School, not detrimental. C. We need more information. All we know is that Rocky complained a lot, but maybe the school and everything needed complaining about. But maybe it didn't, either. We have to know more about Rocky and the School before we can tell if his attitude was detrimental. (Notice that each of the above answers mentioned the question of whether or not Rocky's attitude was detrimental to the School's or Council's welfare, which is the main point of the question. Following are answers which should be considered as indicative of superior understanding of the situation.) A. He should have been dropped. The problem tells us that Rocky's remarks made it obvious that he didn't like the way things were being run. The use of the word "remarks" makes it appear that Rocky's statements were not constructive criticisms but were complaints designed to promote dissatisfaction among the students. His attitude, then, must have been an attitude of complaining, rather than of making helpful suggestions on how to better the various situations. This kind of attitude is detrimental to the welfare of the School, and so Rocky should have been dropped from the Council. B. He shouldn't have been dropped. Regardless of Rocky's former reputation, he was elected to the Council, so apparently many students felt that Rocky would represent their feelings and attitudes in the Council. His remarks about not liking the way things were run would then be indicative of the feelings of many students, and since a school will function better if it is aware of the opinions and attitudes of its students, Rocky's attitude could not have been detrimental to the welfare of the Council or the School, and he should not have been dropped from the Council. C. We need more information. The fact that Rocky's remarks made it obvious that he didn't like the way things were run at the School may or may not give us an indication of his attitude. The problem tells us nothing about his attitude, so we don't know how he expressed his dislikes. If his attitude was one of constant complaining with no constructive suggestions to improve the situations and if he never wanted to work to help improve the situations, then his attitude was detrimental and he should have been dropped. If his attitude was one of constructive criticism and he offered suggestions to improve things, then his attitude was not detrimental, and he should not have been dropped. Until we have this additional information, we cannot decide whether or not Rocky should have been dropped from the Council. **8-12.** Answers will vary.

Sec. 8.4 answers:

1. Note: The given statements will probably be good for quite a bit of discussion, since several of them could support more than one conclusion, depending on the circumstances. Also, they may be especially difficult because so many of them are false or ignore given data. As always, my own answers are subject to challenge. **(1)** E. (We were told to accept the story as true, and the story says Prince killed the geese, so this contradicts the given statement. We cannot accept a statement which contradicts given facts as being supportive of any conclusion.) **(2)** E. (The students may argue that this supports A, but the law said nothing about keeping a dog confined.) **(3)** E. (The students may argue that this supports B, but if the law does not apply in Prince's case, then whether or not Mr. Greene had business keeping geese in his yard is irrelevant and immaterial.) **(4)** B or C. **(5)** E or B. **(6)** E. (Again, this ignores given facts.) **(7)** B or, possibly, C. **(8)** D. **(9)** My choice at the moment is E, but good arguments could probably be presented for B or C. **(10)** E. (It has already been shown that Prince is an exception to the rule.) **(11)** B. **(12)** E. (The question is one of law, not of Mr. Greene's opinion.) **(13)** E. (The statement ignores the question of law, whereas conclusion A is based on the law.) **(14)** D, when used in conjunction with statement (8) above. **(15)** E. (Nobody said that Prince was no good at all.) **(16)** C. **(17)** E, although this statement argues against conclusion C. **2. (1)-(6)** No. **3.** Not especially. First, how come the other 1 out of 4 dermatologists didn't feel the same way? Second, how many dermatologists were asked the question? Third, suppose for the sake of argument that every dermatologist in the country had been interviewed and had agreed that the medicated ingredient in BRAND X shampoo is effective in fighting dandruff. This still wouldn't mean that BRAND X shampoo is effective in fighting dandruff, since the ingredient in question may be used in such a small amount in BRAND X shampoo that it makes no difference in fighting dandruff. **4. (1)** do-gooders, stamp out, make me sick, lurk, bankrupt an entire industry **(2) a.** He implies that it is wrong to try to put an entire industry out of business, even if the

