

PRECISION

TEST PREP

Better Teachers. Better Value. Better Results.

SAT & ACT TIPS AND TRICKS

A FOLLOW-UP TO YOUR PRACTICE TEST

The following information is based solely on our experience teaching and tutoring the SAT and ACT. It is important to note that there is no cookie-cutter approach to success on the SAT or ACT. The tips and tricks shown in this ebook come from years of experience and will work only if the student practices them. However, once a student has a good grasp of the subject matter, these tips and tricks can help to ensure higher scores on both the SAT and the ACT.

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What is tested on the SAT and ACT?

On the surface, the SAT and ACT are standardized tests that assess students' proficiency in reading, grammar, math, and writing.

However, the SAT and ACT are assessing much more than just those skills...

And this is what makes up the difference between an average score and an incredible score.

In order for a student to succeed on the SAT and/or ACT, he or she needs to know:

- ⇒ how to take a test.
- ⇒ how read for comprehension.
 - ⇒ the basics of grammar.
 - ⇒ proper writing structure.
- ⇒ how to use a calculator correctly.
 - ⇒ how to reason and use logic.
 - ⇒ how to study.

What is the SAT?

SAT stands for Scholastic Aptitude Test. This test has been administered since 1926 and has gone through several variations. Recently, the College Board (the makers of the SAT), changed the test, though my experience with the many iterations of SAT tells me that it is fair, and if anything, has numerous positives over the last version.

The current SAT is designed as follows:

Students start off with a 65 minute, 52 question **Reading section**. There are 5 passages in total, with one group of questions pertaining to a "paired passage." Additionally, there are some graphs and/or charts that pertain to some of the passages. Vocabulary-in-context has replaced the archaic vocabulary that the SAT was famous for.

The test then shifts to the **Writing and Language section**. This section is 35 minutes and 44 questions. Proficiency in grammar, a good understanding of structure, and good reading skills are essential to success here. If the test taker has little experience with grammar, it is absolutely critical that this is addressed immediately. A good tutor can show a student creative ways to learn the rules of grammar, especially which rules are tested more than others, and when to expect to see these on the test. In my experience, I have seen tremendous jumps in scores on the grammar section of

tests like the SAT and ACT because most students have a very weak foundation in grammar.

The **Math section** is up next. The Math section is really two separate sections that go together. The first part of the Math section is 25 minutes long. Students answer 15 multiple choice questions and 5 "grid-ins," in which they write in and bubble their answers. However, students can't use calculators on this part. Then, students take the next Math section. This part is 55 minutes long, consisting of 30 multiple choice questions and 8 grid-ins. Included in these 8 grid-ins is an "Extended Thinking" question. An "Extended Thinking" question is longer, word problem type question. Students can use a calculator on this section. I can't stress enough how important it is for the test taker to not only feel comfortable with the calculator, but how to use it to his or her advantage. The ability to use a calculator properly is a skill that tutors must cover because time can be an issue on this section. Knowing how to maneuver through a problem with a calculator is an important skill for a test taker to have.

Next up is the **Essay section**. The Essay section concludes the SAT. This section is optional, but unless you know which schools you are applying to (and if these schools require or do not require the essay), you have to take it. The last thing you want is to find out that a college

What is the SAT?

you are applying to requires the essay and that you didn't take it.

As an English teacher, I like the new version of the essay. The task is tied much closer to what students do in school than it has been in the past. Students are given an article, speech, document, etc. and have to show how the author persuades the reader towards his or her point. Students have 50 minutes for the task, and when they embrace the writing process, can really excel.

Yet, students who struggle with writing analytical essays or haven't encountered this style essay need to meet with

someone who can help them. Since the essay may count, students need to approach this as not only counting for, but possibly against them, especially if the essay score is poor. The good news? ***This essay is very teachable.***

Scores on the SAT are out of 1600. The Reading and Writing & Language sections are counted together out of 800 and the Math section is counted on its own out of 800 as well. The Essay section is scored and counted separately.



SAT[®]

What is superscoring?

Super Scoring involves colleges taking your two best scores from different tests and combining them. This becomes your score.

Can I superscore my SAT scores?

The majority of schools Super Score your SAT scores.

What is the ACT?

The American College Test--more commonly known as the ACT--is another test that colleges consider for acceptance. The ACT has been offered since 1959, but has only recently gained traction among students on the East Coast. The issue I have found with the ACT is that parents and students mistakenly believe that the ACT is easier than the SAT and only take the ACT. This is a mistake in my opinion. The ACT *could* be easier for some students just as the SAT *could* be easier for others. Yet, simply choosing the ACT over the SAT is in my opinion a mistake.

The ACT has four main sections and one optional essay. Depending on breaks given by the proctor, students can expect this test to last for up to four hours.

The test starts off with a 75 question grammar test known as the **English section**. Students are allotted 45 minutes for this section. Students are tasked with editing five essays in the allotted time. Like the SAT, which copied the ACT almost exactly to create the SAT Writing and Language section, students need to be proficient in grammar, reading, and time management to be successful. The problem with the ACT English section is that most students have not been taught enough grammar in school to consider themselves proficient. As a result, students may find this section very challenging and likely need a good tutor to not review, but actually teach, the necessary skills. The good thing is that like the

SAT Writing and Language section, I have found that students typically make exceptional progress on this section once they have learned the basics *and* understand the questions.

The English section is followed by the **Math section**, which is made up of 60 questions to be answered in 60 minutes. This section is roughly broken into three parts that I like to call easy, medium, and hard. However, the "easy" section is by no means easy. This chunk of questions covers more basic math such as addition, subtraction, multiplication, and division. The second twenty or so questions are more difficult and begin to cover tougher concepts. The last twenty or so questions take much more time and require a stronger understanding of mathematics. Students are sure to find geometry and trigonometry towards the end of the section. Students can use a calculator to assist them. Similar to the SAT Math section, knowing how to use a calculator to your advantage is an integral part of this section.

Next, students turn to the **Reading section**, which is 35 minutes long and consists of four, 10 question passages. Unlike the SAT, the vocabulary is not as sophisticated, but the limited amount of time makes this section very difficult to complete. Additionally, the questions are randomized, so, unlike the SAT, students have a hard time figuring out where to look for the answers unless

What is the ACT?

they know where to look.

The next section is the **Science section**. In essence, this is an extension of the Reading section and requires no real science background. Although called Science, this section ***is really a reading test***. Picture a lab you worked on in biology, earth science, chemistry, or physics class. Students are given a page or so of an experiment or lab write-up, complete with background information, graphs, and charts. Students have to quickly maneuver five to seven of these lab write-ups and answer 40 questions in only 35 minutes. Students are almost always fatigued at this point, and this makes the section that much harder.

The test concludes with the optional **Writing Test**. Students are given a prompt about a topic that is fairly

universal. As part of the task, students have to evaluate multiple perspectives within a 40-minute time frame, figure out positives and negatives for each perspective, and either side with one of the perspectives or develop their own. To say the least, it's complicated! Ability to analyze, think critically, and plan are highly valued on this section.

