PRACTICING TO TAKE THE

GRE

GENERAL TEST
SECOND EDITION

GRADUATE RECORD EXAMINATIONS

PRACTICING
TO TAKE THE

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GENERAL TEST
SECOND EDITION

THREE OFFICIAL GRE GENERAL TESTS
ADMINISTERED IN 1983 and 1984

The Graduate Record Examinations Program offers a General Test measuring verbal, quantitative, and analytical abilities and Subject Tests measuring achievement in the following seventeen fields:

Biology	French	Music
Chemistry	Geology	Physics
Computer Science	History	Political Science
Economics	Literature in	Psychology
Education	English	Sociology
Engineering	Mathematics	Spanish

The tests are administered by Educational Testing Service under policies determined by the Graduate Record Examinations Board, an independent board affiliated with the Association of Graduate Schools and the Council of Graduate Schools in the United States.

The Graduate Record Examinations Board has made available for purchase two official practice books, each containing three General Tests, of which this book is the second edition. The Board has also made available one full-length edition of each of the following Subject Tests: Biology, Chemistry, Education, Engineering, Literature in English, and Psychology. The Subject Test practice books and the first edition of the General Test practice book may be purchased by using the order form on page 167.

Full-length editions of the other Subject Tests are not yet available. However, individual booklets describing each test and including sample questions and score interpretation information are available free of charge for all seventeen Subject Tests. The GRE *1984-85 Information Bulletin*, also available free of charge, contains the General Test that was administered in December 1981 and several examples of each type of question used in the test with explanations of how the answers are derived. Copies of the *Bulletin* and the Subject Test Descriptive Booklets may be requested by writing to:

Graduate Record Examinations Program
CN 6000
Princeton, NJ 08541-6000

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PRACTICING TO TAKE THE GRE GENERAL TEST

The General Test is intended to measure verbal, quantitative, and analytical skills developed throughout your life. Although a brief review will not dramatically change the abilities you have acquired over years, use of this book may help you evaluate your ability level and identify areas for further study before you take the General Test.

This practice book contains the three GRE® General Tests that were given at GRE test centers in December 1983, February 1984, and June 1984. The tests are complete except for the single section in each test that was not counted in the scoring. The location of the nonscored section varies from test to test. So, when you take the General Test to earn scores, the sections may not be ordered as these tests are.

The practice book also contains detailed descriptions of the nine types of questions used in the General Test and suggested strategies for answering them. Fifty sample questions with explanations illustrate these strategies.

On the following pages are suggestions for the use of this practice book. To obtain maximum benefit, try the following approach:

- Take the first test, score it, and compare your scores with the scores of other people who took the test.

- Read the practice material on pages 5-20.

- Take the second test, score it, and compare these scores with your previous scores to note your improvement and any persistent areas of weakness.

- Review again the sample questions and explanations related to the problems you've encountered. This will help guide you to further study.

- When you are ready, take the third test. The scores you earn on this test are the best estimate of what your performance might be if you take the General Test under standard conditions in the near future.

TEST-TAKING STRATEGY

Among the problems that may affect your scores is your test-taking strategy.

In preparing to take the General Test, it is important that you become thoroughly familiar with the directions in the practice tests because they are identical to those in the test you will take to earn scores. Once you have done this, it is still necessary to read the directions for each group of questions carefully during the actual test administration.

Work as rapidly as you can without being careless. Check frequently to make sure you are marking your answers in the appropriate rows on your answer sheet. This is a particularly important precaution because one of the most common test-taking errors is misplacing whole blocks of answers on the answer sheet. Since no question carries greater weight than any other, do not spend too much time pondering questions you find extremely difficult or unfamiliar.

Your scores on the General Test will be determined by the number of best answers you select from the choices given. No penalty is assessed for wrong answers. Therefore, even if you are uncertain about a question, it is better that you guess at the answer than not respond at all. You risk nothing by guessing.

PROCEDURE FOR PRACTICING

To get an idea of your performance level at this time, without further review, take the first practice test, under conditions that simulate those in an actual test administration, and evaluate your performance. Before you start timing yourself, we suggest that you remove an answer sheet and turn first to the back cover of the test book (page 64), as you will do at the test center, and follow the instructions for completing the identification areas of the answer sheet. Then read the inside back cover instructions (page 63), which give you advice about guessing and show you how to mark your answer sheet properly.

Be sure to observe the 30-minute time limit imposed for each section, and work through the test with only a 10- to 15-minute break after Section III. Focus your attention on the questions with the same concentration you would use in taking the test to earn scores. Since you will not be permitted to use them at the test center, do not use dictionaries or other books, compasses, rulers, slide rules, calculators, calculator/watch combinations, or any other aids.

During the actual administration of the General Test, you may work only on the section the supervisor designates and only for the time allowed. You may not go back to an earlier section of the test after time has been called for that section. You may be dismissed from the test for doing so.

When you are ready to begin the test, note the time and start marking your answers to the questions in the first section on your answer sheet.

HOW TO SCORE YOUR PRACTICE TEST

On the page following each test is a list of the correct answers. Match your answer to each question against the answer given in the list, crossing out questions you answered incorrectly or omitted. Then add up the number of your correct answers to Sections I and II to obtain your raw verbal score, to Sections III and IV to obtain your raw quantitative score, and to Sections V and VI to obtain your raw analytical ability score. In the conversion table for that test, you will find the scaled scores that correspond to your raw scores on the test. Convert your raw scores to scaled scores.

EVALUATING YOUR PERFORMANCE

To evaluate your performance, you may compare your scaled scores with those of others who have taken the General Test at GRE test centers since October 1, 1981. The percentile rank table (Table 1) on page 157 indicates for each scaled score shown the percent of examinees who earned lower scores. For example, in the percent column opposite the verbal ability scaled score 460 is the percent 46. This means that 46

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percent of the examinees tested between October 1, 1981, and June 30, 1984, earned verbal ability scores below 460. For each score you made on this practice test, note the percent of GRE examinees who earned lower scores. This is a reasonable indication of your rank among GRE General Test examinees if you follow the test-taking suggestions in this practice book.

To identify your areas of weakness, refer to the "P +" column that appears to the right in the list of correct answers for the test you have taken. The P + shown for each question is based on the percent of examinees who actually took this edition of the test and answered the question correctly. This percent, however, has been adjusted for differences in ability level of examinees tested at different administrations. This information enables you to compare your performance on each question with that of other examinees.

In the verbal and analytical ability sections of the test, a question is considered to be of average difficulty if it is answered correctly by about 60 percent (P + = 60) of the examinees. In the quantitative sections the percent is about 62.5 for the four choice questions and about 60 for the five choice questions. Use these percents as a guide for analyzing your own performance on each question.

It is important to realize that the ability patterns of people who have different interests and experience generally do differ. Table 2 on page 157 shows you the average scores for people in various categories of intended graduate major fields. One can see that those whose interests lie in the physical sciences, which are highly mathematical, generally have relatively high scores in quantitative ability, whereas those interested in the humanities generally have relatively high verbal scores. Find the major field category most closely related to your career goal to see how your performance compares with that of others who are striving for the same goal.

CONTINUING YOUR PRACTICE

When you are ready to try again, take the second practice test with the same quiet concentration you worked through the first one. Repeat the process of scoring and comparing your scores to determine whether your practice proved beneficial. If you still note weakness in any types of questions, review those sample questions and explanations and undertake whatever further study you consider necessary. When you are ready, take the third test, once again under conditions that simulate those in the actual test administration to measure your total improvement. Score yourself and convert your scores. These scores are the best estimate of what your performance might be if you take the General Test to earn scores in the near future.