people who wish to do so are convinced that doing so is for the common good. **b.** I don't. For example, stamping out organized crime would bankrupt an entire industry, but I don't think it would be wrong to do so. **(3)** The first paragraph shows Mr. X is against stamping out cigaret smoking, but the second paragraph argues in favor of stamping it out. That is, cigaret smoking obviously adds foreign substances to the air and so is presumably responsible for adding more germs (or whatever) to the air. **(4) a.** He seems to argue that the air is contaminated as it is, and there is no point in trying to make it less contaminated. **b.** No. This is the same as saying that we should not try to eliminate bad conditions. But, by definition, "bad conditions" are conditions which are undesirable and which should, therefore, be changed. Note: You might like to ask your students to compare the reasoning in this writer's second paragraph with the reasoning in problem 6 of section 8.2 ("Banning throwaway bottles will not solve the whole problem of roadside litter, so don't ban them.") and in problem 7 of section 7.5 ("Children will get hurt whether or not you supervise them, so don't bother supervising them."). **(5)** Consider what happens if we try to disagree with the sentence: Us: "Humans have free will. We can choose to smoke or not to smoke." Mr. X: "True. But then you were fated to smoke or not to smoke." Us: "But we could move to an island someplace where the air is clean and pure and never contract such diseases, or we could stay around cities where we might, indeed, contract such diseases." Mr. X: "True. But then you were still fated either not to contract them or to contract them." You see? No matter what we might say to try to convince Mr. X that our fate is not predetermined, he can simply restate his argument that the thing would happen if and only if it was fated to happen. (It didn't happen? That's because it wasn't meant to happen. It did happen? Then it must have been meant to happen.) **(6)** It is important to realize that Mr. X assumes that doctors and nurses do not contract the communicable diseases of their patients simply because they were not fated to do so. First, cancer and emphysema are not thought to be contagious, thus explaining why medical personnel do not contract them from their patients. Second, my encyclopedia says that medical personnel who attend tubercular patients often do contract tuberculosis. Third, medical personnel take certain precautions (such as vaccinations and sterile masks and gloves) when working around patients with other communicable diseases in order to lessen the risk of contracting the disease. (Notice that Mr. X's argument that such personnel do not catch the diseases is refuted by the counterexamples of such personnel who do, in fact, catch the diseases. For these, Mr. X can argue that they were "fated" to do so. For the ones who don't catch the diseases, Mr. X can still argue that they were not "fated" to do so.) **5. (1)-(2)** No. **(3)** Apparently it was to assuage the anger people were feeling about the deaths. In effect, it tried to shift the emphasis from "unnatural death as a result of listening to the government" to "natural death as a result of old age." (Notice the use of "red herring" here.) **(4)** I don't. We can strike the word "older" from the statement and still have a true statement. Most people want to live as long as they can, and knowing that they must die at some time or another doesn't make them any more willing to die (or to have others die) prematurely. **6.** The mother implies that the coroner has said forget about (or not be concerned about) her daughter's death, but the coroner didn't even come close to saying that. Instead, he implied that she should forget about trying to sue the daughter's doctor for malpractice, since the doctor was not at fault. **7. (1)** Answers may vary, but I'd prefer the fine under most circumstances. (Make sure the students realize that the fine and the jail sentence would probably be roughly proportional. That is, if the fine were $100, then the jail sentence in lieu of the fine would not be, say, 6 months.) **(2)** The poor would be jailed because they would be unable to pay the fine. **(3)** No. He believes they should go to jail, per the last paragraph of the letter. **(4)** First, he says that sending the guilty person who is poor to jail would be unjust, but then he says that everyone who is guilty should go to jail. **(5)** There are numerous such examples. For instance: (1) Three drivers are speeding, but only one gets stopped and ticketed. He got what he deserved, but he may say he was treated unfairly. (2) A company has a rule against accepting gifts from suppliers. The penalty for breaking the rule is termination of employment with the company. The company's employees routinely ignore this rule. The company finally fires some but not all of the offending employees. The discharged employees say they have been treated unfairly. (3) The penalty for desertion from the U.S. Army in time of war is execution. A private who deserted is caught, tried, found guilty, and executed by a firing