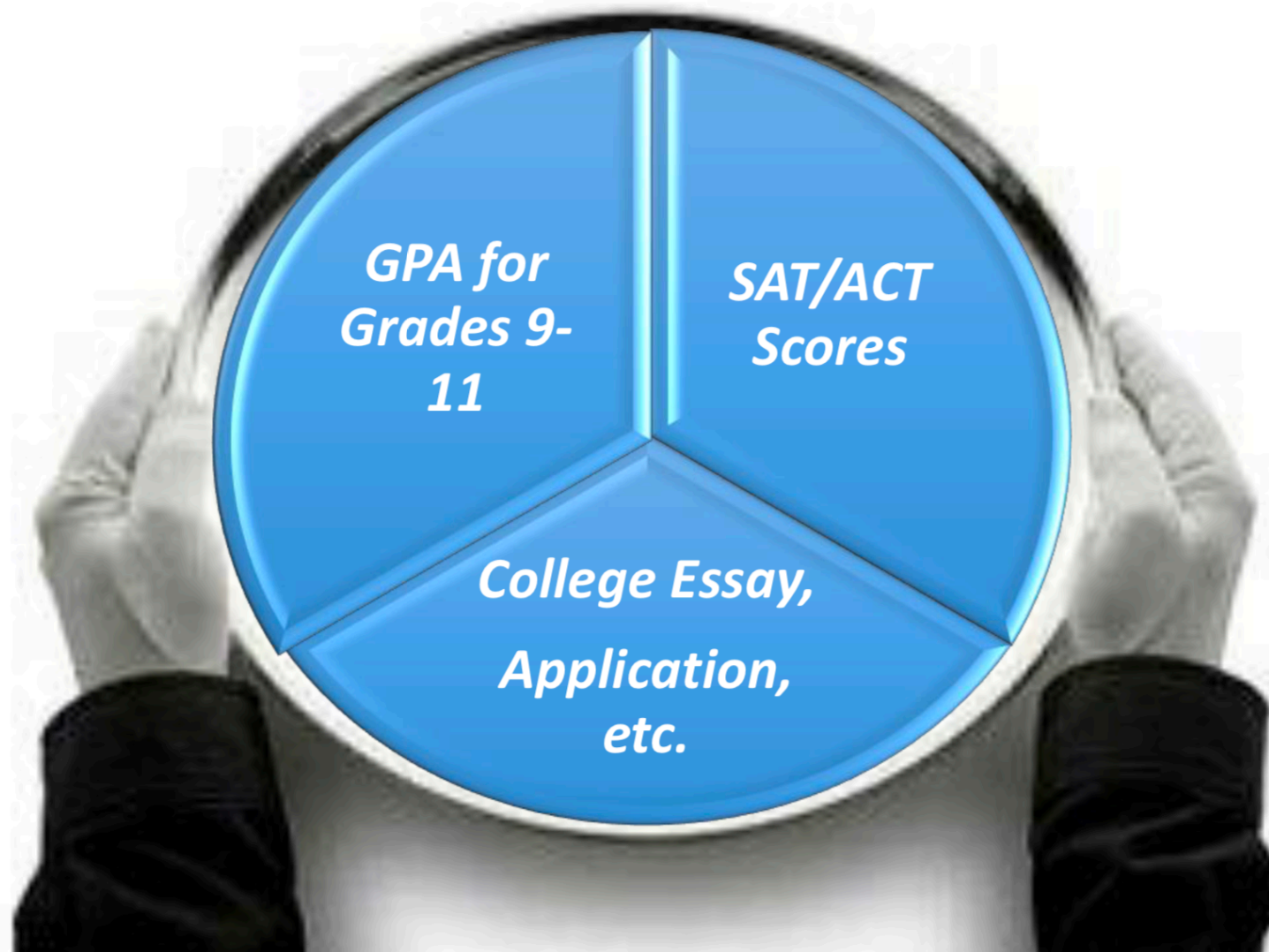
Each section is scored out of 36. How the test makers arrived at this number, I have no idea, though it is easy to score when you know the formula. What I do know is that each question answered incorrectly damages a student's score very quickly. I consider the ACT a reading test with a math section and an optional essay, and the ability to read and process information quickly is extremely important.



Can I superscore my ACT scores?

More and more colleges are beginning to Super Score the ACT, so there is no one answer. It depends on where you are applying.

When applying to college, how much do my SAT and ACT scores weigh compared to my grades?



When should you take the SAT and ACT?

Let's envision the future...

You have already been accepted to college.

Think about how happy you are.

Now, think about the course of action it took to get to that point.

Back track through the year or two...

Questions to consider:

When was the SAT and/or ACT taken?

What times of the school year are historically the best times for you?

What time(s) of the year did you avoid because historically those were stressful or busy times?

When did you start preparation?

Did you take AP classes?

Did you play any sports?

Don't take the test because everyone else says this is the test you should take.

Don't take a test at a specific time because everyone else is.

Only you know yourself, your tendencies, and your schedule.

In the end, the best time for you to take the SAT and/or ACT is when you are ready.

What are test-taking skills?

Test-taking skills are the ability to:

- ⇒ find answers using what you are given *and* not given.
- ⇒ reason through difficult concepts.
- ⇒ think logically.
- ⇒ control (and preferably eliminate) your emotions during the test.
- ⇒ understand that there is only 1 right answer per question.
- ⇒ eliminate any words in questions that make it appear that there is more than one answer.
- ⇒ sift through the unnecessary information to find what you really need.
- ⇒ manage your time.
- ⇒ use a calculator to your advantage.
- ⇒ speak the language of the test.

How can you improve your test-taking skills?

You can improve your test-taking skills by:

- ⇒ reading more. You don't have to read books to read more, but you can't excel on a reading test if you aren't a proficient reader.
- ⇒ improving your math skills. You can't excel on a math test if you don't have the necessary mathematical skills.
- ⇒ remembering that you are taking a test, which means that human beings created it.
- ⇒ learning to listen to *and* trust your gut.
- ⇒ practicing logical thinking.
- ⇒ learning how to use your calculator to your advantage.
- ⇒ understanding the difference between reading and reading comprehension.
- ⇒ learning to limit (and hopefully eliminate) emotion when making decisions on a test.
- ⇒ committing to practicing, learning, studying, and improving.
- ⇒ learning to accept and embrace failure.
- ⇒ learning how to use your mistakes to help you become better.

SAT Reading

Questions 1-10 are based on the following passage.

This passage is adapted from Nikolai Gogol, "The Mysterious Portrait." Originally published in 1835.

Young Tchartkoff was an artist of talent, which promised great things: his work gave evidence of observation, thought, and a strong inclination to

Line approach nearer to nature.