It is important to realize that the conditions under which you tested yourself were not the same as those you will encounter at the test center. For example, your anxiety may be slightly elevated during the actual test administration. One cannot predict how different test-taking conditions will affect test performance, but this is one factor that may cause differences between your practice test scores and your actual test scores.

Data on the General Test show that scores often rise, usually only by a small amount, as a result of taking the test more than once, although scores of some examinees do decline. By preparing to take the General Test as we have suggested here, you may be able to do better than you would if you took the test without any initial preparation. Good luck!

ADDITIONAL INFORMATION

If you have any questions about any of the information in this book, please write to:

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TEST PREPARATION MATERIAL

Purpose of the GRE General Test

The GRE General Test measures certain developed verbal, quantitative, and analytical abilities that are important for academic achievement. In doing so, the test necessarily reflects the opportunities and efforts that have contributed to the development of those abilities.

The General Test is only one of several means of evaluating likely success in graduate school. It is not intended to measure inherent intellectual capacity or intelligence. Neither is it intended to measure creativity, motivation, perseverance, or social worth. The test does, however, make it possible to compare students with different backgrounds. A GRE score of 500, for example, has the same meaning whether earned by a student at a small, private liberal arts college or by a student at a large public university.

Because several different forms (or editions) of the test are in active use, all students do not receive exactly the same test edition. However, all editions measure the same skills and meet the same specifications for content and difficulty. The scores from different editions are made comparable to one another by a statistical procedure known as equating. This process makes it possible to assure that all reported scores of a given value denote the same level of developed ability regardless of which edition of the test is taken.

Since students have wide-ranging backgrounds, interests, and skills, the *verbal sections* of the General Test use questions from diverse areas of experience. The areas range from the activities of daily life to broad categories of academic interest such as the sciences, social studies, and the humanities. Knowledge of high school level arithmetic, plane geometry, and algebra provides adequate preparation for the *quantitative sections* of the test. Questions in the *analytical sections* measure analytical skills developed in virtually all fields of study. No formal training in logic or methods of analysis is needed to do well in these sections.

How the Test is Developed

The General Test is composed of questions formulated by specialists in various fields. Each question is reviewed by several independent critics and revised if necessary. New

questions are pretested in actual tests under standard testing conditions.

Questions appearing in a test for the first time are analyzed for usefulness and weaknesses; they are not used in computing scores. Questions that perform satisfactorily become part of a pool from which a new edition of the General Test will be assembled at a future date. Those that do not perform well are discarded or are rewritten to correct the flaws and tried out again.

When a General Test has been assembled, it is reviewed by other subject matter and test specialists from inside and outside ETS. After any problems raised in these reviews have been resolved, the test goes to a test editor, who may make further suggestions for change.

All reviewers except the editors, copyreaders, and proofreaders must attempt to answer each question without the help of the answer key. Thus, each reviewer "takes the test," uninfluenced by knowledge of what the question writer or test assembler believed each answer should be. The answer key is certified as official only after the reviewers have agreed independently on the best answer for each question.

The extensive procedure described above has been developed to assure that every question in the General Test is appropriate and useful and that the combination of questions is satisfactory. Even so, the appraisal is not complete until after the new edition has been administered nationwide and subjected to a rigorous item analysis to see whether each question yields the expected results.

Such an appraisal sometimes reveals that a question is not satisfactory after all. It may prove to be ambiguous, require information beyond the scope of the test, or be otherwise unsuitable. Answers to such a question are not used in computing scores.

Description of the General Test

In this description, several examples of each type of question included in the verbal, quantitative, and analytical measures of the GRE General Test are discussed and explanations of the correct answers are provided.

Verbal Ability

The verbal ability measure is designed to test one's ability to reason with words in solving problems. Reasoning effectively in a verbal medium depends primarily upon the ability to discern, comprehend, and analyze relationships among words or groups of words and within larger units of discourse such as sentences and written passages. Such factors as knowledge of words and practice in reading will, of course, define the limits within which one can reason using these tools.

The verbal measure consists of four question types: analogies, antonyms, sentence completions, and reading comprehension sets. The examples of verbal questions in this section do not reflect precisely the difficulty range of the verbal measure. A greater number of difficult questions than would be encountered in the test have been included to provide practice in approaching more complex verbal questions.

■■■■■■■■■■■■ANALOGIES■■■■■■■■■■■■

Analogy questions test the ability to recognize relationships among words and the concepts they represent and to recognize when these relationships are parallel. The process of eliminating four wrong answer choices requires one to formulate and then analyze the relationships linking six pairs of words (the given pair and the five answer choices) and to recognize which answer pair is most nearly analogous to the given pair. Some examples of relationships that might be found in analogy questions are kind, size, contiguity, or degree.

Some approaches that may be helpful in answering analogy questions:

■ Before looking at the answer choices, try to establish a precise relationship between the words in the given pair. It is usually helpful to express that relationship in a phrase or sentence; for example, the relationship between the word pair THRIFTY : MISERLY could be expressed as "to be *miserly* is to be *thrifty* to an excessive degree." Next, look for the answer choice with the pair of words whose relationship is closest to that of the given pair and can be expressed in a similar fashion.

■ Occasionally, more than one of the answer choices may seem at first to express a relationship similar to that of the given pair. Go back to the given pair and try to state the relationship more precisely or identify some aspect of the relationship between the given pair of words that is paralleled in only *one* answer choice pair.

■ Remember that a single word can have several different meanings. If you are unable to establish a relationship between the given pair or to find a parallel relationship among the answer choice pairs, check to be sure you have not overlooked a possible second meaning for one of the words.

■ *Never* decide on the best answer without reading *all* the answer choices. If you do not read all the answer choices, you may miss an answer choice that would have appeared superior to the choice you made or might have prompted you to reevaluate your understanding of the question.

■ Practice recognizing and formulating relationships between word pairs. You can do this with the following sample questions and with the analogy questions in the practice tests in this book.

Directions: In each of the following questions, a related pair of words or phrases is followed by five lettered pairs of words or phrases. Select the lettered pair that best expresses a relationship similar to that expressed in the original pair.

1. COLOR : SPECTRUM :: (A) tone : scale
   (B) sound : waves (C) verse : poem
   (D) dimension : space (E) cell : organism

The relationship between *color* and *spectrum* is not merely that of part to whole, in which case (E) or even (C) might be defended as correct. A *spectrum* is made up of a progressive, graduated series of colors, as a *scale* is of a progressive, graduated sequence of tones. Thus, (A) is correct. Here, the best answer must be selected from a group of fairly close choices.

2. ABDICATION : THRONE : : **(A)** paradox : argument
(B) competition : match **(C)** defeat : election
(D) bequest : will **(E)** resignation : office

The relationship between *abdication* and *throne* is easy to perceive and only the correct answer, (E), expresses a similar relationship. (C) is incorrect because *defeat* is not voluntary, as are *abdication* and *resignation* and because *election*, the process of attaining a particular status, is not parallel to *throne* and *office*.

3. DESICCATE : MOISTURE : : **(A)** pulverize : dust
(B) varnish : deterioration **(C)** shatter : shards
(D) bend : contents **(E)** darken : light

To *desiccate* an object is to cause it to dry up by depriving it of *moisture*. Among the answer choices, only (E) has a similar relationship between its two words: to *darken* an object is to make it darker by depriving it of *light*. In the other four choices, the first words, *pulverize, varnish, shatter,* and *bend,* are parallel to *desiccate* in that they describe actions that alter the condition of an object, but the second word is not something of which an object is deprived as a result of the action the first word describes. In (A) and (C), the second words, *dust* and *shards,* are the results of pulverizing and shattering, respectively. *Deterioration* in (B) may be prevented through varnishing, and *contents* in (D) bears no relationship to bending that resembles the relationship between *desiccate* and *moisture*.