squad. The public says that was an unfair action. (Notice in all of these cases that the offender was given the exact penalty the law or rule provided for the offense. It is interesting that the people who are allowed to "get away with" their actions do not believe they themselves have been treated unfairly.) **(6)** It's probably because other people got away with the same actions without penalties. That is, we tend to feel that if a law or rule is to be enforced, it should be enforced uniformly, not selectively. Furthermore, many people feel that if a law or rule has been consistently ignored without penalty, there should be some kind of warning before the law starts being enforced. **(7)** Legal, yes. Fair, yes. OK, no. The purpose of having a law is to regulate an activity. To start enforcing the law without warning after 5 years of not enforcing it would seem to be for the purpose of penalizing the law breakers or making examples of them, rather than for the purpose of preventing the actions in the first place, the purpose of the law. It's like saying, "I'd rather catch you breaking the law than talk you out of breaking it beforehand." **8. (1)** The insinuation is either that the average American thinks that he or she, or that the President thinks that the average American, knows everything about everything. It is unjustified because it not only is not backed up, but I cannot believe that the President or anyone else would think it (notice I'm using "inconceivability" here). **(2)** I give up. (Granted that newspapers, TV, etc. are not always reliable sources of information, other sources are available.) **(3)** The context shows that he thinks the full-time job of people in Congress is to find solutions to national problems, whereas this is not the full-time job of the average American, and there can be no good solution from someone who doesn't pursue the problem as a full-time job. **(4)** The answer to this is implied by the last two paragraphs: the people can't possibly have good solutions, since they are too ignorant; instead, the solutions should be found via the Congress. **(5)** Our people in Congress are supposed to carry out our wishes, not act as an elite group to dictate to us. We have the right and the duty not only to tell them of our concerns but also to suggest solutions to the problems. Granted, it is then their duty to arrive at a solution which will be the most acceptable to the most of their constituents, but the columnist makes it sound as though we, the people, have no business suggesting solutions. **9. (1)** He seems to think that the increase in traffic accidents is directly related to the lowered drinking age. **(2)** Did the number of 18- to 21-year-olds also increase by 167% in the past five years? **10.** I give up. **11.** (Answers will vary.) I think so. Many people lie routinely whenever it suits their purpose to do so, and such people are also likely to lie on the witness stand. (Their swearing "to tell the whole truth and nothing but the truth" can be construed by them as no different than saying, "I like it," about something they don't like.) On the other hand, a person who has internalized the idea that lying is wrong (as in the case of the witness in the newspaper article) is especially unlikely to lie on the witness stand. **12.** No. Pi is a fixed ratio (the circumference of a circle divided by its diameter) and so is not subject to legislation. Trying to legislate that pi is exactly 3 is like trying to pass a law saying that $34/5 = 7$. That is, passing a law which says "dividing 34 things among 5 people guarantees that each person will get exactly 7 of the things" does nothing to change the fact that such a division is not possible. **13.** The tax accountant was right. The intent of the law was to tax an individual on the net, not the gross, proceeds from a business undertaking; consequently, the law provided the deduction for "ordinary and necessary expenses incurred in a trade or business." Furthermore, the intent was to provide a deduction for any expense which was "ordinary and necessary" to a particular kind of business, even though the same expense might not be "ordinary and necessary" to another kind of business. (For example, wages paid to a full-time registered nurse would be "ordinary and necessary" expenses for a privately owned hospital, but would be neither ordinary nor necessary for a small law firm.) The expense of repairing trucks damaged by accidents is both ordinary and necessary in the trucking business, and to deny the deduction of the expense would be contrary to the intent of the law. (Note: The students cannot be expected to know the intent of the law, but it should be pointed out to them that such an intent can be reasonably inferred. Some of the students may argue that the Internal Revenue agent was right and may back up this viewpoint with good reasoning. Such students should be given credit for their good reasoning, despite their "wrong" answer. However, it is not good reasoning to infer that Internal Revenue agents are infallible. For example, an argument like this is not good reasoning: "Well, this person was an Internal Revenue agent and should certainly have known the law. If this agent said

the expense wasn't deductible, then it surely must not have been deductible!") **14-16.** Answers will vary, and you should get some very interesting discussions from these problems. **17.** (This case was reported in *The Detroit News.*) The judge didn't believe the hunter. The hunter was fined $112 for violating Midstate's hunting laws. **18. (1)**

8th grade completed	$12,000/year
1 to 3 years of high school	$14,000/year
12th grade completed	$17,000/year
1 to 3 years of college	$20,000/year
College completed	$25,000/year
5 years or more of college	$30,000/year

Notice that these would be rough figures, since the more education one has, the fewer income-earning years are left. Therefore, the actual income per year would be higher than the figures listed here, since these figures assume that the number of years in which income is earned is the same for everyone. **(2)** (Notice that the conditions of the problem preclude arguing that the high school graduate has more intelligence than the dropout.) In general, the dropout will be a dropout because he lacks motivation to learn, he has a poor attendance record, and he finds it difficult to conform to the discipline of a school. All of these (good motivation, good attendance, and conformity to ordinary discipline) are necessary attributes of the employee who is valued. Without these attributes, the worker will find that a job is hard to keep and that it is even harder to advance in his job. Consequently, his earnings are lower than the employee who has these attributes. **(3)** I think it is. Along with the same reasons as in the answer to item (2) above, we now can consider two other things: First, the college graduate will have specialized in some area, and such in-depth knowledge is worth more money. Second, the college graduate will have picked up a broader base of knowledge on his way to a degree, thus giving him more fields (and so more jobs) in which his knowledge can be applied. **19.** I don't. Taxpayers should have the right to expect information from the IRS to be accurate. When such information is not accurate, the taxpayer is not at fault and should not be penalized. But the court ruling says he or she is at fault and should be penalized. The alternative to relying on the IRS for accurate information is to subscribe to a tax information service at a cost of several hundred dollars yearly, and it is unrealistic either to expect all taxpayers to do this or to expect, even should all do this, that all will understand what they read.