5 "Look here, my friend," his professor said to him more than once, "you have talent; it will be a shame if you waste it: but you are impatient; you have but to be attracted by anything, to fall in love with it, you become engrossed with it, and all else goes for

10 nothing, and you won't even look at it. See to it that you do not become a fashionable artist. At present your colouring begins to assert itself too loudly; and your drawing is at times quite weak; you are already striving after the fashionable style, because it strikes

15 the eye at once. Have a care! society already begins to have its attraction for you: I have seen you with a shiny hat, a foppish neckerchief. . . . It is seductive to paint fashionable little pictures and portraits for

20 money; but talent is ruined, not developed, by that means. Be patient; think out every piece of work, discard your foppishness; let others amass money, your own will not fail you."

The professor was partly right. Our artist sometimes wanted to enjoy himself, to play the fop, 25 in short, to give vent to his youthful impulses in some way or other; but he could control himself withal. At times he would forget everything, when he had once taken his brush in his hand, and could not

2

READ ONLY THIS PARAGRAPH. WHAT IS IT CONCERNED WITH?

4a

WHERE IS THERE INFORMATION ABOUT WHAT THE PROFESSOR FEELS GREAT ART SHOULD BE?

4b

4c

5

buy a dinner with to-morrow? No one will lend me any. If I did bring myself to sell all my pictures and sketches, they would not give me twenty kopeks for the whole of them. They are useful; I feel that not one of them has been undertaken in vain; I have learned something from each one. Yes, but of what use is it? Studies, sketches, all will be studies, trial-sketches to the end. And who will buy, not even knowing me by name? Who wants drawings from the antique, or the life class, or my unfinished love of a Psyche, or the interior of my room, or the portrait of Nikita, though it is better, to tell the truth, than the portraits by any of the fashionable artists? Why do I worry, and toil like a learner over the alphabet, when I might shine as brightly as the rest, and have money, too, like them?"

1 SKIP UNTIL END

- The passage is primarily focused on the
- A) influence of a professor on one of his students.
 - B) struggles of a young artist conflicted about his values.
 - C) descent of a character into hopelessness and madness.
 - D) personal life of a young painter in relation to his art.

2

- The first paragraph serves mainly to establish the
- A) ironic outlook of the narrator.
 - B) central conflict depicted in the passage.
 - C) main character's defining artistic traits.
 - D) relationship between two characters.

① READ THE 1ST PARAGRAPH.
 ② WHAT IS IT ABOUT?
 ③ NOTICE THE ONLY ANSWER THAT ADDRESSES THE PARAGRAPH IS C.

3

The passage suggests that Tchartkoff's professor believes that great art should be

- A) technically accomplished and not garish.
- B) pleasing to the eye but not overly popular.
- C) original in approach and spontaneous in execution.
- D) representative of the artist's morals and beliefs.

① PUT INTO A QUESTION
 ② BRACKET OUT LINES
 ③ READ AND LOOK FOR INFO THAT RELATES

DO THESE TOGETHER

4

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 5-10 ("Look . . . at it")
- B) Lines 11-15 ("At present . . . once")
- C) Lines 15-17 ("Have . . . neckerchief")
- D) Lines 23-27 ("The professor . . . withal")

5

As used in lines 11, 14, and 18, the word "fashionable" most nearly means

- A) stylish.
- B) trendy.
- C) modern.
- D) conventional.

TIP: THE WORD MUST WORK 3 TIMES. IF IT DOESN'T WORK ONCE, IT'S WRONG.

TIP: SUBSTITUTE "BLANK" FOR THE WORD.

6

According to the passage, one point of disagreement between Tchartkoff and his professor concerns whether

- A) making money from selling paintings destroys artistic integrity.
- B) fashionable artists are capable of making enough money from their art to support themselves.
- C) nineteenth-century painters had been able to expand on the insights of the old masters.
- D) nonprofessional painters are capable of producing serious artworks.

In the last paragraph of Passage 1, Douglass rejects a counterargument to one of his claims by

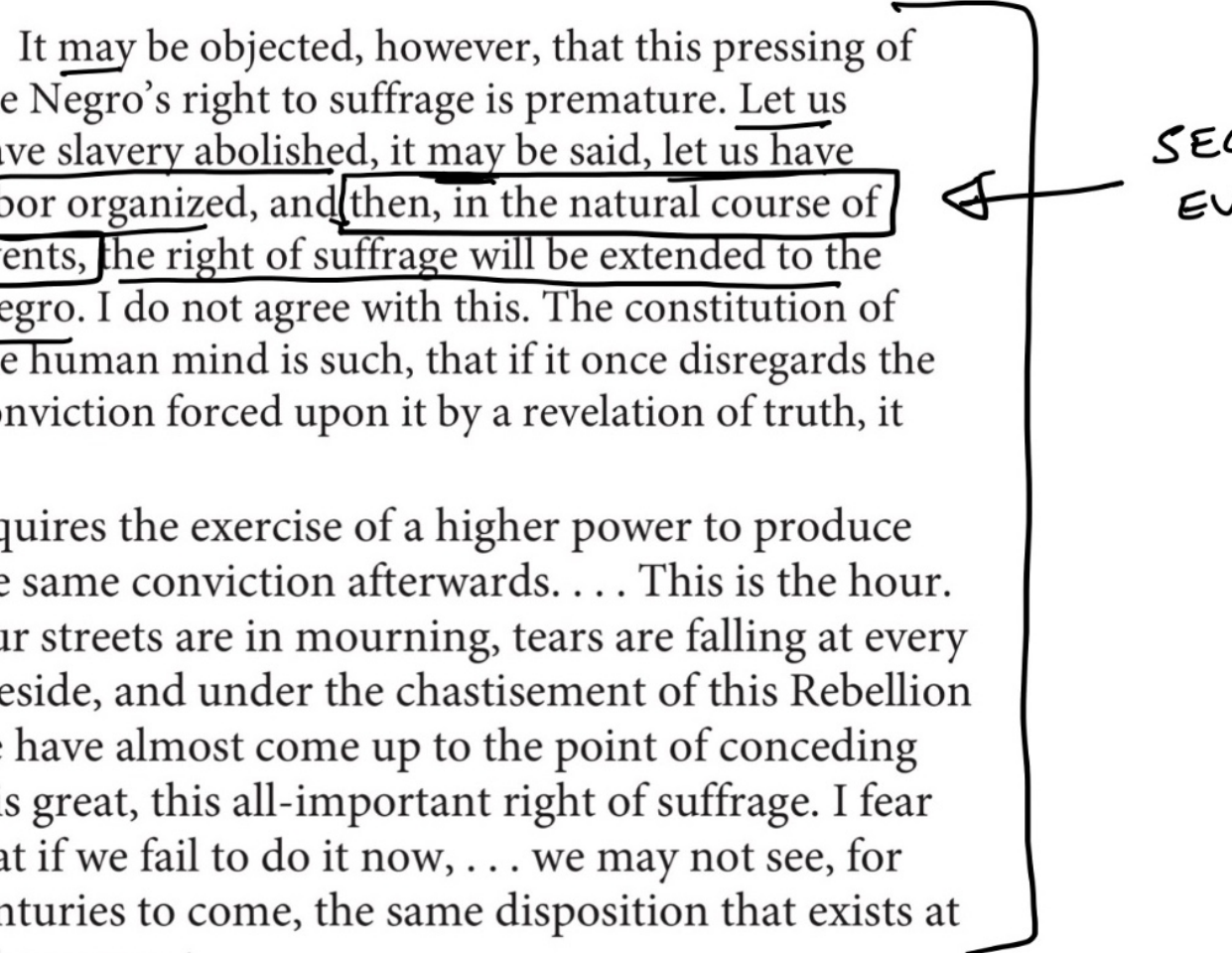
- A) using emotional language to describe the suffering that has resulted from the policies supported in the counterargument.
- B) citing a universal characteristic that makes it unlikely that the sequence of events suggested in the counterargument would actually occur.
- C) pointing out that people who support the counterargument do so out of self-interest rather than because the counterargument is sound.
- D) showing that the counterargument offers at best a temporary solution to a problem that requires a permanent solution.

