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CollegeBoard

Getting Ready for the SAT[®]



INFORMATION
ABOUT THE SAT[®]



AN OFFICIAL
PRACTICETEST



TEST-TAKING
ADVICE AND TIPS

*This booklet can be used by students taking the SAT before the launch of the redesigned exam in the spring of 2016.

Find more free and affordable practice at www.sat.org/practice.

A little practice goes a long way.

SAT[®]

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Available at sat.org/practice

- Free SAT practice tools including:
 - Official practice test
 - Video tutorials and other practice materials from Khan Academy
- The Official SAT Study Guide™ (also available with DVD)
- The Official SAT Online Course™ (valid until January 2016)

SAT[®]

 **CollegeBoard**

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Introduction to the SAT® and the College Board

If you plan to register for the SAT, you can use this book to get familiar with the test. Remember, if you have access to the Internet you can find everything in this booklet and more at sat.org/practice.

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Student Search Service® Program

Our Student Search Service is a free and voluntary program that connects students with information about educational and financial aid opportunities from more than 1,200 colleges, universities, scholarship programs, and educational organizations.

Here's how it works:

1. During SAT or SAT Subject Test registration, indicate that you want to be a part of Student Search Service.
2. As part of the registration, you will also be asked to provide information on your education, aspirations, and backgrounds.
3. Participating, eligible organizations use Student Search Service to find groups of students, like you, to contact because these students may be a good fit for their communities and programs. Only students who opted to participate in Student Search Service will be included.
4. To find groups of students, these organizations can use any attribute you provided, except the following: disability, parental education, self-reported parental income, Social Security number, phone numbers, and actual test scores.
5. The most searched items are expected high school graduation date, cumulative grade point average (GPA), and intended college major. A full list of questions is available in Section 3 of the Student Registration Guide, "Completing the SAT Questionnaire."

If you have questions or concerns about Student Search Service or want more information about the program, please visit collegeboard.org/student-search-service or call (866) 825-8051.

Here are some points to keep in mind about Student Search Service:

- Most students who take the PSAT/NMSQT, AP Exams, SAT, or SAT Subject Tests participate in this free service; however, you may take the test even if you don't take part in Student Search Service.
- Organizations participating in Student Search Service never receive actual student scores, but they can ask for names of students within certain score ranges.
- Being contacted by a college doesn't mean you have been admitted. The colleges and organizations that participate want to find students who fit in with their environment, classes, programs, scholarships, and special activities. However, if you apply, you may be admitted. Student Search Service is simply a way for colleges to reach prospective students like to introduce you to the college and inform you of opportunities at the college.
- Student Search Service will share your contact information only with eligible colleges, universities, and qualified nonprofit educational organizations or scholarship programs that are recruiting students like you. Your name and other information will never be sold to a commercial marketing firm or retailer of merchandise or services (such as test prep). **Student Search Service allows these eligible organizations to send communications directly to the students whose names were received through Student Search Service.** All colleges and other institutions which receive this student information from Student Search Service must comply with our strict guidelines around confidentiality. These Colleges and institutions determine how they will communicate with the students, including the frequency and type of communication (print or electronic). Colleges and institutions must adhere to our guidelines but also comply with applicable federal and state laws governing your privacy.
- To unsubscribe from Student Search Service, go to collegeboard.org/student-search-service, call 800-626-9795, or write to:

The College Board

11955 Democracy Drive
Reston, VA 20190-5662
Attention: Student Search Service

Why Should You Take the SAT?

The SAT is an essential passport for your college admission journey. The SAT gives colleges what they want: a showcase of your skills and potential. The College Board is here to help guide you throughout the college-going process so that you can find the right college fit and best path forward to future opportunities.

It's more than just a test.

The SAT can also help connect you to our college planning resources. Go to bigfuture.org to start your journey. Learn how other students like you made their college choices. Find out more about the application process, access financial aid tools, explore majors, and more — all to help you narrow down your choices and find the right college.

It's one path to financial support and scholarships.

The SAT can help connect you to scholarship organizations, and many colleges use it for merit awards in addition to admission. Take a look at the “Student Search Service” information on this page to learn more.

It's fair to everyone.

The SAT was first created to help level the playing field in college admission. It still does so today. The SAT is the most rigorously researched and designed test in the world, which ensures that students from all backgrounds have an equal chance to succeed.

What Does the SAT Measure?

The SAT measures the skills you have learned in and outside of the classroom and how well you can apply that knowledge. It tests how you think, solve problems, and communicate. The test is composed of three sections:

- **Critical Reading**, which includes sentence completion and passage-based reading questions.
- **Mathematics**, which includes multiple-choice and student-produced response questions based on the math that college-bound students typically learn during their first three years of high school.
- **Writing**, which has multiple-choice questions and a written essay.

You have three hours and 45 minutes of testing time, plus three five-minute breaks, for a total of four hours to complete the entire test.

All multiple-choice questions are scored the same way: one point for each correct answer, and one-quarter point subtracted for a wrong answer. No points are subtracted for answers left blank or for incorrect student-produced response questions (see page 22). The total score for each section is on a 200- to 800-point scale, with 10-point intervals.

How Can You Get Ready for the Test?

Get Started Now

- Take challenging classes, study hard, and read and write outside of the classroom.
- Take the PSAT/NMSQT in your sophomore and/or junior year. Once you get your results, sign in to My College QuickStart™ to get a personalized planning kit to help you start getting ready for the SAT.
- Review the sample questions, test-taking approaches, and directions in this booklet. (Reminder: The information in this booklet is valid until March 2016.)
- Take advantage of our low-cost practice materials, with the lessons, practice questions, and practice exams in The Official SAT Online Course™, and *The Official SAT Study Guide™* Second Edition (also available with DVD).

Use Our Online Resources

At sat.org/practice you'll find a wealth of practice tools to help you put your best foot forward on test day.

- Create your own study plan and practice with The Official SAT Question of the Day™, also available via Twitter or our mobile app.
- Take an official SAT practice test online so you can get it scored automatically and review the answer explanations. You can also take the practice test included in this booklet.
- With SAT Skills Insight™ you can see what you need to get to the next level on the SAT.
- Visit khanacademy.org/sat for additional practice, including tutorials and videos.

Approaches to Taking the SAT

Know What to Expect

Use the information in this booklet and at sat.org/practice to help you be ready on test day.

- **Become familiar with the test.** Study the descriptions of the SAT sections, so you're not surprised or confused on test day.
- **Learn the test directions.** The directions for answering the questions in this booklet are the same as those on the actual test. If you become familiar with the directions now, you'll leave yourself more time to answer the questions when you take the test.
- **Review the sample questions.** The more familiar you are with the question formats, the more comfortable you'll feel when you see similar questions on the actual test. In particular, be sure to practice writing answers to the student-produced response mathematics questions (see page 22).
- **Understand how the tests are scored.** You get one point for each right answer and lose a fraction of a point for each wrong answer. You neither gain nor lose points for omitting an answer. Hard questions count the same amount as easier questions.

Use These Test-Taking Strategies

- **Listen carefully to instructions and follow the directions given to you.** Be sure to fill in the Form Code, Test Form, and Test Book Serial Number fields as directed on page 1 of the answer sheet. If they are not correct, we won't be able to score your test.
- **Read carefully.** Consider all the choices in each question. Avoid careless mistakes that will cause you to lose points.
- **Answer the easy questions first.** Work on less time-consuming questions before moving on to the more difficult ones. Questions in each section are generally ordered from easiest to hardest. The exception is in the passage-based reading questions, which are ordered according to the logic and organization of each passage.
- **Eliminate answer choices that you know are wrong.** Cross them out in your test booklet so that you can clearly see which choices are left.
- **Make educated guesses or skip the question.** If you have eliminated the choices that you know are wrong, guessing is your best strategy. However, if you cannot eliminate any of the answer choices, it is best to skip the question. No points are deducted if an answer is left blank, but you will lose points for incorrect answers
- **Use your test booklet as scratch paper.** Use it to make notes or write down ideas. What you write in the booklet will not affect your score.
- **Circle the questions you've skipped.** This will help you keep track of which questions you've skipped.
- **Check your answer sheet regularly.** Make sure you are in the right place. Check the number of the question and the number on the answer sheet every few questions. This is especially important when you skip a question. Losing your place on the answer sheet can cost you time and even points.
- **Keep your answer sheet neat.** The answer sheet is scored by a machine, which can't tell the difference between an answer and a doodle. If the machine reads what appear to be two answers for one question, it will consider the question unanswered.
- **Work at an even, steady pace and limit your time on any one question.** All questions are worth the same number of points. If you need a lot of time to answer a question, go on to the next one. Later, you may have time to return to the question you skipped. Your goal is to spend time on the questions that you are most likely to answer correctly.
- **Keep track of time.** Occasionally check your progress so that you know where you are and how much time is left.
- **Always use a No. 2 pencil.** All answer sheet circles must be filled in darkly and completely with a No. 2 pencil. If you need to erase an answer, erase it as completely as possible. The SAT essay must be written with a No. 2 pencil. Essays written in pen will receive a score of zero.

On Test Day

Make sure that you read and understand our policies and requirements for taking the SAT. These are available in three places:

- Online at sat.org/test-day
- In the Terms and Conditions you agree to during online registration
- In the *Student Registration Guide to the SAT and SAT Subject Tests*

You will need to bring the following to the test center:

- Your Admission Ticket, which is required for entry to the test center.
- An acceptable photo ID. Be sure to check online or in the registration guide about what ID you can use.
- Two No. 2 pencils and a soft eraser.
- An approved calculator with fresh batteries. For more information on calculators, see pages 11-12.
 - Make sure your calculator is in good working order.
 - You may bring additional batteries and a backup calculator to the test center. Test center staff will not have batteries or calculators for your use.
 - **You may not share a calculator with another test-taker.**

Test Scores

Scores are available for free at sat.org/scores several weeks after each test is given. You can also get your scores, for a fee, by calling Customer Service.

How the Test Is Scored

The first step in scoring is to calculate the raw score for each section. The second step is to convert that raw score to a scale of 200 to 800. The raw scores are calculated as follows:

- For each correct answer, 1 point is added.
- For each incorrect multiple-choice answer, 1/4 point is subtracted.
- For each incorrect student-produced response, no points are subtracted.
- For each question not answered, no points are subtracted.

SAT Writing Subscores

In addition to an overall writing score, you receive two writing subscores — one for your essay, and one for the multiple-choice questions.

- The **essay subscore** is a raw score ranging from 2 to 12. The essay raw score contributes about 30 percent toward your total writing score. (Note: Essays that are not written on the essay assignment, not written in No. 2 pencil, or not considered legible after several attempts at reading will receive a zero.)
- The **multiple-choice writing subscore** on your score report has been converted from a raw score to a scale of 20 to 80. The multiple-choice raw score contributes about 70 percent to your overall writing score.

My SAT Online Score Report

My SAT Online Score Report gives you personalized, practical information about your SAT results, including how your score compares to those of the total group of test-takers and how you performed on each section of the test. It also allows you to access and print your essay to share with your teachers or counselor. Link to your report at collegeboard.org/satscores.

Score Choice™

Score Choice™ gives you the option to choose which scores to send colleges based on what each college wants to receive. You can select which scores to send each college by test date for the SAT and by individual test taken for SAT Subject Tests™. You can choose scores from one, several or all SAT test dates in your record. Score Choice is optional, so if you don't actively choose to use it, all of your scores will be sent automatically with your score report. Since most colleges only consider your best scores, you should still feel comfortable reporting scores from all of your tests.

SAT Customer Service

You can reach us from 8 a.m. to 9 p.m. Eastern Time (8:30 a.m. to 8 p.m. in the summer).

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International: +1-212-713-7789

Email: sat@info.collegeboard.org

Mail: College Board SAT Program
P.O. Box 025505
Miami, FL 33102

About the College Board

The College Board is a mission-driven not-for-profit organization that connects students to college success and opportunity. Founded in 1900, the College Board was created to expand access to higher education. Today, the membership association is made up of over 6,000 of the world's leading educational institutions and is dedicated to promoting excellence and equity in education. Each year, the College Board helps more than seven million students prepare for a successful transition to college through programs and services in college readiness and college success — including the SAT® and the Advanced Placement Program®. The organization also serves the education community through research and advocacy on behalf of students, educators and schools. For further information, visit www.collegeboard.org.

Protecting Your Privacy

Telemarketing and Internet Scams

From time to time, we receive reports of phone scams in which callers posing as employees of the College Board contact students and families attempting to sell test preparation products or otherwise requesting sensitive personally identifying information, such as credit card and social security numbers. Some of these callers engage in illegal spoofing to make it seem as if the call is coming from the actual company. **These calls do not come from the College Board. The College Board does not make unsolicited phone calls to students or families requesting this type of information.** This type of activity, known as telemarketing fraud, is a crime. Should you receive an unsolicited phone call from someone claiming to work for the College Board, including where your Caller ID indicates that the telephone number originates from a College Board location, do not provide the caller with any personal information.

Representatives of the College Board only make calls or send text messages to students and their families in response to student-generated inquiries and/or to provide or gather information about a test or program for which the student registered or regarding preparation for college and the application process. Should you have a question about the origin of a phone call you have received in which the caller claims to be from the College Board, contact Customer Service.

Safety and Security Tips

1. Be wary of unsolicited contacts, whether via telephone or email.
2. Remember that the College Board will never contact you to ask you to send your credit card, bank account, or password information over the telephone or through email.
3. Never supply credit card information to someone who calls or emails you.
4. If you suspect you have received a fraudulent call or email, contact the Federal Trade Commission (FTC) and your local authorities and provide them with all the details.
5. Keep in mind that if an offer appears too good to be true, it probably is.
6. To make a complaint and to obtain more information about protecting yourself from telephone and Internet scams, visit the FTC's Consumer Information site at www.ftc.gov/bcp/menus/consumer/phone.shtm.

The Critical Reading Section

The critical reading section gives you a chance to show how well you understand what you read. This section has two types of questions:

- Sentence completions (19 questions)
- Passage-based reading (48 questions)

Note: Calculators may not be on your desk or used on the critical reading section of the SAT.

Approaches to the Critical Reading Section

- **Work on sentence completion questions first.** They take less time to answer than the passage-based reading questions.
- The difficulty of sentence completion questions increases as you move through the section.
- Passage-based reading questions do not increase in difficulty from easy to hard. Instead, they follow the logic of the passage.
- **Reading carefully is the key to finding the correct answer.** The information you need to answer each reading question is always in the passage(s). Don't be misled by an answer that looks correct but is not supported by the actual text of the passage(s).
- Passage-based reading questions often include line numbers to help direct you to the relevant part(s) of the passage. If one word or more is quoted exactly from the passage, the line number(s) where that quotation can be found will appear in the test question. You may have to look elsewhere in the passage, however, in order to find support for the best answer to the question.
- **Stay with a passage until you have answered as many questions as you can before you proceed to the next passage. Do not jump from passage to passage.**
- **In your test booklet, mark each question you skip so that you can easily go back to it later if you have time.**
- **Remember that all questions are worth one point regardless of the type or difficulty.**

Sentence Completions

Sentence completion questions measure your

- knowledge of the meanings of words; and
- ability to understand how the different parts of a sentence fit together logically.

Directions

Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are five words or sets of words labeled A through E. Choose the word or set of words that, when inserted in the sentence, best fits the meaning of the sentence as a whole.

Example:

Hoping to ----- the dispute, negotiators proposed a compromise that they felt would be ----- to both labor and management.

- (A) enforce . . . useful
- (B) end . . . divisive
- (C) overcome . . . unattractive
- (D) extend . . . satisfactory
- (E) resolve . . . acceptable

(A) (B) (C) (D) ●

Answering Sentence Completion Questions

One way to answer a sentence completion question with two missing words is to focus first on just one of the two blanks. If one of the words in an answer choice is logically wrong, then you can eliminate the entire choice from consideration.

- Look at the first blank in the above example. Would it make sense to say that “negotiators” who have “proposed a compromise” were hoping to **enforce** or **extend** the “dispute”? No, so neither (A) nor (D) can be the correct answer.
- Now you can focus on the second blank. Would the “negotiators” have proposed a compromise that they believed would be **divisive** or **unattractive** to “both labor and management”? No, so (B) and (C) can be eliminated, and only choice (E) remains.
- Always check your answer by reading the entire sentence with your choice filled in. Does it make sense to say, “Hoping to **resolve** the dispute, negotiators proposed a compromise that they felt would be **acceptable** to both labor and management”? Yes.

Correct answer: (E) / Difficulty level: Easy

Sample Questions

1. Because King Philip's desire to make Spain the dominant power in sixteenth-century Europe ran counter to Queen Elizabeth's insistence on autonomy for England, ----- was -----.

(A) reconciliation . . . assured
(B) warfare . . . avoidable
(C) ruination . . . impossible
(D) conflict . . . inevitable
(E) diplomacy . . . simple

Be sure to look for key words and phrases as you read each sentence. Words such as *although*, *however*, *if*, *but*, and *since* are important to notice because they signal how the different parts of a sentence are logically related to each other. Words such as *not* and *never* are important because they indicate negation. In the example above, the entire sentence hinges on a few key words: “*Because something ran counter to something else, blank was blank.*”

- The word “because” indicates that the information in the first part of the sentence (the part before the comma) explains the reason for the situation described in the second part. The first part states that what King Philip wanted (domination for Spain) “ran counter to” what Queen Elizabeth wanted (independence for England).
- Given that there was such a fundamental disagreement between the two monarchs, would **reconciliation** be **assured**? Unlikely.
- Would **warfare** be **avoidable**? Hardly; warfare might be unavoidable.
- Would **ruination** be **impossible**? No.
- Would **diplomacy** be **simple**? Not necessarily.
- Only choice (D) fits logically with the key words in the sentence: *Because* what one person wanted *ran counter to* what another person wanted, **conflict** was **inevitable**.

Correct answer: (D) / Difficulty level: Medium

2. There is no doubt that Larry is a genuine -----: he excels at telling stories that fascinate his listeners.
- (A) braggart (B) dilettante (C) pilferer
(D) prevaricator (E) raconteur

Some sentence completion questions contain a colon. This is a signal that the words after the colon define or directly clarify what came before. In this case, “he excels at telling stories that fascinate his listeners” serves to define the word **raconteur**, choice (E). None of the other words is directly defined by this clause.

- A **braggart** may or may not excel at telling stories and may actually annoy listeners.
- A **dilettante** is someone who dabbles at a career or hobby and so may not excel at anything.
- A **pilferer** steals repeatedly, in small quantities; this has nothing to do with storytelling.
- A **prevaricator** tells lies, but not necessarily in an accomplished or fascinating way; and the sentence refers to stories, not lies.

You should choose the word that best fits the meaning of the sentence as a whole, and only choice (E) does so.

Correct answer: (E) / Difficulty level: Hard

Passage-Based Reading

The passage-based reading questions on the SAT measure your ability to read, and think carefully about several different passages ranging in length from about 100 to about 850 words. Passages are taken from a variety of fields, including the humanities, social studies, natural sciences, and fiction or literary nonfiction. They vary in style and can include narrative, argumentative, and expository elements. Some selections consist of a pair of related passages on a shared issue or theme; in some of the questions, you are asked to compare and contrast these passages.

The following kinds of questions may be asked about a passage:

- **Vocabulary in Context:** These questions ask you to determine the meanings of words from their context in the reading passage.
- **Literal Comprehension:** These questions assess your understanding of significant information directly stated in the passage.
- **Extended Reasoning:** These questions measure your ability to synthesize and analyze information as well as to evaluate the assumptions made and the techniques used by the author. Most of the reading questions fall into this category. You may be asked to identify cause and effect, make inferences, recognize a main idea or an author’s tone, or follow the logic of an analogy or an argument.

Answering Passage-Based Reading Questions

Following are samples of the kinds of reading passages and questions that may appear on your test. For each set of sample materials:

- Read the passage carefully.
- Decide on the best answer to each question.
- Read the explanation for the correct answer.

Some of the reading passages on the SAT are as short as a paragraph or two, about 100 words in length. You will also find one or more pairs of related short passages in each edition of the test. Such material will be followed by one to five questions that measure the same kinds of reading skills that are measured by the questions following longer passages.

Directions

The passages below are followed by questions based on their content; questions following a pair of related passages may also be based on the relationship between the paired passages. Answer the questions on the basis of what is stated or implied in the passages and in any introductory material that may be provided.

Sample Questions

Questions 3-4 are based on the following passage.

“The rock was still wet. The animal was glistening, like it was still swimming,” recalls Hou Xiangang. Hou discovered the unusual fossil while surveying rocks as a paleontology graduate student in 1984, near the Chinese town of Chengjiang. “My teachers always talked about the Burgess Shale animals. It looked like one of them. My hands began to shake.”

Hou had indeed found a *Naraoia* like those from Canada. However, Hou’s animal was 15 million years older than its Canadian relatives.

Some questions ask you to recognize the meaning of a word as it is used in the passage.

3. In line 4, “surveying” most nearly means

- (A) calculating the value of
- (B) examining comprehensively
- (C) determining the boundaries of
- (D) polling randomly
- (E) conducting a statistical study of

The word “surveying” has a number of meanings, several of which are included in the choices above. In the context of this passage, however, only (B) makes sense. A student in the field of “paleontology” is one who studies prehistoric life as recorded in fossil remains. One of the activities of a paleontology student would be to examine rocks carefully and “comprehensively” while looking for fossils.

- (A), (C), and (E) are incorrect because someone who studies fossils would not calculate the “value” of rocks, or determine the “boundaries” of rocks, or conduct a “statistical study” of rocks.
- (D) is wrong because “polling” rocks makes no sense at all.

Correct answer: (B) / Difficulty level: Easy

You may be asked to make an inference or draw a conclusion about a statement made in the passage.

4. It can be inferred that Hou Xiangang’s “hands began to shake” (line 9) because Hou was
- (A) afraid that he might lose the fossil
 - (B) worried about the implications of his finding
 - (C) concerned that he might not get credit for his work
 - (D) uncertain about the authenticity of the fossil
 - (E) excited about the magnitude of his discovery

In the passage, Hou states that the fossil that he found “looked like” certain other fossils that his “teachers always talked about.” He understands almost immediately, therefore, the significance of what he has found, and so (E) is the correct answer: Hou’s hands were shaking because he was “excited about the magnitude of his discovery.”

- (A) is wrong because there is no suggestion that Hou was “afraid that he might lose the fossil.”
- (B) and (C) are wrong because the passage does not indicate that Hou was “worried about” his discovery or “concerned that he might not get credit.” The passage indicates only that Hou recognized that he had found something valuable.
- (D) is wrong because Hou’s immediate reaction is that he thinks he has found an important fossil. The first two sentences of the passage dramatize the discovery; it is Hou’s excitement, not his uncertainty, that causes him to tremble.

Correct answer: (E) / Difficulty level: Easy

Questions 5-8 are based on the following passages.

These two passages were adapted from autobiographical works. In the first, a playwright describes his first visit to a theater in the 1930s; in the second, an eighteenth-century writer describes two visits to theaters in London.

Passage 1

I experienced a shock when I saw a curtain go up for the first time. My mother had taken me to see a play at the Schubert Theater on Lenox Avenue in Harlem in New York City. Here were living people talking to one another inside a large ship whose deck actually heaved up and down with the swells of the sea. By this time I had been going to the movies every Saturday afternoon — Charlie Chaplin’s little comedies, adventure serials, Westerns. Yet once you knew how they worked, movies, unlike the stage, left the mind’s grasp of reality intact since the happenings were not in the theater where you sat. But to see the deck of the ship in the theater moving up and down, and people appearing at the top of a ladder or disappearing through a door—where did

they come from and where did they go?
20 Obviously into and out of the real world of
Lenox Avenue. This was alarming.

And so I learned that there were two
kinds of reality, but that the stage was far
more real. As the play's melodramatic story
25 developed, I began to feel anxious, for there
was a villain on board who had a bomb and
intended to blow everybody up. All over the
stage people were looking for him but he
appeared, furtive and silent, only when the
30 searchers were facing the other way. They
looked for him behind posts and boxes and
on top of beams, even after the audience
had seen him jump into a barrel and pull
the lid over him. People were yelling, "He's
35 in the barrel," but the passengers were deaf.
What anguish! The bomb would go off any
minute, and I kept clawing at my mother's
arm, at the same time glancing at the the-
ater's walls to make sure that the whole
40 thing was not really real. The villain was
finally caught, and we happily walked out
onto sunny Lenox Avenue, saved again.

Passage 2

I was six years old when I saw my first
play at the Old Drury. Upon entering the
45 theater, the first thing I beheld was the green
curtain that veiled a heaven to my imagina-
tion. What breathless anticipations I
endured! I had seen something like it in an
edition of Shakespeare, an illustration of the
50 tent scene with Diomedes in *Troilus and
Cressida*. (A sight of that image can always
bring back in a measure the feeling of that
evening.) The balconies at that time, full of
well-dressed men and women, projected
55 over the orchestra pit; and the pilasters*
reaching down were adorned with a glister-
ing substance resembling sugar candy. The
orchestra lights at length rose. Once the bell
sounded. It was to ring out yet once again—

60 and, incapable of the anticipation, I reposed
my shut eyes in a sort of resignation upon
my mother's lap. It rang the second time.
The curtain drew up—and the play was
Artaxerxes! Here was the court of ancient
65 Persia. I took no proper interest in the
action going on, for I understood not its
import. Instead, all my feeling was absorbed
in vision. Gorgeous costumes, gardens,
palaces, princesses, passed before me. It was
70 all enchantment and a dream.