4. HEADLONG : FORETHOUGHT : :
(A) barefaced : shame **(B)** mealymouthed : talent
(C) heartbroken : emotion **(D)** levelheaded : resolve
(E) singlehanded : ambition

The difficulty of this question probably derives primarily from the complexity of the relationship between *headlong* and *forethought* rather than from any inherent difficulty in the words. Analysis of the relationship between *headlong* and *forethought* reveals the following: an action or behavior that is *headlong* reveals lack of *forethought*. Only answer choice (A) displays the same relationship between its two terms.

ANTONYMS

Although antonym questions test knowledge of vocabulary more directly than do any of the other verbal question types, the purpose of the antonym questions is to measure not merely the strength of one's vocabulary but also the ability to reason from a given concept to its opposite. Antonyms may require only rather general knowledge of a word or they may require one to make fine distinctions among answer choices. Antonyms are generally confined to nouns, verbs, and adjectives; answer choices may be single words or phrases.

Some approaches that may be helpful in answering antonym questions:

■ Remember that you are looking for the word that is the most nearly *opposite* to the given word; you are *not* looking for a synonym. Since many words do not have a precise opposite, you must look for the answer choice that expresses a concept *most nearly* opposite to that of the given word. For this reason, antonym questions are not measures of rote vocabulary knowledge; rather, these questions ask you to evaluate shades of meaning and the interaction of meaning between words.

■ In some cases more than one of the answer choices may appear at first to be opposite to the given word. Questions that require you to make fine distinctions among two or more answer choices are best handled by defining more precisely or in greater detail the meaning of the given word.

■ It is often useful, in weighing answer choices, to make up a sentence using the given word; if you do not know the precise dictionary meaning of a word but have a general sense of how the word might be used, try to make up a phrase or sentence with the word. Substituting the answer choices in the phrase or sentence and seeing which best "fits," in that it reverses the meaning or tone of the sentence or phrase, may help you determine the best answer.

■ Remember that a particular word may have more than one meaning, so if you are unable to find an answer choice that appears opposite to the given word, examine all the words for possible second meanings.

■ Use your knowledge of root, prefix, and suffix meanings to help you determine the meanings of words with which you are not entirely familiar.

Directions: Each question below consists of a word printed in capital letters followed by five lettered words or phrases. Choose the lettered word or phrase that is most nearly *opposite* in meaning to the word in capital letters. Since some of the questions require you to distinguish fine shades of meaning, be sure to consider all the choices before deciding which one is best.

5. DIFFUSE : **(A)** concentrate **(B)** contend
(C) imply **(D)** pretend **(E)** rebel

The answer is (A). *Diffuse* means to permit or cause to spread out; only (A) presents an idea that is in any way opposite to *diffuse*.

6. COINCIDENCE : **(A)** depletion **(B)** incongruity
(C) pessimism **(D)** ill fortune **(E)** lack of ideas

One meaning of *coincidence* is being in harmony or accord; another is corresponding in nature, character, or function. *Incongruity,* the correct answer, means lack of harmony or lack of conformity. Answer choice (D) may seem plausible at first glance since a *coincidence* of events is often a pleasant chance occurrence ("good luck" as opposed to "bad luck"), but careful reflection reveals that a *coincidence* is not necessarily a positive phenomenon.

7. MULTIFARIOUS :
(A) deprived of freedom **(B)** deprived of comfort
(C) lacking space **(D)** lacking stability
(E) lacking diversity

Multifarious means having or occurring in great variety, so the correct answer is (E). Even if one is not entirely familiar with the meaning of *multifarious,* it is possible to use the clue provided by "multi-" to help find the right answer to this question.

8. PARSIMONIOUS : **(A)** initial **(B)** vegetative
(C) prodigal **(D)** affluent **(E)** impromptu

The answer to this question is (C); *parsimonious* means frugal to the point of stinginess, and *prodigal,* which means extravagant to the point of wastefulness, is the only answer choice opposite in meaning. At first, answer choice (D),

affluent, may seem plausible in that it may be thought that wealth is an opposite concept to frugality—but it is well known that not all wealthy persons are generous.

SENTENCE COMPLETIONS

The purpose of the sentence completion questions is to measure the ability to recognize words or phrases that both logically and stylistically complete the meaning of a sentence. In deciding which of five words or sets of words can best be substituted for blank spaces in a sentence, one must analyze the relationships among the component parts of the incomplete sentence. One must consider each answer choice and decide which completes the sentence in such a way that the sentence has a logically satisfying meaning and can be read as a stylistically integrated whole.

Sentence completion questions provide a context within which to analyze the function of words as they relate to and combine with one another to form a meaningful unit of discourse.

Some approaches that may be helpful in answering sentence completion questions:

■ Read the entire sentence carefully before you consider the answer choices; be sure you understand the ideas expressed in the sentence and examine the sentence for possible indications of tone (irony, humor, and the like).

■ Before reading the answer choices you may find it helpful to fill in the blanks with a word or words of your own that complete the meaning of the sentence. Then examine the answer choices to see if any of them parallels your own completion of the sentence.

■ Pay attention to grammatical clues in the sentence. For example, words like *although* and *nevertheless* indicate that some qualification or opposition is taking place in the sentence, whereas *moreover* implies an intensification or support of some idea in the sentence. Pay attention also to the style of, and choice of words in, the sentence; sometimes determining the best answer depends in whole or in part on considerations of stylistic consistency among the parts of the sentence.

■ If a sentence has two blanks, be sure that *both* parts of your answer choice fit logically and stylistically into the sentence. Do not choose an answer on the basis of the fit of the first word alone.

■ When you have chosen an answer, read the complete sentence through to check that it has acquired a logically and stylistically satisfying meaning.

Directions: Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are five lettered words or sets of words. Choose the word or set of words for each blank that *best* fits the meaning of the sentence as a whole.

9. Early ------ of hearing loss is ------ by the fact that the other senses are able to compensate for moderate amounts of loss, so that people frequently do not know that their hearing is imperfect.

(A) discovery . . indicated
(B) development . . prevented
(C) detection . . complicated
(D) treatment . . facilitated
(E) incidence . . corrected

The statement that the other senses compensate for partial loss of hearing indicates that the hearing loss is not *prevented* or *corrected*; therefore, choices (B) and (E) can be eliminated. Furthermore, the ability to compensate for hearing loss certainly does not facilitate the early *treatment* (D) or the early *discovery* (A) of hearing loss. It is reasonable, however, that early *detection* of hearing loss is *complicated* by the ability to compensate for it. The correct answer is (C).

10. The ------ science of seismology has grown just enough so that the first overly bold theories have been ------.

(A) magnetic . . accepted
(B) fledgling . . refuted
(C) revolutionary . . analyzed
(D) predictive . . protected
(E) exploratory . . recalled

At first reading, there may appear to be several answer choices that "make sense" when substituted in the blanks of the sentence. (A) and (D) can be dismissed fairly readily when it is seen that *accepted* and *protected* are not compatible with *overly bold* in the sentence. The sentence yielded by (C) is logically more acceptable but not as strong as the sentences yielded by (B) and (E). Of these two latter choices, (B) is superior on stylistic grounds: theories are not *recalled* (E), and *fledgling* (B) reflects the idea of growth present in the sentence.

11. If her characters are still being written about as unfathomable riddles, it is to be attributed more to a human passion for ------ than to dubious complexities of her art.

(A) conundrums   (B) platitudes   (C) scapegoats
(D) euphemisms   (E) stereotypes

The answer to this question is (A). While any of the answer choices may be argued to be an object of human passion, only *conundrums* enables the sentence *as a whole* to acquire a coherent meaning. It is necessary, in choosing an answer, to complete the sentence in such a way as to make clear why the writer's characters are seen as *unfathomable riddles.* A human penchant for *conundrums,* or puzzling questions whose answers can only be conjectural, will account for this.