CHAPTER 9

General Comments:

Many of life's everyday questions can be answered with a simple "yes" or "no." (Should I buy that car? Should I take that course? Does that make sense to me?) Although some such decisions are more difficult than others, such problems are relatively easy to resolve simply because there are only two ways to go—yes, or no. We list the arguments for and against each side, and we decide which arguments have the more merit. Those are the kinds of problems we have concentrated on both in CTB1 and so far in CTB2.

Now, however, we want to take a good look at some of life's more complicated problems—problems which do not have simple "yes" or "no" answers. This kind of problem can have many possible answers, and people may disagree strongly on the relative desirability of the various solutions. (Which car should I buy—or should I buy any car? Which course should I take? Which line of reasoning makes the most sense to me? What are some possible solutions to this problem?) We want the students to be able to think of possible solutions to such problems. But we also want them to be able to think of the problems their solutions may, in turn, create.

Sec. 9.1 comments:

Brainstorming sessions are routinely used by business, industry, and scientists to solve problems. It often turns out that a practically ideal solution is found as a result of examining a suggestion which at first sounds crazy, stupid, impractical, joking, or all four. Consequently, it is very important that the "no negative comments" rule be strictly enforced.

Many (perhaps most) of the students will probably never have done brainstorming before. Expect them to be hesitant at first. Despite the "no negative comments" rule, they won't want to say something which might sound stupid. Encourage them to say whatever occurs to them.

In order that the students truly experience brainstorming sessions, the problems for this section are not in the students' texts but, instead, appear below.

Problems for Sec. 9.1:

Divide the class into groups of five or six students each. Have each group select a secretary. Make sure the secretary has paper and a pen or pencil. The secretary will probably be so busy writing that he or she will not have time to think of suggestions, but this will still leave four or five brainstormers in each group. Have the group select a different secretary for each problem so that everyone in the group has a chance to participate as a brainstormer.

Allow exactly two minutes for each brainstorming session. Start the timing as soon as you finish reading the problem to the class. (Each group will work on the same problem.) When the two minutes of time is up, allow the groups time (perhaps 30 minutes, if needed) to explore the suggestions and come up with an acceptable solution. When all groups have their solutions, ask one member of each group to present that group's complete solution to the class for class discussion.

Successful brainstorming is not amenable to mass production techniques, so it is definitely recommended that you not do more than two problems (and perhaps only one) a day.

Here are the problems:

1. A family in the school district has been having a lot of bad luck. The father has been sick and out of work. The mother is in the hospital with heart trouble. There is no insurance to cover hospital and other medical bills. The four kids range from age 5 to age 12, and the older ones take care of the younger ones. The family is thousands of dollars in debt and the amount is growing every day because of the huge medical bills. Your Student Council has asked you to come up with ideas for helping the family. What are your ideas?
2. Your neighbor's kids are real brats. They stand three abreast on the sidewalk so that others have to walk around them. They tease your dog so that he barks constantly every time you let him out. They throw things at passing cars, and three drivers who have ducked to avoid being hit have almost had very serious accidents. They run around ringing people's doorbells and then run away. They pick on the smaller kids in the neighborhood. They are outside making loud noises even at 10 and 11 at night, when many of the neighbors are trying to sleep. They harrass elderly people by threatening to knock them down or steal their groceries. What do you think should be done?
3. Jim's parents want to give him a birthday party. Their house is small, so they said he can invite only ten friends. Jim likes the idea of a party. But no matter which ten friends he invites, there will be at least ten others who will be hurt if they are not invited. What do you think Jim should do to solve the problem?
4. You live in a tough neighborhood. It is not safe to be on the streets at night. It is not safe for elderly people to be on the streets at any time, because even in broad daylight, they are knocked down and robbed. What can be done to make the neighborhood safer?
5. Your math teacher really knows her subject. But she makes no effort to keep the class from talking while she's explaining something. About two-thirds of the kids, including you, want to hear what she's saying, but the other kids are talking and you can't hear the teacher. This goes on all the time. There is no way you can pass the class unless you can start hearing what the teacher is saying. What can you do to solve the problem?
6. You bought a new car from a dealer. The car is a lemon. First, the gears wouldn't shift properly. Then the fuel gauge wouldn't work. Then the ignition key stuck in one position. Then the gear shift problem came back. Then the fuel gauge problem returned. Then the windshield wipers wouldn't work. Then the directional signals stopped working. It's been one thing after another. Every time you take the car back and have something fixed, something else goes wrong. Besides that, you're without the car the whole day and have to pay to rent a car for the day so that you can get back and forth to work. (The car dealer's repair shop isn't open on Saturday or Sunday.) What can you do?