After the intervention of six or seven
years I again entered the doors of a theater.
That old *Artaxerxes* evening had never done
ringing in my fancy. I expected the same
75 feelings to come again with the same occa-
sion. But we differ from ourselves less at
sixty and sixteen, than the latter does from
six. In that interval what had I not lost! At
six I knew nothing, understood nothing,
80 discriminated nothing. I felt all, loved all,
wondered all. I could not tell how, but I had
left the temple a devotee, and was returned a
rationalist. The same things were there
materially; but the emblem, the reference,
85 was gone. The green curtain was no longer a
veil, drawn between two worlds, the unfold-
ing of which was to bring back past ages, but
a certain quantity of green material, which
was to separate the audience for a given time
90 from certain of their fellows who were to
come forward and pretend those parts. The
lights—the orchestra lights—came up a
clumsy machinery. The first ring, and the
second ring, was now but a trick of the
95 prompter's bell. The actors were men and
women painted. I thought the fault was in
them; but it was in myself, and the alteration
which those many centuries—those six
short years—had wrought in me.

* Pilasters are ornamental columns set into walls.

Following are four sample questions about this pair of related passages. In the test, as many as 13 questions may appear with a passage of this length. Some questions will focus on Passage 1, others will focus on Passage 2, and about half of the questions following each pair of passages will focus on the relationships between the passages.

Some questions require you to identify shared ideas or similarities between the two related passages.

5. The authors of both passages describe
- (A) a young person's sense of wonder at first seeing a play
 - (B) a young person's desire to become a playwright
 - (C) the similarities between plays and other art forms
 - (D) how one's perception of the theater may develop over time
 - (E) the experience of reading a play and then seeing it performed

To answer this question, you have to figure out what these two passages have in common. The subject of Passage 1 is a child's first visit to see a play performed in a theater, and how captivated he was by the entire experience. Passage 2 describes two different visits to the theater; at age six the child is entranced by the spectacle of the performance, but "after the intervention of six or seven years" the older and now more knowledgeable child is not so impressed. (A) is the correct answer because all of Passage 1 and the first half of Passage 2 describe "a young person's sense of wonder at first seeing a play."

- (B) is wrong; even though the introduction to these passages reveals that one of the authors is a "playwright," there is no mention in either passage of a "desire to become a playwright."
- (C) is wrong because Passage 1 mentions differences rather than "similarities" between plays and movies, and Passage 2 does not mention any "other art forms" at all.
- (D) is wrong because only Passage 2 discusses "how one's perception of the theater may develop over time"—this subject is unmentioned in Passage 1.
- (E) is wrong because there is no reference in either passage to "the experience of reading a play."

Correct answer: (A) / Difficulty level: Easy

Some questions assess your comprehension of information that is directly stated in a passage.

6. The "happenings" mentioned in line 14 refer to the
- (A) work undertaken to produce a movie
 - (B) events occurring in the street outside the theater
 - (C) fantasies imagined by a child
 - (D) activity captured on the movie screen
 - (E) story unfolding on the stage

To answer this question correctly, you have to understand lines 11–15, a rather complex sentence that makes an important distinction in Passage 1. The author indicates that, unlike plays, movies leave "the mind's grasp of reality intact," because the "happenings" in a movie are not occurring in the actual theater. Instead, images are projected on a screen in the theater. Thus (D) is the correct answer; the word "happenings" refers to the "activity captured on the movie screen."

- (A) and (B) are wrong because, when you insert them in place of the word "happenings," the sentence in lines 11–15 makes no sense.
- (C) is wrong; even if the movies being referred to include "fantasies" in them, they are not "imagined by a child" but are actually projected on the movie screen.
- (E) is wrong because, in line 14, "happenings" refers to the "story unfolding" in a movie, not "on the stage."

Correct answer: (D) / Difficulty level: Medium

You may be asked to recognize the author's tone or attitude in a particular part of a passage, or in the passage as a whole.

7. In the final sentence of Passage 2 ("I thought . . . in me"), the author expresses
- (A) exultation
 - (B) vindication
 - (C) pleasure
 - (D) regret
 - (E) guilt

Even though this question focuses on a single sentence, you must understand the context in which the statement occurs in order to determine the feeling expressed by the author. In the second paragraph of Passage 2, the author states that the experience of attending a play at age 12 or 13 was much different than at age 6. "The same things were there materially" in the theater, but the older child knew much more than the younger one about what was going on. Ironically, this increased knowledge actually decreased the author's pleasure in attending the play. "In that interval what had I not lost!" the author exclaims in line 78. Where the younger child saw nobles in "the court of ancient Persia," the older child saw "men and women painted." Thus the final sentence of Passage 2 expresses "regret" concerning the changes that "those many centuries — those six short years — had wrought" in the author. (D) is the correct answer.

- (A) and (C) are incorrect because the author does not feel "exultation" about or take "pleasure" in the "alteration" that has occurred; on the contrary, the author laments it.
- (B) is incorrect because there is no expression of "vindication" in the final sentence; the author is not trying to justify, support, or defend the experiences described in the passage, but rather to explain the changes that have occurred due to the passing of time.
- (E) is incorrect because, even though the final sentence states that the "fault" was not in the actors but in the now more knowledgeable child, the author feels no "guilt" about the change. There is no way to avoid the passage of time (and the learning that goes along with it). Aging is not the child's "fault," but the loss of a youthful sense of wonder and innocence can still cause regret.

Correct answer: (D) / Difficulty level: Hard

Some questions require you to determine and compare the primary purpose or main idea expressed in each passage.

8. Which of the following best describes the difference between Passages 1 and 2 ?
- (A) Passage 1 remembers an event with fondness, while Passage 2 recalls a similar event with bitter detachment.
 - (B) Passage 1 considers why the author responded to the visit as he did, while Passage 2 supplies the author's reactions without further analysis.
 - (C) Passage 1 relates a story from a number of different perspectives, while Passage 2 maintains a single point of view.
 - (D) Passage 1 treats the visit to the theater as a disturbing episode in the author's life, while Passage 2 describes the author's visit as joyful.
 - (E) Passage 1 recounts a childhood experience, while Passage 2 examines how a similar experience changed over time.

This question asks you to do two things: first, understand the overall subject or purpose of each passage; second, recognize an important "difference between" the two. The correct answer is (E) because the entire first passage does indeed tell the story of a particular "childhood experience" — a trip to the theater — whereas the second passage describes two different trips to the theater and how the "experience changed over time."

- (A) is wrong because there is neither bitterness nor "detachment" in Passage 2. In fact, the first paragraph of Passage 2 expresses excitement and "enchantment," and the second paragraph expresses disappointment and regret.
- (B) is wrong because Passage 2 includes a great deal more than just "the author's reactions" to visiting the theater; most of the second paragraph provides "further analysis" of what had changed and why the reactions to the two visits were so different.
- (C) is wrong because it reverses the two narrative approaches in this pair of passages. Passage 1 "maintains a single point of view," that of the youthful first-time theatergoer, whereas the author of Passage 2 presents at least two "different perspectives," that of the enchanted six-year-old and of the older child returning to the theater.
- (D) is wrong because the author of Passage 1 does not find his first visit to the theater "disturbing" in a negative way. Although he feels "shock" when the curtain goes up and anxiety during the play, these responses merely indicate how effective and "real" the performance was for him. In the end, the child and his mother walked "happily" out of the theater.

Correct answer: (E) / Difficulty level: Easy

The Mathematics Section

The mathematics section of the SAT contains two types of questions:

- Standard multiple-choice (44 questions)
- Student-produced response questions that provide no answer choices (10 questions)

Some questions are like those you may have seen in your mathematics courses. The ability to reason logically in a variety of situations, some of which may be new to you, is tested throughout.

Approaches to the Mathematics Section

- **Familiarize yourself with the directions ahead of time.**
- **The test does not require you to memorize formulas.** Commonly used formulas are provided in the test booklet at the beginning of each mathematics section. It is up to you to decide which formula is appropriate to a question.
- **Read the problem carefully.** Look for key words that tell you what the problem is asking. Ask yourself the following questions before you solve each problem: What is the question asking? What do I know?
- **With some problems, it may be useful to draw a sketch or diagram of the given information.**
- **Use the test booklet for scratch work.** You are not expected to do all the reasoning and figuring in your head. You will not receive credit for anything written in the booklet, but you will be able to check your work easily later.
- **Decide when to use a calculator.** (See Calculator Tips.)
- **Eliminate choices.** If you don't know the correct answer to a question, try some of the choices. It's sometimes easier to find the wrong answers than the correct one. On some questions, you can eliminate all the incorrect choices.
- **Make sure your answer is a reasonable answer to the question asked.** This is especially true for student-produced response questions, where no answer choices are given.
- **All figures are drawn to scale unless otherwise indicated.**

Calculator Policy

You will not be allowed to share calculators. You will be dismissed and your scores will be canceled if you use your calculator to share information during the test or to remove test questions or answers from the test room.

Calculator Tips

- **Remember to bring your calculator on test day.** Calculators will not be available at the test center. You should be familiar with how to use the calculator you bring to the test.
- **Make sure your calculator is in good working order and that its batteries are fresh.** If your calculator fails during testing and you have no backup, you will have to complete the test without it (or cancel your scores for the entire test).

- **Don't buy an expensive, sophisticated calculator just to take the test.** Although you can use them for the test, more sophisticated calculators are not required for any problem.
- **Don't try to use a calculator on every question.** First, decide how you will solve the problem, and then decide whether to use the calculator. The calculator is meant to aid you in problem solving, not to get in the way.
- **Get your thoughts down before using your calculator.** It may help to do scratch work in the test booklet.
- **Take the practice test with a calculator at hand.** This will help you determine which types of questions you should use your calculator to answer.

Acceptable Calculators

We recommend that you bring a calculator to use on the mathematics section of the SAT. Every question on the test can be solved without a calculator, but you may have an advantage if you use a scientific or graphing calculator on some questions.

Calculators permitted during testing are:

- Most graphing calculators (See page 12 for a list of approved graphing calculators.)
- Scientific calculators
- Four-function calculators (not recommended). See page 12 for the calculators that are permitted for use on the SAT.

If you bring a calculator with large characters (one inch high or more) or raised display that might be visible to other test-takers the test supervisor has discretion to seat you in a location where other test-takers cannot view the large or raised display.

Unacceptable Calculators

Do NOT bring these unacceptable calculators:

- Laptops or other computers, tablets, cell phones, or smart phones
- Models that can access the Internet, have wireless, Bluetooth, cellular, audio/video recording and playing, camera, or any other smart phone type feature
- Models that have typewriter-like keypad, pen-input, or stylus
- Models that use electrical outlets, make noise, or have a paper tape

In addition, the use of hardware peripherals such as a stylus with an approved calculator is not permitted. Some models with touch-screen capability are not permitted (e.g., Casio ClassPad). Check the list of acceptable calculators for models that are permitted.

The following graphing calculators are permitted on the SAT:

Casio

FX-6000 series
FX-6200 series
FX-6300 series
FX-6500 series
FX-7000 series
FX-7300 series
FX-7400 series
FX-7500 series
FX-7700 series
FX-7800 series
FX-8000 series
FX-8500 series
FX-8700 series
FX-8800 series

FX-9700 series
FX-9750 series
FX-9860 series
CFX-9800 series
CFX-9850 series
CFX-9950 series
CFX-9970 series
FX 1.0 series
Algebra FX 2.0 series
FX-CG-10 (PRIZM)
FX-CG-20

Hewlett-Packard

HP-9G
HP-28 series
HP-38G
HP-39 series
HP-40 series
HP-48 series
HP-49 series
HP-50 series
HP Prime

Radio Shack

EC-4033
EC-4034
EC-4037

Sharp

EL-5200
EL-9200 series
EL-9300 series
EL-9600 series*
EL-9900 series

*The use of the stylus is not permitted.

Other

Datexx DS-883
Micronta
Smart²

Texas Instruments

TI-73
TI-80
TI-81
TI-82
TI-83/TI-83 Plus
TI-83 Plus Silver
TI-84 Plus
TI-84 Plus Silver
TI-84 Plus C Silver
TI-85
TI-86
TI-89
TI-89 Titanium
TI-Nspire
TI-Nspire CX
TI-Nspire CM-C
TI-Nspire CAS
TI-Nspire CX CAS
TI-Nspire CAS CX-C

Mathematics Review

Number and Operations (20–25%)

- Arithmetic word problems (including percent, ratio, and proportion)
- Properties of integers (even, odd, prime numbers, divisibility, etc.)
- Rational numbers
- Sets (union, intersection, elements)
- Counting techniques
- Sequences and series (including exponential growth)
- Elementary number theory

Algebra and Functions (35–40%)

- Substitution and simplifying algebraic expressions
- Properties of exponents
- Algebraic word problems
- Solutions of linear equations and inequalities
- Systems of equations and inequalities
- Quadratic equations
- Rational and radical equations
- Equations of lines
- Absolute value
- Direct and inverse variation
- Concepts of algebraic functions
- Newly defined symbols based on commonly used operations

Geometry and Measurement (25–30%)

- Area and perimeter of a polygon
- Area and circumference of a circle
- Volume of a box, cube, and cylinder
- Pythagorean Theorem and special properties of isosceles, equilateral, and right triangles
- Properties of parallel and perpendicular lines
- Coordinate geometry
- Geometric visualization
- Slope
- Similarity
- Transformations

Data Analysis, Statistics and Probability (10–15%)

- Data interpretation (tables and graphs)
- Descriptive statistics (mean, median, mode, and range)
- Probability

Number and Operations

- **Integers:** $\dots, -4, -3, -2, -1, 0, 1, 2, 3, 4, \dots$
(Note: zero is neither positive nor negative.)
- **Consecutive Integers:** Integers that follow in sequence; for example, 22, 23, 24, 25. Consecutive integers can be more generally represented by $n, n + 1, n + 2, n + 3, \dots$
- **Odd Integers:** $\dots, -7, -5, -3, -1, 1, 3, 5, 7, \dots, 2k + 1, \dots$ where k is an integer
- **Even Integers:** $\dots, -6, -4, -2, 0, 2, 4, 6, \dots, 2k, \dots$, where k is an integer (Note: zero is an even integer.)
- **Prime Numbers:** 2, 3, 5, 7, 11, 13, 17, 19, \dots
(Note: 1 is not a prime and 2 is the only even prime.)
- **Digits:** 0, 1, 2, 3, 4, 5, 6, 7, 8, 9
(Note: the units digit and the ones digit refer to the same digit in a number. For example, in the number 125, the 5 is called the units digit or the ones digit.)

Percent

Percent means hundredths, or number out of 100. For example, 40 percent means $\frac{40}{100}$ or 0.40 or $\frac{2}{5}$.

Problem 1: If the sales tax on a \$30.00 item is \$1.80, what is the sales tax rate?

Solution: $\$1.80 = \frac{n}{100} \times \30.00

$n = 6$, so 6% is the sales tax rate.

Percent Increase / Decrease

Problem 2: If the price of a computer was decreased from \$1,000 to \$750, by what percent was the price decreased?

Solution: The price decrease is \$250. The percent decrease is the value of n in the equation $\frac{250}{1,000} = \frac{n}{100}$. The value of n is 25, so the price was decreased by 25%.

Note: $n\%$ increase means $\frac{\text{increase}}{\text{original}} = \frac{n}{100}$;

$n\%$ decrease means $\frac{\text{decrease}}{\text{original}} = \frac{n}{100}$.

Average Speed

Problem: José traveled for 2 hours at a rate of 70 kilometers per hour and for 5 hours at a rate of 60 kilometers per hour. What was his average speed for the 7-hour period?

Solution: In this situation, the average speed was

$$\frac{\text{total distance}}{\text{total time}}$$

The total distance was

$$2 \text{ hr} \left(70 \frac{\text{km}}{\text{hr}} \right) + 5 \text{ hr} \left(60 \frac{\text{km}}{\text{hr}} \right) = 440 \text{ km.}$$

The total time was 7 hours. Thus, the average speed was

$$\frac{440 \text{ km}}{7 \text{ hr}} = 62\frac{6}{7} \text{ kilometers per hour.}$$

Note: In this example, the average speed over the 7-hour period is not the average of the two given speeds, which would be 65 kilometers per hour.

Sequences

Two common types of sequences that appear on the SAT are arithmetic and geometric sequences.

An **arithmetic sequence** is a sequence in which successive terms differ by the same constant amount.

For example: 3, 5, 7, 9, . . . is an arithmetic sequence.

A **geometric sequence** is a sequence in which the ratio of successive terms is a constant.

For example: 2, 4, 8, 16, . . . is a geometric sequence.

A sequence may also be defined using previously defined terms. For example, the first term of a sequence is 2, and each successive term is 1 less than twice the preceding term. This sequence would be 2, 3, 5, 9, 17, . . .

On the SAT, explicit rules are given for each sequence. For example, in the sequence above, you would not be expected to know that the 6th term is 33 without being given the fact that each term is one less than twice the preceding term. For sequences on the SAT, the first term is *never* referred to as the “zeroth” term.

Algebra and Functions

Factoring

You may need to apply these types of factoring:

$$x^2 + 2x = x(x + 2)$$

$$x^2 - 1 = (x + 1)(x - 1)$$

$$x^2 + 2x + 1 = (x + 1)(x + 1) = (x + 1)^2$$

$$2x^2 + 5x - 3 = (2x - 1)(x + 3)$$

Functions

A function is a relation in which each element of the domain is paired with *exactly* one element of the range. On the SAT, unless otherwise specified, the domain of any function f is assumed to be the set of all real numbers x for which $f(x)$ is a real number. For example, if

$f(x) = \sqrt{x + 2}$, the domain of f is all real numbers greater than or equal to -2 . For this function, 14 is paired with 4, since $f(14) = \sqrt{14 + 2} = \sqrt{16} = 4$.

Note: The $\sqrt{\quad}$ symbol represents the positive, or principal, square root. For example, $\sqrt{16} = 4$, not ± 4 .

Exponents

You should be familiar with the following rules for exponents on the SAT.

For all values of a , b , x , y :

$$x^a \cdot x^b = x^{a+b} \quad (x^a)^b = x^{ab} \quad (xy)^a = x^a \cdot y^a$$

For all values of a , b , $x > 0$, $y > 0$:

$$\frac{x^a}{x^b} = x^{a-b} \quad \left(\frac{x}{y}\right)^a = \frac{x^a}{y^a} \quad x^{-a} = \frac{1}{x^a}$$

Also, $x^{\frac{a}{b}} = \sqrt[b]{x^a}$. For example, $x^{\frac{2}{3}} = \sqrt[3]{x^2}$.

Note: For any nonzero number x , it is true that $x^0 = 1$.

Variation

Direct Variation: The variable y is directly proportional to the variable x if there exists a nonzero constant k such that $y = kx$.

Inverse Variation: The variable y is inversely proportional to the variable x if there exists a nonzero constant k such that $y = \frac{k}{x}$ or $xy = k$.

Absolute Value

The absolute value of x is defined as the distance from x to zero on the number line. The absolute value of x is written as $|x|$. For all real numbers x :

$$|x| = \begin{cases} x, & \text{if } x \geq 0 \\ -x, & \text{if } x < 0 \end{cases}$$

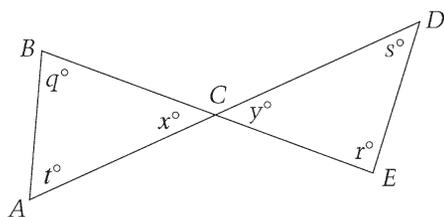
For example: $\begin{cases} |2| = 2, & \text{since } 2 > 0 \\ |-2| = -(-2) = 2, & \text{since } -2 < 0 \\ |0| = 0 \end{cases}$

Geometry and Measurement

Figures that accompany problems are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a particular problem that the figure is not drawn to scale. In general, even when figures are not drawn to scale, the relative positions of points and angles may be assumed to be in the order shown. Also, line segments that extend through points and appear to lie on the same line may be assumed to be on the same line. A point that appears to lie on a line or curve may be assumed to lie on the line or curve.

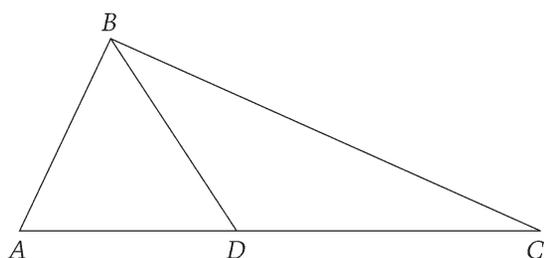
The text “Note: Figure not drawn to scale” is included with the figure when degree measures may not be accurately shown and specific lengths may not be drawn proportionally. The following examples illustrate what information can and cannot be assumed from figures.

Example 1:



Since \overline{AD} and \overline{BE} are line segments, angles ACB and DCE are vertical angles. Therefore, you can conclude that $x = y$. Even though the figure is drawn to scale, you should NOT make any other assumptions without additional information. For example, you should NOT assume that $AC = CD$ or that the angle at vertex E is a right angle even though they might look that way in the figure.

Example 2:



Note: Figure not drawn to scale.

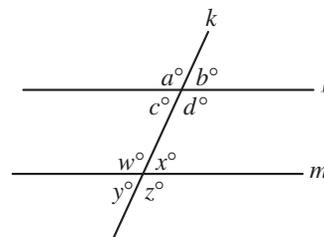
A question may refer to a triangle such as ABC above. Although the note indicates that the figure is not drawn to scale, you may assume the following from the figure:

- ABD and DBC are triangles.
- D is between A and C .
- A , D , and C are points on a line.
- The length of \overline{AD} is less than the length of \overline{AC} .
- The measure of angle ABD is less than the measure of angle ABC .

You may *not* assume the following from the figure:

- The length of \overline{AD} is less than the length of \overline{DC} .
- The measures of angles BAD and BDA are equal.
- The measure of angle ABD is greater than the measure of angle DBC .
- Angle ABC is a right angle.

Properties of Parallel Lines



1. If two parallel lines are cut by a third line, the alternate interior angles are congruent. In the figure above,

$$c = x \text{ and } w = d.$$

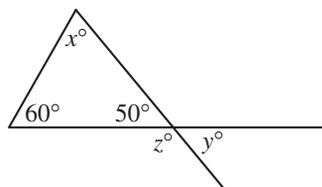
2. If two parallel lines are cut by a third line, the corresponding angles are congruent. In the figure,

$$a = w, \quad b = x, \quad c = y, \quad \text{and} \quad d = z.$$

3. If two parallel lines are cut by a third line, the sum of the measures of the interior angles on the same side of the transversal is 180° . In the figure,

$$c + w = 180 \text{ and } d + x = 180.$$

Angle Relationships



1. The sum of the measures of the interior angles of a triangle is 180° . In the figure above,

$$x = 70 \text{ because } 60 + 50 + x = 180.$$

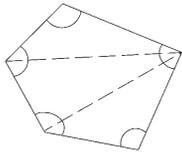
2. When two lines intersect, vertical angles are congruent. In the figure,

$$y = 50.$$

3. A straight angle measures 180° . In the figure,

$$z = 130 \text{ because } z + 50 = 180.$$

4. The sum of the measures of the interior angles of a polygon can be found by drawing all diagonals of the polygon from one vertex and multiplying the number of triangles formed by 180° .



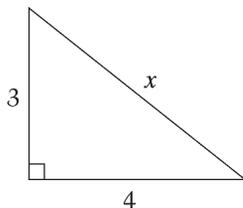
Since this polygon is divided into 3 triangles, the sum of the measures of its angles is $3 \times 180^\circ$, or 540° .

Unless otherwise noted on the SAT, the term “polygon” will be used to mean a convex polygon; that is, a polygon in which each interior angle has a measure of less than 180° .

A polygon is “regular” if all its sides are congruent and all its angles are congruent.

Side Relationships

1. Pythagorean Theorem: In any right triangle, $a^2 + b^2 = c^2$, where c is the length of the longest side and a and b are the lengths of the two shorter sides.



To find the value of x , use the Pythagorean Theorem.

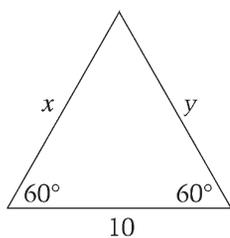
$$x^2 = 3^2 + 4^2$$

$$x^2 = 9 + 16$$

$$x^2 = 25$$

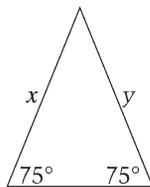
$$x = \sqrt{25} = 5$$

2. In any equilateral triangle, all sides are congruent and all angles are congruent.

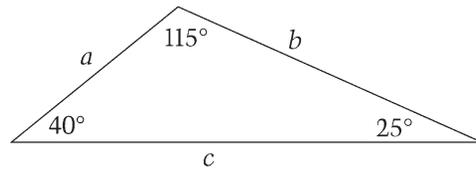


Because the measure of the unmarked angle is 60° , the measures of all angles of the triangle are equal; therefore, the lengths of all sides of the triangle are equal:
 $x = y = 10$.

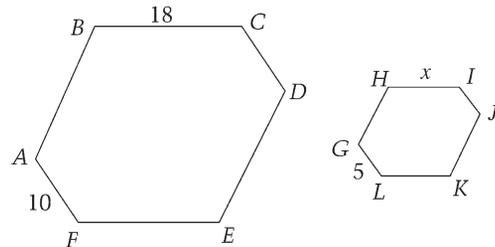
3. In an isosceles triangle, the angles opposite congruent sides are congruent. Also, the sides opposite congruent angles are congruent. In the figures below, $a = b$ and $x = y$.



4. In any triangle, the longest side is opposite the largest angle, and the shortest side is opposite the smallest angle. In the figure below, $a < b < c$.