READING COMPREHENSION

The purpose of the reading comprehension questions is to measure the ability to read with understanding, insight, and discrimination. This type of question explores the examinee's ability to analyze a written passage from several perspectives, including the ability to recognize both explicitly stated elements in the passage and assumptions underlying statements or arguments in the passage as well as the implications of those statements or arguments. Because the written passage upon which reading comprehension questions are based presents a sustained discussion of a particular topic, there is ample context for analyzing a variety of relationships; for example, the function of a word in relation to a larger segment of the passage, the relationships among the various ideas in the passage, or the relation of the author to his or her topic or to the audience.

There are six types of reading comprehension questions. These types focus on (1) the main idea or primary purpose of the passage; (2) information explicitly stated in the passage; (3) information or ideas implied or suggested by the author; (4) possible application of the author's ideas to

other situations; (5) the author's logic, reasoning, or persuasive techniques; and (6) the tone of the passage or the author's attitude as it is revealed in the language used.

In each edition of the General Test, there are two relatively long reading comprehension passages, each providing the basis for answering seven or eight questions, and two relatively short passages, each providing the basis for answering three or four questions. The four passages are drawn from four different subject matter areas: the humanities, the social sciences, the biological sciences, and the physical sciences.

Some approaches that may be helpful in answering reading comprehension questions:

■ Since reading passages are drawn from many different disciplines and sources, you should not expect to be familiar with the material in all the passages. However, you should not be discouraged by encountering material with which you are not familiar; questions are to be answered on the basis of the information provided in the passage, and you are not expected to rely on outside knowledge, which you may or may not have, of a particular topic. You may, however, want to do last a passage that seems to you particularly difficult or unfamiliar.

■ There are different strategies for approaching reading comprehension questions; you must decide which works most effectively for you. You might try different strategies as you do the reading comprehension questions in the practice tests in this book. Some different strategies are: reading the passage very closely and then proceeding to the questions; skimming the passage, reading quickly through the questions, and then rereading the passage closely; and reading the questions first, then reading the passage closely. You may find that different strategies work better for different kinds of passages; for example, it might be helpful with a difficult or unfamiliar passage to read through the questions first.

■ Whatever strategy you choose, you should analyze the passage carefully before answering the questions. As with any kind of close and thoughtful reading, you should be sensitive to clues that will help you understand less explicit aspects of the passage. Try to separate main ideas from supporting ideas or evidence; try also to separate the author's own ideas or attitudes from information he or she is simply presenting. It is important to note transitions from one idea to the next and to examine the relationships among the different ideas or parts of the passage: Are they contrasting? Are they complementary?, for example. You should consider both the points the author makes and the conclusions he or she draws and also how and why those points are made or conclusions drawn.

■ You may find it helpful to underline or mark key parts of the passage. For example, you might underline main ideas or important arguments or you might circle transitional words that will help you map the logical structure of the passage (although, nevertheless, correspondingly, and the like) or descriptive words that will help you identify the author's attitude toward a particular idea or person.

■ Read each question carefully and be certain that you understand exactly what is being asked.

■ Always read all the answer choices before selecting the best answer.

■ The best answer is the one that most accurately and most completely answers the question being posed. Be careful not to pick an answer choice simply because it is a true statement; be careful also not to be misled by answer choices that are only partially true or only partially satisfy the problem posed in the question.

▣ Answer the questions on the basis of the information provided in the passage and do not rely on outside knowledge. Your own views or opinions may sometimes conflict with the views expressed or the information provided in the passage; be sure that you work within the context provided by the passage. You should not expect to agree with everything you encounter in reading passages.

Directions: The passage is followed by questions based on its content. After reading the passage, choose the best answer to each question. Answer all questions following the passage on the basis of what is *stated* or *implied* in the passage.

In the years following the Civil War, economic exploitation for the first time was provided with adequate resources and a competent technique, and busy prospectors were daily uncovering new sources of wealth. The coal and oil of Pennsylvania and Ohio, the copper and iron ore of Upper Michigan, the gold and silver, and the lumber and fisheries of the Pacific Coast provided limitless raw materials for the rising industrialism. The Bessemer process quickly turned an age of iron into an age of steel and created the great mills of Pittsburgh from which issued the rails for expanding railways. The reaper and binder, the sulky plow, and the threshing machine created a large scale agriculture on the fertile prairies. Wild grasslands provided grazing for immense herds of cattle and sheep; the development of the corn belt enormously increased the supply of hogs; and with railways at hand the Middle Border poured into Omaha and Kansas City and Chicago an endless stream of produce.

As the line of the frontier pushed westward, new towns were built, thousands of claims to homesteads were filed, and speculator and promoter hovered over the prairies like buzzards seeking their carrion. With rising land values money was to be made out of unearned increment, and the creation of booms was a profitable industry. The times were stirring, and it was a shiftless fellow who did not make his pile. If he had been too late to file on desirable acres, he had only to find a careless homesteader who had failed in some legal technicality and "jump his claim." Good bottom land could be had even by late-comers if they were sharp at the game.

This bustling America of 1870 accounted itself a democratic world. A free people had put away all aristocratic privileges and, conscious of power, had gone forth to possess the last frontier. But America's essential social philosophy, which it found adequate to its needs, was summed up in three words—preemption, exploitation, progress. Its immediate and pressing business was to dispossess the government of its rich holdings. Lands in the possession of the government were so much idle waste, untaxed and profitless; in private hands they would be developed. They would provide work, pay taxes, support schools, enrich the community. Preemption meant exploitation and exploitation meant progress.

It was a simple philosophy and it suited the simple individualism of the times. The Gilded Age knew nothing of enlightenment; it recognized only the acquisitive instinct. That much at least the frontier had taught the great American democracy; and in applying to the resources of a continent the lesson it had been so well taught, the Gilded Age wrote a profoundly characteristic chapter of American history.

12. According to the passage, increased corn production was mainly responsible for an increase in the

(A) number of sheep (B) output of farm implements
(C) supply of hogs (D) amount of pasture land
(E) number of cattle

This question is based on the first paragraph of the passage. The author states explicitly that the development of the corn belt enormously increased the supply of hogs; therefore, the correct answer is (C).

13. As used by the author, the term "Gilded Age" refers to an age of

(A) social progress
(B) intellectual enlightenment
(C) frontier living
(D) great fortunes
(E) aristocratic privilege

The answer to this question is (D). Choices (B) and (E) are specifically rejected in the passage by the statements that "the Gilded Age knew nothing of enlightenment" and that "a free people had put away all aristocratic privileges." The author states that the Gilded Age derived its "acquisitive instinct" from the frontier, but he does not suggest that a rough frontier life was the primary characteristic of the Gilded Age. (C) is not therefore the correct choice. Since there is nothing in the passage to indicate that social concerns such as public welfare and public health were of great importance, choice (A) can be eliminated. The focus of the passage is on material progress and the acquisition of material wealth, and these concepts are best represented by choice (D).

14. With which of the following aphorisms would the exploiters of the 1870s probably have been in strongest agreement?

(A) A penny saved is a penny earned.
(B) Nothing ventured, nothing gained.
(C) Grasp all, lose all.
(D) He who dances must pay the fiddler.
(E) The love of money is the root of all evil.

