May 2018

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May QAS 5/5/18

Introduction

Congratulations on taking the SAT®! This booklet contains the SAT you took in May 2018, including (if you took the SAT Essay) an Essay prompt you responded to. This booklet contains every question and prompt that was scored.

As part of the Question-and-Answer Service (QAS) you also have received:

1. A customized report that lists the following details about each question:
   - answer you gave
   - best or correct answer
   - question type
   - difficulty level
2. A QAS Student Guide that explains your scores and how to interpret them.

The test begins on the next page.

Reading Test

65 MINUTES, 52 QUESTIONS

Turn to Section 1 of your answer sheet to answer the questions in this section.

DIRECTIONS

Each passage or pair of passages below is followed by a number of questions. After reading each passage or pair, choose the best answer to each question based on what is stated or implied in the passage or passages and in any accompanying graphics (such as a table or graph).

Questions 1-10 are based on the following passage.

This passage is adapted from Theodore Dreiser, *Sister Carrie*. Originally published in 1900.

It was not often that she came to the play stirred to her heart's core by actualities. To-day a low song of longing had been set singing in her heart by the finery, the merriment, the beauty she had seen. Oh, these women who had passed her by, hundreds and hundreds strong, who were they? Whence came the rich, elegant dresses, the astonishingly coloured buttons, the knick-knacks of silver and gold? Where were these lovely creatures housed? Amid what elegancies of carved furniture, decorated walls, elaborate tapestries did they move? Where were their rich apartments, loaded with all that money could provide? In what stables champed these sleek, nervous horses and rested the gorgeous carriages? Where lounged the richly groomed footmen? Oh, the mansions, the lights, the perfume, the loaded boudoirs and tables! New York must be filled with such bowers, or the beautiful, insolent, supercilious creatures could not be. Some hothouses held them. It ached her to know that she was not one of them—that, alas, she had dreamed a dream and it had not come true. She wondered at her own solitude these two years past—her indifference to the fact that she had never achieved what she had expected.

The play was one of those drawing-room concoctions in which charmingly overdressed ladies and gentlemen suffer the pangs of love and jealousy amid gilded surroundings. Such bon-mots are ever enticing to those who have all their days longed for such material surroundings and have never had them gratified. They have the charm of showing suffering under ideal conditions. Who would not grieve upon a gilded chair? Who would not suffer amid perfumed tapestries, cushioned furniture, and liveried servants? Grief under such circumstances becomes an enticing thing. Carrie longed to be of it. She wanted to take her sufferings, whatever they were, in such a world, or failing that, at least to simulate them under such charming conditions upon the stage. So affected was her mind by what she had seen, that the play now seemed an extraordinarily beautiful thing. She was soon lost in the world it represented, and wished that she might never return. Between the acts she studied the galaxy of matinee attendants in front rows and boxes, and conceived a new idea of the possibilities of New York. She was sure she had not seen it all—that the city was one whirl of pleasure and delight.

Going out, the same Broadway taught her a sharper lesson. The scene she had witnessed coming down was now augmented and at its height. Such a crush of finery and folly she had never seen. It clinched her convictions concerning her state. She had not lived, could not lay claim to having lived, until something of this had come into her own life. Women were spending money like water; she could see that in every elegant shop she passed. Flowers, candy, jewelry, seemed the principal things in which the elegant dames were interested. And she—she had scarcely enough pin money to indulge in such outings as this a few times a month.

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CONTINUE

1

That night the pretty little flat seemed a commonplace thing. It was not what the rest of the world was enjoying. She saw the servant working at dinner with an indifferent eye. In her mind were running scenes of the play. Particularly she remembered one beautiful actress—the sweetheart who had been wooed and won. The grace of this woman had won Carrie's heart. Her dresses had been all that art could suggest, her sufferings had been so real. The anguish which she had portrayed Carrie could feel. It was done as she was sure she could do it. There were places in which she could even do better. Hence she repeated the lines to herself. Oh, if she could only have such a part, how broad would be her life! She, too, could act appealingly.

1

Throughout the passage, the narrator provides insight into Carrie's character mainly by

A) explaining how Carrie is similar to a character she sees in a play.

B) developing a contrast between how Carrie perceives herself and how she is perceived by others.

C) comparing Carrie's actual appearance to her perceptions of her appearance.

D) juxtaposing Carrie's perceptions of the city and her impressions at the theater.