5. Two polygons are *similar* if and only if the lengths of their corresponding sides are in the same ratio and the measures of their corresponding angles are equal.



If polygons $ABCDEF$ and $GHIJKL$ are similar, then \overline{AF} and \overline{GL} are corresponding sides, so that $\frac{AF}{GL} = \frac{10}{5} = \frac{2}{1} = \frac{BC}{HI} = \frac{18}{x}$. Therefore, $x = 9 = HI$.

Note: \overline{AF} means the line segment with endpoints A and F , and AF means the length of \overline{AF} .

Area and Perimeter

Rectangles

Area of a rectangle = length \times width = $\ell \times w$

Perimeter of a rectangle = $2(\ell + w) = 2\ell + 2w$

Circles

Area of a circle = πr^2 (where r is the radius)

Circumference of a circle = $2\pi r = \pi d$ (where d is the diameter)

Triangles

Area of a triangle = $\frac{1}{2}$ (base \times altitude)

Perimeter of a triangle = the sum of the lengths of the three sides

Triangle inequality: The sum of the lengths of any two sides of a triangle must be greater than the length of the third side.

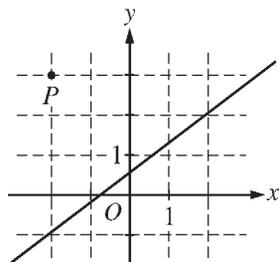
Volume

Volume of a rectangular solid (or cube) = $\ell \times w \times h$
(ℓ is the length, w is the width and h is the height)

Volume of a right circular cylinder = $\pi r^2 h$
(r is the radius of the base, and h is the height)

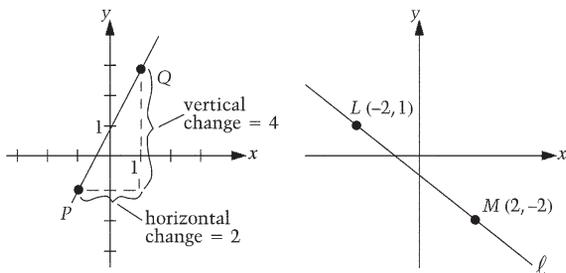
Be familiar with the formulas that are provided in the Reference Information included with the test directions. Refer to the test directions in the sample test in this publication.

Coordinate Geometry



- In questions that involve the x - and y -axes, x -values to the right of the y -axis are positive and x -values to the left of the y -axis are negative. Similarly, y -values above the x -axis are positive and y -values below the x -axis are negative. In an ordered pair (x, y) , the x -coordinate is written first. Point P in the figure above appears to lie at the intersection of gridlines. From the figure, you can conclude that the x -coordinate of P is -2 and the y -coordinate of P is 3 . Therefore, the coordinates of point P are $(-2, 3)$. Similarly, you can conclude that the line shown in the figure passes through the point with coordinates $(-2, -1)$ and the point $(2, 2)$.

- Slope of a line = $\frac{\text{change in } y\text{-coordinates}}{\text{change in } x\text{-coordinates}}$



$$\text{Slope of } \overline{PQ} = \frac{4}{2} = 2$$

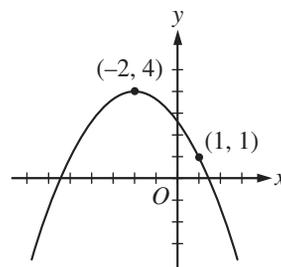
$$\text{Slope of } \ell = \frac{1 - (-2)}{-2 - 2} = -\frac{3}{4}$$

A line that slopes upward as you go from left to right has a *positive* slope. A line that slopes downward as you go from left to right has a *negative* slope. A horizontal line has a slope of zero. The slope of a vertical line is undefined.

Parallel lines have the same slope. The product of the slopes of two perpendicular lines is -1 , provided the slope of each of the lines is defined. For example, any line perpendicular to line ℓ above has a slope of $\frac{4}{3}$.

The equation of a line can be expressed as $y = mx + b$, where m is the slope and b is the y -intercept. Since the slope of line ℓ is $-\frac{3}{4}$, the equation of line ℓ can be expressed as $y = -\frac{3}{4}x + b$. Since the point $(-2, 1)$ is on the line, $x = -2$ and $y = 1$ must satisfy the equation. Hence, $1 = \frac{3}{2} + b$, so $b = -\frac{1}{2}$ and the equation of line ℓ is $y = -\frac{3}{4}x - \frac{1}{2}$.

- A quadratic function can be expressed as $y = a(x - h)^2 + k$ where the vertex of the parabola is at the point (h, k) and $a \neq 0$. If $a > 0$, the parabola opens upward; and if $a < 0$, the parabola opens downward.



The parabola above has its vertex at $(-2, 4)$. Therefore, $h = -2$ and $k = 4$. The equation can be represented by $y = a(x + 2)^2 + 4$. Since the parabola opens downward, we know that $a < 0$. To find the value of a , we also need to know another point on the parabola. Since we know the parabola passes through the point $(1, 1)$, $x = 1$ and $y = 1$ must satisfy the equation. Hence, $1 = a(1 + 2)^2 + 4$, so $a = -\frac{1}{3}$. Therefore, an equation for the parabola is $y = -\frac{1}{3}(x + 2)^2 + 4$.

Data Analysis, Statistics and Probability

Measures of Center

An **average** is a statistic that is used to summarize data. The most common type of average is the **arithmetic mean**. The average (arithmetic mean) of a list of n numbers is equal to the sum of the numbers divided by n .

For example, the mean of 2, 3, 5, 7 and 13 is equal to

$$\frac{2 + 3 + 5 + 7 + 13}{5} = 6.$$

When the average of a list of n numbers is given, the sum of the numbers can be found. For example, if the average of six numbers is 12, the sum of these six numbers is 12×6 , or 72.

The **median** of a list of numbers is the number in the middle when the numbers are ordered from greatest to least or from least to greatest. For example, the median of 3, 8, 2, 6 and 9 is 6 because when the numbers are ordered, 2, 3, 6, 8, 9, the number in the middle is 6. When there is an even number of values, the median is the same as the mean of the two middle numbers. For example, the median of 6, 8, 9, 13, 14 and 16 is the mean of 9 and 13, which is 11.

The **mode** of a list of numbers is the number that occurs most often in the list. For example, 7 is the mode of 2, 7, 5, 8, 7 and 12. The list 2, 4, 2, 8, 2, 4, 7, 4, 9 and 11 has two modes, 2 and 4.

Note: On the SAT, the use of the word *average* refers to the arithmetic mean and is indicated by “average (arithmetic mean).” An exception is when a question involves average speed (see page 14). Questions involving median and mode will have those terms stated as part of the question’s text.

Range

The **range** of a list of numbers is the value obtained by subtracting the smallest number in the list from the greatest number in the list. For example, in the list 8, 15, 11, -4, 0, 6, -7 and 12, the range is equal to the difference between 15 and -7, which is 22.

Probability

Probability refers to the chance that a specific outcome can occur. When outcomes are equally likely, probability can be found by using the following definition:

$$\frac{\text{number of ways that a specific outcome can occur}}{\text{total number of possible outcomes}}$$

For example, if a jar contains 13 red marbles and 7 green marbles, the probability that a marble selected from the jar at random will be green is

$$\frac{7}{7 + 13} = \frac{7}{20} \text{ or } 0.35$$

Note: The phrase *at random* in the preceding example means that each individual marble in the jar is equally likely to be selected. It does not mean the two colors are equally likely to be selected.

If a particular outcome can never occur, its probability is 0. If an outcome is certain to occur, its probability is 1. In general, if p is the probability that a specific outcome will occur, values of p fall in the range $0 \leq p \leq 1$. Probability may be expressed as either a decimal, a fraction, or a ratio.

Multiple-Choice Questions

The questions that follow will give you an idea of the type of mathematical thinking required to solve problems on the SAT. First, try to answer each question yourself, and then read the solutions that follow. These solutions may give you new insights into solving the problems or point out techniques you'll be able

to use again. Most problems can be solved in a variety of ways, so don't be concerned if your method is different from the one given. Note that the directions indicate that you are to select the *best* of the answer choices given.

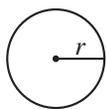
Directions

For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratch work.

Notes

- The use of a calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
- Unless otherwise specified, the domain of any function f is assumed to be the set of all real numbers x for which $f(x)$ is a real number.

Reference Information

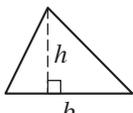


$$A = \pi r^2$$

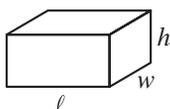
$$C = 2\pi r$$



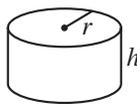
$$A = \ell w$$



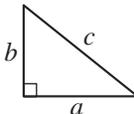
$$A = \frac{1}{2}bh$$



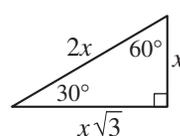
$$V = \ell wh$$



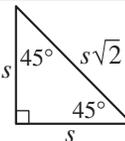
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



Special Right Triangles



The number of degrees of arc in a circle is 360.

The sum of the measures in degrees of the angles of a triangle is 180.

Sample Questions

Below are seven examples of standard multiple-choice questions. Following each question, you will find one or two solutions.

- A special lottery is to be held to select the student who will live in the only deluxe room in a dormitory. There are 100 seniors, 150 juniors, and 200 sophomores who applied. Each senior's name is placed in the lottery 3 times; each junior's name, 2 times; and each sophomore's name, 1 time. If a student's name is chosen at random from the names in the lottery, what is the probability that a senior's name will be chosen?

- (A) $\frac{1}{8}$ (B) $\frac{2}{9}$ (C) $\frac{2}{7}$
- (D) $\frac{3}{8}$ (E) $\frac{1}{2}$

To determine the probability that a senior's name will be chosen, you must determine the total number of seniors' names that are in the lottery and divide this number by the total number of names in the lottery. Since each senior's name is placed in the lottery 3 times, there are $3 \times 100 = 300$ seniors' names. Likewise, there are $2 \times 150 = 300$ juniors' names and $1 \times 200 = 200$ sophomores' names in the lottery. The probability that a senior's name will be chosen is

$$\frac{300}{300 + 300 + 200} = \frac{300}{800} = \frac{3}{8}$$

Correct answer: (D) / Difficulty level: Medium

NOONTIME TEMPERATURES IN HILO, HAWAII

Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	Sun.
66	78	75	69	78	77	70

2. The table above shows the temperatures at noon, in degrees Fahrenheit, in a city in Hawaii over a one-week period. If m represents the median of these temperatures, f represents the temperature that occurred most often, and a represents the average (arithmetic mean) of these seven temperatures, which of the following is the correct order of m , f , and a ?

- (A) $a < m < f$
 (B) $a < f < m$
 (C) $m < a < f$
 (D) $m < f < a$
 (E) $a = m < f$

Correct answer: (A) / Difficulty level: Medium

To determine the correct order of m , f , and a , it is helpful to first place the seven temperatures in ascending order, as shown below:

66 69 70 75 77 78 78

The median temperature is the middle temperature in the ordered list, which is 75, so $m = 75$. The temperature that occurred most often, or the mode, is 78, so $f = 78$. To determine the average, you can add the seven numbers together and divide by 7. However, you can determine the relationship between the average and the median by inspection. The three numbers greater than 75 are closer to 75 than are the three numbers smaller than 75. Therefore, the average of the seven numbers will be less than 75. The correct order of m , f , and a is $a < m < f$.

3. The projected sales volume of a video game cartridge is given

by the function $s(p) = \frac{3000}{2p + a}$, where s is the number of

cartridges sold, in thousands; p is the price per cartridge, in dollars; and a is a constant. If according to the projections, 100,000 cartridges are sold at \$10 per cartridge, how many cartridges will be sold at \$20 per cartridge?

- (A) 20,000 (B) 50,000 (C) 60,000
 (D) 150,000 (E) 200,000

Correct answer: (C) / Difficulty level: Medium

For 100,000 cartridges sold at \$10 per cartridge, $s = 100$ (since s is the number of cartridges sold, in thousands) and $p = 10$. Substituting into the equation yields

$$100 = \frac{3000}{2(10) + a}$$

$$100(20 + a) = 3000$$

$$20 + a = 30$$

$$a = 10$$

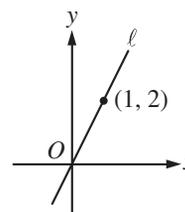
Since a is a constant, the function can be written as

$$s(p) = \frac{3000}{2p + 10}$$

To determine how many cartridges will be sold at \$20 per cartridge, you need to evaluate

$$s(20) = \frac{3000}{2(20) + 10} = 60$$

Since s is given in thousands, there will be 60,000 cartridges sold at \$20 per cartridge.



4. In the xy -coordinate plane above, line ℓ contains the points $(0, 0)$ and $(1, 2)$. If line m (not shown) contains the point $(0, 0)$ and is perpendicular to ℓ , what is an equation of m ?

- (A) $y = -\frac{1}{2}x$
 (B) $y = -\frac{1}{2}x + 1$
 (C) $y = -x$
 (D) $y = -x + 2$
 (E) $y = -2x$

Correct Answer: (A) / Difficulty level: Medium

Using the coordinates of the two points given on line ℓ , the slope

of ℓ is $\frac{2 - 0}{1 - 0} = 2$. Line m , which is perpendicular

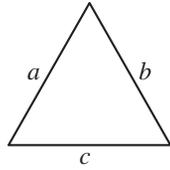
to ℓ , will have a slope of $-\frac{1}{2}$, since slopes of perpendicular lines

are negative reciprocals of each other. An equation

of m can be written as $y = -\frac{1}{2}x + b$. Since line m also

contains point $(0, 0)$, it follows that $b = 0$. Therefore, an equation

of line m is $y = -\frac{1}{2}x$.



Note: Figure not drawn to scale.

5. If two sides of the triangle above have lengths 5 and 6, the perimeter of the triangle could be which of the following?

- I. 15
 II. 20
 III. 22

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

Correct answer: (B) / Difficulty level: Hard

In questions of this type, statements I, II, and III should each be considered independently of the others. In this question, you must determine which of those statements *could* be true.

- Statement I states that 15 could be the perimeter of the triangle. This is true. If the perimeter of the triangle is 15, and two sides have lengths 5 and 6, then the third side of the triangle would have length $15 - (6 + 5)$, or 4. A triangle can have side lengths of 4, 5, and 6. So the perimeter of the triangle could be 15.
- Similarly, statement II is true. If 20 is the perimeter of the triangle, then the third side of the triangle would have length $20 - (6 + 5)$, or 9. A triangle can have side lengths of 5, 6, and 9. So the perimeter of the triangle *could* be 20.
- Finally, consider whether the triangle could have a perimeter of 22. In this case, the length of the third side would be $22 - (6 + 5) = 11$. The triangle inequality states that the sum of the lengths of any two sides of a triangle must be greater than the length of the third side. Since the sum of 5 and 6 is not greater than 11, it follows that 5, 6, and 11 cannot be the lengths of the sides of a triangle, and so the given triangle cannot have a perimeter of 22.

Therefore, the correct answer to the question is I and II only, which is choice (B).

6. If $x > 1$ and $\frac{\sqrt{x}}{x^3} = x^m$, what is the value of m ?

- (A) $-\frac{7}{2}$ (B) -3 (C) $-\frac{5}{2}$
 (D) -2 (E) $-\frac{3}{2}$

Correct answer: (C) / Difficulty level: Medium

Since \sqrt{x} can be written as $x^{\frac{1}{2}}$ and $\frac{1}{x^3}$ can be written as x^{-3} , the left side of the equation is

$x^{\frac{1}{2}} \cdot x^{-3} = x^{\left(\frac{1}{2} - 3\right)} = x^{-\frac{5}{2}}$. Since $x^{-\frac{5}{2}} = x^m$, the value of m is $-\frac{5}{2}$.

7. If k is divisible by 2, 3, and 15, which of the following is also divisible by these numbers?

- (A) $k + 5$ (B) $k + 15$ (C) $k + 20$
 (D) $k + 30$ (E) $k + 45$

Correct answer: (D) / Difficulty level: Medium

Since k is divisible by 2, 3, and 15, k must be a multiple of 30, as 30 is the least common multiple of 2, 3, and 15. Some multiples of 30 are 0, 30, 60, 90, and 120.

- If you add two multiples of 30, the sum will also be a multiple of 30. For example, 60 and 90 are multiples of 30, and their sum, 150, is also a multiple of 30.
- If you add a multiple of 30 to a number that is not a multiple of 30, the sum will not be a multiple of 30. For example, 60 is a multiple of 30 and 45 is not. Their sum, 105, is not a multiple of 30.
- The question asks which answer choice is divisible by 2, 3, and 15 — that is, which answer choice is a multiple of 30. All the answer choices are in the form of “ k plus a number.” Only choice (D), $k + 30$, is the sum of k and a multiple of 30. The sum of k and 30 is also a multiple of 30, so the correct answer is choice (D).

Student-Produced Response Questions

Questions of this type have no answer choices provided. Instead, you must solve the problem and fill in your answer on a special grid. Ten questions on the test will be of this type.

It is very important for you to understand the directions for entering answers on the grid. You will lose valuable testing time if you have to stop to figure out how to grid the answers when you take the test. Take the time now to understand how to enter your answers in this special format.

A primary advantage of this format is that it allows you to enter the form of the answer that you obtain, whether a whole number, decimal or fraction. For example, if you obtain $\frac{2}{5}$, you can grid $\frac{2}{5}$. If you obtain .4, you can grid .4. Generally, you should grid the form of the answer that you obtain naturally in solving the problem. The grid will only hold numbers that range from 0 to 9999. Decimals and fractions can also be gridded.

Below are the actual directions that you will find on the test — read them carefully.

Each of the remaining questions requires you to solve the problem and enter your answer by marking the circles in the special grid, as shown in the examples below. You may use any available space for scratch work.

Answer: $\frac{7}{12}$

Write answer in boxes.

7	/	1	2
○	○	○	○
1	0	0	0
2	1	1	1
3	2	2	●
4	3	3	3
5	4	4	4
6	5	5	5
7	6	6	6
8	7	7	7
9	8	8	8
9	9	9	9

Grid in result.

Answer: 2.5

2	.	5
○	○	○
1	0	0
2	1	1
3	2	2
4	3	3
5	4	4
6	5	5
7	6	6
8	7	7
9	8	8
9	9	9

Decimal point

Answer: 201

Either position is correct.

2	0	1
○	○	○
1	0	0
2	1	1
3	2	2
4	3	3
5	4	4
6	5	5
7	6	6
8	7	7
9	8	8
9	9	9

Note: You may start your answers in any column, space permitting. Columns not needed should be left blank.

- Mark no more than one circle in any column.
- Because the answer sheet will be machine-scored, **you will receive credit only if the circles are filled in correctly.**
- Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately.
- Some problems may have more than one correct answer. In such cases, grid only one answer.
- No question has a negative answer.
- **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If

3	1	/	2
○	○	○	○

 is gridded, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)

Acceptable ways to grid $\frac{2}{3}$ are:

2	/	3
○	○	○
1	0	0
2	1	1
3	2	2
4	3	3
5	4	4
6	5	5
7	6	6
8	7	7
9	8	8
9	9	9

.	6	6	6
○	○	○	○
1	0	0	0
2	1	1	1
3	2	2	2
4	3	3	3
5	4	4	4
6	5	5	5
7	6	6	6
8	7	7	7
9	8	8	8
9	9	9	9

.	6	6	7
○	○	○	○
1	0	0	0
2	1	1	1
3	2	2	2
4	3	3	3
5	4	4	4
6	5	5	5
7	6	6	6
8	7	7	7
9	8	8	8
9	9	9	9

Approaches to Student-Produced Response Questions

- **Always enter your answer by filling in the circles on the grid.** Only answers entered on the grid are scored. Your handwritten answer at the top of the grid isn't scored. However, writing your answer at the top of the grid may help you avoid gridding errors.
- **Decide in which column you want to begin gridding your answers before the test starts.** You can start gridding your answers in any column (space permitting), but it helps to decide on a method ahead of time.
- **If the answer is zero, grid it in column 2, 3, or 4.** Note that there is no circle to grid for zero in column 1.
- **Do not use leading zeros.** For example, if your answer is .125, you must grid .125 or convert it to the fraction $\frac{1}{8}$.
- **A fraction does not have to be reduced unless it will not fit the grid.** For example, $\frac{15}{25}$ will not fit. The reduced form of $\frac{3}{5}$ can be entered. Note that $\frac{6}{10}$ and $\frac{9}{15}$ would also be considered correct and do not have to be reduced. The decimal form, .6, can also be gridded.
- **Do your best to be certain of your answer before you grid it.** If you erase your answer, do so completely. Incomplete erasures may be picked up by the scoring machines as intended answers.
- **Check your work if your answer does not fit on the grid.** If you obtain a negative value, a value greater than 9999 or an irrational number, you have made an error.
- **Make an educated guess if you don't know the answer.** On student-produced response (grid-in) questions, you don't lose points for wrong answers.

Sample Questions

Below are five examples of student-produced response questions. Following each question, you will find a solution and several ways to enter the correct answer.

$$\begin{aligned} |4x - 7| &= 5 \\ |3 - 8x| &= 1 \end{aligned}$$

8. What value of x satisfies both of the equations above?

	1	/	2
.	✓	●	.
0	0	0	0
1	●	1	1
2	2	2	●
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

.	5		
●	✓	✓	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	●	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Since $|4x - 7| = 5$, the value of $4x - 7$ is either 5 or -5 :

$$\begin{aligned} 4x - 7 &= 5 & 4x - 7 &= -5 \\ 4x &= 12 & 4x &= 2 \\ x &= 3 & \text{or} & x = \frac{1}{2} \end{aligned}$$

The two values of x that satisfy the first equation are 3 and $\frac{1}{2}$.

Since $|3 - 8x| = 1$, the value of $3 - 8x$ is either 1 or -1 :

$$\begin{aligned} 3 - 8x &= 1 & 3 - 8x &= -1 \\ 8x &= 2 & 8x &= 4 \\ x &= \frac{1}{4} & \text{or} & x = \frac{1}{2} \end{aligned}$$

The two values of x that satisfy the second equation are $\frac{1}{4}$ and $\frac{1}{2}$. You are asked to find the value of x that satisfies both equations. That value is $\frac{1}{2}$. The answer can

be entered in the grid as 1/2 or .5.

Difficulty level: Hard

9. For all positive integers a and b , let $a \diamond b$ be defined by $a \diamond b = \frac{a^b + 1}{a - 1}$. What is the value of $4 \diamond 2$?

1	7	/	3
.	✓	●	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	●
4	4	4	4
5	5	5	5
6	6	6	6
7	●	7	7
8	8	8	8
9	9	9	9

5	.	6	6
.	✓	✓	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	●	●
7	7	7	7
8	8	8	8
9	9	9	9

5	.	6	7
.	✓	✓	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	●	6
7	7	7	●
8	8	8	8
9	9	9	9

The words "let $a \diamond b$ be defined by" tell you that the symbol \diamond is not supposed to represent a common mathematical operation, but one that is made up for this question. To evaluate $4 \diamond 2$, you substitute 4 for a and 2 for b in the expression $\frac{a^b + 1}{a - 1}$.

This gives $\frac{4^2 + 1}{4 - 1}$, which equals $\frac{17}{3}$.

The answer may be entered in the grid as 17/3 or as 5.66 or 5.67.

Difficulty level: Medium

10. Of the 6 courses offered by the music department at her college, Kay must choose exactly 2 of them. How many different combinations of 2 courses are possible for Kay if there are no restrictions on which 2 courses she can choose?

		1	5
.	✓	✓	.
0	0	0	0
1	1	●	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	●
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

There are 6 courses offered; let us refer to them as 1, 2, 3, 4, 5 and 6. One way to find the number of combinations is to list all possible pairings. They are 1-2, 1-3, 1-4, 1-5, 1-6, 2-3, 2-4, 2-5, 2-6, 3-4, 3-5, 3-6, 4-5, 4-6 and 5-6. There are 15 combinations. Note that 1-2 and 2-1 represent the same combination, so only one is in the list.

You could also notice that there are 5 pairings that start with course 1 and 4 additional pairings that start with course 2, and so forth. The total number of combinations is $5 + 4 + 3 + 2 + 1 = 15$.

You could also solve the problem by noting that the total number of permutations (that is, the number of different ways 2 of 6 courses could be selected) is 6 for the first course selected times 5 for the second course selected, or $6 \times 5 = 30$. To find the number of combinations, you must divide the number of permutations by the number of arrangements. For each pair of courses $A-B$ selected, the arrangement $B-A$ is also possible. Therefore, there are 2 arrangements. So the number of combinations is $30 \div 2 = 15$.

Difficulty level: Medium

11. Let the function f be defined by $f(x) = x^2 - 7x + 10$.

If $f(t + 1) = 0$, what is one possible value of t ?

1			
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

4			
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	<input checked="" type="radio"/>
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Since $f(x) = x^2 - 7x + 10$, substituting $(t + 1)$ for x into the function yields $f(t + 1) = (t + 1)^2 - 7(t + 1) + 10$, or $f(t + 1) = (t^2 + 2t + 1) - (7t + 7) + 10$, or $f(t + 1) = t^2 - 5t + 4$.

Since $f(t + 1) = 0$, it follows that $t^2 - 5t + 4 = 0$, or $(t - 1)(t - 4) = 0$. Therefore, $t = 1$ or $t = 4$.

Another way to solve the question would be to use a dummy variable k . For example, let $k = t + 1$. Then $f(k) = k^2 - 7k + 10 = (k - 5)(k - 2)$. Since $k = t + 1$ and $f(t + 1) = 0$, it follows that $f(k) = 0$. So $(k - 5)(k - 2) = 0$, and therefore, $k = 5$ or $k = 2$. Since $t = k - 1$, it follows that $t = 4$ or $t = 1$.