Answering this question requires an accurate understanding of the exploiters' attitudes as such attitudes are implied throughout the passage. The exploiters would not agree with choice (E) because, as discussed in the passage, most were concerned with accumulating wealth and making profits. Further, the general absence of moral concepts in the ideas of "making a pile" or "jumping a claim" suggest little agreement with (E) or with choice (D), which clearly suggests moral retribution. Further, there is in the passage no suggestion that the exploiters were concerned with consequences or with the possibility of loss, and for this reason both (C) and (D) are inappropriate. Finally, it is unlikely that the exploiters would agree with choice (A) because, as noted especially in the third paragraph, theirs was a philosophy of use and development rather than of simple frugality. In fact, the idea of use and development, of "preemption, exploitation, progress," is the chief clue to the correct answer (B), for the exploiters, driven by "the acquisitive instinct," knew that, without action, no profit was to be made.

10

Quantitative Ability

The quantitative sections of the General Test are designed to measure basic mathematical skills, understanding of elementary mathematical concepts, and ability to reason quantitatively and to solve problems in a quantitative setting. The mathematics required does not extend beyond that assumed to be common to the mathematics background of all examinees. There is a balance among the questions requiring arithmetic, algebra, and geometry.

ARITHMETIC

Questions classified as arithmetic can be answered by performing arithmetic operations on numbers (adding, subtracting, multiplying, dividing, and finding powers, roots of powers, percents, and averages), by reasoning, or by a combination of the two.

Some facts about numbers that might be helpful. An odd integer power of a negative number is negative, and an even integer power is positive; for example, $(-2)^3 = -8$, but $(-2)^2 = 4$.

Squaring a number between 0 and 1 (or raising it to a higher power) results in a smaller number; for example, $(\frac{1}{2})^2 = \frac{1}{4}$ and $\frac{1}{4}$ is less than $\frac{1}{2}$.

The integers 0 and 1 have some properties that other numbers do not have; for example, the product of 0 and any number is 0, and the product of 1 and any number is that number.

ALGEBRA

The algebra required does not extend beyond that usually covered in a first-year high school course and includes such topics as properties of odd and even integers, divisibility, factors, and multiples in the system of integers, prime numbers, properties of signed numbers, linear equations and inequalities, factorable quadratic equations, factorization, simplification of algebraic expressions, exponents, and radicals. The skills required include the ability to solve simple equations, the ability to read and set up an equation for solving a complex problem, and the ability to apply basic algebraic skills to solve unfamiliar problems. It is expected that examinees will be familiar with symbols that are conventionally used in elementary algebra, such as the following: $x < y$ (this means that x is less than y), $x \neq y$ (this means that x is not equal to y), $|x|$ (this is defined to be x if $x \geq 0$ and $-x$ if $x < 0$), and $\sqrt{x^2}$ (this denotes the non-negative square root of x^2, that is, $\sqrt{x^2} = |x|$). Nonstandard notation is used only when it is explicitly defined for a particular question.

Some facts about algebra that might be helpful. The sum and product of even and odd integers will be even or odd depending on the operation and the kinds of integers; for example, the sum of an odd integer and an even integer is odd.

If an integer P is a divisor or a factor of another integer N, then N is the product of P and another integer and N is said to be an integer multiple of P; for example, 3 is a divisor or a factor of 6, and 6 is an integer multiple of 3.

A prime number is a number that has only two distinct positive divisors, 1 and itself; for example, 2, 3, and 5 are prime numbers, but $9 = 3 \cdot 3$ is not.

The sum and product of signed numbers will be positive or negative depending on the operation and the kinds of numbers; for example, the product of a negative number and a positive number is negative.

For any two numbers on the number line, the number on the left is less than the number on the right; for example, $2 < 3$ and $-4 < -3$.

Multiplying an inequality by a negative number reverses the direction of the inequality sign; for example, if the inequality $2 < 4$ is multipled by -2, the resulting inequality will be $-4 > -8$.

The two numbers $\sqrt{x}$ and $|x|$ are never negative; for example $\sqrt{3^2} = \sqrt{(-3)^2} = 3$ and $|-2| = -(-2) = 2$.

If $ab = 0$, then $a = 0$ or $b = 0$; for example, if $x^2 - 1 = 0$, then, since $x^2 - 1 = (x-1)(x+1)$, $(x-1)(x+1) = 0$ and therefore $x = 1$ or $x = -1$.

A positive integer exponent on a number indicates the number of times that number appears in the product; for example, x^4 means $x \cdot x \cdot x \cdot x$ and, therefore,

$$x^4 \cdot x^3 = (x \cdot x \cdot x \cdot x)(x \cdot x \cdot x) = x^7 \text{ or } \frac{x^4}{x^3} = \frac{x \cdot x \cdot x \cdot x}{x \cdot x \cdot x} = x.$$

GEOMETRY

The geometry questions are limited primarily to measurement and intuitive geometry or spatial visualization. Although a question may be posed in either English units or metric units of measure, the knowledge required for converting units in one system to units in another system or from one unit to another in the same system will not be tested. If an answer to a question is expected to be a unit of measure different from the unit in which the question is posed, a relationship between the units will be provided in the question. Topics include properties of lines, circles, triangles, rectangles, and other polygons; measurement-related concepts of area, perimeter, volume, and angle measure in degrees; and the Pythagorean theorem. Knowledge of simple coordinate geometry and special triangles such as isosceles, equilateral, and $30° - 60° - 90°$ triangles is also assumed. It is expected that examinees will be familiar with symbols that are conventionally used in elementary geometry, such as the following: $||$ (this means is parallel to), $\perp$ (this means is

perpendicular to), and (this means that $\angle ABC$ is a

right angle). The ability to construct proofs and knowledge of theorems that are usually learned only in a formal geometry course are not measured.

Some facts about geometry that might be helpful. If two lines intersect, the vertical angles are equal; for example, in the
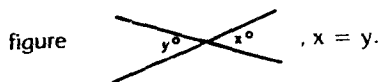
figure , $x = y$.

If two parallel lines are intersected by a third line, some of the angles formed are equal; for example, in the figure

where $\ell_1 \,||\, \ell_2$, $y = x = z$.
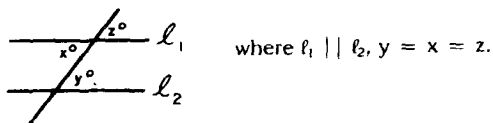
The number of degrees of arc in a circle is 360; for example,

in the figure if $x = 60$, then arc ABC is $\frac{60}{360}$ of the circumference of the circle.

The sum of the degree measures of the angles of a triangle is 180.

The volume of a rectangular solid or of a right circular cylinder is the product of the area of the base and the height; for example, the volume of a cylinder with base of radius 2 and height 5 is $\pi (2^2)(5) = 20\pi$.

The square of the hypotenuse of a right triangle is equal to the sum of the squares of the two legs.

The coordinates of a point (x,y) give the location of the point in the coordinate plane; for example, the point $(2, -3)$ is located in the fourth quadrant 2 units to the right of the Y-axis and 3 units below the X-axis.

The sides of a $45° - 45° - 90°$ triangle are in the ratio $1 : 1 : \sqrt{2}$, and the sides of a $30° - 60° - 90°$ triangle are in the ratio $1 : \sqrt{3} : 2$.

Drawing in lines that are not shown in a figure can sometimes help in solving a geometry problem; for example, by drawing the dashed lines in the pentagon
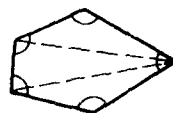
, the number of degrees in the pentagon

can be found by adding up the number of degrees in the three triangles.

The quantitative measure employs three types of questions: quantitative comparison, discrete quantitative, and data interpretation. Pacing yourself on all of these question types is important. Do not spend an excessive amount of time pondering over problems you find difficult. Go on to the next question and, if time permits, come back to the difficult questions when you have completed the section.

The following information on numbers and figures applies to all questions in the quantitative sections.