Sec. 9.2 comments:

In this section, students are given various problems to consider, most of which have no easy solutions. Here, the students' solutions may be (1) too vague to be meaningful (make sure they define vague terms; make sure they specify the details of their solutions), (2) cases of oversimplification or card-stacking (make sure they admit the problems concomitant with their solutions and then come up with solutions to those problems), (3) wishful thinking (ignoring the realities of how people would react to their solutions), (4) not drawing the line (not admitting that there is a problem to be solved, or suggesting a solution which doesn't solve the problem),

(5) avoiding the question (perhaps by stating something like, "It shouldn't have happened in the first place"), or (6) any of several other reasoning errors or inappropriate propaganda techniques which I'm sure will occur to some of them to use.

We want the students not only to be able to think of solutions but, unlike the brainstorming in section 9.1, we want these solutions to be practical, we want to know what problems are concomitant with them, and we want to know whether or not there are solutions, in turn, to these concomitant problems.

Give the students plenty of time to discuss solutions to each problem. To try to rush them would encourage them not to try to think deeply about the problems, and yet the problems are ones faced by people every day.

It is suggested that you do no more than one of these problems a day. It is also suggested that you assign a problem for homework, then spend the next day in a class discussion of each student's proposed solutions and the problems that student found in those solutions, along with problems the other students might find in those solutions.

Sec. 9.2 answers:

1. (Make sure the students realize that a school board resolution has the force of law in the district.) The school board could (1) rescind the resolution, (2) add a definition of "student" to the present resolution, (3) rescind the resolution and replace it with one which does not bar student teachers such as Miss Brown, or (4) ignore the situation entirely. (Ask the students what problems are concomitant with each solution they suggest. For solution (1) above, the old problem will then arise again. For solution (4), they will be breaking their own law and the students will be disgruntled by being shown once again that "rules are made to be broken" and "it isn't what you know but who you know." **2. (1)-(3)** Answers will vary. **3.** Answers will vary. (Ask the students to tell why they think the penalties they propose are appropriate.) **4. (1)-(2)** Answers will vary. Introduce such points as these: (1) Surely the parents have not just learned that their son can't read. Why didn't they demand years ago that he be kept back instead of being promoted? (2) How could the son have kept passing classes if he couldn't read? (3) Should a high school diploma signify that a certain reading level has been attained? If so, what level? (Many daily newspapers and magazines are written, on the whole, at a sixth grade reading level.) (4) When a school finds out that a student is reading below grade level, what should the school do? (5) What if the son was not capable of reading at a higher level? (6) Suppose the son was mentally capable of learning to read at, say, a sixth-grade level. What would you think of a judgment which provided that the son return the diploma and stay in school until he learned to read at that level? **5. (1)** They claim the girl had trouble with math even in grade school, so she would not have passed exit texts even if they had been given at lower levels. It follows that whether exit tests had been given at the lower levels or whether one was given at the twelfth grade level, the girl would not graduate either way. Yet the parents are using these arguments to say that the school should grant the girl a diploma. **(2)** Answers will vary. (I think not, for I believe that a high school diploma should signify a high school level of attainment in at least basic academic subjects.) **(3) a-c.** Answers will vary. For **b,** watch for answers like, "If a student passes all required subjects (plus enough more to get the number of credits needed), then that should be enough to get the diploma." In this case, ask, "What about the student who passes because the teacher wanted to get rid of him or her and be sure of not getting stuck with that student again? What about the teacher who gives a passing grade just because the student's attendance was good and the student seemed to be trying to learn? What about the teacher who gives a passing grade because the student did bulletin boards and was a nice person?" **6.** Answers will vary. **7.** Make sure the students discuss such problems as (1) the terrific teacher who gets stuck with remedial classes just because she or he is so good; (2) the student whose attendance is poor; (3) the student who refuses extra help; (4) the student who doesn't try to learn; (5) the situation where a class contains 2 or 3 students who try to keep the class in a continual state of commotion; (6) how to assure that students are trying their bests on tests which measure progress; (7) scheduling of students into classes above their ability levels; (8) what to do when a teacher gets more than his or her "share" of weak students. **8. (1) a.** Students should be more dedicated. **b.** Answers will vary. **(2)** His second through fourth paragraphs back this up. **(3)** Junior and senior high school students. **(4)** His second through fifth paragraphs from the end back this up. **(5)-(6)** Answers will vary. Watch for students who