* PUT THIS STATEMENT INTO THE FORM OF A QUESTION.

It may be objected, however, that this pressing of the Negro's right to suffrage is premature. Let us have slavery abolished, it may be said, let us have labor organized, and then, in the natural course of
35 events, the right of suffrage will be extended to the
Negro. I do not agree with this. The constitution of the human mind is such, that if it once disregards the conviction forced upon it by a revelation of truth, it

requires the exercise of a higher power to produce
40 the same conviction afterwards. . . . This is the hour. Our streets are in mourning, tears are falling at every fireside, and under the chastisement of this Rebellion we have almost come up to the point of conceding this great, this all-important right of suffrage. I fear
45 that if we fail to do it now, . . . we may not see, for centuries to come, the same disposition that exists at this moment.

SEQUENCE OF
EVENTS



***SAT Writing and
Language***

Questions 1-11 are based on the following passage.

Benjamin Banneker: Marking Time

Benjamin Banneker gained local fame for making a working clock in 1753, a time when few people owned clocks, let alone understood **1** they're mechanics. A twenty-two-year-old free black man living in Maryland, Banneker learned how to make the clock by examining the insides of a watch a merchant friend had lent him. His sharp skills in measuring the passage of time would eventually lead Banneker to the job of determining the official borders of the new United States capital.

1

- A) NO CHANGE
- B) their
- C) it's
- D) its

- ① BRACKET THE SENTENCE.
- ② WHOSE "MECHANICS"?
- ③ MAKE THE CONNECTION

[1] In that same decade, the United States became a fledgling nation with no permanent capital. [2] Federal legislators met in eight different northern cities before they decided that, as part of a broader compromise, a capital should be built farther south. [3] His cousin

George likely recommended Baneker for the job. [4] In 1791 President Washington issued a directive: the capital would be situated on the Potomac River and encompass a ten-mile square that included the booming ports of Georgetown, then a part of Maryland, and Alexandria, Virginia.

[5] Leading the team to determine the capital's boundaries were Major Andrew Ellicott, a well-known land surveyor who needed a capable assistant. [6] Land surveying, the art of measuring horizontal and vertical distances between objects, demands a strong command of trigonometry and astronomy, [7] particularly to the ability to chart mathematically the course of celestial bodies in relation to the curvature of the rotating Earth—skills Baneker possessed. [8] D

WHOSE COUSIN?
WHAT JOB?

6

- A) NO CHANGE
- B) will be
- C) have been
- D) was

WHO WAS/WERE LEADING THE TEAM?

7

- A) NO CHANGE
- B) particular about
- C) particularly
- D) in particularly

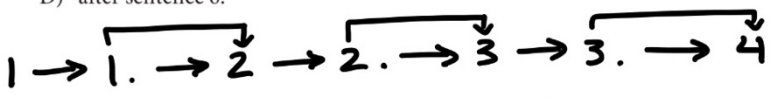
① THIS SENTENCE IS VERY LONG. HOWEVER, IT IS EASY TO ELIMINATE WHAT ISN'T NEEDED.

8

To make this paragraph most logical, sentence 3 should be placed

- A) where it is now.
- B) after sentence 4.
- C) after sentence 5.
- D) after sentence 6.

② NOTICE HOW 3 ANSWER CHOICES HAVE AN EXTRA WORD. THERE IS A 99% CHANCE THAT THE SINGLE WORD IS THE ANSWER.



END OF 1 CONNECTS TO BEGINNING OF 2.
END OF 2 CONNECTS TO BEGINNING OF 3.

[1] Power plants with CAES systems use surplus energy produced during off-peak hours to pump air into large underground cavities, such as naturally occurring or human-made salt or rock caverns. ^A [2] The expanding air drives a turbine, generating electricity. [3] The walls of these spaces have been specially fortified to handle the high pressure and density of pressurized air. ^B [4] As air is pumped into the inflexible cavern, the pressure increases to 1,100 pounds per square inch. ^C [5] When energy is needed later, the power plant releases pressurized air from the cavity, causing the air to expand. ^D 15

THE EXPANDING AIR ...

15

To make this paragraph most logical, sentence 2 should be placed

- A) where it is now.
- B) after sentence 3.
- C) after sentence 4.
- D) after sentence 5.

Currently, only two power plants use **16** CAES; one in McIntosh, Alabama, and another in Huntorf, Germany. The McIntosh power plant can produce up to 110 megawatts of electrical **17** power, the German plant can produce 321 megawatts. **18** Combined, that's enough energy to service approximately 431,000 homes. There are a few other CAES projects in progress across the United States, including pilot projects in Ohio, California, and New Jersey.

16

- A) NO CHANGE
- B) CAES. One
- C) CAES: one
- D) CAES, one:

]} ; = . : is =

17

- A) NO CHANGE
- B) power, as well as
- C) power, and
- D) power; while

THIS IS A COMMA SPLICE
USE AND 99% OF TIME
COORDINATING CONJUNCTION
READ THE NEW SENTENCE.
YOU WILL HEAR THAT IT IS
INCOMPLETE

18

The writer is considering deleting the underlined sentence. Should the sentence be kept or deleted?

- A) Kept, because it shows the impact of the two CAES plants currently in use.
- B) Kept, because it provides a transition to another point about how to provide electricity to homes.
- C) Deleted, because it ignores differences in the levels of energy usage of individual homes.
- D) Deleted, because it interrupts the paragraph's description of the McIntosh facility.

- READ WITH IT
- READ WITHOUT IT
- DOES THE SENTENCE
ADD VALUE?

may be preserved.” The completed *Dictionary of the English Language* finally appeared in **24** 1755, its release was every bit the publishing event that the writer and his backers had imagined. Along **25** one’s laborious journey from planning to publication, however, Johnson’s *Dictionary* had become a book with more humble ambitions—one that no longer aspired to preserve the purity of the language. Johnson had come to realize that, like all languages, the English language was a living, changing thing that could not be preserved, only described.

English-language dictionary; he was encouraged in this by a group of London booksellers.