2

One important theme of the passage developed through the narrator's presentation of Carrie is that

A) natural talent will languish if it remains unnourished.

B) imagined pleasures have the power to make everyday life seem unacceptable.

C) no goal is unfeasible so long as it is pursued with stubborn persistence.

D) relationships are ultimately more important than money in determining an individual's happiness.

3

As used in line 2, "stirred" most nearly means

A) moved.

B) angered.

C) prodded.

D) encouraged.

4

What main effect do the words "knick-knacks" (line 8) and "concoctions" (line 26) have on the passage?

A) They underscore the widespread popularity of the things being described.

B) They provide insight into the causes underlying Carrie's materialistic mind-set.

C) They emphasize how little value Carrie actually attaches to the things she appears to covet.

D) They suggest that the things Carrie is observing ought to be regarded as trivial.

5

The main purpose of the series of questions in the first paragraph is to

A) reveal Carrie's ignorance of the women's private struggles.

B) capture the scene's authenticity by providing detailed descriptions of the women.

C) emphasize the narrator's contempt for the women's displays of affluence.

D) develop the narrator's portrayal of Carrie's intense admiration of privileged women.

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CONTINUE

6

Which choice provides the best evidence that the narrator does not share Carrie's view of the type of play that Carrie attends?

A) Lines 20-22 ("It ached . . . true")
B) Lines 28-31 ("Such . . . gratified")
C) Lines 39-41 ("So affected . . . thing")
D) Lines 41-43 ("She was . . . return")

7

Based on the passage, Carrie regards her day-to-day lifestyle as one that has

A) not been conducive to helping her achieve her ambitions.
B) followed a repetitive but productive pattern.
C) allowed for interaction with a range of interesting people.
D) facilitated her goals as an actress.

8

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

A) Lines 22-24 ("She wondered . . . expected")
B) Lines 36-39 ("She wanted . . . stage")
C) Lines 49-50 ("The scene . . . height")
D) Lines 56-58 ("Flowers . . . interested")

9

According to the passage, as Carrie views the play, she envies which aspect of the characters' lives?

A) Their lack of everyday problems
B) Their ability to forget the past easily and focus on the present
C) Their opportunity to bear their sufferings in fortunate circumstances
D) Their open indifference to material possessions

10

According to the passage, Carrie judges the performance of the actress who played the hero's sweetheart as

A) inferior in certain respects to the performance that she believes herself to be capable of giving.
B) dissatisfying in its emphasis on physical grace over emotional authenticity.
C) clumsy and melodramatic yet superior to the other actors' performances.
D) difficult to watch because of the intense suffering it evoked.

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CONTINUE

Questions 11-20 are based on the following passage and supplementary material.

This passage and accompanying figures are adapted from Giovanni Frazzetto, *Joy, Guilt, Anger, Love: What Neuroscience Can—and Can't—Tell Us about How We Feel.* ©2013 by Giovanni Frazzetto.

Dr. Anna Abraham wanted to find out whether the brain operates by different mechanisms when it is exposed to a situation that is real as opposed to one that is entirely fictional. So she designed an interesting fMRI-based[1] experiment that explored the brain's reactions to situations that involved either real or fictional characters.

Participants were shown one-sentence written scenarios in which a real person named Peter was involved in situations that included George Bush or Cinderella. In one set of situations, Peter simply received information about both characters. The other set of situations involved direct interactions with the characters. What participants had to do was simple. They had to decide whether the scenarios portrayed were possible or not—that is, if they could indeed happen in the physical reality of the world we live in.

How does the brain operate when assessing these two different types of scenarios? The results were intriguing. Common to both types of situation was some level of mental activity in parts of the brain, such as the hippocampus, that are at work when we in general recall facts or events. Such activity was detectable regardless of the nature of the scenario—that is, whether the scenario was informative (when Peter only heard about the characters) or interactive (when he actually met the characters). However, there were a few striking finer distinctions in activity relative to the two scenarios and these depended on the type of character involved.

When exposed to scenarios featuring George Bush—a famous real person—the brain involved the anterior medial prefrontal cortex (amPFC) and the precuneus and posterior cingulate cortex (PCC). The amPFC and the PCC are medial parts of the brain that are involved in autobiographical memory retrieval as well as self-referential thinking.