answer "no" to item (5) and "good" to item (6). Ask them how come the argument wouldn't convince such students to change if it's a good argument. (One of my students gave the excellent response of, "Well, the fact that an argument doesn't convince someone of something doesn't mean anything's wrong with the argument. Maybe the person listening just doesn't want to be convinced, so you could have a real good argument, but you still wouldn't be able to change his mind.") **(7)-(8)** Answers will vary. **9. (1) a.** Either in all U.S. cities, or in all of her state's cities. **b.** She doesn't. **c.** Answers will vary, but be sure the students realize that people still live without fear of violent crime in some small communities, so apparently these people disagree with Mrs. A. **(2)** The person who killed the child. **(3)** d or e. **(4) a.** She doesn't. **b.** Answers will vary, but make sure the students realize that Mrs. A is saying "it very likely is," not just "it may be." The students should realize they haven't enough information to make such a judgment. **(5) a.** The taxpayers. **b.** The phrase "where they really have to work" tells us she means that prisoners would be forced to work at income-producing jobs, and the income would be used to support the prisons. **c.** Sure. I don't think I should have to pay to support criminals. **d.** In theory, the prisoners would work at jobs normally paid for out of government funds, such as making license plates, building and maintaining roads, and government paperwork. Problems and possible solutions include: The prisoners are imprisoned because they have refused to obey our laws, so what would guarantee that they'd work as required? (Don't feed them if they don't work.) What if they go on a hunger strike and don't care if they don't get fed? (It's OK with me. Let them starve to death. Credit their accounts with the minimum wage scale for all work done. Deduct for the proportional cost of the prison and let the rest build up for the prisoners' personal use.) Some work is more difficult than other work. There would be dissatisfaction if all were paid the same. (Determine the current industrial rates for such work, and pay proportionally.) The overseers would be prison guards, and some would be unreasonable in the amount of work expected of the prisoners. (Set a daily quota to be met for each type of work. When the prisoner finishes the quota, either he or she is through for the day regardless of the overseer, or the prisoner gets a bonus for overproduction.) Such an arrangement will put ordinary people out of work, since the prisoners would then be doing jobs which the government has been paying outsiders to do. (I can't think of a solution to this one, except for the oversimplification of, "Help the out-of-work people to find jobs in private industry.") Note: The students will be able to think of other problems and solutions. Be sure they also discuss the problems which are inherent in some of the solutions. **(6)** Oversimplification. **(7)** Answers will vary. **10. (1)** See the first paragraph. Besides this, H.M. apparently also said that either her daughter or her daughter's friends, or teenagers she sees (second paragraph) are uncouth, smoke cigarets and pot, and swear; (third paragraph) they are delinquents; (fifth paragraph) they lack good manners and respect. **(2) a.** I'm undecided. They justify the swearing and cigaret smoking by saying that half of the adults do it, too, but does this mean they think it's OK? If so, they're saying that adults are models to be copied. But in this case, they are being inconsistent, since adults, on the whole, do not smoke pot, and yet the writers do. (Watch for an answer like, "They must think it's OK—otherwise, they wouldn't do it." Follow through with the question, "Then you believe that nobody does something unless he or she believes it's OK to do? In other words, nobody ever does anything he or she thinks is wrong?") **b.** No. First, the context implies that half don't do these things, so why not use this other half for a model instead of the first half? Second, some adults do many things which are wrong for anyone to do—beating wives and children, committing other crimes, being rude, stepping on others to get ahead, for example. Third, with few exceptions, the additional years of living give an adult more common sense than he or she had when younger, which makes the adult better able to judge whether or not it is appropriate to copy other adults' actions. Fourth, adults can be held legally responsible for their actions, whereas nonadults are generally treated more leniently—again implying that nonadults lack mature judgment. Fifth, the fact that adults are allowed to do some things—such as voting, entering contracts, heading corporations—does not imply that nonadults should be allowed to do these things. **c.** Again, I'm undecided. Unless it is meant to justify the writers' actions, it appears to be a case of "red herring." **(3) a.** Answers will vary. **b.** Yes. In this context, the word "all" in the third sentence implies that some are and some aren't. **c.** No. Mental institutions are filled with people who have found ways to escape, rather