This question asks for one possible value of t . Either 1 or 4 satisfies the question being asked. Choose only one correct answer (not both) to enter in the grid.

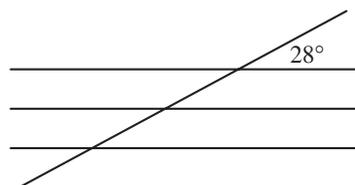
When there is a range of possible correct answers, your *gridded response* must lie within the range. For example, consider a problem for which all numbers between 4 and 5, exclusive, are correct answers. For this problem, although 4.0002 is within the range ($4 < t < 5$), its rounded value 4.00 is not within the range and therefore would not be considered a correct answer to the problem.

Difficulty level: Hard

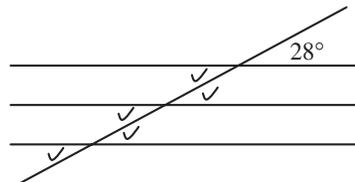
12. Three parallel lines in a plane are intersected by a fourth line, forming twelve angles. If one of the angles has measure 28° , how many of the other eleven angles have measure 28° ?

			5
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
<input type="radio"/>	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	<input checked="" type="radio"/>
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Drawing the figure described in the problem will help you visualize the correct solution to the problem. The figure below shows three parallel lines intersected by a fourth line. The acute angle is labeled 28° .



Using the fact that vertical angles and alternate interior angles are equal, you can put a check showing the other angles in the figure that also measure 28° , as shown below.



There are 5 other angles that measure 28° . Therefore, the correct answer to this problem is 5. The number 5 can be gridded in any of the four columns on the answer grid.

Difficulty level: Easy

The Writing Section

The writing section includes both multiple-choice questions and a direct writing measure in the form of an essay.

The multiple-choice sections include:

- Improving sentences (25 questions)
- Identifying sentence errors (18 questions)
- Improving paragraphs (6 questions)

The multiple-choice sections measure your ability to

- communicate ideas clearly and effectively;
- improve a piece of writing through revision and editing;
- recognize and identify sentence-level errors;
- understand grammatical elements and structures and how they relate to one another in a sentence;
- recognize correctly formed grammatical structures;
- clearly express ideas through sentence combining and use of transitional words and phrases; and
- improve coherence of ideas within and among paragraphs.

Note: Calculators may not be on your desk or used on the writing section of the SAT.

Characteristics of Effective Writing		
Multiple-choice writing questions focus on common problems associated with four characteristics of effective writing. Illustrations of problems are given below. Multiple-choice writing questions also require recognition of correct sentences and effective writing strategies.		
Writing problem	Sentence illustrating the problem	Should be...
1. Being consistent		
Sequence of tenses	After he broke his arm, he is home for two weeks.	After he broke his arm, he was home for two weeks.
Shift of pronoun	If you are tense, one should try to relax.	If you are tense, you should try to relax.
Parallelism	She skis, plays tennis, and flying hang gliders.	She skis, plays tennis, and flies hang gliders.
Noun agreement	Carmen and Sarah are both a pilot.	Carmen and Sarah are both pilots.
Pronoun reference	Several people wanted the job, so he or she filled out the required applications.	Several people wanted the job, so they filled out the required applications.
Subject-verb agreement	There is eight people on the shore.	There are eight people on the shore.
2. Expressing ideas logically		
Coordination and subordination	Tawanda has a rash, and she is probably allergic to something.	Tawanda has a rash; she is probably allergic to something.
Logical comparison	Nathan grew more vegetables than his neighbor's garden.	Nathan grew more vegetables than his neighbor grew.
Modification and word order	Barking loudly, the tree had the dog's leash wrapped around it.	Barking loudly, the dog wrapped its leash around the tree.
3. Being clear and precise		
Ambiguous and vague pronouns	In the newspaper they say that few people voted.	The newspaper reported that few people voted.
Diction	He circumvented the globe on his trip.	He circumnavigated the globe on his trip.
Wordiness	There are many problems in the contemporary world in which we live.	There are many problems in the contemporary world.
Improper modification	If your car is parked here while not eating in the restaurant, it will be towed away.	If you park here and do not eat in the restaurant, your car will be towed away.
4. Following conventions		
Pronoun case	He sat between you and I at the stadium.	He sat between you and me at the stadium.
Idiom	Natalie had a different opinion for her.	Natalie had a different opinion of her.
Comparison of modifiers	Of the sixteen executives, Naomi makes more money.	Of the sixteen executives, Naomi makes the most money.
Sentence fragment	Fred having to go home early.	Fred has to go home early.
Comma splice	Mary took time out of her busy schedule to visit her aunt, John decided to continue working through the summer.	Mary took time out of her busy schedule to visit her aunt, but John decided to continue working through the summer.
5. Recognizing effective writing Some sentences require students to recognize that there is no error.		

Improving Sentences

This question type measures your ability to

- Recognize and correct faults in grammar and sentence structure.
- Recognize effective sentences that follow the conventions of standard written English.

Directions

The following sentence tests correctness and effectiveness of expression. Part of the sentence or the entire sentence is underlined; beneath the sentence are five ways of phrasing the underlined material. Choice A repeats the original phrasing; the other four choices are different. If you think the original phrasing produces a better sentence than any of the alternatives, select choice A; if not, select one of the other choices.

In making your selection, follow the requirements of standard written English; that is, pay attention to grammar, choice of words, sentence construction, and punctuation. Your selection should result in the most effective sentence — clear and precise, without awkwardness or ambiguity.

EXAMPLE:

Laura Ingalls Wilder published her first book and she was sixty-five years old then.

- (A) and she was sixty-five years old then
- (B) when she was sixty-five
- (C) at age sixty-five years old
- (D) upon the reaching of sixty-five years
- (E) at the time when she was sixty-five

A B C D E

Answering Improving Sentences Questions

Read the entire sentence carefully but quickly and ask yourself whether the underlined portion is correct or whether it needs to be revised.

Remember that choice (A) is the same as the underlined portion. Even if you think that the sentence does not require correction and that choice (A) is the correct answer, it is a good idea to read each choice quickly to make sure.

When reading choices (A) through (E), replace the underlined part of the sentence with each answer choice to determine which revision results in a sentence that is clear and precise and meets the requirements of standard written English.

Look for common problem areas in sentences. These include subject-verb agreement, parallelism, placement of modifiers, and the use of relative clauses.

Remember that the right answer will be the one correct version among the five choices.

Keep in mind that while the answer choices change, the rest of the sentence stays the same.

In the example, connecting the two ideas (“Laura Ingalls Wilder published her first book”) and (“she was sixty-five years old then”) with the word “and” indicates that the two ideas are independent and equally important. The word “and” should be replaced to establish the relationship between the two ideas.

- The word “and” indicates that the two ideas it connects are independent and equally important. No.
- Replacing the word “and” with “when” clearly expresses the information that the sentence is intended to convey by relating Laura Ingalls Wilder’s age to her achievement. Yes, but continue to look at the other revisions.
- Using the word “at” results in a phrase that is not idiomatic. No.
- The phrase “upon the reaching of” also results in a phrase that is not idiomatic. No.
- The phrase “at the time when she was sixty-five” is awkward and wordy. No.

Correct answer: (B) / Difficulty level: Easy

Sample Question

1. Looking up from the base of the mountain, the trail seemed more treacherous than it really was.
 - (A) Looking up
 - (B) While looking up
 - (C) By looking up
 - (D) Viewing
 - (E) Viewed

When a modifying phrase begins a sentence, it must logically modify the sentence’s subject; otherwise, it is a *dangling modifier*. In this example, every option except (E) is a dangling modifier.

- In (A), the phrase “Looking up from the base of the mountain” does not logically modify the subject “the trail.” A person might stand at the base of a mountain and look up at a trail, but it is illogical to suggest that a trail looks up from the base of a mountain.
- (B), (C), and (D) are simply variations of the error found in (A). Each results in a sentence that illogically suggests that a trail was looking up from the base of a mountain.
- (E) is correct. Although a trail cannot itself look up from the base of a mountain, a trail can be viewed by someone looking up from the base of a mountain, so the phrase “Viewed from the base of the mountain” logically modifies the subject “the trail.”

Correct answer: (E) / Difficulty level: Hard

Identifying Sentence Errors

This question type measures your ability to

- Recognize faults in grammar and usage.
- Recognize effective sentences that follow the conventions of standard written English.

Directions

The following sentence tests your ability to recognize grammar and usage errors. The sentence contains either a single error or no error at all. No sentence contains more than one error. The error, if there is one, is underlined and lettered. If the sentence contains an error, select the one underlined part that must be changed to make the sentence correct. If the sentence is correct, select choice E.

In choosing answers, follow the requirements of standard written English.

EXAMPLE:

The other delegates and him immediately

A B C

accepted the resolution drafted by the

D

neutral states. No error

E

(A) (B) (C) (D) (E)

Answering Identifying Sentence Errors Questions

Read the entire sentence carefully but quickly, paying attention to the underlined choices (A) through (D). Ask yourself whether any of the underlined words or phrases in the sentence contains a grammar or usage error. Keep in mind that some sentences do not contain an error.

Select the underlined word or phrase that must be changed to make the sentence correct. Mark (E) No error if you believe that the sentence is correct as written.

Develop the habit of looking for the most common mistakes that people make in grammar: subject-verb agreement, pronoun reference and agreement, and adjective/adverb confusion.

In the example above, “The other delegates and him” are the people who “immediately accepted the resolution,” and the phrase “drafted by the neutral states” describes “the resolution.” Check each underlined word or phrase for correctness.

- The phrase “The other” correctly modifies the word “delegates.”
- The pronoun “him” is in the wrong case. (One would not say “him immediately accepted.”) “Him” is an error, but go on to check the other choices, especially if you are not sure.
- The word “immediately” correctly modifies the verb “accepted.”
- The phrase “drafted by” correctly expresses the action of the “neutral states.”

Correct answer: (B) / Difficulty level: Easy

Sample Question

2. After hours of futile debate, the committee has

A

decided to postpone further discussion

B

of the resolution until their next meeting.

C

D

No error

E

- The error in this sentence occurs at (D). A pronoun must agree in number (singular or plural) with the noun to which it refers. Collective nouns such as “committee” can be treated as plural when members of the group act as individuals, or as singular when the group functions as a unit. In this sentence, the committee acts as a singular unit, as shown by the use of the singular verb “has,” which is not underlined and so cannot be changed. Therefore, the plural pronoun “their” at (D) is used incorrectly.
- The other options contain no errors. In (A), the preposition “After” appropriately introduces a phrase that indicates when the committee made its decision. In (B), “to postpone” is the verb form needed to complete the description of the committee’s decision. In (C), the prepositional phrase “of the resolution” appropriately specifies the subject of the postponed discussion.
- The sentence may be corrected as follows: After hours of futile debate, the committee has decided to postpone further discussion of the resolution until *its* next meeting.

Correct answer: (D) / Difficulty level: Hard

Improving Paragraphs

This type of question measures your ability to

- Edit and revise sentences in the context of a paragraph or entire essay.
- Organize and develop paragraphs in a coherent and logical manner.
- Apply the conventions of standard written English.

Directions

The following passage is an early draft of an essay. Some parts of the passage need to be rewritten.

Read the passage and select the best answers for the questions that follow. Some questions are about particular sentences or parts of sentences and ask you to improve sentence structure or word choice. Other questions ask you to consider organization and development. In choosing answers, follow the requirements of standard written English.

Answering Improving Paragraphs Questions

To answer the improving paragraphs questions that accompany the draft essay, you will need to note what sentences need to be corrected and to know how each sentence relates to the other sentences and to the essay as a whole.

Read the entire essay quickly to determine its overall meaning. The essay is intended as a draft, so you will notice errors.

In answering each question, make sure that your answer about a particular sentence or group of sentences makes sense in the context of the passage as a whole. Choose the best answer from among the choices given, even if you can imagine another correct response.

Sample Questions

Questions 3 and 4 are based on the following passage:

- (1) Many times art history courses focus on the great “masters,” ignoring those women who should have achieved fame. (2) Often women artists like Mary Cassatt have worked in the shadows of their male contemporaries. (3) They have rarely received much attention during their lifetimes.
- (4) My art teacher has tried to make up for it by teaching us about women artists and their work. (5) Recently she came to class very excited; she had just read about a little-known artist named Annie Johnson, a high school teacher who had lived all of her life in New Haven, Connecticut. (6) Johnson never sold a painting, and her obituary in 1937 did not even mention her many paintings. (7) Thanks to Bruce Blanchard, a Connecticut businessman who bought some of her watercolors at an estate sale. (8) Johnson is finally starting to get the attention that she deserved more than one hundred years ago. (9) Blanchard now owns a private collection of hundreds of Johnson’s works — watercolors, charcoal sketches, and pen-and-ink drawings.
- (10) There are portraits and there are landscapes. (11) The thing that makes her work stand out are the portraits. (12) My teacher described them as “unsentimental.” (13) They do not idealize characters. (14) Characters are presented almost photographically. (15) Many of the people in the pictures had an isolated, haunted look. (16) My teacher said that isolation symbolizes Johnson’s life as an artist.

3. In context, which is the best revision to the underlined portion of sentence 3 (reproduced below)?

They have rarely received much attention during their lifetimes.

- (A) In fact, they had
- (B) Too bad these artists have
- (C) As a result, these women have
- (D) In spite of this, women artists
- (E) Often it is the case that the former have

Although sentence 3 is not grammatically incorrect, its relationship to the preceding sentence needs to be made clearer. A transitional phrase should be added to emphasize the cause-and-effect relationship between the stated facts — women artists received little attention *as a consequence* of having worked in the shadows of their male contemporaries — and the ambiguous pronoun “They” should be replaced with a word or phrase that clearly refers to the “women artists” and not the “male contemporaries” mentioned in sentence 2.

- (A), (B), and (D) are unsatisfactory because in each case the transitional phrase (“In fact,” “Too bad,” or “In spite of this”) fails to indicate the cause-and-effect relationship. Moreover, both (A) and (B) leave the ambiguity of the pronoun unresolved.
- (E) is unsatisfactory not only because it fails to signal the cause-and-effect relationship, but also because it is wordy and illogically combines the adverbs “Often” and “rarely.”
- (C) is correct. The transitional phrase “As a result” clearly indicates a cause-and-effect relationship, and “these women” properly resolves the ambiguity of the pronoun “They.”

Correct answer: (C) / Difficulty level: Hard

4. In context, which of the following is the best version of sentence 10 (reproduced below)?

There are portraits and there are landscapes.

- (A) (As it is now)
- (B) You can see both portraits and landscapes.
- (C) Therefore, both portraits and landscapes are among her works.
- (D) Johnson painted both portraits and landscapes.
- (E) Among them Johnson has portraits and landscapes.

In addition to being vague, sentence 10 contains no noun to which the pronoun “her” in sentence 11 may refer. It should be revised so that Johnson is clearly identified as the painter of the portraits and landscapes.

- (A), (B), and (C) are unsatisfactory because they do not mention Johnson.
- Though (E) does mention Johnson, it is misleading in that the words “Johnson has” suggest that Johnson is the owner rather than the painter of the portraits and landscapes.
- (D) is correct because it properly identifies Johnson as the painter of the artworks and thus provides an antecedent for the pronoun “her” in sentence 11.

Correct answer: (D) / Difficulty level: Easy

The Essay

The essay measures your ability to:

- Develop a point of view on an issue presented in an excerpt;
- Support your point of view using reasoning and examples from your reading, studies, experience, or observations; and
- Follow the conventions of standard written English.

Approaches to the Essay

There are no shortcuts to success on the SAT essay. You will not receive high scores on your essay just because it is long, or has five paragraphs, or uses literary examples. The high school and college teachers who score the SAT reward essays that insightfully develop a point of view with appropriate reasons and examples and that use language skillfully. So what can you do to write a successful SAT essay?

- **Read the entire assignment. It’s all there to help you.** Every essay assignment contains a short paragraph about the issue. Imagine that you are talking to the author of the paragraph about the issue. Would you argue with him or her, or agree? What other ideas or examples would you bring up? Answering these questions will help you develop your own point of view.
- **Don’t oversimplify.** Developing your point of view doesn’t mean coming up with as many examples as you can. Rushing to give multiple relevant examples can lead you to oversimplify a complex topic. An essay with one or two thoughtful, well-developed reasons or examples is more likely to get a high score than an essay with three short, simplistic examples.
- **There’s nothing wrong with “I.”** You are asked to develop your point of view on the issue, not give a straight report of the facts. This is your opinion, so feel free to use “I,” and give examples that are meaningful to you, even ones from your personal life or experiences. Of course you need to support your ideas appropriately and show that you can use language well, but remember: The essay is an opportunity for you to say what you think about an issue relevant to your life.

Directions

The essay gives you an opportunity to show how effectively you can develop and express ideas. You should, therefore, take care to develop your point of view, present your ideas logically and clearly, and use language precisely.

Your essay must be written on the lines provided on your answer sheet — you will receive no other paper on which to write. You will have enough space if you write on every line, avoid wide margins, and keep your handwriting to a reasonable size. Remember that people who are not familiar with your handwriting will read what you write. Try to write or print so that what you are writing is legible to those readers.

Important Reminders:

- **A pencil is required for the essay.** An essay written in ink will receive a score of zero.
- **Do not write your essay in your test book.** You will receive credit only for what you write on your answer sheet.
- **An off-topic essay will receive a score of zero.**
- **If your essay does not reflect your original and individual work, your scores for the entire test may be canceled.**
- **An electronic copy of your essay will be made available to each of your designated score recipients: colleges, universities, and scholarship programs.**

You have twenty-five minutes to write an essay on the topic assigned below.

Think carefully about the issue presented in the following excerpt and the assignment below.

Many persons believe that to move up the ladder of success and achievement, they must forget the past, repress it, and relinquish it. But others have just the opposite view. They see old memories as a chance to reckon with the past and integrate past and present.

Adapted from Sara Lawrence-Lightfoot,
I’ve Known Rivers: Lives of Loss and Liberation

Assignment: Do memories hinder or help people in their effort to learn from the past and succeed in the present? Plan and write an essay in which you develop your point of view on this issue. Support your position with reasoning and examples taken from your reading, studies, experience, or observations.

Sample Essays

Score of 6:

Without our past, our future would be a tortuous path leading to nowhere. In order to move up the ladder of success and achievement we must come to terms with our past and integrate it into our future. Even if in the past we made mistakes, this will only make wiser people out of us and guide us to where we are supposed to be.

This past year, I was auditioning for the fall play, “Cat on a Hot Tin Roof.” To my detriment I thought it would be a good idea to watch the movie in order to prepare. For two hours I studied Elizabeth Taylor’s mannerisms, attitude, and diction, hoping I could mimic her performance. I auditioned for the part of “Maggie” feeling perfectly confident in my portrayal of Elizabeth Taylor, however, I was unaware that my director saw exactly what I had been thinking. Unfortunately, I didn’t get the part, and my director told me that he needed to see “Maggie” from my perspective, not Elizabeth Taylor’s.

I learned from this experience, and promised myself I would not try to imitate another actress, in order to create my character. Persevering, I was anxious to audition for the winter play just two months later. The play was Neil Simon’s “Rumors,” and would get the opportunity to play “Chris,” a sarcastic yet witty role, which would be my final performance in high school. In order to develop my character, I planned out her life just as I thought it should be, gave her the voice I thought was right, and the rest of her character unfolded beautifully from there. My director told me after the first show that “Rumors” was the best work he’d ever seen from me, and that he was amazed at how I’d developed such a believable character. Thinking back to my first audition I was grateful for that chance I had to learn and to grow, because without that mistake I might have tried to base “Chris” off of someone I’d known or something I’d seen instead of becoming my own character. I utilized the memory of the Elizabeth Taylor debacle to improve my approach to acting and gave the best performance of my life so far.

This essay effectively and insightfully develops its point of view (*In order to move up the ladder of success and achievement we must come to terms with our past and integrate it into our future*) through a clearly appropriate extended example drawing on the writer’s experience as an actor. The essay exhibits outstanding critical thinking by presenting a well-organized and clearly focused narrative that aptly illustrates the value of memory. The essay also uses language skillfully, demonstrating meaningful variety in sentence structure (*To my detriment I thought it would be a good idea to watch the movie in order to prepare. For two hours I studied Elizabeth Taylor’s mannerisms, attitude, and diction, hoping I could mimic her performance. I auditioned for the part of “Maggie” feeling perfectly confident in my portrayal of Elizabeth Taylor, however, I was unaware that my director...*). Despite minor errors, the essay demonstrates clear and consistent mastery and is scored a 6.

Score of 5:

I agree with Ms. Sara Lawrence-Lightfoot in saying that some people “see old memories as a chance to reckon with the past and integrate past and present.” Many people are so troubled by things that happened in their past that they are not able to focus on the present. For example, in the book *Ceremony*, by Leslie Marmon Silko, Tayo, the main character, can not concentrate on the present because he constantly hounds himself over things that happened during World War II and his troubled childhood. However, past memories can help people to succeed in the present. An historical example of people learning from the past would be the Marshall Plan. After the conclusion of World War II there were many countries around the world in need of economical assistance to help rebuild their war torn countries, and the United States would have to be the one to provide that assistance. Many American politicians thought it was foolish for the US government to spend money abroad on countries that would not be able to repay the loan for a long time. However, George Marshall, a former general and later Secretary of State under President Truman, remembered how the exact same argument of “why should we spend money on war torn nations that really owe us reparations?” had been used after World War I towards Germany. The lack of assistance towards Germany after World War I had caused a gigantic economic depression in Germany that had made the Mark (German money) virtually worthless. The German people became so desperate that they started supporting an extreme German nationalist named Adolf Hitler, who eventually started World War II. Marshall knew that if the US did not help war torn Germany and, especially, Japan, we could eventually have a World War III on our hands.

This focused essay effectively develops its point of view and demonstrates strong critical thinking (*Many people are so troubled by things that happened in their past that they are not able to focus on the present. . . . However, past memories can help people to succeed in the present*). The essay uses appropriate reasoning and examples and demonstrates coherence and progression of ideas (*Many American politicians thought it was foolish for the US government to spend money abroad on countries that would not be able to repay the loan for a long time. However, George Marshall . . . remembered how the exact same argument . . . had been used after World War I towards Germany*). The essay also exhibits facility in the use of language. To earn a score of 6, the writer needs to achieve clearer coherence and smoother progression of ideas by integrating the example of *Ceremony* more effectively into the overall essay, perhaps through an extended comparison of Tayo’s and Marshall’s experiences of World War II. The essay demonstrates reasonably consistent mastery and is scored a 5.

Score of 4:

Interestingly enough, I fall in the middle of these statements. I believe that one should remember the past and learn from those events. However, I also believe that many bad memories harm the present and the future. The only way to continue, many times, is to forget and forgive.

My brother, who is college, has proved to me the importance of getting good grades and actively participating in extracurricular activities. These two ideas helped him to get into the prestigious college of the University of Notre Dame. His education there will allow him to have a prosperous career as an adult. Reviewing these facts and ideas has led me to believe if I do the same, I will have a similar promising career. Consequently, I have gotten good grades and have seen interest from many prestigious programs.

Through my knowledge, I have learned that in many bad instances, time to forget is very important. Ireland, for example, had been persecuted for many hundreds of years from 1000 AD to 1900 AD. After being granted the Irish Free State, they attacked many parts of Britain for retribution of those many years of being oppressed. Consequently there has been on going hostility between the two peoples. This hostility has cost the lives of many hundreds of people. A quote once said, "Violence begets violence" is the perfect phrase for this warfare. The only way to stop the loss of life is to forget and forgive; start anew.

Different situations require different actions to proceed in a positive manner. Many times, people are required to use both elements. For example, let's forget this part and concentrate on how to bring this positive part into light. Both of the ideas on remembering and forgetting have their reasons for existing and both are positive.

This essay provides adequate reasons and examples to support both aspects of its point of view (*I believe that one should remember the past and learn from those events. However, I also believe that many bad memories harm the present and the future*), thus demonstrating competent critical thinking. The essay is generally organized and focused and features coherence and progression of ideas. Facility in the use of language is adequate, despite some inconsistencies (*Through my knowledge, I have learned that in many bad instances, time to forget is very important*). The essay also has some errors in grammar, usage, and mechanics. To earn a higher score, the writer should provide additional appropriate evidence and use critical thinking to extend the discussion of situations in which "people are required to use both elements." The essay demonstrates adequate mastery and receives a 4.

Score of 3:

Memories can be helpful to some and hinder others. I believe that memories from different aspects of ones life have different consequences. One memory may be bad and it may be best forgotten about, when trying to succeed. Though some memories may give on strength to succeed in achieving a higher status in life.

When a person completes a task they have done once before, it triggers a memory and lets the reader reflect on that particular time in life. For example, a sporting team at the local high school makes it to the state championships, but severely loses to their opponent, the next time they get to the state championships they may think about the past and how they lost before, and it may hinder there feelings and they may once again lose. This demonstrates how a memory can ruin a certain activity for ever. On the other hand a memory can also help someone to move up the ladder of success. As an example if a person has cancer and is given treatment then diagnosed in remission they feel like they have beat the cancer. When the patient in remission is later told that the cancer has grown back, the patient might feel that they can kill the cancer again because when looking at the past they see they have beat it once why not beat it again. This demonstrates how a memory can be helpful to a person. In this case it did not help the person climb the ladder of success though it helped the to continue climbing the ladder of life to the extent that they were able to climb.