When fictional characters were featured, the brain responded somewhat differently. Parts of the lateral frontal lobe, such as the inferior frontal gyrus (IFG), were more active. The IFG is thought to provide mirroring capacities, but is also involved in high-level language processing. The fact that George Bush was linked to personal memory retrieval but Cinderella was not led the researchers to think that a crucial difference when assessing real or fictional scenarios might lie not so much in the degree of *realness* of the character involved, but in their *relevance* to our reality. To test this hypothesis, they peered into the brain of nineteen new volunteers who, as in the previous study, were asked to assess the possibility that a real protagonist could either imagine, hear or dream about or actually interact with a set of characters. However, this time the characters involved in the scenarios were ranked in three categories with differing degrees of personal relevance for the participants: their friends or family (high personal relevance), famous people (medium relevance) and fictional characters (low personal relevance). As predicted, the activation in the amPFC and PCC was indeed proportionally modulated by the degree of relevance of the characters described. It was highest in the case of friends and family members and lowest in the case of fictional characters.

The researchers gave the following explanation. When you encounter real characters, even if you have never met them, they will integrate into a wide, comprehensive and intricately connected structure in the conceptual storage of your mind. You are familiar with their basic behavioural features as human beings. You know more or less how they think, what kind of opinions they may produce. You are aware of the range of emotions that you can expect from them. By contrast, your mind is not equally familiar with fictional characters. No matter how much we know about the world of a fictional character there will still be something alien and inscrutable to us about that world. You may have read all the books about a fictional character, but the amount of information you have gathered about that character is still definitely limited compared with the wealth of information that is available to you about members of your family, friends, or famous real people who are part of your immediate and past experience. Basically, in order to understand a fictional character, you need to dig deeper into your imagination, because he or she is bound up to fewer nodes of reference in your network than are real, or relevant, people in your life.

[1] fMRI is short for "functional *magnetic resonance* imaging."

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CONTINUE

1

Figure 1

Percent Change in Activity in the Precuneus and Posterior Cingulate Cortex (PCC) in Experimental Scenarios

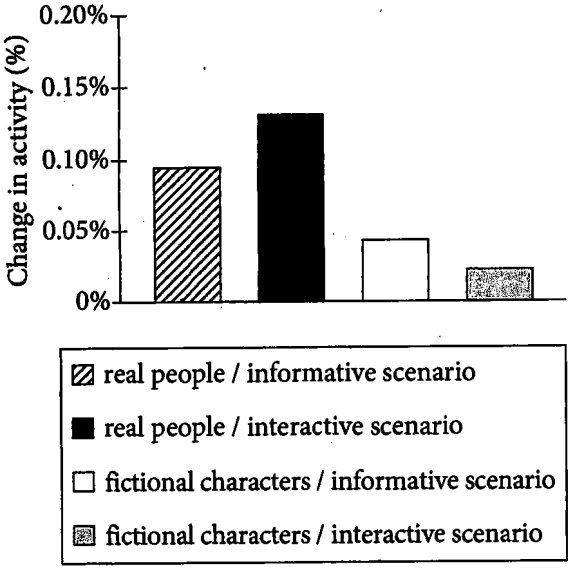
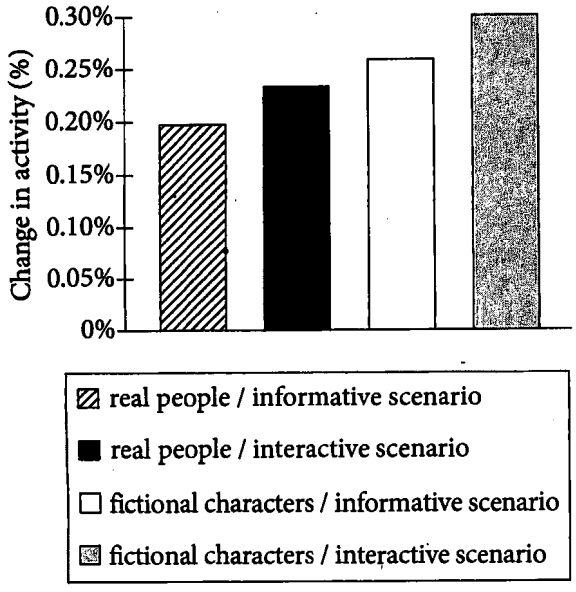


Figure 2

Percent Change in Activity in the Inferior Frontal Gyrus (IFG) in Experimental Scenarios



11

The main purpose of the passage is to

A) advocate for more research on how the brain connects real and fictional events.

B) inform the reader about the results of experiments on brain function.