than face, their problems. All people have problems. Learning to face and deal with them, rather than ignoring or escaping them, is one way maturity is measured. In the context of the letter and the question, "escaping" does not imply that the problems disappear but rather that we ignore them and pretend they aren't there. **d.** No. One person's idea of a "good time" might be to torture other people. Or it might be to race a car up and down a crowded street. Or it might be to harm oneself (in which case the rest of society ends up paying the bills). **(4)** Answers will vary. For the students who answer "yes," ask them what they think should be done so that adults will understand their problems and their world. **(5) a.** Apparently not, as implied by everything after the comma. **b.** It's hard to tell exactly. Certainly, the term itself is derogatory and implies that a "second-class" citizen is a citizen who does not have all the rights or privileges of a "full" or "first-class" citizen. But the converse isn't necessarily true. That is, a citizen who doesn't have all such rights and privileges is not necessarily a second-class citizen in a derogatory sense. For example, a 5-year-old does not and should not have the right to vote or enter into contracts, but this doesn't imply that he or she is a second-class citizen. (Encourage your students to explore question (5)b—to try to figure out what the writers meant.) **c.** They don't. **d.** Probably adults, but we can't be sure. (Since 18-year-olds are legal adults, do the writers think 18-year-olds consider the writers—or teenagers in general—to be second-class citizens?) **e.** I do. The lack of good manners and respect tells me that the other person has contempt for ordinary people's standards and, as a result, does not wish to get along with other people. (I'll make exceptions for kids who don't know any better, but by the age of 10, almost every kid knows the way he or she should behave.) (Note: Don't let the students avoid the question by maintaining that all people are equal and should be thought of as such. "Equal" in this context means "the same," and it is obvious that not everyone is the same.) General note for the fifth paragraph: This is a good time to initiate a discussion of which came first— do the adults "look down on" such teenagers because the teenagers swear, smoke pot, drink, and lack good manners and respect; or do the teenagers act this way because the adults "look down on" them? **(6) a.** Teenagers in general, probably. **b.** Probably either parents or adults in general. **c.** See the second sentence of the paragraph. **d.** Answers will vary, but obvious examples abound in the realm of crime. **e.** As used in ordinary English (rather than in logic), "some of you wouldn't understand" in the sixth paragraph usually implies that the speaker also thinks "some of you would understand"; yet the fourth paragraph makes the flat statement that adults don't understand. **f.** The third paragraph implies that they escape their problems, but the sixth paragraph implies that they face them in sharing them with others. **(7) a.** They can't. They probably take it for granted because of their own experiences ("proof" by selected instances). **b.** Heatsick Mom's daughter's problems and confusions. **c.** Answers will vary. **d.** Answers will vary. Watch for inconsistencies between this answer and the answer to "c" above. For example, if the "c" answer is "no" but this answer is "yes," ask how come it's "yes" in this case but not always, and ask how adults can tell when the answer is "yes" and when it's "no." **e.** They can't. I suspect it's a case of wishful thinking. **f.** Answers will vary. (I tend to think not, for I tend to think that teenagers who have adults they can turn to for help do not become "burnouts" in the first place.) **(8)** Not hardly. The letter implies that smoking pot, swearing, drinking and being generally uncouth are OK because (1) some adults do some of these things, (2) these things are a way of escaping problems instead of facing them, (3) people who are thought of as "second-class citizens" have a right to behave in those ways, (4) teenagers still have good qualities despite the bad ones, and (5) you should ignore your parental duty to guide your daughter and, instead, let her fend for herself. **(9)** Answers will vary. Be sure the students realize that a complete personality reversal from "good" to "bad" may indicate a serious psychological disturbance requiring professional help. **(10)** Answers will vary.

11. (1) c **(2) a.** He doesn't. **b.** No. This is a fact and is common knowledge. **(3) a.** Two things: He can't find a good reason for paying a teacher more for having a master's degree, and having a master's degree doesn't make a teacher any better at teaching than not having one. **b.** It means that the holder has passed graduate-level courses required for the degree and so assumes that the holder has acquired knowledge from these courses. **c.** Answers will vary. **d.** He doesn't. **e.** (Answers will vary.) Yes. It implies that the additional courses required for the degree did not improve the teacher's teaching ability. I disagree with it and so would need support for his statement in order to change