Those two short examples just go to demonstrate how memories of the past can both help and hinder a person in their path of not only success but also in the path of life.

This essay develops a point of view (*Memories can be helpful to some and hinder others*) and shows some critical thinking by providing examples of the positive and negative effects of memories. However, the examples are limited in focus, featuring some lapses in coherence and progression of ideas, and are thus inadequate to support the position. The essay also demonstrates occasional problems in sentence structure and mechanics. To achieve a higher score, this writer needs to use critical thinking to clarify and expand each example by adding additional focused reasoning and details. The writer also needs to avoid using run-on sentences (*. . . when looking at the past they see they have beat it once why not beat it again*). The essay demonstrates developing mastery and earns a 3.

Score of 2:

I think it is wrong to believe that to move up the ladder of success and achievement, that they must forget the past, repress it, and relinquish it. Everything you did and saw in the past helps you to move on. Every single happy moment, every mistake you make is getting a part of you. Your actions become habits which creates your personality and helps you to make your own experience. Therefore memories help people in their effort to learn from the past and succeed in the present. Everything we do has to do with our experiences in the past, the way we get along with people or treat them, the way we turn out to be an adult. If you don't live with making your own decisions, mistakes, and your experience with people and the world or school you won't have any examples to compare or to handle any coming situations in the future. If you get everything told you by someone, you will always wait for other people to make decisions for you and won't have your own point of view. For succeed you have to know what you want, to find that out, you have to have been through some difficult situations in the PAST.

Although it expresses a point of view (*I think it is wrong to believe that to move up the ladder of success and achievement, that they must forget the past, repress it, and relinquish it*), this essay is seriously limited, exhibiting weak critical thinking, insufficient use of evidence, and serious problems with progression of ideas. The essay also demonstrates frequent problems in usage, grammar, and sentence structure. To achieve a higher score, the writer needs to develop the point of view with reasons and specific examples instead of merely repeating the same vague ideas (*Everything you did and saw in the past helps you to move on. . . . Everything we do has to do with our experiences in the past*). The essay demonstrates little mastery and is scored a 2.

Score of 1:

My oppion on this topic are oposing memories and favoring them. People do succed with repeating their memories. They might have horrible memories but also succeed because they don't repeat the past. I also think memories should not rule the present. If you let the past overcome the preset you won't get any where. This is why memories should be guidelines, not rules. If you repeat the past it won't come out as well as it did because the world has changed. See the past will never change with the world, but the world will change to overcome the past. So in conclusion don't forget the past or live in it, and the past is only guidelines.

This minimal essay demonstrates very little mastery, offering only a collection of general ideas in support of the writer's point of view (*don't forget the past or live in it, and the past is only guidelines*). The evidence presented is disorganized and unfocused, resulting in a disjointed essay. To earn a higher score, this writer needs to provide additional focused evidence that develops the point of view, including specific examples. The essay demonstrates very little mastery and receives a 1.

Official SAT Practice Test

About the Practice Test

Take the practice test, which starts on page 42, to reinforce your test-taking skills and to be more comfortable when you take the SAT. This practice test will give you a good idea of what to expect on the actual test.

Of course, the test you eventually take will differ in some ways. For example, its sections may be in a different order. Your actual test will also be longer than the practice test, because it will contain an additional 25-minute, unscored section (unless you are approved to take the SAT with extended time or a similar accommodation).

The practice test originally contained an unscored section, Section 4, when it was given in a test center. Section 4 is omitted in this booklet, so you need to **set aside three hours and 35 minutes to take the test** — 25 minutes less than the actual testing time you'll experience on test day.

Approaches to the Practice Test

The practice test will help you most if you take it under conditions as close as possible to those of the actual test.

- Plan to complete the entire test in one sitting.
 - You get three five-minute breaks. Take a break after every other 25-minute section, then work through all the shorter sections without a break.
 - Allow yourself the specified amount of time for each section. Pace yourself by using a watch (without an audible alarm).
- Sit at a desk or table cleared of any other papers or books. Do not use any prohibited items such as dictionaries, notes, or scratch paper.
- Use an acceptable calculator that is familiar to you for the mathematics section.
- Read the test instructions carefully.

Marking the Answer Sheet

Getting credit for the right answer depends on marking it correctly. On test day, and when filling out your answer sheet for the practice test, follow these important instructions:

- Make sure you use a No. 2 pencil.
- Fill in the entire circle on the answer sheet darkly and completely.
- If you change your response, erase it as completely as possible.

Calculating Your Scores

To score your test, follow the instructions on page 82. You'll need to count the right and wrong answers for each section, and then convert your "raw" score to the College Board scale of 200 to 800.

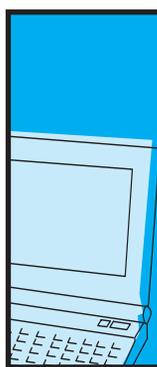
You will need to choose a score for your essay. Use the Scoring Guide on page 81 to determine how your particular essay might be scored.

Reviewing Your Performance

After you score your practice test, review your performance and ask yourself these questions:

- **Did I run out of time before I finished a section?**
Remember, all questions count the same. Be prepared to keep moving on test day and not spend too much time on any one question.
- **Did I make careless mistakes?**
You may have misread the question, neglected to notice a word like "except" or "best," or solved for the wrong value. Recognizing these small errors will help you avoid them on test day.
- **Did I spend too much time reading directions?**
Review any directions that gave you trouble so you don't have to spend as much time reading them when you take the actual test.

Visit collegeboard.org/satpracticetest to read sample scored essays and take an online practice test with automatic scoring.



The Official SAT Online Course™

- Take a practice test online
- Receive an immediate essay score
- Practice with more tests and quizzes

Visit:

collegeboard.org/satonlinecourse

SECTION

1

I understand that my essay (without my name) may be reproduced in other College Board materials. If I mark this circle, I withhold my permission to reproduce my essay for any purposes beyond score reporting and the assessment of my writing skills. Marking this circle will have no effect on my score, nor will it prevent my essay from being made available to any college to which I send my SAT scores.

IMPORTANT: USE A NO. 2 PENCIL. DO NOT WRITE OUTSIDE THE BORDER!

Words written outside the essay box or written in ink **WILL NOT APPEAR** in the copy sent to be scored, and your score will be affected.

Begin your essay on this page. If you need more space, continue on the next page.

Large rectangular area with horizontal lines for writing an essay.

COMPLETE MARK ●

EXAMPLES OF INCOMPLETE MARKS



You must use a No. 2 pencil and marks must be complete. Do not use a mechanical pencil. It is very important that you fill in the entire circle darkly and completely. If you change your response, erase as completely as possible. Incomplete marks or erasures may affect your score.

SECTION 4

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SECTION 5

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CAUTION

Grid answers in the section below for SECTION 4 or SECTION 5 only if directed to do so in your test book.

Student-Produced Responses

ONLY ANSWERS THAT ARE GRIDDED WILL BE SCORED. YOU WILL NOT RECEIVE CREDIT FOR ANYTHING WRITTEN IN THE BOXES.

Quality Assurance Mark

SECT. 4 OR 5 ONLY

9
Grid with columns for digits 0-9 and a row for answer 9.

10
Grid with columns for digits 0-9 and a row for answer 10.

11
Grid with columns for digits 0-9 and a row for answer 11.

12
Grid with columns for digits 0-9 and a row for answer 12.

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18
Grid with columns for digits 0-9 and a row for answer 18.

COMPLETE MARK ●

EXAMPLES OF INCOMPLETE MARKS



You must use a No. 2 pencil and marks must be complete. Do not use a mechanical pencil. It is very important that you fill in the entire circle darkly and completely. If you change your response, erase as completely as possible. Incomplete marks or erasures may affect your score.

SECTION 6

6

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SECTION 7

7

- 1 (A) (B) (C) (D) (E) ... 30 (A) (B) (C) (D) (E)

CAUTION

Grid answers in the section below for SECTION 6 or SECTION 7 only if directed to do so in your test book.

Student-Produced Responses

ONLY ANSWERS THAT ARE GRIDDED WILL BE SCORED. YOU WILL NOT RECEIVE CREDIT FOR ANYTHING WRITTEN IN THE BOXES.

SECT. 6 OR 7 ONLY

Grids for questions 9 through 18, each with a 5-column header and 10 rows of bubbles for digits 0-9.

Quality Assurance Mark

PLEASE DO NOT WRITE IN THIS AREA

Row of 25 empty circles for writing.

SERIAL #

COMPLETE MARK ●

EXAMPLES OF
INCOMPLETE MARKS



You must use a No. 2 pencil and marks must be complete. Do not use a mechanical pencil. It is very important that you fill in the entire circle darkly and completely. If you change your response, erase as completely as possible. Incomplete marks or erasures may affect your score.

SECTION
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SECTION
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SECTION
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ESSAY

Time — 25 minutes

Turn to page 2 of your answer sheet to write your ESSAY.

The essay gives you an opportunity to show how effectively you can develop and express ideas. You should, therefore, take care to develop your point of view, present your ideas logically and clearly, and use language precisely.

Your essay must be written on the lines provided on your answer sheet—you will receive no other paper on which to write. You will have enough space if you write on every line, avoid wide margins, and keep your handwriting to a reasonable size. Remember that people who are not familiar with your handwriting will read what you write. Try to write or print so that what you are writing is legible to those readers.

Important Reminders:

- **A pencil is required for the essay.** An essay written in ink will receive a score of zero.
- **Do not write your essay in your test book.** You will receive credit only for what you write on your answer sheet.
- **An off-topic essay will receive a score of zero.**
- **If your essay does not reflect your original and individual work, your scores for the entire test may be canceled.**
- **An electronic copy of your essay will be made available to each of your designated score recipients: colleges, universities, and scholarship programs.**

You have twenty-five minutes to write an essay on the topic assigned below.

Think carefully about the issue presented in the following excerpt and the assignment below.

Nowadays nothing is private: our culture has become too confessional and self-expressive. People think that to hide one's thoughts or feelings is to pretend not to have those thoughts or feelings. They assume that honesty requires one to express every inclination and impulse.

Adapted from J. David Velleman, "The Genesis of Shame"

Assignment: Should people make more of an effort to keep some things private? Plan and write an essay in which you develop your point of view on this issue. Support your position with reasoning and examples taken from your reading, studies, experience, or observations.

BEGIN WRITING YOUR ESSAY ON PAGE 2 OF THE ANSWER SHEET.

**If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.**



SECTION 2

Time — 25 minutes

20 Questions

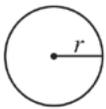
Turn to Section 2 (page 4) of your answer sheet to answer the questions in this section.

Directions: For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratch work.

Notes

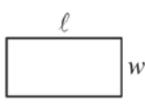
- The use of a calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
- Unless otherwise specified, the domain of any function f is assumed to be the set of all real numbers x for which $f(x)$ is a real number.

Reference Information

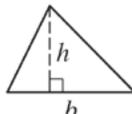


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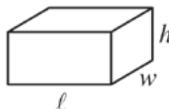
$$C = 2\pi r$$



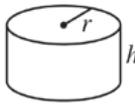
$$A = \ell w$$



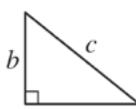
$$A = \frac{1}{2}bh$$



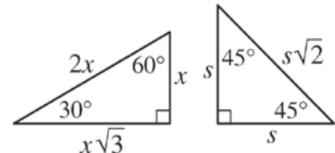
$$V = \ell wh$$



$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



Special Right Triangles

The number of degrees of arc in a circle is 360.

The sum of the measures in degrees of the angles of a triangle is 180.

1. If $10 + x$ is 5 more than 10, what is the value of $2x$?

- (A) -5
(B) 5
(C) 10
(D) 25
(E) 50

2. The result when a number is divided by 2 is equal to the result when that same number is divided by 4. What is that number?

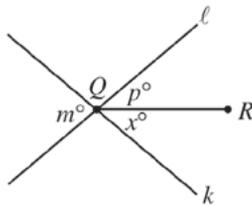
- (A) -4
(B) -2
(C) 0
(D) 2
(E) 4

GO ON TO THE NEXT PAGE



3. If this page was folded along the dotted line in the figure above, the left half of the letter W would exactly coincide with the right half of W. Which of the following letters, as shown, CANNOT be folded along a vertical line so that its left half would coincide with its right half?

- (A) A
(B) I
(C) O
(D) U
(E) E



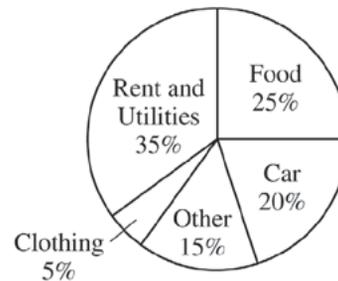
Note: Figure not drawn to scale.

4. In the figure above, lines l and k intersect at point Q . If $m = 40$ and $p = 25$, what is the value of x ?
- (A) 15
(B) 20
(C) 25
(D) 40
(E) 65

x	y
-2	-3
0	3
1	6
2	9
4	15

5. Which of the following equations is satisfied by the five pairs of numbers listed in the table above?
- (A) $y = x^3 + 3$
(B) $y = 3x + 3$
(C) $y = -3x + 6$
(D) $y = x^2 + 6$
(E) $y = x^2 - 7$

DAVID'S MONTHLY EXPENSES



6. The circle graph above shows how David's monthly expenses are divided. If David spends \$450 per month for food, how much does he spend per month on his car?
- (A) \$200
(B) \$320
(C) \$360
(D) \$400
(E) \$450

GO ON TO THE NEXT PAGE



7. If n and k are positive integers and $8^n = 2^k$, what is the value of $\frac{n}{k}$?

- (A) $\frac{1}{4}$
 (B) $\frac{1}{3}$
 (C) $\frac{1}{2}$
 (D) 3
 (E) 4

8. In a certain store, the regular price of a refrigerator is \$600. How much money is saved by buying this refrigerator at 20 percent off the regular price rather than buying it on sale at 10 percent off the regular price with an additional discount of 10 percent off the sale price?

- (A) \$6
 (B) \$12
 (C) \$24
 (D) \$54
 (E) \$60

9. If the function f is defined by $f(x) = 3x + 4$, then $2f(x) + 4 =$

- (A) $5x + 4$
 (B) $5x + 8$
 (C) $6x + 4$
 (D) $6x + 8$
 (E) $6x + 12$

10. What is the greatest possible area of a triangle with one side of length 7 and another side of length 10?

- (A) 17
 (B) 34
 (C) 35
 (D) 70
 (E) 140

11. A total of 120,000 votes were cast for 2 opposing candidates, Garcia and Pérez. If Garcia won by a ratio of 5 to 3, what was the number of votes cast for Pérez?

- (A) 15,000
 (B) 30,000
 (C) 45,000
 (D) 75,000
 (E) 80,000

12. If a positive integer n is picked at random from the positive integers less than or equal to 10, what is the probability that $5n + 3 \leq 14$?

- (A) 0
 (B) $\frac{1}{10}$
 (C) $\frac{1}{5}$
 (D) $\frac{3}{10}$
 (E) $\frac{2}{5}$

13. If t is a number greater than 1, then t^2 is how much greater than t ?

- (A) 1
 (B) 2
 (C) t
 (D) $t(t - 1)$
 (E) $(t - 1)(t + 1)$

14. The height of a right circular cylinder is 5 and the diameter of its base is 4. What is the distance from the center of one base to a point on the circumference of the other base?

- (A) 3
 (B) 5
 (C) $\sqrt{29}$ (approximately 5.39)
 (D) $\sqrt{33}$ (approximately 5.74)
 (E) $\sqrt{41}$ (approximately 6.40)

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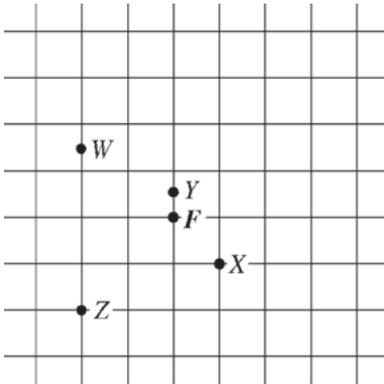


15. If p and n are integers such that $p > n > 0$ and $p^2 - n^2 = 12$, which of the following can be the value of $p - n$?

- I. 1
II. 2
III. 4

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

Questions 16-18 refer to the following figure and information.



The grid above represents equally spaced streets in a town that has no one-way streets. F marks the corner where a firehouse is located. Points W , X , Y , and Z represent the locations of some other buildings. The fire company defines a building's m -distance as the minimum number of blocks that a fire truck must travel from the firehouse to reach the building. For example, the building at X is an m -distance of 2, and the building at Y is an m -distance of $\frac{1}{2}$ from the firehouse.

16. What is the m -distance of the building at W from the firehouse?

- (A) 2
(B) $2\frac{1}{2}$
(C) 3
(D) $3\frac{1}{2}$
(E) $4\frac{1}{2}$

17. What is the total number of different routes that a fire truck can travel the m -distance from F to Z ?

- (A) Six
(B) Five
(C) Four
(D) Three
(E) Two

18. All of the buildings in the town that are an m -distance of 3 from the firehouse must lie on a

- (A) circle
(B) square
(C) right isosceles triangle
(D) pair of intersecting lines
(E) line



19. If x and y are positive integers, which of the following is equivalent to $(2x)^{3y} - (2x)^y$?

- (A) $(2x)^{2y}$
- (B) $2^y(x^3 - x^y)$
- (C) $(2x)^y[(2x)^{2y} - 1]$
- (D) $(2x)^y(4x^y - 1)$
- (E) $(2x)^y[(2x)^3 - 1]$

20. If j , k , and n are consecutive integers such that $0 < j < k < n$ and the units (ones) digit of the product jn is 9, what is the units digit of k ?

- (A) 0
- (B) 1
- (C) 2
- (D) 3
- (E) 4

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.

**SECTION 3**

Time — 25 minutes

24 Questions

Turn to Section 3 (page 4) of your answer sheet to answer the questions in this section.**Directions:** For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are five words or sets of words labeled A through E. Choose the word or set of words that, when inserted in the sentence, best fits the meaning of the sentence as a whole.

Example:

Hoping to ----- the dispute, negotiators proposed a compromise that they felt would be ----- to both labor and management.

- (A) enforce . . useful
 (B) end . . divisive
 (C) overcome . . unattractive
 (D) extend . . satisfactory
 (E) resolve . . acceptable

(A) (B) (C) (D)

- Many private universities depend heavily on -----, the wealthy individuals who support them with gifts and bequests.

(A) instructors (B) administrators
 (C) monitors (D) accountants
 (E) benefactors
- One of the characters in Milton Murayama's novel is considered ----- because he deliberately defies an oppressive hierarchical society.

(A) rebellious (B) impulsive (C) artistic
 (D) industrious (E) tyrannical
- Nightjars possess a camouflage perhaps unparalleled in the bird world: by day they roost hidden in shady woods, so ----- with their surroundings that they are nearly impossible to ----- .

(A) vexed . . dislodge
 (B) blended . . discern
 (C) harmonized . . interrupt
 (D) impatient . . distinguish
 (E) integrated . . classify
- Many economists believe that since resources are scarce and since human desires cannot all be -----, a method of ----- is needed.

(A) indulged . . apportionment
 (B) verified . . distribution
 (C) usurped . . expropriation
 (D) expressed . . repairation
 (E) anticipated . . advertising
- The range of colors that homeowners could use on the exterior of their houses was ----- by the community's stringent rules regarding upkeep of property.

(A) circumscribed (B) bolstered
 (C) embellished (D) insinuated
 (E) cultivated

GO ON TO THE NEXT PAGE



The passages below are followed by questions based on their content; questions following a pair of related passages may also be based on the relationship between the paired passages. Answer the questions on the basis of what is stated or implied in the passages and in any introductory material that may be provided.

Questions 6-9 are based on the following passages.

Passage 1

I know what your e-mail in-box looks like, and it isn't pretty: a babble of come-ons and lies from hucksters and con artists. To find your real e-mail, you must wade through the torrent of fraud and obscenity known politely as "unsolicited bulk e-mail" and colloquially as "spam." In a perverse tribute to the power of the online revolution, we are all suddenly getting the same mail: easy weight loss, get-rich-quick schemes, etc. The crush of these messages is now numbered in billions per day. "It's becoming a major systems and engineering and network problem," says one e-mail expert. "Spammers are gaining control of the Internet."

Passage 2

Many people who hate spam assume that it is protected as free speech. Not necessarily so. The United States Supreme Court has previously ruled that individuals may preserve a threshold of privacy. "Nothing in the Constitution compels us to listen to or view any unwanted communication, whatever its merit," wrote Chief Justice Warren Burger in a 1970 decision. "We therefore categorically reject the argument that a vendor has a right to send unwanted material into the home of another." With regard to a seemingly similar problem, the Telephone Consumer Protection Act of 1991 made it illegal in the United States to send unsolicited faxes; why not extend the act to include unsolicited bulk e-mail?

6. The primary purpose of Passage 1 is to
- (A) make a comparison
 - (B) dispute a hypothesis
 - (C) settle a controversy
 - (D) justify a distinction
 - (E) highlight a concern
7. The primary purpose of Passage 2 is to
- (A) confirm a widely held belief
 - (B) discuss the inadequacies of a ruling
 - (C) defend a controversial technology
 - (D) analyze a widespread social problem
 - (E) lay the foundation for a course of action
8. What would be the most likely reaction by the author of Passage 1 to the argument cited in lines 16-21 of Passage 2 ("Nothing . . . another") ?
- (A) Surprise at the assumption that freedom of speech is indispensable to democracy
 - (B) Dismay at the Supreme Court's vigorous defense of vendors' rights
 - (C) Hope that the same reasoning would be applied to all unsolicited e-mail
 - (D) Concern for the plight of mass marketers facing substantial economic losses
 - (E) Appreciation for the political complexity of the debate about spam
9. Unlike the author of Passage 1, the author of Passage 2
- (A) criticizes a practice
 - (B) offers an example
 - (C) proposes a solution
 - (D) states an opinion
 - (E) quotes an expert

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Questions 10-16 are based on the following passage.

The following passage is adapted from a novel set in the early twentieth century. Mr. Beebe, a clergyman, is speaking with Cecil Vyse about a mutual acquaintance, Lucy Honeychurch. Miss Honeychurch has recently returned from a journey with her older cousin and chaperone, Miss Bartlett.

“Lucy Honeychurch has no faults,” said Cecil, with grave sincerity.

“I quite agree. At present she has none.”

Line “At present?”

5 “I’m not cynical. I’m only thinking of my pet theory about Miss Honeychurch. Does it seem reasonable that she should play piano so wonderfully, and live so quietly? I suspect that someday she shall be wonderful in both. The water-tight compartments in her will break down, and music and life will mingle. Then we shall have her heroically good, heroically bad—too heroic, perhaps, to be good or bad.”

Cecil found his companion interesting.

15 “And at present you think her not wonderful as far as life goes?”

“Well, I must say I’ve only seen her at Tunbridge Wells, where she was not wonderful, and at Florence. She wasn’t wonderful in Florence either, but I kept on expecting that she would be.”

20 “In what way?”

Conversation had become agreeable to them, and they were pacing up and down the terrace.

25 “I could as easily tell you what tune she’ll play next. There was simply the sense that she found wings and meant to use them. I can show you a beautiful picture in my diary. Miss Honeychurch as a kite, Miss Bartlett holding the string. Picture number two: the string breaks.”

30 The sketch was in his diary, but it had been made afterwards, when he viewed things artistically. At the time he had given surreptitious tugs to the string himself.

“But the string never broke?”

“No. I mightn’t have seen Miss Honeychurch rise, but I should certainly have heard Miss Bartlett fall.”

35 “It has broken now,” said the young man in low, vibrating tones.

Immediately he realized that of all the conceited, ludicrous, contemptible ways of announcing an engagement this was the worst. He cursed his love of metaphor; had he suggested that he was a star and that Lucy was soaring up to reach him?

40 “Broken? What do you mean?”

“I meant,” Cecil said stiffly, “that she is going to marry me.”

45 The clergyman was conscious of some bitter disappointment which he could not keep out of his voice.

50 “I am sorry; I must apologize. I had no idea you were intimate with her, or I should never have talked in this flippant, superficial way. You ought to have stopped me.” And down in the garden he saw Lucy herself; yes, he was disappointed.

Cecil, who naturally preferred congratulations to apologies, drew down the corner of his mouth. Was this the reaction his action would get from the whole world? Of course, he despised the world as a whole; every thoughtful man should; it is almost a test of refinement.

60 “I’m sorry I have given you a shock,” he said dryly. “I fear that Lucy’s choice does not meet with your approval.”

10. Cecil’s remark in line 1 (“Lucy . . . faults”) is made in a tone of

- (A) great conviction
- (B) studied neutrality
- (C) playful irony
- (D) genuine surprise
- (E) weary cynicism

11. Mr. Beebe asks the question in lines 6-7 (“Does . . . quietly”) primarily in order to

- (A) raise an urgent concern
- (B) anticipate a possible objection
- (C) challenge a widely accepted theory
- (D) note an apparent inconsistency
- (E) criticize a popular pastime

12. Mr. Beebe’s statement, “The water-tight . . . bad” (lines 9-11), suggests that Lucy will

- (A) ultimately become a famous and respected musician
- (B) eventually play music in a less disciplined fashion
- (C) one day begin to live with great passion
- (D) soon regret an impetuous decision
- (E) someday marry a man who will be the cause of her undoing

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13. In line 24, “sense” most nearly means
- (A) definition
 - (B) intelligence
 - (C) plausibility
 - (D) consensus
 - (E) impression
14. For Mr. Beebe, “Picture number two” (line 27) represents
- (A) a misleading occurrence
 - (B) a dangerous gamble
 - (C) an unlikely development
 - (D) an anticipated outcome
 - (E) an avoidable difficulty
15. Ultimately, Cecil views his remark in line 34 (“It . . . now”) as
- (A) singularly poetic
 - (B) particularly memorable
 - (C) embarrassingly inapt
 - (D) excessively critical
 - (E) regrettably underhanded
16. The question in lines 39-40 (“had . . . him”) suggests that Cecil fears that Mr. Beebe will
- (A) detect the lack of originality in his thinking
 - (B) consider him to be vain
 - (C) tell Lucy of his inappropriate remark
 - (D) distrust him as a confidant
 - (E) attempt to block his engagement to Lucy

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Questions 17-24 are based on the following passage.