C) explore how the brain processes factual information.

D) argue that the way the brain processes fictional situations is widely misunderstood.

12

As used in line 19, "operate" most nearly means

A) manipulate.

B) exercise.

C) function.

D) conduct.

13

Which choice best supports the claim that there are important similarities between how the brain responds to scenarios involving real people and how it responds to those involving fictional people?

A) Lines 21-24 ("Common . . . events")

B) Lines 29-32 ("However . . . involved")

C) Lines 72-77 ("You are . . . them")

D) Lines 81-88 ("You may . . . experience")

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CONTINUE

1

14

It can reasonably be inferred from the passage that the results of Abraham's experiments showed that

A) interactive scenarios resulted in finer distinctions in brain activity than did informative scenarios.

B) both interactive and informative scenarios required memory recall.

C) informative scenarios were more likely to be considered possible than were interactive scenarios.

D) all scenarios yielded some unclassifiable brain activity.

15

The greatest increase in activity in the amPFC of a research subject's brain would most likely be observed in scenarios in which a real protagonist

A) has a conversation with a real person who is unknown to the subject.

B) interacts with real people who were childhood friends of the subject's.

C) encounters a fictional character about whom the subject is quite knowledgeable.

D) is told about a real person the subject has previously met.

16

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

A) Lines 11-12 ("In one . . . characters")

B) Lines 56-62 ("However . . . personal relevance")

C) Lines 62-64 ("As predicted . . . described")

D) Lines 72-74 ("You are . . . beings")

17

According to the passage, the brain stores information about famous real people

A) in order to allow efficient retrieval later.

B) exactly as it stores information about close friends or family members.

C) in different areas depending on the type of contact one has with them.

D) in a network of memories broader in scope than memories about fictional people.

18

As used in line 80, "alien" most nearly means

A) inconsistent.

B) foreign.

C) extraterrestrial.

D) complex.

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19

According to figure 1, the percent increase in the activity of the PCC in subjects reacting to a scenario in which someone has a conversation with a real person is approximately

A) 0.05%.

B) 0.1%.

C) 0.13%.

D) 0.18%.

20

According to figure 1 and figure 2, the highest percent change in activity in any of the studied areas of the brain was in the

A) PCC when the subjects were exposed to an interactive scenario involving real people.

B) IFG when the subjects were exposed to an interactive scenario involving fictional people.

C) PCC when the subjects were exposed to any scenario involving fictional people.

D) IFG when the subjects were exposed to an interactive scenario involving real people.

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Questions 21-30 are based on the following passage.

This passage is adapted from David Grimm, "The Genes That Turned Wildcats into Kitty Cats." ©2014 by American Association for the Advancement of Science.

Place a housecat next to its direct ancestor, the Near Eastern wildcat, and it may take you a minute to spot the difference. They're about the same size and shape, and, well, they both look like cats. But the wildcat is fierce and feral, whereas the housecat, thanks to nearly 10,000 years of domestication, is tame and adaptable enough to have become the world's most popular pet. Now scientists have begun to pinpoint the genetic changes that drove this remarkable transformation. The findings, based on the first high-quality sequence of the cat genome, could shed light on how other creatures become tame.

"This is the closest thing to a smoking gun we've ever had," says Greger Larson, an evolutionary biologist at the University of Oxford in the United Kingdom who has studied the domestication of pigs, dogs, and other animals. "We're much closer to understanding the nitty-gritty of domestication than we were a decade ago."

Cats first entered human society about 9,500 years ago, not long after people first took up farming in the Middle East. Drawn to rodents that had invaded grain stores, wildcats slunk out of the deserts and into villages. There, many scientists suspect, they mostly domesticated themselves, with the friendliest ones able to take advantage of human table scraps and protection. Over thousands of years, cats shrank slightly in size, acquired a panoply of coat colors and patterns, and (largely) shed the antisocial tendencies of their past. Domestic animals from cows to dogs have undergone similar transformations, yet scientists know relatively little about the genes involved.

Researchers led by Michael Montague, a postdoc at the Washington University School of Medicine in St. Louis, have now pinpointed some of them. The scientists started with the genome of a domestic cat—a female Abyssinian—that had been published in draft form in 2007, then filled in missing sequences and identified genes. They compared the resulting genome with those of cows, tigers, dogs, and humans.