my mind. **(4)** No. His last statement tells us this. **(5)** Poor. His only support for his point was his third sentence, which I consider to be false. **(6)** (Answers will vary.) Yes. I find it difficult to believe that a teacher can earn a master's degree and not pick up more expertise in teaching as a result of the additional courses taken and work done. **(7)** When the students come up with the idea that a "good" (proficient, efficient, competent, or whatever—make sure they define the term) teacher should be paid more than a "poor" (definition?) teacher, ask how they would determine whether or not a teacher is "good" (or "poor"). Don't let vague terms pass unchallenged. (Example: " 'Good' means the students understand the material. 'Poor' means the students don't understand it." Oh? How would we determine whether or not they understand it? What about "hard" and "easy" subjects? Should a teacher of advanced chemistry be paid less than a teacher of general science just because the advanced chemistry students have a harder time understanding than the general science students?) **12.** Answers will vary. (I had a student like that, and I never did figure out how I should have handled it.) **13. (1)** Humanists believe in personal responsibility, but Mrs. T insinuates that personal responsibility went out when humanism came in. **(2) a.** She doesn't. **b.** Answers will vary. **(3)** c. **(4)** She doesn't say. She could mean teaching anything from ethical values to catechisms for certain religions. **(5)-(7)** Answers will vary. **14.** Answers will vary. My own reaction is that it's a poor idea, for I don't think it's up to the government either to clean up, or to keep clean, any neighborhood whose residents are able to clean it up and keep it clean themselves. (I work at keeping my own neighborhood clean. Why should part of my taxes go toward cleaning up a neighborhood whose residents are just too lazy to clean it up?) Publicity campaigns, formation of block clubs, and regular street-sweeping (by the city) might be effective in instilling pride in a clean neighborhood. **15-16.** Answers will vary.

TEST INFORMATION
PART 3.

Listed below are the parts of the various chapters in CRITICAL THINKING—BOOK 2 that relate to the *CORNELL LEVEL X and Z TESTS* plus the *ENNIS-WEIR TEST.* These tests are available from Midwest Publications, P.O. Box 448, Pacific Grove, CA 93950.

TESTS	SECTIONS THAT PROMOTE THE COMPETENCE	SECTIONS THAT PARTIALLY PROMOTE THE COMPETENCE
Cornell Level X:[a]		
Induction (3-25)	Ch. 5	3.2, 4.1, 7.1, 7.2, 8.1, 9.2
Credibility of Source & Observation (27-50)	1.7, 4.1, 4.2, 4.3	
Deduction (52-65)	1.6, Ch. 2, Ch. 6	
Assumption Identification (67-76)	7.3	Ch. 2, Ch. 6
Cornell Level Z:[a]		
Deduction (1-10)	1.2, 1.3, 1.6, Ch. 2, Ch. 6	1.9, 3.5
Fallacies (11-21)	1.4, 1.5, 1.7, 1.8, 1.9, 3.2, 3.3, 3.7, 4.1, 4.7	
Credibility of Source (22-25)	1.7, 4.1, 4.2, 4.3	
Induction (26-38)	Ch. 5	4.1, 7.1, 7.2, 8.1, 9.2
Experimental Planning and Prediction (39-42)		1.5, Ch. 2, Ch. 6, 9.2
Reported Definition and Assumption Identification (43-46)	7.3	Ch. 2, Ch. 6
Assumption Identification (47-52)	7.3	Ch. 2, Ch. 6
ENNIS-WEIR TEST:[ab]		
Paragraph 1	1.4, 1.7, 1.8, Ch. 8	1.9, 7.3
Paragraph 2	1.7, 4.2, 7.1, Ch. 8	1.9, 7.3
Paragraph 3	7.1, Ch. 8	7.3
Paragraph 4	1.8, 3.6, Ch. 8	1.5, 1.7, 7.3
Paragraph 5	7.1, Ch. 8, 9.2	1.6, 7.3, 9.1
Paragraph 6	1.7, 3.2, 3.3, Ch. 5, 7.1, Ch. 8	7.3
Paragraph 7	1.4, 1.7, 1.8, Ch. 8	1.9, 7.3
Paragraph 8	Ch. 8	4.3, 4.5, 7.1, 7.3
Paragraph 9	1.2, 1.3, 3.5, 4.3, 7.1, Ch. 8, 9.2	7.3

Notes:

a. Test sections are too short for reliable diagnoses of individual students. The same holds for paragraph scores. However, average test section and paragraph scores might be used to make judgements about groups.

b. See **ENNIS-WEIR TEST** scoring sheet and manual for an indication of the competencies for which each paragraph tests.

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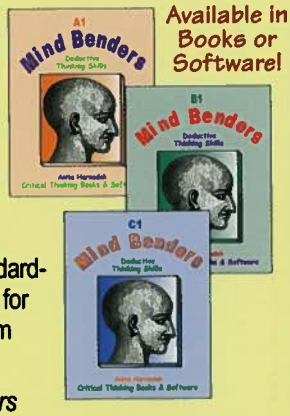

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