The following passage is adapted from a book published in 1999.

Line 5 Calling it a cover-up would be far too dramatic. But for more than half a century—even in the midst of some of the greatest scientific achievements in history—physicists have been quietly aware of a dark cloud looming on a distant horizon. The problem is this: There are two foundational pillars upon which modern physics rests. One is general relativity, which provides a theoretical framework for understanding the universe on the largest of scales: stars, galaxies, clusters of galaxies, and beyond to the immense expanse of the universe itself. The other is quantum mechanics, which provides a theoretical framework for understanding the universe on the smallest of scales: molecules, atoms, and all the way down to subatomic particles like electrons and quarks. Through years of research, physicists have experimentally confirmed to almost unimaginable accuracy virtually all predictions made by each of these theories. But these same theoretical tools inexorably lead to another disturbing conclusion: As they are currently formulated, general relativity and quantum mechanics *cannot both be right*. The two theories underlying the tremendous progress of physics during the last hundred years—progress that has explained the expansion of the heavens and the fundamental structure of matter—are mutually incompatible.

25 If you have not heard previously about this ferocious antagonism, you may be wondering why. The answer is not hard to come by. In all but the most extreme situations, physicists study things that are either small and light (like atoms and their constituents) or things that are huge and heavy (like stars and galaxies), but not both. This means that they need use only quantum mechanics or only general relativity and can, with a furtive glance, shrug off the barking admonition of the other. For 50 years this approach has not been quite as blissful as ignorance, but it has been pretty close.

35 But the universe *can* be extreme. In the central depths of a black hole, an enormous mass is crushed to a minuscule size. According to the big bang theory, the whole of the universe erupted from a microscopic nugget whose size makes a grain of sand look colossal. These are realms that are tiny and yet incredibly massive, therefore requiring that both quantum mechanics and general relativity simultaneously be brought to bear. The equations of general relativity and quantum mechanics, when combined, begin to shake, rattle, and gush with steam like a decrepit automobile. Put less figuratively, well-posed physical questions elicit nonsensical answers from the unhappy amalgam of

50 these two theories. Even if you are willing to keep the deep interior of a black hole and the beginning of the universe shrouded in mystery, you can't help feeling that the hostility between quantum mechanics and general relativity cries out for a deeper level of understanding. Can it really be that the universe at its most fundamental level is divided, requiring one set of laws when things are large and a different, incompatible set when things are small?

55 Superstring theory, a young upstart compared with the venerable edifices of quantum mechanics and general relativity, answers with a resounding no. Intense research over the past decade by physicists and mathematicians around the world has revealed that this new approach to describing matter at its most fundamental level resolves the tension between general relativity and quantum mechanics. In fact, superstring theory shows more: within this new framework, general relativity and quantum mechanics require one another for the theory to make sense. According to superstring theory, the marriage of the laws of the large and the small is not only happy but inevitable. Superstring theory has the potential to show that all of the wondrous happenings in the universe—from the frantic dance of subatomic quarks to the stately waltz of orbiting binary stars—are reflections of one grand physical principle, one master equation.

17. The “dark cloud” mentioned in line 4 refers to an
- (A) atypical diagnosis
 - (B) unsupported hypothesis
 - (C) unknown threat
 - (D) evil influence
 - (E) important contradiction
18. Which pairing best represents the different models of the universe presented in lines 7-14 ?
- (A) Big and little
 - (B) Old and new
 - (C) Complex and simple
 - (D) Verified and undocumented
 - (E) Theoretical and practical
19. The author’s use of italics in line 20 serves primarily to
- (A) draw attention to a commonly known hypothesis
 - (B) stress a speculative aspect of two theories
 - (C) support a difficult claim
 - (D) underscore a surprising point
 - (E) emphasize an area of agreement

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20. The author uses the “automobile” (lines 45-46) to represent equations that
- (A) demand a professional’s attention
 - (B) are intrinsically unreliable
 - (C) do not work together effectively
 - (D) can be easily adjusted if necessary
 - (E) are based on dated mathematics
21. Which of the following, if available, would best refute the author’s assertion about the “young upstart” (line 57) ?
- (A) Evidence that certain kinds of particles in nature exceed the speed of light
 - (B) Confirmation of conditions that existed in the earliest stages of the big bang
 - (C) Speculation that the deep interior of a black hole is not as dense as scientists have believed
 - (D) Mathematical formulas that link general relativity and quantum mechanics in the same realm
 - (E) Proof that the laws governing the universe depend on the size of the system being studied
22. The primary reason described for the usefulness of the theory mentioned in line 57 is its ability to
- (A) explain new phenomena
 - (B) replace the theory of general relativity
 - (C) reinforce the predictions of quantum mechanics
 - (D) indicate where other theories are inapplicable
 - (E) reconcile two seemingly contradictory theories
23. Those who hold the “conclusion” referred to in line 18 would most likely believe that the “marriage” (line 68) was an
- (A) inevitable result of their research
 - (B) unjustifiable elevation of their hypotheses
 - (C) inadvisable use of research funds
 - (D) unfortunate consequence
 - (E) impossible outcome
24. The author uses dance imagery in lines 71-72 in order to
- (A) suggest a similarity between the study of science and the study of dance
 - (B) highlight the extremes found in the physical world
 - (C) emphasize the different ways that binary stars move
 - (D) illustrate the intricacy of the subatomic world of quarks
 - (E) suggest the cohesive nature of both science and dance

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.



SECTION 5
Time — 25 minutes
35 Questions

Turn to Section 5 (page 5) of your answer sheet to answer the questions in this section.

Directions: For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

The following sentences test correctness and effectiveness of expression. Part of each sentence or the entire sentence is underlined; beneath each sentence are five ways of phrasing the underlined material. Choice A repeats the original phrasing; the other four choices are different. If you think the original phrasing produces a better sentence than any of the alternatives, select choice A; if not, select one of the other choices.

In making your selection, follow the requirements of standard written English; that is, pay attention to grammar, choice of words, sentence construction, and punctuation. Your selection should result in the most effective sentence—clear and precise, without awkwardness or ambiguity.

EXAMPLE:

Laura Ingalls Wilder published her first book and she was sixty-five years old then.

- (A) and she was sixty-five years old then
- (B) when she was sixty-five
- (C) at age sixty-five years old
- (D) upon the reaching of sixty-five years
- (E) at the time when she was sixty-five

(A) (B) (C) (D) (E)

1. Since last September Patricia has been working at the convenience store down the road.
- (A) has been working
 - (B) works
 - (C) is working
 - (D) will be working
 - (E) worked

2. To help freshmen and sophomores in selecting their courses, candid reviews of courses and instructors compiled by juniors and seniors.
- (A) candid reviews of courses and instructors compiled by juniors and seniors
 - (B) candid reviews of courses and instructors being compiled by juniors and seniors
 - (C) and to compile candid reviews of courses and instructors by juniors and seniors
 - (D) juniors and seniors have compiled candid reviews of courses and instructors
 - (E) with juniors and seniors compiling candid reviews of courses and instructors
3. The landscape artist who designed New York City's Central Park believed that providing scenic settings accessible to all would not only benefit the public's physical and mental health and also foster a sense of democracy.
- (A) and also foster a sense of democracy
 - (B) as it also fosters a sense of democracy
 - (C) and would foster a sense of democracy also
 - (D) but also foster a sense of democracy
 - (E) and foster a sense of democracy also
4. In areas where deer roam freely, residents must dress to protect themselves against deer ticks that might transmit diseases.
- (A) areas where deer roam freely
 - (B) areas roamed by deer freely
 - (C) areas, freely roamed by deer
 - (D) areas, in which there are deer that roam freely
 - (E) areas which deer roam free

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5. Given the cost of a hardcover book, the price of it typically hovers around \$25, many consumers ask their book dealers, “When will the paperback be out?”
- (A) the price of it typically hovers
(B) and typically it hovers at a price
(C) which typically hovers
(D) in that it typically hovers
(E) they typically hover
6. The article featured the Sea Islands because many were known there to live much as their ancestors of a century ago had lived.
- (A) many were known there to live
(B) they were known there for living
(C) many of the people there were known to live
(D) of the many people, they were there living
(E) of knowing that many people lived there
7. A poetic form congenial to Robert Browning was the dramatic monologue, it let him explore a character’s mind without the simplifications demanded by stage productions.
- (A) monologue, it let him explore
(B) monologue, which let him explore
(C) monologue that lets him explore
(D) monologue; letting him explore
(E) monologue by letting him do exploration of
8. Many eighteenth- and nineteenth-century Romantic poets were believers in rebellion against social conventions, express strong emotion, and the power of imagination.
- (A) were believers in rebellion against social conventions, express strong emotion
(B) are believers in rebelling against social conventions, strong emotions being expressed
(C) who believed in rebellion against social conventions, express strong emotion
(D) believed in rebellion against social conventions, to express strong emotions
(E) believed in rebellion against social conventions, the expression of strong emotions
9. At the Constitutional Convention of 1787, the proposal to replace the existing Articles of Confederation with a federal constitution were met with fierce opposition.
- (A) were met with
(B) having been met with
(C) it met
(D) met with
(E) met their
10. When for the first time the United States imported more oil than it exported, Americans should have realized that an energy crisis was imminent and could happen in the future.
- (A) was imminent and could happen in the future
(B) could happen imminently in the future
(C) will be imminent and happening soon
(D) is an imminent thing
(E) might be imminent
11. Intimacy, love, and marriage are three different, if interrelated, subjects.
- (A) different, if interrelated, subjects
(B) interrelated subjects, being, however, different
(C) different subjects, whereas they are interrelated
(D) different subjects when interrelated
(E) subjects that are different although being interrelated

GO ON TO THE NEXT PAGE 



The following sentences test your ability to recognize grammar and usage errors. Each sentence contains either a single error or no error at all. No sentence contains more than one error. The error, if there is one, is underlined and lettered. If the sentence contains an error, select the one underlined part that must be changed to make the sentence correct. If the sentence is correct, select choice E. In choosing answers, follow the requirements of standard written English.

EXAMPLE:

The other delegates and him immediately
 A B C
 accepted the resolution drafted by the
 D
 neutral states. No error
 E

(A) (B) (C) (D) (E)

12. America's first roller coaster ride, which opened in
 A
 1884 at Coney Island, Brooklyn, and capable of
 B
 a top speed of only six miles per hour. No error
 C D E
13. The inflation rate in that country is so high that
 A
even with adjusted wages, most workers can barely
 B C D
 pay for food and shelter. No error
 E
14. Over the past two years, apparel manufacturers have
 A B
 worked to meeting the revised federal standards
 C
for the design of uniforms. No error
 D E
15. Storing bread in the refrigerator delays drying and the
 A
 growth of mold but increase the rate at which the
 B C
 bread loses flavor. No error
 D E
16. According to last week's survey, most voters
 were disappointed by legislators' inability working
 A B C
together on key issues. No error
 D E
17. When Marie Curie shared the 1903 Nobel Prize for
 A
 Physics with two other scientists—her husband
 B
 Pierre Curie and Henri Becquerel—she had been
 C
 the first woman to win the prize. No error
 D E
18. Every spring in rural Vermont the sound of sap
 A
dripping into galvanized metal buckets signal the
 B C
 beginning of the traditional season for gathering
 D
 maple syrup. No error
 E
19. Those investors who sold stocks just before the
 A B
 stock market crashed in 1929 were either wise or
 C
exceptional lucky. No error
 D E

GO ON TO THE NEXT PAGE



20. Most of the sediment and nutrients of the Mississippi River no longer reach the coastal wetlands, a phenomenon that has adversely affected the region's ecological balance.
- A
B
C
D
E
21. Most major air pollutants cannot be seen, although large amounts of them concentrated in cities are visible as smog. No error
- A
B
C
D
E
22. The light emitted by high-intensity-discharge car headlights are very effective in activating the reflective paints of road markers, thereby making driving at night safer. No error
- A
B
C
D
E
23. During the nineteenth century, Greek mythology acquired renewed significance when both poets and painters turned to the ancient myths for subject matter. No error
- A
B
C
D
E
24. The museum is submitting proposals to several foundations in the hope to gain funds to build a tropical butterfly conservatory. No error
- A
B
C
D
E
25. In order for the audience to believe in and be engaged by a Shakespearean character, they have to come across as a real person on the stage. No error
- A
B
C
D
E
26. Most of the hypotheses that Kepler developed to explain physical forces were later rejected as inconsistent to Newtonian theory. No error
- A
B
C
D
E
27. Lynn Margulis's theory that evolution is a process involving interdependency rather than competition among organisms differs dramatically from most biologists. No error
- A
B
C
D
E
28. The Empire State Building, the Sears Tower, the Canadian National Tower—each of these structures was the tallest in the world at the time they were built. No error
- A
B
C
D
E
29. The cost of safely disposing of the toxic chemicals is approximately five times what the company paid to purchase it. No error
- A
B
C
D
E

GO ON TO THE NEXT PAGE 



Directions: The following passage is an early draft of an essay. Some parts of the passage need to be rewritten.

Read the passage and select the best answers for the questions that follow. Some questions are about particular sentences or parts of sentences and ask you to improve sentence structure or word choice. Other questions ask you to consider organization and development. In choosing answers, follow the requirements of standard written English.

Questions 30-35 refer to the following passage.

(1) On September 10, 1973, the United States Postal Service issued a stamp honoring Henry Ossawa Tanner (1859-1937), one of four stamps in the American Arts series. (2) Acclaimed as an artist in the United States and Europe at the turn of the century, Tanner was called the “dean” of art by W. E. B. Du Bois. (3) But after his death, Tanner’s work was largely forgotten. (4) And so it remained, and even later, in 1969, the donation of one of his paintings to the Smithsonian Institution aroused new interest in the art of this American master. (5) Now his works are on exhibit again. (6) You can even buy posters of his paintings!

(7) One of his most famous works is a realistic painting by the name of “The Banjo Lesson.” (8) It was inspired by a poem of Paul Laurence Dunbar. (9) The painting isn’t like a photograph. (10) The magnificence of his work can be seen with each subtle brush stroke, each carefully crafted detail. (11) The effect is truly beautiful. (12) If I were to try to identify the dominant theme of the painting, I would have to say that it is family cohesiveness because the entire scene seems to emphasize the bond between the boy and his grandfather.

30. Which is the best version of the underlined part of sentence 2 (reproduced below) ?

Acclaimed as an artist in the United States and Europe at the turn of the century, Tanner was called the “dean” of art by W. E. B. Du Bois.

- (A) (as it is now)
 (B) century; Tanner was called the “dean” of art by W. E. B. Du Bois
 (C) century, Tanner, who was called “dean” of art by W. E. B. Du Bois
 (D) century, W. E. B. Du Bois calling Tanner the “dean” of art
 (E) century, it was W. E. B. Du Bois who called Tanner the “dean” of art

31. Which is the best version of the underlined portion of sentence 4 (reproduced below) ?

And so it remained, and even later, in 1969, the donation of one of his paintings to the Smithsonian Institution aroused new interest in the art of this American master.

- (A) (as it is now)
 (B) remained, and even after that, in 1969,
 (C) remained, but even then, in 1969,
 (D) remained until 1969, when
 (E) remained when in 1969
32. In context, which is the best revision of sentence 6 (reproduced below) ?
- You can even buy posters of his paintings!*
- (A) It is amazing, you can buy posters of his paintings.
 (B) Even ordinary people like us can buy posters of his paintings.
 (C) Posters of his paintings had been sold.
 (D) People can even buy his paintings as a poster.
 (E) One can even buy posters of his paintings.

GO ON TO THE NEXT PAGE 

33. In context, which is the best way to revise sentence 7 (reproduced below) ?

One of his most famous works is a realistic painting by the name of "The Banjo Lesson."

- (A) Add "In contrast," to the beginning of the sentence.
(B) Change "a realistic painting by the name of" to "the realistic painting".
(C) Delete the words "of his most famous works".
(D) Change "is" to "had been".
(E) Delete "most famous".
34. Which sentence is best inserted after sentence 7 ?
- (A) The painting shows a man teaching his grandson how to play the banjo.
(B) He finished "The Banjo Lesson" in 1893.
(C) In the painting, a bright light sets off the man and boy.
(D) Banjos came to the United States from West Africa.
(E) Portraits by Tanner show a psychological depth and compassion.

35. Which is best to add to the beginning of sentence 9 ?

- (A) Although it is realistic,
(B) You can almost hear the music, but
(C) Photographs have a beauty of their own, but
(D) As a lifelike work,
(E) Some people just copy what they see;

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.



SECTION 6

Time — 25 minutes

18 Questions

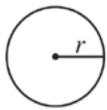
Turn to Section 6 (page 6) of your answer sheet to answer the questions in this section.

Directions: This section contains two types of questions. You have 25 minutes to complete both types. For questions 1-8, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratch work.

Notes

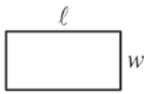
- The use of a calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
- Unless otherwise specified, the domain of any function f is assumed to be the set of all real numbers x for which $f(x)$ is a real number.

Reference Information

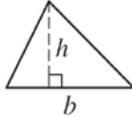


$$A = \pi r^2$$

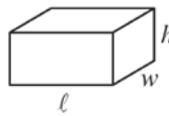
$$C = 2\pi r$$



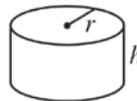
$$A = \ell w$$



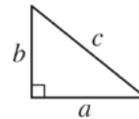
$$A = \frac{1}{2}bh$$



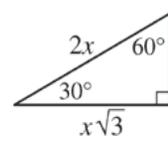
$$V = \ell wh$$



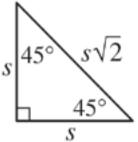
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



Special Right Triangles



The number of degrees of arc in a circle is 360.

The sum of the measures in degrees of the angles of a triangle is 180.

4, 11, 18, ...

1. In the sequence above, the first term is 4 and each term after the first is 7 more than the previous term. What is the 12th term of the sequence?

- (A) 77
(B) 81
(C) 84
(D) 86
(E) 92

2. If $(x - 2)^2 = 49$, then x could be

- (A) -9
(B) -7
(C) 2
(D) 5
(E) 9

3. The average (arithmetic mean) of t and y is 15, and the average of w and x is 15. What is the average of t , w , x , and y ?

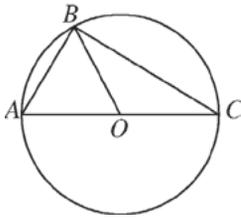
- (A) 7.5
(B) 15
(C) 22.5
(D) 30
(E) 60

GO ON TO THE NEXT PAGE



All of Kay's brothers can swim.

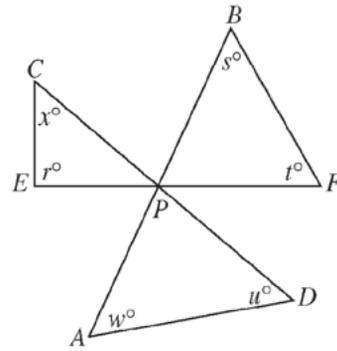
4. If the statement above is true, which of the following must also be true?
- (A) If Fred cannot swim, then he is not Kay's brother.
 (B) If Dave can swim, then he is not Kay's brother.
 (C) If Walt can swim, then he is Kay's brother.
 (D) If Pete is Kay's brother, then he cannot swim.
 (E) If Mark is not Kay's brother, then he cannot swim.



5. In the figure above, triangle ABC is inscribed in the circle with center O and diameter \overline{AC} . If $AB = AO$, what is the degree measure of $\angle ABO$?
- (A) 15°
 (B) 30°
 (C) 45°
 (D) 60°
 (E) 90°

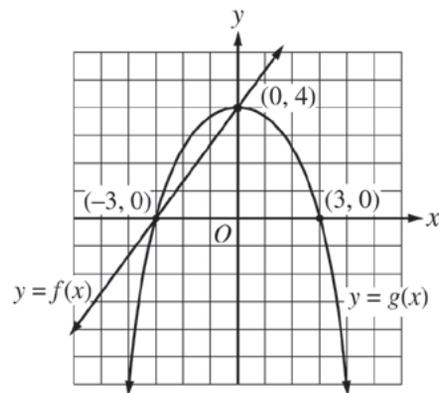
6. Each of the following is equivalent to $\frac{a}{b}(bc + k)$ EXCEPT

- (A) $a\left(\frac{c+k}{b}\right)$
 (B) $a\left(c + \frac{k}{b}\right)$
 (C) $\frac{a}{b}(k + bc)$
 (D) $ac + \frac{ak}{b}$
 (E) $\frac{abc + ak}{b}$



Note: Figure not drawn to scale.

7. In the figure above, \overline{AB} , \overline{CD} , and \overline{EF} intersect at P . If $r = 90$, $s = 50$, $t = 60$, $u = 45$, and $w = 50$, what is the value of x ?
- (A) 45
 (B) 50
 (C) 65
 (D) 75
 (E) It cannot be determined from the information given.



8. Based on the portions of the graphs of the functions f and g shown above, what are all values of x between -6 and 6 for which $g(x) > f(x)$?
- (A) $-6 < x < -3$ only
 (B) $-3 < x < 0$ only
 (C) $0 < x < 3$ only
 (D) $3 < x < 6$ only
 (E) $-6 < x < -3$ and $0 < x < 3$

GO ON TO THE NEXT PAGE



Directions: For Student-Produced Response questions 9-18, use the grids at the bottom of the answer sheet page on which you have answered questions 1-8.

Each of the remaining 10 questions requires you to solve the problem and enter your answer by marking the circles in the special grid, as shown in the examples below. You may use any available space for scratch work.

Write answer in boxes.

Answer: $\frac{7}{12}$

Fraction line

Grid in result.

Answer: 2.5

Decimal point

Answer: 201

Either position is correct.

Note: You may start your answers in any column, space permitting. Columns not needed should be left blank.

- Mark no more than one circle in any column.
- Because the answer sheet will be machine-scored, **you will receive credit only if the circles are filled in correctly.**
- Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately.
- Some problems may have more than one correct answer. In such cases, grid only one answer.
- No question has a negative answer.
- **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or $7/2$. (If $\frac{31}{2}$ is gridded, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)

- **Decimal Answers:** If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid. For example, if you obtain an answer such as 0.6666..., you should record your result as .666 or .667. **A less accurate value such as .66 or .67 will be scored as incorrect.**

Acceptable ways to grid $\frac{2}{3}$ are:

9. When her son's class held its magazine drive, Dr. Nelson bought 7 one-year magazine subscriptions for the waiting room in her office. She bought 4 subscriptions that have 12 issues per year, 2 subscriptions that have 4 issues per year, and 1 subscription that has 52 issues per year. Altogether, how many magazines will her office receive from these subscriptions?

10. Three more than twice a number is equal to 4. What is the number?

SALES OF BOOK *B*

	Total Number of Copies Sold
End of 1st week	3200
End of 2nd week	5500
End of 3rd week	6800
End of 4th week	7400
End of 5th week	7700

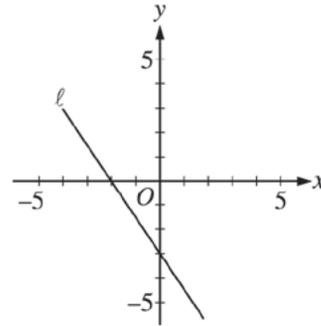
11. The table above shows the total number of copies of Book *B* that were sold by the end of each of the first 5 weeks of its publication. How many copies of the book were sold during the 3rd week of its publication?

12. If $\frac{j}{k} = 32$ and $k = \frac{3}{2}$, what is the value of $\frac{1}{2}j$?

$$\begin{aligned}x + y + 3z &= 600 \\x + y + z &= 400\end{aligned}$$

13. In the system of equations above, what is the value of $x + y$?

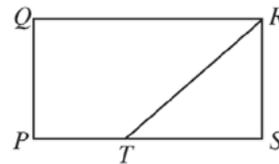
14. There are 25 trays on a table in the cafeteria. Each tray contains a cup only, a plate only, or both a cup and a plate. If 15 of the trays contain cups and 21 of the trays contain plates, how many contain both a cup and a plate?



15. In the figure above, line ℓ intersects the x -axis at $x = -2$ and the y -axis at $y = -3$. If line m (not shown) passes through the origin and is perpendicular to line ℓ , what is the slope of line m ?

16. If $6 < |x - 3| < 7$ and $x < 0$, what is one possible value of $|x|$?

17. What is the product of the smallest prime number that is greater than 50 and the greatest prime number that is less than 50?



18. In the figure above, $PQRS$ is a rectangle. The area of $\triangle RST$ is 7 and $PT = \frac{2}{5}PS$. What is the area of $PQRS$?

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.



SECTION 7
Time — 25 minutes
24 Questions

Turn to Section 7 (page 6) of your answer sheet to answer the questions in this section.

Directions: For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are five words or sets of words labeled A through E. Choose the word or set of words that, when inserted in the sentence, best fits the meaning of the sentence as a whole.