Numbers: All numbers used are real numbers.

Figures: Position of points, angles, regions, etc. can be assumed to be in the order shown, and angle measures can be assumed to be positive.

Lines shown as straight can be assumed to be straight.

Figures can be assumed to lie in a plane unless otherwise indicated.

Figures that accompany questions are intended to provide information useful in answering the questions. However, unless a note states that a figure is drawn to scale, you should solve these problems NOT by estimating sizes by sight or by measurement, but by using your knowledge of mathematics.

The quantitative comparison questions test the ability to reason quickly and accurately about the relative sizes of two quantities or to perceive that not enough information is provided to make such a decision. To solve a quantitative comparison problem, you compare the quantities given in two columns, Column A and Column B, and decide whether one quantity is greater than the other, whether the two quantities are equal, or whether the relationship cannot be determined from the information given. Some questions only require some manipulation to determine which of the quantities is greater; other questions require you to reason more or to think of special cases in which the relative sizes of the quantities reverse.

The following strategies might help in answering quantitative comparison questions.

■ Do not waste time performing needless computations in order to eventually compare two specific numbers. Simplify or transform one or both of the given quantities only as much as is necessary to determine which quantity is greater or whether the two quantities are equal. Once you have determined that one quantity is greater than the other, do not take time to find the exact sizes of the quantities. Answer and go on to the next question.

■ If both quantities being compared involve no variables, then the correct answer can never be (D), which states that the relationship cannot be determined. The answer is then reduced to three choices.

■ Consider all kinds of numbers before you make a decision. As soon as you establish that quantity A is greater in one case while quantity B is greater in another case, choose answer (D) immediately and move on to the next comparison.

■ Geometric figures may not be drawn to scale. Comparisons should be made based on knowledge of mathematics rather than appearance. However, you can sometimes find a clue by sketching another figure in your test book. Try to visualize the parts of a figure that are fixed by the information given and the parts that are collapsible and changeable. If a figure can flow into other shapes and sizes while conforming to given information, the answer is probably (D).

Directions for quantitative comparison questions and some examples with explanations follow.
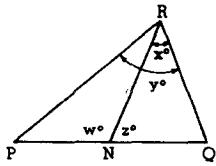
Directions: Each of the following questions consists of two quantities, one in Column A and one in Column B. You are to compare the two quantities and choose

   A if the quantity in Column A is greater;
   B if the quantity in Column B is greater;
   C if the two quantities are equal;
   D if the relationship cannot be determined from the information given.

Note: Since there are only four choices, NEVER MARK (E).

Common Information: In a question, information concerning one or both of the quantities to be compared is centered above the two columns. A symbol that appears in both columns represents the same thing in Column A as it does in Column B.

	Column A	Column B	Sample Answers
Example 1:	2×6	$2 + 6$	● Ⓑ ⒸⒹ Ⓔ

Examples 2-4 refer to △PQR.

Example 2:   PN   NQ   Ⓐ Ⓑ Ⓒ ● Ⓔ
(since equal measures cannot be assumed, even though PN and NQ appear equal)

Example 3:   x   y   Ⓐ ● Ⓒ Ⓓ Ⓔ
(since N is between P and Q)

Example 4: $w + z$ 180   Ⓐ Ⓑ ● Ⓓ Ⓔ
(since PQ is a straight line)

	Column A	Column B
15.	9.8	$\sqrt{100}$

$\sqrt{100}$ denotes 10, the positive square root of 100. (For any positive number x, $\sqrt{x}$ denotes the *positive* number whose square is x.) Since 10 is greater than 9.8, the correct answer is B. It is important not to confuse this question with a comparison of 9.8 and x where $x^2 = 100$. The latter comparison would yield D as the correct answer because $x^2 = 100$ implies that either $x = \sqrt{100}$ or $x = -\sqrt{100}$, and there is no way to determine which value x actually would have. However, this question asks for a comparison of 9.8 and $\sqrt{100}$, and $9.8 < \sqrt{100}$ for the reasons previously given.

16. $(-6)^4$ $(-6)^5$

Since $(-6)^4$ is the product of four negative factors and the product of an even number of negative numbers is positive, $(-6)^4$ is positive. Since the product of an odd number of negative numbers is negative, $(-6)^5$ is negative. Therefore $(-6)^4$ is greater than $(-6)^5$ since any positive number is greater than any negative number. The correct answer is A. Do not waste time determining that $(-6)^4 = 1{,}296$ and that $(-6)^5 = -7{,}776$. This information is not needed to make the comparison.

$$x + y = 10$$
$$x - y = 2$$

17. $x^2 - y^2$ 19

Since $x^2 - y^2 = (x + y)(x - y)$ and, from the information given, $(x + y)(x - y) = 10 \cdot 2 = 20$, which is greater than 19, the correct answer is A. The two equations could be solved for x and y, giving $x = 6$ and $y = 4$, and then $x^2 - y^2$ could be computed, but this solution is more time-consuming.

Column A	Column B
18. The area of an equilateral triangle with side 6	The area of a right triangle with legs $\sqrt{3}$ and 9

The area of a triangle is one half the product of the lengths of the base and the altitude. In column A, the length of the altitude must first be determined. A sketch of the triangle may be helpful.
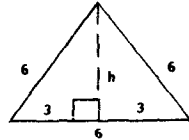
The altitude h divides the base of an equilateral triangle into two equal parts. From the Pythagorean theorem, $h^2 + 3^2 = 6^2$ or $h = 3\sqrt{3}$. Therefore the area of the triangle in column A is

$\frac{1}{2} \cdot 6 \cdot 3\sqrt{3} = 9\sqrt{3}$. In column B, the base and the altitude of the right triangle are the two legs, and therefore the area is

$\frac{9\sqrt{3}}{2}$. Since $9\sqrt{3}$ is greater than $\frac{9\sqrt{3}}{2}$, the correct answer is A.
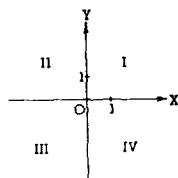
A point (x,y) is in region III.

19.	x	y

From the fact that point (x,y) is in region III, it is clear that x and y are both negative. However, since the location of the point within the region is not known, the relative sizes of x and y cannot be determined; for example, if the point is $(-3, -6)$, $x > y$ but if the point is $(-6, -3)$, $x < y$. Thus the answer is D.

$$(273 \times 87) + q = 29,235$$
$$(273 \times 87) + p = 30,063$$

20.	p	q

It is not necessary to do a lot of computation to solve this problem. The sum of a number and q is less than the sum of the same number and p. Therefore $q < p$, and the answer is A.

$$x^2 = y^2 + 1$$

21.	x	y

From the given equation, it can be determined that $x^2 > y^2$; however, the relative sizes of x and y cannot be determined. For example, if $y = 0$, x could be 1 or -1 and, since there is no way to tell which number x is, the answer is D.

DISCRETE QUANTITATIVE

Each discrete question contains all the information needed for answering the question except for the basic mathematical knowledge assumed to be common to the backgrounds of all examinees. Many of these questions require little more than manipulation and very basic knowledge; others require the examinee to read, understand, and solve a problem that involves either an actual or an abstract situation.

The following strategies might be helpful in answering discrete quantitative questions.

- Read each question carefully to determine what information is given and what is being asked.

- Before attempting to answer a question, scan the answer choices; otherwise you may waste time putting answers in a form that is not given (for example, putting an answer in the form $\frac{\sqrt{2}}{2}$ when the options are given in the form $\frac{1}{\sqrt{2}}$ or finding the answer in decimal form, such as 0.25, when the choices are given in fractional form, such as $\frac{1}{4}$).