- D) Johnson, encouraged by a group of London booksellers, announced an ambitious plan for a new English-language dictionary.

24

- A) NO CHANGE
B) 1755, and
C) 1755, as
D) 1755 with

SAME EXACT QUESTION AS # 17.

25

- A) NO CHANGE
B) each one’s
C) it’s
D) its

] SAME

IT IS

POSSESSIVE

WHOSE LABORIOUS JOURNEY?

Johnson had begun his work in 1746, furnishing his house with several large tables and massive heaps of books. To provide examples of proper word use for his *Dictionary*, Johnson looked to those he considered the **26** hotshot experts on the English language: the leading English writers of the past and present. Johnson read through the works of hundreds of **27** writers, his marking the passages he viewed as exemplary. He then handed the books off to six scribes he had hired to copy out his chosen excerpts.

28 Johnson was extremely selective in the passages he used to illustrate his words. No earlier English lexicographer, or dictionary writer, had attempted to define words as precisely as Johnson did. However, Johnson's careful analysis of his sources revealed subtle but inexorable changes in the ways words were used by different writers at different times. When the *Dictionary* was published in 1755, Johnson's preface

29 acknowledged this inherent mutability of language, noting that no lexicographer "shall imagine that his

RCWA →

26

- A) NO CHANGE
- B) foremost
- C) big-name
- D) primo

WHAT IS THE MOST "SAT-LEVEL" WORD?

27

- A) NO CHANGE
- B) writers,
- C) writers, and
- D) writers by

NOTICE HOW A, C, AND D HAVE THE SECOND WORD

28

Which choice ~~best~~ introduces the topic of this paragraph?

- A) NO CHANGE
- B) It is unknown precisely how much work Johnson's scribes did beyond copying down passages.
- C) Johnson was not the first writer to create a dictionary of the English language.
- D) Next, Johnson undertook the more difficult task of composing definitions.

This recognition did not mean that Johnson had no opinions about how words should be used. On the contrary, Johnson ^S 30 ^V used the *Dictionary* to promote words he favored and to protest words he disliked. 31

In the definition for “pictorial,” a term coined by Sir Thomas Browne, Johnson described the word as one “not adopted by other writers, but elegant and useful.” 32 By the same token, the word “writative,” which Johnson had found in the letters of Alexander Pope, was not even granted a definition; Johnson simply wrote “A word of Pope’s coining: not to be imitated.” Johnson understood that he could not preserve his language—but he 33 could—at the very least, try to shape its future use. In that more modest goal he appears to have succeeded:

Johnson’s work stood as the definitive English dictionary for well over a century, influencing generations of English writers and readers.

30

- A) NO CHANGE
- B) had used
- C) will use
- D) uses

31

At this point, the writer is considering adding the following sentence.

When it was finished, Johnson’s *Dictionary* contained 42,773 words, which made it neither the longest nor the shortest dictionary of the eighteenth century.

Should the writer make this addition here?

- A) Yes, because it provides relevant contextual information about eighteenth-century dictionaries.
- B) Yes, because it puts in perspective just how many words Johnson had influence over.
- C) No, because it interrupts the discussion of how Johnson used his *Dictionary* to affect the English language.
- D) No, because it merely repeats information about Johnson’s *Dictionary* that appears earlier in the passage.

- DOES THIS ADD VALUE?
- IF NOT, DON'T ADD IT.

32

- A) NO CHANGE
- B)** On the other hand,
- C) For example,
- D) Nevertheless,

- ① READ THE TWO SENTENCES, BUT OMIT THE TRANSITION.
- ② WHAT IS THE RELATIONSHIP BETWEEN THE TWO SENTENCES?
- ③ MATCH THE ANSWER CHOICE TO YOUR WORD FEELING, OR IDEA.

33

- A) NO CHANGE
- B) could, at the very least—
- C)** could, at the very least,
- D) could; at the very least,

TIP: 2 ARE THE SAME
1 IS DIFFERENT
1 IS RIGHT

) _____)
— _____ —
(_____)

***SAT Math -
No Calculator***

In the xy -plane, the point $(2, 6)$ lies on the graph of

$y = \frac{k}{x}$, where k is a constant. Which of the following

points must also lie on the graph?

- A) $(1, 3)$
- B) $(1, 4)$
- C) $(3, 3)$
- D) $(3, 4)$

Handwritten solution showing the derivation of $k = 12$ from the point $(2, 6)$ and the verification that $(3, 4)$ lies on the graph.

$y = \frac{k}{x}$ $(2, 6)$ lies on graph

$6 = \frac{k}{2}$

$k = 12$

$(3, 4)$

$4 = \frac{12}{3}$

$4 = 4$

$$Q = \sqrt{\frac{2dK}{h}}$$

The formula above is used to estimate the ideal quantity, Q , of items a store manager needs to order given the demand quantity, d ; the setup cost per order, K ; and the storage cost per item, h . Which of the following correctly expresses the storage cost per item in terms of the other variables?

A) $h = \sqrt{\frac{2dK}{Q}}$

B) $h = \frac{\sqrt{2dK}}{Q}$

C) $h = \frac{2dK}{Q^2}$

D) $h = \frac{Q^2}{2dK}$

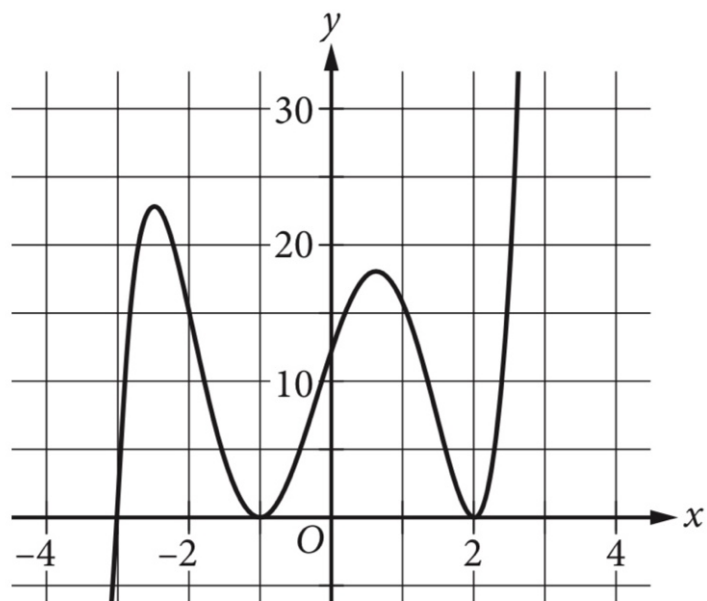
① $Q = \sqrt{\frac{2dK}{h}}$ isolate "h"

I. $Q^2 = \left(\sqrt{\frac{2dK}{h}}\right)^2$

II. $\frac{Q^2}{1} = \frac{2dK}{h}$

III. $2dK = Q^2 \cdot h$ Cross Multiply

IV. $\frac{2dK}{Q^2} = h$ (D)



The graph of the function f is shown in the xy -plane above, where $y = f(x)$. Which of the following functions could define f ?