Example:

Hoping to ----- the dispute, negotiators proposed a compromise that they felt would be ----- to both labor and management.

- (A) enforce . . useful
- (B) end . . divisive
- (C) overcome . . unattractive
- (D) extend . . satisfactory
- (E) resolve . . acceptable

(A) (B) (C) (D) ●

1. Years of ----- lifting of heavy furniture had left him too ----- to be able to stand erect for long periods of time.
 - (A) profitable . . dumbfounded
 - (B) generous . . distracted
 - (C) onerous . . hesitant
 - (D) strenuous . . debilitated
 - (E) unstinting . . eminent
2. Canadian Lynn Johnston was named Cartoonist of the Year in 1985, the first woman to be so -----.
 - (A) inspired (B) entrusted (C) honored
 - (D) employed (E) refined
3. Because the photographer believed that wild animals should be ----- only in their various natural surroundings, she ----- often in her career.
 - (A) depicted . . traveled
 - (B) displayed . . spoke
 - (C) captured . . protested
 - (D) domesticated . . roamed
 - (E) represented . . publicized
4. Folk painter Grandma Moses has become such an enduring icon that many consider her ----- of America.
 - (A) an innovator (B) an emblem
 - (C) a successor (D) a detractor
 - (E) a lobbyist
5. Whether substances are medicines or poisons often depends on dosage, for substances that are ----- in small doses can be ----- in large.
 - (A) useless . . effective
 - (B) mild . . benign
 - (C) curative . . toxic
 - (D) harmful . . fatal
 - (E) beneficial . . miraculous
6. Critics dismissed the engineer's seemingly creative design as being -----, that is, underdeveloped and lacking in sophistication.
 - (A) defunct (B) unorthodox (C) simplistic
 - (D) erroneous (E) ambiguous
7. The professor commented to other faculty members that Sheila seemed temperamentally suited to the study of logic, given her ----- for ----- intricate arguments.
 - (A) sympathy . . influencing
 - (B) penchant . . evading
 - (C) disregard . . unhinging
 - (D) contempt . . following
 - (E) bent . . analyzing
8. While traveling near the Sun, the comet Hale-Bopp produced a ----- amount of dust, much more than the comets Halley or Hyakutake.
 - (A) voracious (B) disposable (C) redundant
 - (D) superficial (E) prodigious

GO ON TO THE NEXT PAGE 



The passages below are followed by questions based on their content; questions following a pair of related passages may also be based on the relationship between the paired passages. Answer the questions on the basis of what is stated or implied in the passages and in any introductory material that may be provided.

Questions 9-10 are based on the following passage.

Line Newspaper editor and political commentator Henry
Louis Mencken was a force of nature, brushing aside
all objects animal and mineral in his headlong rush
to the publicity that surely awaited him. He seized
5 each day, shook it to within an inch of its life, and
then gaily went on to the next. No matter where his
writing appeared, it was quoted widely, his pungently
outspoken opinions debated hotly. Nobody else could
make so many people so angry, or make so many others
10 laugh so hard.

9. In lines 4-5, the words “seized” and “shook” help establish which aspect of Mencken’s personality?
- (A) His code of honor
 - (B) His sense of humor
 - (C) His vindictiveness
 - (D) His intensity
 - (E) His petulance
10. The public response described in lines 6-8 most strongly suggests that Mencken’s writings were
- (A) authoritative
 - (B) controversial
 - (C) arrogant
 - (D) informal
 - (E) frivolous

Questions 11-12 are based on the following passage.

Line The ability to see the situation as your opponents see it,
as difficult as it may be, is one of the most important skills
that you can possess as a negotiator. You must know more
than simply that they see things differently. It is not
5 enough to study them like beetles under a microscope;
you need to know what it feels like to be a beetle. To
accomplish this you should be prepared to withhold
judgment as you “try on” their views. Your opponents
may well believe that their views are right as strongly
10 as you believe yours are.

11. The reference to beetles in lines 5-6 serves to suggest that
- (A) people need to be more attuned to their surroundings
 - (B) effective negotiation is more of a science than an art
 - (C) people can be made to do what they would prefer not to do
 - (D) effective negotiation requires identifying with a different viewpoint
 - (E) people feel uncomfortable when their actions are under scrutiny
12. The primary purpose of the passage is to
- (A) persuade people to defend their positions on critical issues
 - (B) indicate a specific ability that is useful in negotiation
 - (C) encourage people to be more accepting of others
 - (D) argue that few people are fit for the demands of negotiation
 - (E) suggest that negotiators should always seek consensus

GO ON TO THE NEXT PAGE 



Questions 13-24 are based on the following passages.

Passage 1 is from a 2003 book that examines the famous “I Have a Dream” speech delivered by Martin Luther King, Jr. at the historic March on Washington in August 1963. Passage 2 is from a 2000 biography of Martin Luther King, Jr. written by an African American scholar.

Passage 1

The ability of the “I Have a Dream” speech to highlight King’s early career at the expense of his later career accounts for the tone of impatience and betrayal that often appears when modern-day supporters of King’s agenda talk about the speech. Former Georgia state legislator Julian Bond said in 1986 that commemorations of King seemed to “focus almost entirely on Martin Luther King the dreamer, not on Martin King the antiwar activist, not on Martin King the challenger of the economic order, not on Martin King the opponent of apartheid, not on the complete Martin Luther King.” One King scholar has proposed a ten-year moratorium on reading or listening to the “I Have a Dream” speech, in the hopes that America will then discover the rest of King’s legacy.

This proposal effectively concedes that King’s magnificent address cannot be recovered from the misuse and overquotation it has suffered since his death. But it is not clear that this is so. Even now, upon hearing the speech, one is struck by the many forms of King’s genius. Many people can still remember the first time they heard “I Have a Dream,” and they tend to speak of that memory with the reverence reserved for a religious experience. At the very least, reflecting on the “I Have a Dream” speech should be an opportunity to be grateful for the astonishing transformation of America that the freedom movement wrought. In just under a decade, the civil rights movement brought down a system of segregation that stood essentially unaltered since Reconstruction. King’s dreams of an America free from racial discrimination are still some distance away, but it is astounding how far the nation has come since that hot August day in 1963. Segregation in the South has been dismantled; there are no longer “Whites Only” signs; segregationist governors do not try to prevent Black children from entering public schools. Toward the end of his life, King preached a sermon entitled “Ingratitude,” in which he called ingratitude “one of the greatest of all sins,” because the sinner “fail[s] to realize his dependence on others.” The annual Martin Luther King holiday is properly a day of national thanksgiving, a time for the nation to recognize the immense debt it owes to King and the thousands of heroes of the civil rights movement for saving the soul of America.

Passage 2

Martin Luther King was at his best when he was willing to reshape the wisdom of many of his intellectual predecessors. He ingeniously harnessed their ideas to his views to advocate sweeping social change. He believed that his early views on race failed to challenge America fundamentally. He later confessed that he had underestimated how deeply entrenched racism was in America. If Black Americans could not depend on goodwill to create social change, they had to provoke social change through bigger efforts at nonviolent direct action. This meant that Blacks and their allies had to obtain political power. They also had to try to restructure American society, solving the riddles of poverty and economic inequality.

This is not the image of King that is celebrated on Martin Luther King Day. Many of King’s admirers are uncomfortable with a focus on his mature beliefs. They seek to deflect unfair attacks on King’s legacy by shrouding him in the cloth of superhuman heroism. In truth, this shroud is little more than romantic tissue. King’s image has often suffered a sad fate. His strengths have been needlessly exaggerated, his weaknesses wildly overplayed. King’s true legacy has been lost to cultural amnesia. As a nation, we have emphasized King’s aspiration to save America through inspiring words and sacrificial deeds. Time and again we replay the powerful image of King standing on a national stage in the shadow of the Lincoln Memorial mouthing perhaps the most famous four words ever uttered by a Black American: “I have a dream.” For most Americans, those words capture King’s unique genius. They express his immortal longing for freedom, a longing that is familiar to every person who dares imagine a future beyond unjust laws and unfair customs. The edifying universality of those four words—who hasn’t dreamed, and who cannot identify with people whose dreams of a better world are punished with violence?—helps to explain their durability. But those words survive, too, because they comfort folk who would rather entertain the dreams of unfree people than confront their rage and despair.

13. The authors of both passages agree that King’s “I Have a Dream” speech

- (A) had significant global as well as national influence
- (B) has been imitated by many of King’s followers
- (C) had a profound impact on many Americans
- (D) was typical of King’s thought as a whole
- (E) questioned the ethical beliefs of many Americans

GO ON TO THE NEXT PAGE



14. It can be inferred that, for Julian Bond, a portrait of “the complete Martin Luther King” (lines 10-11) would
- (A) celebrate King’s influence both within and outside the United States
 - (B) acknowledge the logical lapses in some of King’s later work
 - (C) compare King with other significant figures of his era
 - (D) achieve a balance between King’s earlier concerns and his later ones
 - (E) reveal information about King’s personal as well as his public life
15. The author of Passage 2 would most likely view Julian Bond’s statement in lines 7-11 of Passage 1 with
- (A) outright disapproval
 - (B) considerable surprise
 - (C) cynical mistrust
 - (D) cautious optimism
 - (E) complete agreement
16. In line 17, “suffered” most nearly means
- (A) endured
 - (B) felt
 - (C) prolonged
 - (D) tolerated
 - (E) lamented
17. Lines 31-34 (“Segregation in . . . schools”) serve primarily to
- (A) express ambitious hopes for the future
 - (B) challenge the accuracy of historical accounts
 - (C) provide a contrast with other cultures
 - (D) illustrate a point with particular examples
 - (E) defend a series of unusual occurrences
18. The author of Passage 1 mentions the “sermon” (line 35) primarily in order to
- (A) show King’s effectiveness as a public speaker
 - (B) demonstrate the broad range of King’s interests
 - (C) illustrate an important trait that King possessed
 - (D) question King’s ability to empathize with others
 - (E) remind readers of a significant obligation to King
19. The author of Passage 2 would most likely characterize the view of King expressed in lines 38-42 of Passage 1 (“The annual . . . America”) as
- (A) contradictory
 - (B) insightful
 - (C) atypical
 - (D) simplistic
 - (E) arrogant
20. Lines 57-58 (“This is . . . Day”) mark a transition within Passage 2 from a
- (A) consideration of King’s views to a critique of people’s understanding of them
 - (B) challenge to King’s beliefs to an acceptance of their cultural resonance
 - (C) discussion of King’s intellectual predecessors to an analysis of his legacy
 - (D) celebration of King’s strengths to an examination of his weaknesses
 - (E) defense of King’s aspirations to an attack on those who fail to support them
21. Lines 76-79 in Passage 2 (“The edifying . . . durability”) are best described as
- (A) contesting the notion of King’s historical importance that is advanced by the author of Passage 1
 - (B) providing an explanation for the view of King’s speech that is expressed by the author of Passage 1
 - (C) challenging the portrait of the civil rights movement that is presented by the author of Passage 1
 - (D) offering a humorous anecdote that supports a statement made by the author of Passage 1
 - (E) dismissing a perspective that is similarly rejected by the author of Passage 1
22. Unlike the author of Passage 2, the author of Passage 1 develops his or her argument by
- (A) citing an authority with whom he or she disagrees
 - (B) referring to a famous speech delivered by King
 - (C) discussing the universal human trait of dreaming
 - (D) dismissing those who fail to understand the subtlety of King’s thought
 - (E) assuming that his or her readers are completely unfamiliar with King’s ideas



23. The author of Passage 2 would most likely argue that commemorations focus on “Martin Luther King the dreamer” (line 7 of Passage 1) because people find this aspect of King to be
- (A) courageous
 - (B) unpretentious
 - (C) reassuring
 - (D) provocative
 - (E) unexpected
24. Which best characterizes the overall relationship between the two passages?
- (A) Passage 2 rejects the political goals that are described in Passage 1.
 - (B) Passage 2 helps account for the responses to a speech discussed in Passage 1.
 - (C) Passage 2 romanticizes a person who is objectively depicted in Passage 1.
 - (D) Passage 2 recounts the history of a national holiday that is celebrated in Passage 1.
 - (E) Passage 2 reflects on a figure who is denounced in Passage 1.

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.



SECTION 8

Time — 20 minutes

16 Questions

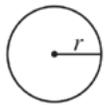
Turn to Section 8 (page 7) of your answer sheet to answer the questions in this section.

Directions: For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratch work.

Notes

- The use of a calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
- Unless otherwise specified, the domain of any function f is assumed to be the set of all real numbers x for which $f(x)$ is a real number.

Reference Information

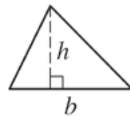


$$A = \pi r^2$$

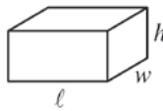
$$C = 2\pi r$$



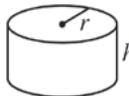
$$A = \ell w$$



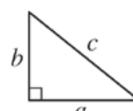
$$A = \frac{1}{2}bh$$



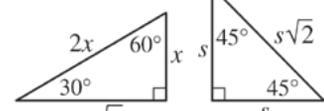
$$V = \ell wh$$



$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



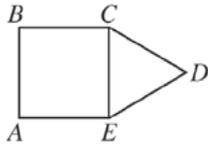
Special Right Triangles

The number of degrees of arc in a circle is 360.

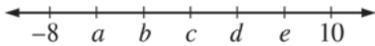
The sum of the measures in degrees of the angles of a triangle is 180.

- On Wednesday Heather ran 3 miles in 30 minutes. If she ran for 45 minutes at this rate on Thursday, how far did Heather run on Thursday?
 - 3.5 miles
 - 4 miles
 - 4.5 miles
 - 5 miles
 - 5.5 miles
- If $(2m)k = 6$, then $mk =$
 - 3
 - 4
 - 5
 - 6
 - 12
- If 3 times a number is equal to $\frac{3}{2}$, what is the number?
 - $\frac{1}{3}$
 - $\frac{1}{2}$
 - $\frac{2}{3}$
 - 2
 - 3

GO ON TO THE NEXT PAGE



4. In the figure above, CDE is an equilateral triangle and $ABCE$ is a square with an area of 1. What is the perimeter of polygon $ABCDE$?
- (A) 4
(B) 5
(C) 6
(D) 7
(E) 8



5. On the number line above, the tick marks are equally spaced and their coordinates are shown. Of these coordinates, which has the smallest positive value?
- (A) a
(B) b
(C) c
(D) d
(E) e

10, 18, 4, 15, 3, 21, x

6. If x is the median of the 7 numbers listed above, which of the following could be the value of x ?
- (A) 5
(B) 8
(C) 9
(D) 14
(E) 16

7. Two spheres, one with radius 7 and one with radius 4, are tangent to each other. If P is any point on one sphere and Q is any point on the other sphere, what is the maximum possible length of \overline{PQ} ?
- (A) 7
(B) 11
(C) 14
(D) 18
(E) 22

NUMBER OF PREMIUM MEMBERS

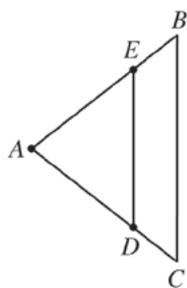
Year	2000	2001	2002
Store A	250	400	750
Store B	500	1,000	1,250

AVERAGE NUMBER OF VIDEO
RENTALS PER PREMIUM MEMBER
AT STORE B

Year	Rentals
2000	12
2001	15
2002	20

8. The first table above shows the number of premium members at two video rental stores, A and B , during the years 2000–2002. The second table shows the average (arithmetic mean) number of video rentals per premium member at store B during each of those years. Based on this information, which of the following best approximates the total number of video rentals by premium members at Store B during the years 2000–2002?
- (A) 24,000
(B) 46,000
(C) 58,000
(D) 70,000
(E) 130,000

GO ON TO THE NEXT PAGE



Note: Figure not drawn to scale.

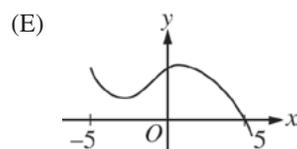
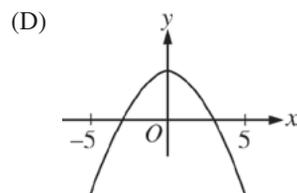
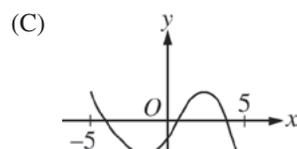
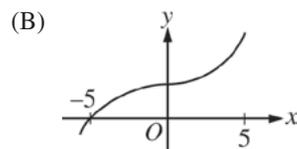
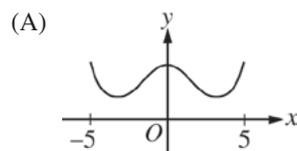
9. In $\triangle ABC$ above, $AB = AC$, E is the midpoint of \overline{AB} , and D is the midpoint of \overline{AC} . If $AE = x$ and $ED = 4$, what is length BC ?

- (A) 6
(B) 8
(C) $2x$
(D) $4x$
(E) $4x^2$

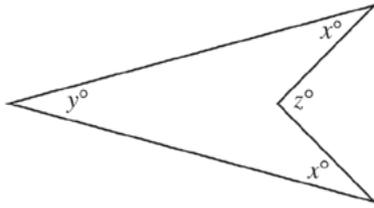
10. A student was given a piece of rope and told to cut it into two equal pieces, keep one piece, and pass the other piece to the next student. Each student was to repeat this process until every student in the class had exactly one piece of rope. Which of the following could be the fraction of the original rope that one of the students had?

- (A) $\frac{1}{14}$
(B) $\frac{1}{15}$
(C) $\frac{1}{16}$
(D) $\frac{1}{17}$
(E) $\frac{1}{18}$

11. Which of the following is the graph of a function f such that $f(x) = 0$ for exactly two values of x between -5 and 5 ?



GO ON TO THE NEXT PAGE



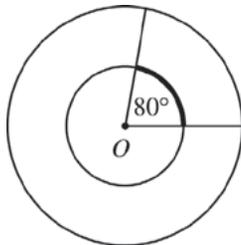
Note: Figure not drawn to scale.

12. If $x = 20$ and $y = 30$ in the figure above, what is the value of z ?

(A) 60
(B) 70
(C) 80
(D) 90
(E) 100

13. If x and y are integers, $7 < y < 16$, and $\frac{x}{y} = \frac{2}{5}$,
how many possible values are there for x ?

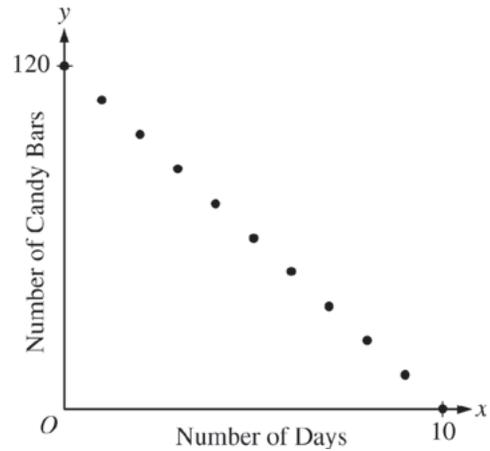
(A) One
(B) Two
(C) Three
(D) Four
(E) Five



14. Point O is the center of both circles in the figure above. If the circumference of the large circle is 36 and the radius of the small circle is half of the radius of the large circle, what is the length of the darkened arc?

(A) 10
(B) 8
(C) 6
(D) 4
(E) 2

GEORGE'S UNSOLD CANDY BARS



15. The graph above shows the number of George's unsold candy bars over a 10-day period. The points on the graph all lie on which of the following lines?

(A) $y = 10x - 120$
(B) $y = 10x + 120$
(C) $y = 12x - 120$
(D) $y = 120 - 10x$
(E) $y = 120 - 12x$

16. Let ∇x be defined as $x + \frac{1}{x}$ for all nonzero integers x . If $\nabla x = t$, where t is an integer, which of the following is a possible value of t ?

(A) 1
(B) 0
(C) -1
(D) -2
(E) -3

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.

**SECTION 9**

Time — 20 minutes

19 Questions

Turn to Section 9 (page 7) of your answer sheet to answer the questions in this section.**Directions:** For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are five words or sets of words labeled A through E. Choose the word or set of words that, when inserted in the sentence, best fits the meaning of the sentence as a whole.

Example:

Hoping to ----- the dispute, negotiators proposed a compromise that they felt would be ----- to both labor and management.

- (A) enforce . . useful
 (B) end . . divisive
 (C) overcome . . unattractive
 (D) extend . . satisfactory
 (E) resolve . . acceptable

(A) (B) (C) (D)

- The writer came to be labeled ----- because she isolated herself in her apartment, shunning outside contact.
 (A) a loner (B) a miser (C) a connoisseur
 (D) a conspirator (E) an ingenue
- Some Tibetan nomads used yak butter as a -----, one that often took the place of money in commercial transactions.
 (A) promotion (B) commodity (C) formula
 (D) refund (E) register
- Geysers vary widely: some may discharge -----, whereas others may have only a brief explosive eruption and then remain ----- for hours or days.
 (A) violently . . dangerous
 (B) continuously . . quiescent
 (C) spontaneously . . unpredictable
 (D) regularly . . active
 (E) faintly . . imperceptible
- Although the administration repeatedly threatened to use its authority in order to ----- the student protestors into submission, they refused to be intimidated.
 (A) ease (B) delude (C) cajole
 (D) bully (E) nudge
- Only after the campaign volunteers became aware of their candidate's questionable motives could they recognize the ----- statements made in his seemingly ----- speeches.
 (A) insightful . . astute
 (B) partisan . . callous
 (C) cordial . . hostile
 (D) duplicitous . . candid
 (E) cunning . . surreptitious
- No longer narrowly preoccupied with their own national pasts, historians are increasingly ----- in that they often take a transnational perspective.
 (A) conciliatory (B) bombastic (C) mendacious
 (D) cosmopolitan (E) jocular

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The passage below is followed by questions based on its content. Answer the questions on the basis of what is stated or implied in the passage and in any introductory material that may be provided.

Questions 7-19 are based on the following passage.

In the introduction to one of her dramas, a well-known playwright and actor discusses some of her ideas about acting.

Words have always held a particular power for me. I remember leafing through a book of Native American poems one morning while I was waiting for my Shakespeare class to begin and being struck by a phrase from the preface,
 Line 5 “The word, the word above all, is truly magical, not only by its meaning, but by its artful manipulation.”

This quote, which I added to my journal, reminded me of something my grandfather had told me when I was a girl: “If you say a word often enough it becomes your
 10 own.” I added that phrase to my journal next to the quote about the magic of words. When I traveled home to Baltimore for my grandfather’s funeral a year after my journal entry, I mentioned my grandfather’s words to my father. He corrected me. He told me that my grandfather
 15 had actually said, “If you say a word often enough, it becomes you.” I was still a student at the time, but I knew even then, even before I had made a conscious decision to teach as well as act, that my grandfather’s words would be important.

Actors are very impressionable people, or some would say, suggestible people. We are trained to develop aspects of our memories that are more emotional and sensory than intellectual. The general public often wonders how actors
 20 remember their lines. What’s more remarkable to me is how actors remember, recall, and reiterate feelings and sensations. The body has a memory just as the mind does. The heart has a memory, just as the mind does. The act of speech is a physical act. It is powerful enough that it can create, with the rest of the body, a kind of cooperative
 25 dance. That dance is a sketch of something that is inside a person, and not fully revealed by the words alone. I came to realize that if I were able to record part of the dance—that is, the spoken part—and reenact it, the rest of the body would follow. I could then create the illusion of being
 30 another person by reenacting something she had said *as she had said it*. My grandfather’s idea led me to consider that the reenactment, or the reiteration, of a person’s words would also teach me about that person.

I had been trained in the tradition of acting called
 40 “psychological realism.” A basic tenet of psychological realism is that characters live inside of you and that you create a lifelike portrayal of the character through a process of realizing your own similarity to the character. When I

later became a teacher of acting, I began to become more
 45 and more troubled by the self-oriented method. I began to look for ways to engage my students in putting themselves in other people’s shoes. This went against the grain of the psychological realism tradition, which was to get the character to walk in the *actor’s shoes*. It became less and less
 50 interesting intellectually to bring the dramatic literature of the world into a classroom of people in their late teens and twenties, and to explore it within the framework of their real lives. Aesthetically it seemed limited, because most of the time the characters all sounded the same. Most characters spoke somewhere inside the rhythmic range of the students. More troubling was that this method left an important bridge out of acting. The spirit of acting is the
 55 *travel* from the self to the other. This “self-based” method seemed to come to a spiritual halt. It saw the self as the ultimate home of the character. To me, the search for character is constantly in motion. It is a quest that moves back and forth between the self and the other.

I needed evidence that you could find a character’s psychological reality by “inhabiting” that character’s words. I
 60 needed evidence of the limitations of basing a character on a series of metaphors from an actor’s real life. I wanted to develop an alternative to the self-based technique, a technique that would begin with the other and come to the self, a technique that would empower the other to find the actor
 70 rather than the other way around.