- For questions that require approximations, scan the answer choices to get some idea of the required closeness of approximation; otherwise, you may waste time on long computations when a short mental process would be sufficient (for example, finding 48 percent of a number when taking half of the number would give a close enough approximation).

Directions for discrete quantitative questions and some examples with explanations follow.

Directions: Each of the following questions has five answer choices. For each of these questions, select the best of the answer choices given.

22. The average of x and y is 20. If $z = 5$, what is the average of x, y, and z?

(A) $8\frac{1}{3}$ (B) 10   (C) $12\frac{1}{2}$ (D) 15   (E) $17\frac{1}{2}$

Since the average of x and y is 20, $\frac{x+y}{2} = 20$ or $x + y = 40$. Thus $x + y + z = x + y + 5 = 40 + 5 = 45$ and therefore $\frac{x+y+z}{3} = \frac{45}{3} = 15$. The correct answer is D.

23. Several years ago, Minnesota produced $\frac{2}{3}$ and Michigan $\frac{1}{6}$ of all the iron ore produced in the United States. If all the other states combined produced 18 million tons in a year, how many million tons did Minnesota produce that year?

(A) 27   (B) 36   (C) 54   (D) 72   (E) 162

Since Minnesota produced $\frac{2}{3}$ and Michigan $\frac{1}{6}$ of all the iron

ore produced in the United States, the two states together produced $\frac{5}{6}$ of the iron ore. Therefore the 18 million tons produced by the rest of the United States was $\frac{1}{6}$ of the total production. Thus the total United States production was $6 \cdot 18 = 108$ million tons, and Minnesota produced $\frac{2}{3}(108) = 72$ million tons. The correct answer is D.

24. Into how many segments, each 20 centimeters long, can a segment 5 meters long be divided? (1 meter = 100 centimeters)

   (A) 20 (B) 25 (C) 45 (D) 50 (E) 80

Using the given information that there are 100 centimeters in a meter, it can be determined that there are 500 centimeters in 5 meters. The number of segments, each 20 centimeters long, into which a 500-centimeter segment can be divided is $\frac{500}{20} = 25$. The answer is B.

25. If $\frac{x}{3} - \frac{x}{6} + \frac{x}{9} - \frac{x}{12} = 1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4}$, then $x =$

   (A) 3 (B) 1 (C) $\frac{1}{3}$ (D) $-\frac{1}{3}$ (E) -3

This problem can be solved without a lot of computation by factoring $\frac{x}{3}$ out of the expression on the left side of the equation $\frac{x}{3} - \frac{x}{6} + \frac{x}{9} - \frac{x}{12} = \frac{x}{3}(1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4})$ and substituting the factored expression into the equation, obtaining $\frac{x}{3}(1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4}) = 1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4}$. Dividing both sides of the equation by $1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4}$ (which is not zero) gives the resulting equation, $\frac{x}{3} = 1$. Thus $x = 3$ and the answer is A.
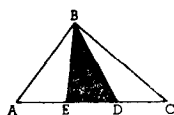
26. In the figure above, if AE = ED = DC and the area of the shaded region is 5, what is the area of △ABC?

   (A) 10 (B) 12.5 (C) 15 (D) 20 (E) 25

In this geometry problem, the shaded triangular region has a base that is $\frac{1}{3}$ the base of △ABC and has the same height as △ABC. Therefore, the area of the shaded region is $\frac{1}{3}$ the area of △ABC, and hence the area of △ABC = 3(5) = 15. The answer is C.

27. Joan earned twice as much as Bill and Sam earned $3 more than half as much as Bill. If the amounts earned by Joan, Bill, and Sam are j, b, and s, respectively, which of the following is a correct ordering of these amounts?

   (A) j < b < s (B) j < s < b
   (C) b < j < s (D) b < s < j
   (E) It cannot be determined from the information given.

From the first sentence the following two equations can be written: $j = 2b$ and $s = \frac{1}{2}b + 3$. The first equation implies that j is greater than b (j > b). The second equation, however, does not imply anything about the relationship between s and b; for example, if b = 2, $s = \frac{1}{2}(2) + 3 = 4$ and s > b but if b = 8, $s = \frac{1}{2}(8) + 3 = 7$ and s < b. Thus E is the best of the choices given.

■■■■■■■■DATA INTERPRETATION■■■■■■■■

The data interpretation questions, like the reading comprehension questions in the verbal measure, usually appear in sets. These questions are based on data presented in tables or graphs and test one's ability to synthesize information, to select appropriate data for answering a question, or to determine that sufficient information for answering a question is not provided.

The following strategies might help in answering sets of data interpretation questions.

■ Scan the set of data briefly to see what it is about, but do not attempt to grasp everything before reading the first question. Become familiar with it gradually, while trying to answer the questions. Be sure to read all notes related to the data.

■ If a graph has insufficient grid lines, use the edge of the answer sheet as a grid line to help read more accurately.

■ When possible, try to determine averages by visualizing a line through the important values and estimating the midpoint rather than reading off each value and then computing the average. Remember the average must be somewhere between the least value and the greatest value.

■ If a question is too long and involved to take in at one time, break it down into parts and substitute the values from the graph for each part. Then reread the question and attempt to answer it.

■ If the numbers are large, estimate products and quotients instead of performing involved computations.

■ Remember that these questions are to be answered only on the basis of the data given, everyday facts (such as the number of days in a year), and your knowledge of mathematics. Do not make use of specific information that you recall that may seem to relate to the particular situation on which the questions are based unless that information is derivable from the data provided.

The directions for data interpretation questions are the same as those for the discrete questions. Some examples of data interpretation questions with explanations follow.

Questions 28-30 refer to the following table:

PERCENT CHANGE IN DOLLAR AMOUNT OF SALES IN CERTAIN RETAIL STORES FROM 1977 TO 1979

Store	Percent Change From 1977 to 1978	From 1978 to 1979
P	+ 10	− 10
Q	− 20	+ 9
R	+ 5	+ 12
S	− 7	− 15
T	+ 17	− 8

28. In 1979 which of the stores had greater sales than any of the others shown?

(A) P (B) Q (C) R (D) S
(E) It cannot be determined from the information given.

Since the only information given in the table is the percent change from year to year, there is no way to compare the amount of sales for the stores in any one year. The best answer is E.

29. In store T, the sales for 1978 amounted to approximately what percent of the sales for 1979?
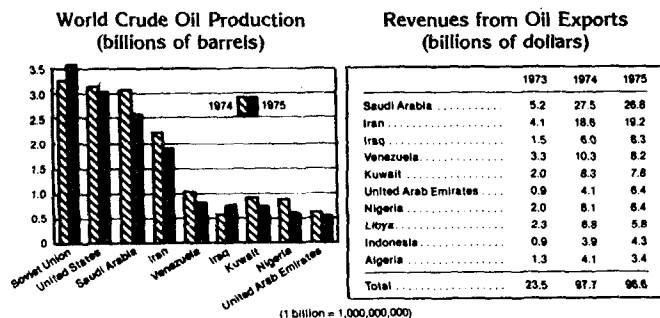
(A) 86% (B) 92% (C) 109% (D) 117% (E) 122%

If A is the amount of sales for store T in 1978, then 0.08 A is the amount of decrease and A − 0.08 A = 0.92 A is the amount of sales for 1979. Therefore the desired result can be obtained by dividing A by 0.92 A, which equals $\frac{1}{0.92}$ or approximately 109%. The best answer is C.

30. If sales in store P amounted to $800,000 in 1977, what did the sales amount to in that store in 1979?

(A) $727,200 (B) $792,000 (C) $800,000
(D) $880,000 (E) $968,000

If sales in store P amounted to $800,000 in 1977, then in 1978 they amounted to 110 percent of that; i.e., $880,000. In 1979 sales amounted to 90 percent of $880,000; i.e., $792,000. Note that an increase of 10 percent in one year and a decrease of 10 percent in the following year does not result in the same amount as the original amount of sales because the base used in computing the percents changes from $800,000 to $880,000. The correct answer is B.