- A) $f(x) = (x - 3)(x - 1)^2(x + 2)^2$
- B) $f(x) = (x - 3)^2(x - 1)(x + 2)$
- C) $f(x) = (x + 3)(x + 1)^2(x - 2)^2$
- D) $f(x) = (x + 3)^2(x + 1)(x - 2)$

12

$x = -1$ and $x = 2$ are Double zeros
 $x = -3$ is a single zero

Solution: $f(x) = (x + 3)(x + 1)^2(x - 2)^2$ (C)

$$(x + 2)^2 + (y - 3)^2 = 40$$

$$y = -2x + 4$$

Which of the following could be the x -coordinate of a solution to the system of equations above?

A) $\sqrt{7}$

B) $\frac{\sqrt{35}}{2}$

C) $\frac{6 + 2\sqrt{34}}{5}$

D) $\frac{4 + \sqrt{191}}{5}$

(13) $(x+2)^2 + (y-3)^2 = 40$
 $y = -2x + 4$

I. substitute $y = -2x + 4$ into $(y-3)^2$

$$(x+2)^2 + (-2x+4-3)^2 = 40$$

$$x^2 + 4x + 4 + (-2x+1)^2 = 40$$

$$x^2 + 4x + 4 + (-2x+1)(-2x+1) = 40$$

$$x^2 + 4x + 4 + 4x^2 - 4x + 1 = 40$$

$$5x^2 + 5 = 40$$

$$5x^2 = 35$$

$$x^2 = 7$$

$$x = \sqrt{7}$$

A

Which of the following is an equivalent form of the expression $(2x - 2)^2 - (2x - 2)$?

- A) $2x^2 - 6x + 6$
- B) $4x^2 - 10x + 2$
- C) $(2x - 2)(2x - 2)$
- D) $(2x - 3)(2x - 2)$

$$\textcircled{B} \quad (2x - 2)^2 - (2x - 2)$$

$$(2x - 2)(2x - 2) - 2x + 2$$

$$4x^2 - 8x + 4 - 2x + 2$$

$$4x^2 - 10x + 6$$

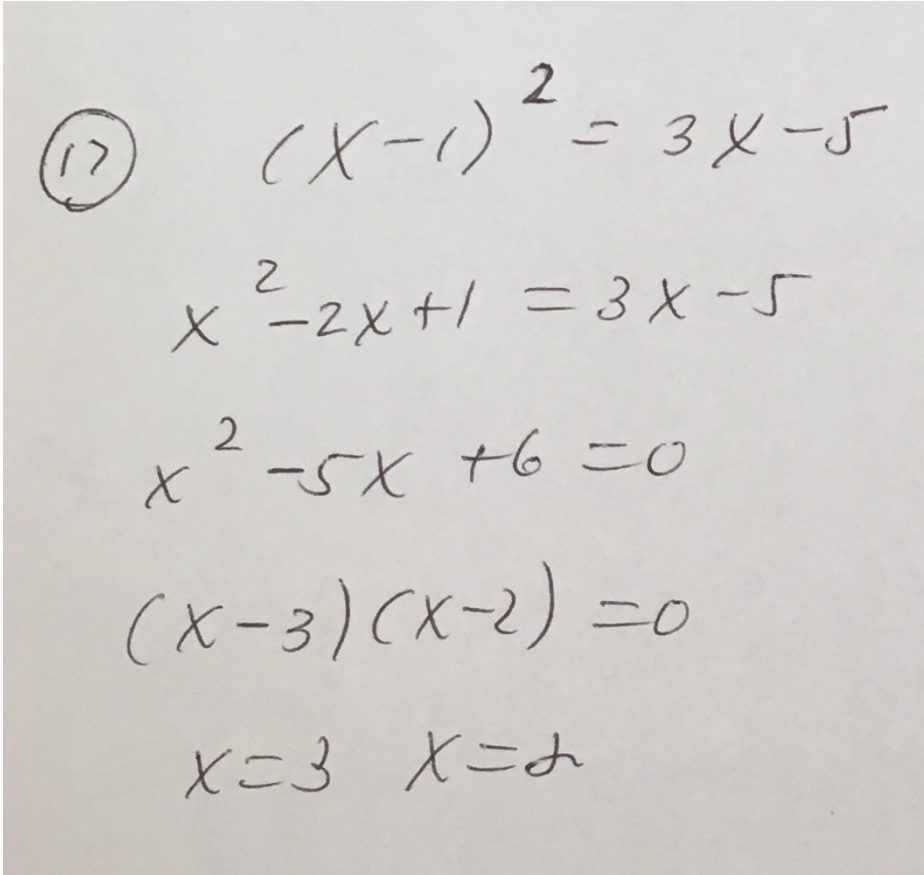
$$(2x - 3)(2x - 2)$$

$$4x^2 - 4x - 6x + 6$$

$$4x^2 - 10x + 6$$

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

What is one possible solution to the equation above?



Handwritten solution for problem 17:

$$\textcircled{17} \quad (x-1)^2 = 3x-5$$

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

$$x^2 - 5x + 6 = 0$$

$$(x-3)(x-2) = 0$$

$$x=3 \quad x=2$$

In the complex number system, what is the value of the expression $16i^4 - 8i^2 + 4$? (Note: $i = \sqrt{-1}$)

Handwritten solution for the expression $16i^4 - 8i^2 + 4$. The solution shows the simplification of powers of i and the final result.

$$\textcircled{18} \quad 16i^4 - 8i^2 + 4$$
$$i^4 = 1 \quad 16(1) - 8(-1) + 4$$
$$i^2 = -1 \quad 16 + 8 + 4$$
$$\boxed{28}$$

x	$f(x)$
8	12
12	17

The table above shows two pairs of values for the linear function f . The function can be written in the form $f(x) = ax + b$, where a and b are constants. What is the value of $a + b$?

19

x	$f(x)$
8	12
12	17

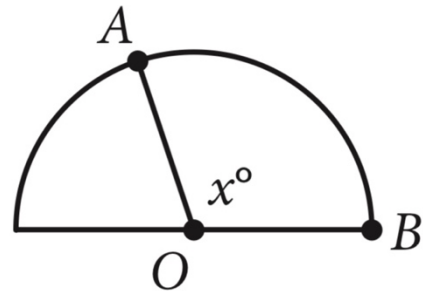
Linear = $y = mx + b$
 $y = \underline{a}x + \underline{b}$

I. $m = \frac{17-12}{12-8} = \frac{5}{4}$

II. $y = \frac{5}{4}x + b$
 $17 = \frac{5}{4}(12) + b$

$17 = \frac{60}{4} + b$
 $17 = 15 + b \quad | \quad \underline{b=2}$

$a = \frac{5}{4}$
 $b = 2$
Sum = 3.25



Segments \overline{OA} and \overline{OB} are radii of the semicircle above. Arc \widehat{AB} has length 3π and $OA = 5$. What is the value of x ?