7. The primary purpose of the first three paragraphs (lines 1-38) is to

- (A) describe the actor’s process of developing a role
- (B) trace the beginnings of a personal philosophy
- (C) analyze the grandfather’s insights into acting
- (D) investigate the effect of words on interpersonal relationships
- (E) explore a viewpoint that the author is forced to reverse

8. The author of the passage uses the quotation in lines 5-6 primarily as a

- (A) vivid expression of how she views words
- (B) powerful example of what she sought in Shakespeare
- (C) scholarly citation linking her to poetic words
- (D) comical introduction to a problem encountered by every dramatic performer
- (E) pragmatic assessment of the power of words for beginning drama students

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9. By presenting both versions of the grandfather's words (lines 9-10 and lines 15-16), the author primarily conveys the
- (A) grandfather's attempts to play with language
 - (B) grandfather's enthusiasm in spite of her reaction
 - (C) father's intervention in a private moment
 - (D) ambivalence she feels toward her grandfather
 - (E) significance of the grandfather's message
10. The comparisons in lines 26-27 serve primarily to
- (A) show the similarities that exist between dancing and acting
 - (B) celebrate the broad range of memories that actors learn to draw on
 - (C) justify the author's adherence to conventional acting theory
 - (D) explain why actors have difficulty interpreting character
 - (E) enhance the author's credibility as a technically trained actor
11. In lines 29-34 ("a kind . . . follow"), the author uses the idea of a dance to
- (A) supply an image for the awkwardness some actors experience
 - (B) illustrate a process that words can set in motion
 - (C) portray the enactment of a character as an exhilarating experience
 - (D) argue that acting requires physical agility
 - (E) show how a word can evoke multiple meanings
12. In line 34, "follow" most nearly means
- (A) pursue
 - (B) result
 - (C) surpass
 - (D) join in
 - (E) listen carefully
13. In lines 39-62, the author reveals herself to be someone who believes that
- (A) teachers and students should examine controversial issues together
 - (B) playwrights especially benefit from experience on stage
 - (C) conventional approaches should be open to questioning and reevaluation
 - (D) traditional methods often reflect the accumulated insight of generations
 - (E) standard practices are the most suitable to teach to beginners
14. Lines 39-70 present the author's argument primarily by
- (A) celebrating the appeal of a discredited tradition
 - (B) exploring the impact of her early experiences on her acting
 - (C) explaining her reasons for rejecting a technique
 - (D) describing challenges commonly met by professional actors
 - (E) analyzing insights gained from debates with other drama professors
15. The author's explanation in the fourth paragraph suggests that the "self-oriented method" (line 45) rests on the assumption that
- (A) audience members appreciate complex nuances of character
 - (B) the playwright's biography provides the main evidence for interpreting character
 - (C) actors have already felt the full range of human emotions
 - (D) actors are extremely independent and self-serving people
 - (E) actors' lives become fulfilled through their dramatic portrayals

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16. Which statement best captures the author’s point in lines 54-56 (“Most characters . . . students”)?
- (A) The characters spoke through the students’ own rich cadences.
 - (B) Young drama students have an uncanny knack for conveying character.
 - (C) Most students found class to be repetitious.
 - (D) Characterizations were confined by what the students knew.
 - (E) The spontaneity that the students had hoped for had not been achieved.
17. In line 60, the phrase “home of the character” most nearly means
- (A) way of understanding eccentricities
 - (B) social context surrounding a character
 - (C) environment for practicing acting
 - (D) forum in which the self is presented publicly
 - (E) source of a role’s psychological truth
18. In lines 63-64, “psychological reality” describes which quality?
- (A) The versatility of a performer
 - (B) The physical gestures of a character
 - (C) The essence of an identity
 - (D) The accuracy of an audience’s expectations
 - (E) The logical consistency of certain actions
19. The “metaphors” in line 66 are best described as
- (A) private misgivings
 - (B) objective observations
 - (C) abstract equations
 - (D) memorable phrases
 - (E) personal comparisons

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.



SECTION 10

Time — 10 minutes

14 Questions

Turn to Section 10 (page 7) of your answer sheet to answer the questions in this section.

Directions: For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

The following sentences test correctness and effectiveness of expression. Part of each sentence or the entire sentence is underlined; beneath each sentence are five ways of phrasing the underlined material. Choice A repeats the original phrasing; the other four choices are different. If you think the original phrasing produces a better sentence than any of the alternatives, select choice A; if not, select one of the other choices.

In making your selection, follow the requirements of standard written English; that is, pay attention to grammar, choice of words, sentence construction, and punctuation. Your selection should result in the most effective sentence—clear and precise, without awkwardness or ambiguity.

EXAMPLE:

Laura Ingalls Wilder published her first book and she was sixty-five years old then.

- (A) and she was sixty-five years old then
- (B) when she was sixty-five
- (C) at age sixty-five years old
- (D) upon the reaching of sixty-five years
- (E) at the time when she was sixty-five

(A) ● (C) (D) (E)

1. In everything from finding comets to spotting supernovae, amateur astronomers have become so accomplished, and professional astronomers sometimes seek their help.
 - (A) accomplished, and
 - (B) accomplished, also
 - (C) accomplished that
 - (D) accomplished therefore
 - (E) accomplished when
2. Since scientific advances are central to progress, basic research deserving continuing support.
 - (A) basic research deserving continuing support
 - (B) basic research being what deserves continuing support
 - (C) basic research deserves continuing support
 - (D) continuing support is deserved by basic research
 - (E) continuing support is what they deserve in basic research
3. With Americans consuming sugar in record amounts, nutritionists are urging the public to reduce its consumption of sodas, which have largely replaced other, more healthful, beverages.
 - (A) nutritionists are urging the public to reduce its consumption of sodas, which
 - (B) nutritionists have been urging that the public reduces its consumption of sodas; those
 - (C) the public ought to reduce its consuming of sodas, as urged by nutritionists, because they
 - (D) nutritionists urge about reducing public soda consumption, which
 - (E) less soda should be consumed by the public, urge nutritionists, which
4. Experts disagree about what is the definition of intelligence and how to measure it.
 - (A) what is the definition of intelligence and how to measure it
 - (B) how to define intelligence, and also its measurement
 - (C) how to define and measure intelligence
 - (D) defining intelligence as well as measurement
 - (E) the definition of intelligence and measuring it

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5. The charges against the organization are being investigated by a committee, it includes several senators.
- (A) committee, it includes
(B) committee; it including
(C) committee, and it will include
(D) committee, they include
(E) committee that includes
6. Travel writing often describes a journey of exploration and endurance, a trip that is risky either because of natural hazards but also because of political unrest.
- (A) but also because of
(B) but also due to
(C) or because there was
(D) or because of
(E) or the cause is
7. Though they had earlier indicated otherwise, it was eventually decided upon by the legislators to have the bill passed.
- (A) it was eventually decided upon by the legislators to have the bill passed
(B) it was eventually decided upon by the legislators to pass the bill
(C) the eventual decision of the legislators was for passage of the bill
(D) the legislators' eventual decision was passing the bill
(E) the legislators eventually decided to pass the bill
8. Spread by rat fleas, millions of people in medieval Europe were killed by bubonic plague.
- (A) millions of people in medieval Europe were killed by bubonic plague
(B) and millions of medieval Europeans killed by bubonic plague
(C) this led to the killing of millions of medieval Europeans by bubonic plague
(D) bubonic plague in medieval Europe was why millions of people were killed
(E) bubonic plague killed millions of people in medieval Europe
9. Traditional Jamaican music, enriched with rock, jazz, and other modern rhythms from America, were the basis for reggae.
- (A) were the basis for
(B) have been a basis for
(C) become the basis of
(D) was the basis for
(E) being the basis of
10. James Barrie, the author of *Peter Pan* and other plays, is noted for portraying adulthood as unpleasant and childhood is glorified.
- (A) childhood is glorified
(B) childhood as being glorious
(C) childhood as glorious
(D) childhood glorified
(E) glorified childhood
11. Medical insurance coverage that requires high monthly premiums and that is beyond the financial means of many people.
- (A) that requires high monthly premiums and that is
(B) that requires high monthly premiums and it is
(C) requiring high monthly premiums are
(D) with the requirements of high monthly premiums are
(E) that requires high monthly premiums is
12. Among the most flavorful cuisines in the United States, New Orleans has also become one of the most popular.
- (A) New Orleans has also become
(B) New Orleans has also become famous as
(C) the cuisine of New Orleans is also
(D) cuisines in New Orleans also have become
(E) also the cuisine of New Orleans is

GO ON TO THE NEXT PAGE 



13. Meals prepared by the Algonquin Indians, who were farmers as well as hunters, included more maize and pumpkin than other Indian tribes.
- (A) pumpkin than other Indian tribes
 - (B) pumpkin than did those prepared by other Indian tribes
 - (C) pumpkin than that which other Indian tribes did
 - (D) pumpkin, and this was not the same as other Indian tribes
 - (E) pumpkin; and other Indian tribes did not prepare meals in this way

14. Born of Ibuza parents in Nigeria, novelist Buchi Emecheta moved to England in 1962, since which she has lived in North London.
- (A) 1962, since which she has lived in North London
 - (B) 1962 and has lived since then in North London
 - (C) 1962, since then she has lived in North London
 - (D) 1962 and lived since then in North London
 - (E) 1962, and living in North London since that time

S T O P

**If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.**

Correct Answers and Difficulty Levels for the Official SAT Practice Test

Critical Reading

Section 3					Section 7					Section 9							
COR. DIFF.		COR. DIFF.			COR. DIFF.		COR. DIFF.			COR. DIFF.		COR. DIFF.					
ANS.	LEV.	ANS.	LEV.		ANS.	LEV.	ANS.	LEV.		ANS.	LEV.	ANS.	LEV.				
1.	E	1	13.	E	2	1.	D	1	13.	C	3	1.	A	1	11.	B	2
2.	A	1	14.	D	3	2.	C	1	14.	D	3	2.	B	2	12.	D	2
3.	B	3	15.	C	5	3.	A	2	15.	E	3	3.	B	3	13.	C	3
4.	A	3	16.	B	3	4.	B	2	16.	A	3	4.	D	4	14.	C	3
5.	A	5	17.	E	4	5.	C	2	17.	D	2	5.	D	4	15.	C	4
6.	E	1	18.	A	2	6.	C	3	18.	E	5	6.	D	5	16.	D	3
7.	E	3	19.	D	5	7.	E	4	19.	D	5	7.	B	3	17.	E	4
8.	C	3	20.	C	3	8.	E	5	20.	A	3	8.	A	3	18.	C	3
9.	C	2	21.	E	5	9.	D	2	21.	B	4	9.	E	1	19.	E	3
10.	A	3	22.	E	3	10.	B	1	22.	A	5	10.	B	3			
11.	D	3	23.	E	4	11.	D	1	23.	C	4						
12.	C	3	24.	B	4	12.	B	3	24.	B	4						

Number correct _____

Number incorrect _____

Mathematics

Section 2					Section 6					Section 8							
COR. DIFF.		COR. DIFF.			Multiple-Choice Questions		Student-Produced Response Questions			COR. DIFF.		COR. DIFF.					
ANS.	LEV.	ANS.	LEV.		COR. DIFF.	ANS.	COR.	DIFF.		ANS.	LEV.	ANS.	LEV.				
1.	C	1	11.	C	3	1.	B	1	9.	108		1.	C	1	9.	B	4
2.	C	1	12.	C	3	2.	E	1	10.	1/2 or .5		2.	A	1	10.	C	3
3.	E	1	13.	D	4	3.	B	3	11.	1300		3.	B	1	11.	D	3
4.	A	2	14.	C	4	4.	A	2	12.	24		4.	B	2	12.	B	4
5.	B	1	15.	B	3	5.	D	3	13.	300		5.	C	2	13.	B	3
6.	C	2	16.	D	2	6.	A	4	14.	11		6.	D	2	14.	D	4
7.	B	2	17.	A	4	7.	C	3	15.	2/3, .666, or .667		7.	E	3	15.	E	5
8.	A	2	18.	B	4	8.	B	4	16.	3 < x < 4		8.	B	3	16.	D	5
9.	E	3	19.	C	5				17.	2491							
10.	C	3	20.	A	5				18.	70/3 or 23.3							

Number correct _____

Number incorrect _____

Writing

Section 5					Section 10															
COR. DIFF.		COR. DIFF.			COR. DIFF.		COR. DIFF.			COR. DIFF.										
ANS.	LEV.	ANS.	LEV.		ANS.	LEV.	ANS.	LEV.		ANS.	LEV.									
1.	A	1	10.	E	5	19.	D	2	28.	D	5	1.	C	1	6.	D	2	11.	E	3
2.	D	1	11.	A	5	20.	E	3	29.	D	5	2.	C	1	7.	E	2	12.	C	4
3.	D	1	12.	B	1	21.	E	4	30.	A	3	3.	A	2	8.	E	3	13.	B	5
4.	A	2	13.	E	2	22.	A	3	31.	D	2	4.	C	2	9.	D	3	14.	B	4
5.	C	1	14.	C	1	23.	E	3	32.	E	3	5.	E	1	10.	C	3			
6.	C	3	15.	B	1	24.	D	4	33.	B	3									
7.	B	2	16.	C	1	25.	C	4	34.	A	3									
8.	E	3	17.	C	3	26.	D	5	35.	A	2									
9.	D	3	18.	C	3	27.	D	5												

Number correct _____

Number incorrect _____



Get a score report and answer explanations! Enter your answers online at collegeboard.org/satpracticetest.

NOTE: Difficulty levels are estimates of question difficulty for a reference group of college-bound seniors. Difficulty levels range from 1 (easiest) to 5 (hardest).

Scoring the Essay

Essays are scored in a manner that is fair and consistent, using a holistic approach. In holistic scoring, a piece of writing is considered as a total work, the whole of which is greater than the sum of its parts. Essays are scored by experienced high school teachers and college faculty members. The majority of essay readers teach English, composition, or language arts courses. Each essay is scored independently by two readers on a scale of 1 to 6, with 6 being the highest score. The combined score for both readers will range from 2 to 12. If the two readers' scores are more than one point apart, a third reader resolves the discrepancy.

In scoring the essays, readers follow the scoring guide below.

The scoring guide describes the features typically found in essays at each score point, including critical thinking, development, organization, language use, and sentence structure. A student can get a top score on the essay even with minor errors in grammar, usage, and mechanics. The SAT essay neither rewards nor penalizes formulaic approaches to writing, such as the five-paragraph essay.

There is no formula for effective writing, no single best way to communicate an idea. Any essay that features clear lines of reasoning, appropriate choices of evidence, ample development of ideas, effective organization, and precise use of language will receive a high score, regardless of style or approach. Readers are trained to recognize and reward a wide variety of essays at each score point.

SAT ESSAY Scoring Guide

SCORE OF 6	SCORE OF 5	SCORE OF 4
An essay in this category demonstrates <i>clear and consistent mastery</i> , although it may have a few minor errors. A typical essay	An essay in this category demonstrates <i>reasonably consistent mastery</i> , although it will have occasional errors or lapses in quality. A typical essay	An essay in this category demonstrates <i>adequate mastery</i> , although it will have lapses in quality. A typical essay
<ul style="list-style-type: none"> effectively and insightfully develops a point of view on the issue and demonstrates outstanding critical thinking, using clearly appropriate examples, reasons, and other evidence to support its position 	<ul style="list-style-type: none"> effectively develops a point of view on the issue and demonstrates strong critical thinking, generally using appropriate examples, reasons, and other evidence to support its position 	<ul style="list-style-type: none"> develops a point of view on the issue and demonstrates competent critical thinking, using adequate examples, reasons, and other evidence to support its position
<ul style="list-style-type: none"> is well organized and clearly focused, demonstrating clear coherence and smooth progression of ideas 	<ul style="list-style-type: none"> is well organized and focused, demonstrating coherence and progression of ideas 	<ul style="list-style-type: none"> is generally organized and focused, demonstrating some coherence and progression of ideas
<ul style="list-style-type: none"> exhibits skillful use of language, using a varied, accurate, and apt vocabulary 	<ul style="list-style-type: none"> exhibits facility in the use of language, using appropriate vocabulary 	<ul style="list-style-type: none"> exhibits adequate but inconsistent facility in the use of language, using generally appropriate vocabulary
<ul style="list-style-type: none"> demonstrates meaningful variety in sentence structure 	<ul style="list-style-type: none"> demonstrates variety in sentence structure 	<ul style="list-style-type: none"> demonstrates some variety in sentence structure
<ul style="list-style-type: none"> is free of most errors in grammar, usage, and mechanics 	<ul style="list-style-type: none"> is generally free of most errors in grammar, usage, and mechanics 	<ul style="list-style-type: none"> has some errors in grammar, usage, and mechanics
SCORE OF 3	SCORE OF 2	SCORE OF 1
An essay in this category demonstrates <i>developing mastery</i> , and is marked by ONE OR MORE of the following weaknesses:	An essay in this category demonstrates <i>little mastery</i> , and is flawed by ONE OR MORE of the following weaknesses:	An essay in this category demonstrates <i>very little or no mastery</i> , and is severely flawed by ONE OR MORE of the following weaknesses:
<ul style="list-style-type: none"> develops a point of view on the issue, demonstrating some critical thinking, but may do so inconsistently or use inadequate examples, reasons, or other evidence to support its position 	<ul style="list-style-type: none"> develops a point of view on the issue that is vague or seriously limited, and demonstrates weak critical thinking, providing inappropriate or insufficient examples, reasons, or other evidence to support its position 	<ul style="list-style-type: none"> develops no viable point of view on the issue, or provides little or no evidence to support its position
<ul style="list-style-type: none"> is limited in its organization or focus, or may demonstrate some lapses in coherence or progression of ideas 	<ul style="list-style-type: none"> is poorly organized and/or focused, or demonstrates serious problems with coherence or progression of ideas 	<ul style="list-style-type: none"> is disorganized or unfocused, resulting in a disjointed or incoherent essay
<ul style="list-style-type: none"> displays developing facility in the use of language, but sometimes uses weak vocabulary or inappropriate word choice 	<ul style="list-style-type: none"> displays very little facility in the use of language, using very limited vocabulary or incorrect word choice 	<ul style="list-style-type: none"> displays fundamental errors in vocabulary
<ul style="list-style-type: none"> lacks variety or demonstrates problems in sentence structure 	<ul style="list-style-type: none"> demonstrates frequent problems in sentence structure 	<ul style="list-style-type: none"> demonstrates severe flaws in sentence structure
<ul style="list-style-type: none"> contains an accumulation of errors in grammar, usage, and mechanics 	<ul style="list-style-type: none"> contains errors in grammar, usage, and mechanics so serious that meaning is somewhat obscured 	<ul style="list-style-type: none"> contains pervasive errors in grammar, usage, or mechanics that persistently interfere with meaning

Essays not written on the essay assignment will receive a score of zero.

Scoring the Official SAT Practice Test

To have your score calculated automatically, go to www.collegeboard.org/satpracticetest. You'll receive:

- A detailed score report
- Answer explanations

To calculate your score on paper, check your responses with the correct answers on page 80. Fill in the blanks below and do the calculations to get your mathematics, critical reading, and writing raw scores. Use the tables on pages 83–84 to find your scaled scores.

Get Your Critical Reading Score

How many critical reading questions did you get **right**?

Section 3: Questions 1–24 _____

Section 7: Questions 1–24 + _____

Section 9: Questions 1–19 + _____

Total = _____ (A)

How many critical reading questions did you get **wrong**?

Section 3: Questions 1–24 _____

Section 7: Questions 1–24 + _____

Section 9: Questions 1–19 + _____

Total = _____

$\times 0.25 =$ _____ (B)

A – B = _____
Critical Reading
Raw Score

Round the critical reading raw score to the nearest whole number.

Use the table on page 83 to find your critical reading scaled score.

Get Your Mathematics Score

How many mathematics questions did you get **right**?

Section 2: Questions 1–20 _____

Section 6: Questions 1–8 + _____

Section 8: Questions 1–16 + _____

Total = _____ (A)

How many **multiple-choice** mathematics questions did you get **wrong**?

Section 2: Questions 1–20 _____

Section 6: Questions 1–8 + _____

Section 8: Questions 1–16 + _____

Total = _____

$\times 0.25 =$ _____ (B)

A – B = _____
Mathematics Raw Score

Round the mathematics raw score to the nearest whole number.

Use the table on page 83 to find your mathematics scaled score.

Get Your Writing Score

How many multiple-choice writing questions did you get **right**?

Section 5: Questions 1–35 _____

Section 10: Questions 1–14 + _____

Total = _____ (A)

How many multiple-choice writing questions did you get **wrong**?

Section 5: Questions 1–35 _____

Section 10: Questions 1–14 + _____

Total = _____

$\times 0.25 =$ _____ (B)

A – B = _____
Writing Multiple-Choice
Raw Score

Round the writing multiple-choice raw score to the nearest whole number.

_____ (C)

Use the table on page 83 to find your writing multiple-choice scaled score.

Estimate your essay score using the Essay Scoring Guide on page 81.

_____ $\times 2 =$ _____ (D)

Use the table on page 84, your multiple-choice raw score (C), and your essay score (D) to find your writing composite scaled score.

SAT Score Conversion Table

Raw Score	Critical Reading Scaled Score	Math Scaled Score	Writing Multiple-Choice Scaled Score*	Raw Score	Critical Reading Scaled Score	Math Scaled Score	Writing Multiple-Choice Scaled Score*
67	800			31	500	550	55
66	800			30	500	540	54
65	800			29	490	540	53
64	790			28	480	530	52
63	770			27	480	520	51
62	760			26	470	510	50
61	740			25	460	500	49
60	730			24	460	490	48
59	720			23	450	480	47
58	700			22	440	480	46
57	690			21	440	470	45
56	680			20	430	460	44
55	670			19	420	450	43
54	670	800		18	410	440	42
53	660	790		17	410	430	41
52	650	760		16	400	420	40
51	640	740		15	390	420	39
50	630	720		14	380	410	38
49	620	710	80	13	380	400	38
48	620	700	78	12	370	390	37
47	610	690	75	11	360	380	36
46	600	680	73	10	350	370	35
45	600	670	71	9	340	360	34
44	590	660	70	8	330	350	33
43	580	650	68	7	320	330	32
42	570	640	67	6	310	320	31
41	570	640	66	5	300	310	30
40	560	630	64	4	290	290	29
39	550	620	63	3	270	280	27
38	550	610	62	2	260	260	26
37	540	600	61	1	240	240	24
36	530	590	60	0	220	220	22
35	530	590	59	-1	210	200	20
34	520	580	58	-2	200	200	20
33	520	570	57	and			
32	510	560	56	below			

This table is for use only with the test in this booklet.

* The writing multiple-choice score is reported on a scale of 20–80. Use the table on page 84 for the writing composite scaled score.

SAT Writing Composite Score Conversion Table

Writing MC Raw Score	Essay Raw Score											
	12	11	10	9	8	7	6	5	4	3	2	0
49	800	800	800	790	770	750	740	720	710	700	680	670
48	800	800	780	760	740	720	710	690	680	670	650	640
47	790	770	760	740	720	700	690	670	660	640	630	620
46	770	750	740	720	700	680	670	650	640	630	610	600
45	760	740	720	710	690	670	650	640	630	610	590	580
44	740	730	710	700	670	660	640	620	610	600	580	570
43	730	720	700	680	660	640	630	610	600	590	570	560
42	720	700	690	670	650	630	620	600	590	570	560	550
41	710	690	680	660	640	620	610	590	580	560	550	540
40	700	680	670	650	630	610	600	580	570	550	540	530
39	690	680	660	640	620	600	590	570	560	550	530	520
38	680	670	650	630	610	600	580	560	550	540	520	510
37	670	660	640	630	610	590	570	550	540	530	510	500
36	660	650	630	620	600	580	560	550	530	520	500	490
35	660	640	620	610	590	570	550	540	530	510	490	480
34	650	630	620	600	580	560	550	530	520	500	490	480
33	640	620	610	590	570	550	540	520	510	490	480	470
32	630	620	600	580	560	540	530	510	500	490	470	460
31	620	610	590	580	550	540	520	500	490	480	460	450
30	610	600	580	570	550	530	510	500	480	470	450	440
29	610	590	570	560	540	520	500	490	480	460	440	430
28	600	580	570	550	530	510	490	480	470	450	440	430
27	590	570	560	540	520	500	490	470	460	440	430	420
26	580	570	550	530	510	490	480	460	450	440	420	410
25	570	560	540	530	500	490	470	450	440	430	410	400
24	560	550	530	520	500	480	460	450	430	420	400	390
23	560	540	520	510	490	470	450	440	430	410	390	380
22	550	530	520	500	480	460	450	430	420	400	390	380
21	540	520	510	490	470	450	440	420	410	390	380	370
20	530	520	500	480	460	440	430	410	400	390	370	360
19	520	510	490	480	460	440	420	410	390	380	360	350
18	520	500	480	470	450	430	410	400	390	370	350	340
17	510	490	480	460	440	420	410	390	380	360	350	340
16	500	490	470	450	430	410	400	380	370	360	340	330
15	490	480	460	450	430	410	390	370	360	350	330	320
14	490	470	450	440	420	400	380	370	360	340	320	310
13	480	460	450	430	410	390	380	360	350	330	320	310
12	470	460	440	420	400	380	370	350	340	330	310	300
11	460	450	430	420	400	380	360	350	330	320	300	290
10	460	440	420	410	390	370	350	340	330	310	290	280
9	450	430	420	400	380	360	350	330	320	300	290	280
8	440	430	410	390	370	350	340	320	310	300	280	270
7	430	420	400	390	360	350	330	310	300	290	270	260
6	420	410	390	380	360	340	320	310	290	280	260	250
5	410	400	380	370	350	330	310	300	280	270	250	240
4	400	390	370	360	340	320	300	290	270	260	240	230
3	390	380	360	350	330	310	290	280	260	250	230	220
2	380	370	350	330	310	290	280	260	250	240	220	210
1	370	350	340	320	300	280	260	250	240	220	210	200
0	350	340	320	300	280	260	250	230	220	210	200	200
-1	330	320	300	290	270	250	230	220	200	200	200	200
-2	310	300	280	270	250	230	210	200	200	200	200	200
-3 and below	310	290	280	260	240	220	210	200	200	200	200	200

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