Questions 31-34 refer to the following data.

World Crude Oil Production (billions of barrels)

Revenues from Oil Exports (billions of dollars)

	1973	1974	1975
Saudi Arabia	5.2	27.5	26.8
Iran	4.1	18.6	19.2
Iraq	1.5	6.0	8.3
Venezuela	3.3	10.3	8.2
Kuwait	2.0	8.3	7.8
United Arab Emirates	0.9	4.1	6.4
Nigeria	2.0	8.1	6.4
Libya	2.3	6.8	5.8
Indonesia	0.9	3.9	4.3
Algeria	1.3	4.1	3.4
Total	23.5	97.7	96.6

(1 billion = 1,000,000,000)

Note: Drawn to scale.

31. How many of the countries shown produced more crude oil in 1975 than in 1974?

(A) None (B) One (C) Two
(D) Three (E) Four

To answer this question, one needs only to examine the bar graph that deals with production and count the number of countries for which the solid bar is taller than the lined bar. The Soviet Union and Iraq are the only such countries; therefore, the answer is C.

32. In 1974, for which of the following countries were revenues from oil exports most nearly equal to 20 percent of the total for all the countries listed?

(A) Iran (B) Iraq (C) Kuwait
(D) Saudi Arabia (E) Venezuela

For this question, only the table is needed. Since 20 percent of the total (97.7) is a little less than 20, and 18.6, the revenue for Iran, is the only 1974 entry a little less than 20, the answer is A.

33. The country that had the greatest percent decrease in crude oil production from 1974 to 1975 had how many billions of dollars of revenue from oil exports in 1974?

(A) $27.5 (B) $18.6 (C) $10.3 (D) $8.1 (E) $4.1

This question requires the use of both the bar graph and the table. From the bar graph, it can be seen that there are eight countries that had a decrease in production; however, it would be very time-consuming to compute all of the percents. If the percent decrease is to be the greatest, then the difference between the two bars must be larger in relation to the height of the lined bar than any of the others. Some countries, such as the United States and United Arab Emirates, can be ruled out because the heights of the bars are so nearly the same. Venezuela and Kuwait can be ruled out because they have smaller differences but taller lined bars than Nigeria. Iran can be ruled out because it has about the same difference as Nigeria but a much taller lined bar. That leaves only Saudi Arabia and Nigeria and one would suspect that the ratio of the difference to the height of the lined bar is smaller for Saudi Arabia. A quick check shows that $\frac{0.5}{3}$ is less than $\frac{0.2}{0.9}$ and, therefore, Nigeria had the greatest percent decrease. From the table, Nigeria had 8.1 billions of dollars of revenue, and the best answer is D.

34. Which of the following can be concluded from the data?

    I. In 1974, Iraq exported four times as many barrels of oil as in 1973.

    II. In 1974, Iran exported three times as much oil as Iraq.

    III. In 1975, the combined crude oil production of the Soviet Union, the United States, and Saudi Arabia was more than half of the total production of all nine countries shown.

    (A) I only (B) II only (C) III only
    (D) I and II (E) II and III

In this question, you have to decide whether each of three statements can be concluded from the data. Statement I cannot be concluded since no information is given about numbers of barrels exported in either year or about revenue per barrel in any given year. Although Iran's revenue in 1974 was approximately three times that of Iraq, no information is given about the cost per barrel in each of the countries; therefore, Statement II cannot be concluded. Note that it cannot be assumed that the price per barrel is the same in Iran and Iraq (although it might seem to be a reasonable assumption on the basis of outside knowledge) because no such information is provided in the data. In 1975 the combined production of the Soviet Union, the United States, and Saudi Arabia was about 9 billion barrels. Iran's production was about 2 billion and the remaining 5 countries produced less than 1 billion each , giving a total of less than 7 billion barrels for these countries. Therefore Statement III can be concluded, and the answer is C.

Analytical Ability

Each analytical section includes two kinds of questions:

- analytical reasoning questions in groups of three or more questions, with each group based on a different set of conditions describing a fictional situation, and

- logical reasoning questions, usually with each question based on a separate short prose passage, but sometimes with two or three questions based on the same passage.

These sections of the General Test are designed to measure the ability to think analytically. Analytical reasoning questions focus on the ability to analyze a given structure of arbitrary relationships and to deduce new information from that structure, and logical reasoning questions focus on the ability to understand and to analyze relationships among arguments or parts of an argument.

The directions for all the questions in the analytical ability sections are the same and are as follows:

Directions: Each question or group of questions is based on a passage or set of conditions. In answering some of the questions, it may be useful to draw a rough diagram. For each question, select the best answer choice given.

◼◼◼◼◼◼◼ ANALYTICAL REASONING ◼◼◼◼◼◼◼

Analytical reasoning questions test the ability to understand a given structure of arbitrary relationships among fictitious persons, places, things, or events; to deduce new information from the relationships given; and to assess the conditions used to establish the structure of relationships. Each analytical reasoning group consists of (1) a set of about three to seven related statements or conditions (and sometimes other explanatory material) describing a structure of relationships, and (2) three or more questions that test understanding of that structure and its implications. Although each question in a group is based on the same set of conditions, the questions are independent of one another; answering one question in a group does not depend on answering any other question.

No knowledge of formal logic or mathematics is required for solving analytical reasoning problems. Although some of the same processes of reasoning are involved in solving both analytical reasoning problems and problems in those specialized fields, analytical reasoning problems can be solved using knowledge, skills, vocabulary, and computational ability (simple addition and subtraction) common to college students.

Each group of analytical reasoning questions is based on a set of conditions that establish relationships among persons, places, things, or events. These relationships are common ones such as temporal order (X arrived before Y but after Z), spatial order (City X is west of point Y and point Z), set membership (If Professor Green serves on the committee, then Professor Brown must also serve), cause and effect (Event Q always causes event R), and family relationship (Mary is Juan's mother and Belinda's sister-in-law). The conditions should be read carefully to determine the exact nature of the relationship or relationships involved. Some relationships are fixed or constant (The second house on the block belongs to P). Other relationships are variable (Q must be assigned to either campsite 1 or campsite 3). Some relationships that are not given can be easily deduced from those given. (If one condition about books on a shelf specifies that book L is to the left of book Y, and another specifies that book P is to the left of book L, then it can be deduced that book P is to the left of book Y.)

The following strategies may be helpful in answering analytical reasoning questions:

- In general, it is best to answer first those questions in a group that seem to pose little difficulty and then to return to those that seem troublesome. It is best not to start one group before finishing another because much time can be lost later in returning to an analytical reasoning group and reestablishing familiarity with its relationships. Do not avoid a group merely because its conditions look long or complicated.

- In reading the conditions, it is important not to introduce unwarranted assumptions; for instance, in a set establishing relationships of height and weight among the members of a team, do not assume that a person who is taller than another person must weigh more than that person.

- Since it is intended that the conditions be as clear as possible, avoid interpreting them as if they were designed to trick you by means of hidden ambiguities or other such devices. When in doubt, read the conditions in their most obvious, common-language sense. This does not mean, however, that the language in the conditions is not intended to be read for precise meaning. It is essential, for instance, to pay particular attention to function words that describe or limit relationships, such as only, exactly, never, always, must be, cannot be, and the like. The result of the thorough reading described above should be a clear picture of a structure of relationships, including what kind or kinds of relationships are involved, who or what the participants in the relationships are, and what is and is not known about the structure of the relationships. For instance, at this point it can often be determined whether only a single