(20)

Arc $AB = 3\pi$
 $OA = 5$

$$x = \theta = \frac{S}{R} = \frac{3\pi}{5}$$

$$x = \frac{3\pi}{5} \text{ radians} = \frac{3(180)}{5} = 108^\circ$$

***SAT Math -
Calculator***

In the xy -plane, the graph of line ℓ has slope 3. Line k is parallel to line ℓ and contains the point $(3, 10)$. Which of the following is an equation of line k ?

A) $y = -\frac{1}{3}x + 11$

B) $y = \frac{1}{3}x + 9$

C) $y = 3x + 7$

D) $y = 3x + 1$

(19) Line ℓ has a slope of 3
Line k is parallel to line ℓ $(3, 10)$

(B) $y = \frac{1}{3}x + 9$ b/c $10 = \frac{1}{3}(3) + 9$
 $10 = 1 + 9$
 $10 = 10$

The front row of an auditorium has 10 seats. There are 50 rows in total. If each row has 2 more seats than the row before it, which expression gives the total number of seats in the last row?

- A) $10 + 2(50 - 1)$
- B) $10 + 2(50)$
- C) $50(10 + 2)$
- D) $10 + 2^{50}$

(28) $10, 12, 14, 16, 18$
 $a_1 \quad a_2$

$$a_{50} = 108$$

(A) $10 + 2(50 - 1) = 10 + 2(49) = \boxed{108}$

A poster has an area of 432 square inches. The length x , in inches, of the poster is 6 inches longer than the width of the poster. Which of the following equations can be solved to determine the length, in inches, of the poster?

A) $x^2 - 6 = 432$

B) $x^2 - 6x = 432$

C) $x^2 + 6 = 432$

D) $x^2 + 6x = 432$

Handwritten solution showing the derivation of the correct equation and the solution for x .

30

$$L = x + 6$$
$$w = x$$
$$\text{Area} = L \cdot W = 432$$
$$= (x+6)(x)$$
$$= x^2 + 6x = 432$$
$$x^2 + 6x - 432 = 0$$
$$(x+24)(x-18) = 0$$
$$\boxed{x = 18}$$

$y = \frac{-432}{x}$

(B)

31

If $|2x + 3| = 5$ and $|3y - 3| = 6$, what is one possible value of $|xy|$?

$$\textcircled{31} \quad |2x + 3| = 5$$

$$2x + 3 = 5$$

$$2x = 2$$

$$x = 1$$

$$xy = (1)(3) = 3$$

$$xy = (1)(-1) = -1$$

$$2x + 3 = -5$$

$$2x = -8$$

$$x = -4$$

$$xy = -4(3) = -12$$

$$xy = -4(-1) = 4$$

$$|3y - 3| = 6$$

$$3y - 3 = 6 \quad 3y - 3 = -6$$

$$3y = 9 \quad 3y = -3$$

$$y = 3 \quad y = -1$$

$$\boxed{3, -1, -12, 4}$$

Jacob bought two types of pens: blue pens that cost \$0.60 each and red pens that each cost d times as much as a blue pen. If the cost of 3 blue pens and 6 red pens was \$10.80, what is the value of d ?

(34) $0.60B$

$$3B + 6R = 10.80$$
$$3(0.60) + 6R = 10.80$$
$$1.80 + 6R = 10.80$$
$$6R = 9.00$$
$$\boxed{R = 1.50}$$
$$B = 0.60$$
$$R = 1.50$$
$$d = \frac{1.50}{0.60} = 2.5$$
$$\boxed{d = 2.5}$$

George took a nonstop flight from Dallas to Los Angeles, a total flight distance of 1,233 miles. The plane flew at a speed of 460 miles per hour for the first 75 minutes of the flight and at a speed of 439 miles per hour for the remainder of the flight. To the nearest minute, for how many minutes did the plane fly at a speed of 439 miles per hour?

(35) D → LA = 1,233

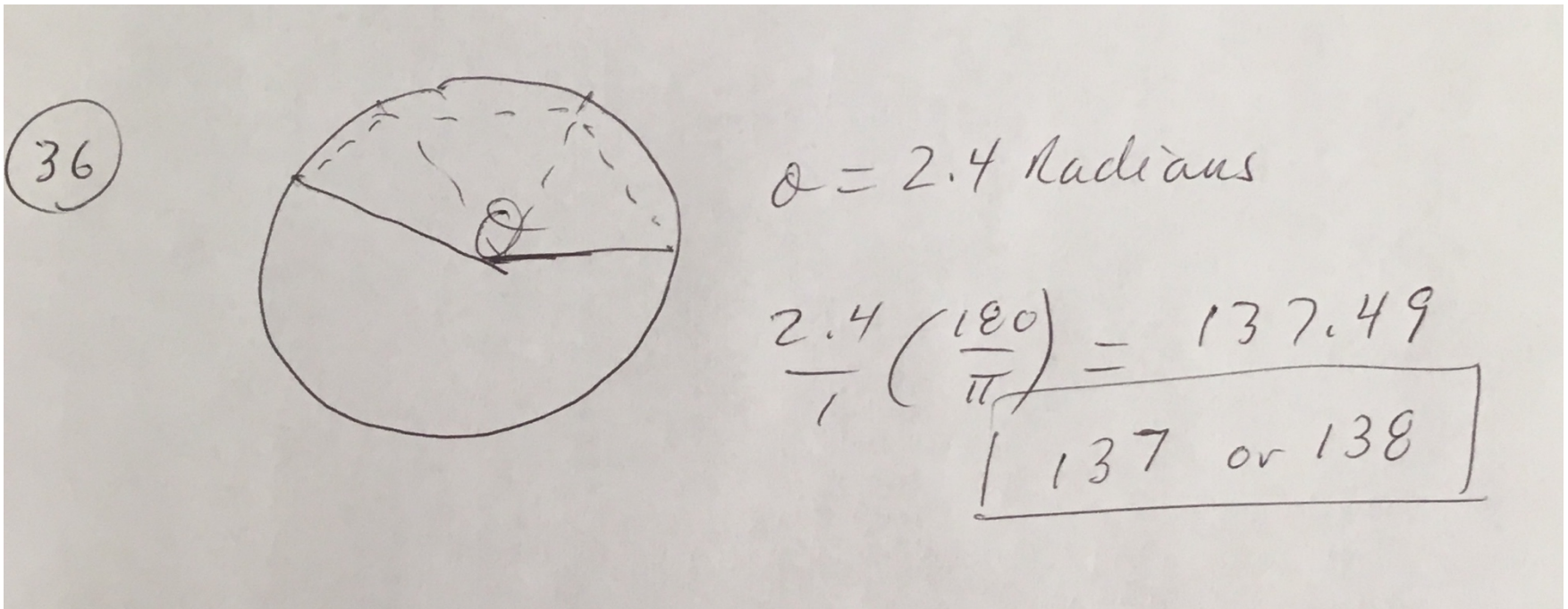
I. 460 mph / 75 minutes $460 \times (1.25) = 575 \text{ miles}$

II. $1233 - 575 = \boxed{658}$

III. $\frac{658}{439} = 1.498 \text{ hours}$ $1.498 \times 60 = \boxed{90}$

36

An arc of a circle measures 2.4 radians. To the nearest degree, what is the measure, in degrees, of this arc? (Disregard the degree sign when gridding your answer.)



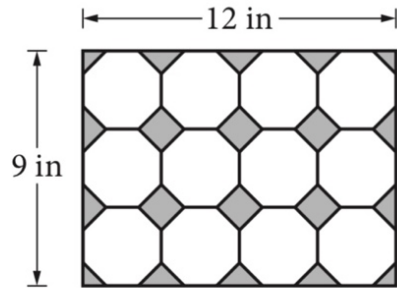
36

$\theta = 2.4 \text{ Radians}$

$$2.4 \left(\frac{180}{\pi} \right) = 137.49$$

137 or 138

Questions 37 and 38 refer to the following information.



Carrie, a packaging engineer, is designing a container to hold 12 drinking glasses shaped as regular octagonal prisms. Her initial sketch of the top view of the base of the container is shown above.

37

If the length and width of the container base in the initial sketch were doubled, at most how many more glasses could the new container hold?

$$\begin{aligned} (37) \quad \frac{12}{9} = \frac{4}{3} &\rightarrow \frac{24}{18} = \frac{8}{6} \\ 4 \times 3 = 12 &\quad 8 \times 6 = 48 \\ 48 - 12 = &\boxed{36} \end{aligned}$$

38

Carrie redesigned the container because the initial sketch did not account for cushioning material between the glasses. The area of the base of the newly designed container is 25% greater than the area of the base in the initial sketch. What is the area, in square inches, of the base of the newly designed container?

$$\begin{aligned} (38) \quad \text{Area of original} &= 12 \times 9 = 108 \\ 108 \times (1.25) &= \boxed{135} \end{aligned}$$

SAT Essay

The SAT Essay Section is 50 minutes long and offers colleges a look into your writing.

This score won't change your overall SAT score.

Luckily, you have been writing essays of this nature for a long time. The concept is simple: How does the author persuade his audience to _____?

You have free reign here. You can write about anything that persuaded you or that you feel will persuade others. This includes, but is not limited to:

- ⇒ Ethos, pathos, and logos.
- ⇒ Figurative language
- ⇒ Anecdotes
- ⇒ Statistics
- ⇒ Structure
- ⇒ Use of examples

When I tell you have free reign, you really do! You can literally write about whatever persuaded you...as long as you explain HOW the author did so. This is where the points are!

How is the essay graded?

Graders are evaluating students on 3 different aspects:

Analysis

Reading

Writing

The scoring is out of 4 for each.

There are always two graders.

Grab the reader's attention by relating to the topic in a general way.

INTRO

Thesis: In [title of article], [The author] persuades the reader to [...] by [point of ¶1], [point of ¶2], and [point of ¶3].

BODY PARAGRAPHS

Topic Sentence: [The author] persuades the reader to [...] through his/her use of [...]

Give **first example** that shows your topic sentence.

Explain HOW this persuades the reader to see things the writer's way.

Ex: By doing so..., By using this..., The purpose of this is to...,

Transition to the next example.

Ex: Furthermore,... In addition,...

Give **second example** that shows your topic sentence.

Explain HOW this persuades the reader to see things the writer's way.

Ex: By doing so..., By using this..., The purpose of this is to...,

Wrap up the paragraph. Be sure to keep the focus on HOW the writer persuades the reader to his/her point.

CONCLUSION

Restate Thesis: In [title of article], [the author] persuades the reader to [...]

Explain how the author persuaded the reader to [...]
End in a creative, memorable way.

A simple, but highly effective introduction...

In response to our world's growing reliance on artificial light, writer Paul Bogard argues that natural darkness should be preserved in his article "Let There be dark". He effectively builds his argument by using a personal anecdote, allusions to art and history, and rhetorical questions.

A solid body paragraph with a focus on how the writer persuades the readers to...

Bogard starts his article off by recounting a personal story – a summer spent on a Minnesota lake where there was “woods so dark that [his] hands disappeared before [his] eyes.” In telling this brief anecdote, Bogard challenges the audience to remember a time where they could fully amass themselves in natural darkness void of artificial light. By drawing in his readers with a personal encounter about night darkness, the author means to establish the potential for beauty, glamour, and awe-inspiring mystery that genuine darkness can possess. He builds his argument for the preservation of natural darkness by reminiscing for his readers a first-hand encounter that proves the “irreplaceable value of darkness.” This anecdote provides a baseline of sorts for readers to find credence with the author’s claims.

Another solid body paragraph with a focus on how the writer persuades the readers to...

Bogard's argument is also furthered by his use of allusion to art – Van Gogh's "Starry Night" – and modern history – Paris' reputation as "The City of Light". By first referencing "Starry Night", a painting generally considered to be undoubtedly beautiful, Bogard establishes that the natural magnificence of stars in a dark sky is definite. A world absent of excess artificial light could potentially hold the key to a grand, glorious night sky like Van Gogh's according to the writer. This urges the readers to weigh the disadvantages of our world consumed by unnatural, vapid lighting. Furthermore, Bogard's alludes to Paris as "the famed 'city of light'". He then goes on to state how Paris has taken steps to exercise more sustainable lighting practices. By doing this, Bogard creates a dichotomy between Paris' traditionally alluded-to name and the reality of what Paris is becoming – no longer "the city of light", but moreso "the city of light...before 2 AM". This furthers his line of argumentation because it shows how steps can be and are being taken to preserve natural darkness. It shows that even a city that is literally famous for being constantly lit can practically address light pollution in a manner that preserves the beauty of both the city itself and the universe as a whole.

A third solid body paragraph with a focus on how the writer persuades the readers to...

Finally, Bogard makes subtle yet efficient use of rhetorical questioning to persuade his audience that natural darkness preservation is essential. He asks the readers to consider “what the vision of the night sky might inspire in each of us, in our children or grandchildren?” in a way that brutally plays to each of our emotions. By asking this question, Bogard draws out heartfelt ponderance from his readers about the affecting power of an untainted night sky. This rhetorical question tugs at the readers’ heartstrings; while the reader may have seen an unobscured night skyline before, the possibility that their child or grandchild will never get the chance sways them to see as Bogard sees. This strategy is definitively an appeal to pathos, forcing the audience to directly face an emotionally-charged inquiry that will surely spur some kind of response. By doing this, Bogard develops his argument, adding guttural power to the idea that the issue of maintaining natural darkness is relevant and multifaceted.

A conclusion that is short but still focuses on how the writer persuades the readers to...

Writing as a reaction to his disappointment that artificial light has largely permeated the presence of natural darkness, Paul Bogard argues that we must preserve true, unaffected darkness. He builds this claim by making use of a personal anecdote, allusions, and rhetorical questioning.