The analysis, published recently in the *Proceedings of the National Academy of Sciences*, revealed 281 genes that show signs of rapid or numerous genetic changes—a hallmark of recent selections—in domestic cats. Some appear to be involved in hearing and vision, the senses that felines rely on most. Others play a role in fat metabolism and are likely an adaptation to cats' highly carnivorous lifestyle.

But the most intriguing findings came when the team sequenced the genomes of 22 domestic cats—representing a wide variety of breeds and locations—and compared them with the genomes of two Near Eastern and two European wildcats. The researchers uncovered at least 13 genes that changed as cats morphed from feral to friendly. Some of these, based on previous studies of knockout mice [genetically engineered mice], seem to play a role in cognition, including fear responses and the ability to learn new behaviors when given food rewards. "That jibes with what we know about the domestication of cats," Montague says, "because they would have needed to become less fearful of new locations and individuals, and the promise of food would have kept them sticking around."

"This is my favorite part of the paper," says Kerstin Lindblad-Toh, a leading comparative genomicist at Uppsala University in Sweden who was not involved in the work. She notes that a few of the genes the team identified code for glutamate receptors, which play a key role in learning and memory and may have been selected in humans as well. "We're hitting on genes that allow our brains to develop and make us interact socially."

The team also found five genes in domestic cats that influence the migration of neural crest cells, stem cells in the developing embryo that affect everything from skull shape to coat color. This supports a recent proposal that such cells may be the master control switches of domestication, explaining why domestic animals share common traits, such as smaller brains and certain pigmentation patterns.

So why are cats still a bit wilder than our other favorite domesticate, the dog? Co-author William Murphy, a geneticist at Texas A&M University, College Station, says the cat genome appears to have undergone less intense and more recent evolutionary

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CONTINUE

pressure than that of dogs; that's not surprising, considering that dogs may have lived with us for up to 30,000 years. "Cats were not selected for a purpose like dogs and other domesticates," Murphy speculates.

21

The main purpose of the passage is to

A) summarize a study of the genetic differences between various breeds of domestic cats.

B) describe findings regarding the benefits that cats provided to humans as a result of domestication.

C) discuss research into the genetic changes that cats underwent as part of domestication.

D) present experimental evidence contrasting the behavior of wildcats and domestic cats.

22

The author includes the phrase "and, well" (line 4) most likely to

A) stress that the relationship between wildcats and domestic cats is continually shifting.

B) introduce a discussion of the physical attributes of domestic cats.

C) advance a tentative hypothesis about the evolution and development of wildcats.

D) acknowledge the obviousness of a similarity between wildcats and domestic cats.

23

The passage suggests that some scientists would agree with which statement about the domestication of cats?

A) It did not occur until after the domestication of cows and pigs.

B) It caused cats to slightly increase in size.

C) It was not intentionally undertaken by humans.

D) It resulted from humans' need for pets.

24

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

A) Lines 25-28 ("There . . . protection")

B) Lines 28-31 ("Over . . . past")

C) Lines 31-34 ("Domestic . . . involved")

D) Lines 44-48 ("The analysis . . . cats")

25

Which choice best describes how Montague's team achieved the results discussed in the sixth paragraph (lines 52-67)?

A) The team sequenced the genomes of twenty-two breeds of domestic cats from around the world, compared those genomes to one another, and identified the genes that appear to have changed as a result of breeding.

B) The team used a previously published genome sequence of a domestic cat to locate the genes associated with hearing and vision, compared those genes to the same genes in two species of wildcats, and identified the point in time at which those genes appear to have diverged.

C) The team sequenced the genomes of several breeds of geographically diverse domestic cats, compared those genomes to the genomes of four wildcats from two locations, and identified the genes that appear to have changed due to domestication.

D) The team sequenced the genomes of domestic cats from two locations, compared those genomes to the genomes of wildcats from the same locations, and identified which genes appear to be geographically specific.

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CONTINUE

1

26

As presented in the passage, Montague's explanation for the gene changes in domestic cats is based on the assumption that

A) genes associated with particular characteristics in one species are associated with similar characteristics in other species.

B) missing sequences in the genome of one particular breed of cat can be completed by the parallel sequences in the genome of another breed of cat.

C) the number of genes affected by domestication is greater in some breeds of domestic cats than in other breeds.

D) changes to the cat genome as a result of domestication occurred simultaneously with changes to genomes of other species associated with sociability.

27

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

A) Lines 37-41 ("The scientists . . . genes")

B) Lines 57-58 ("The researchers . . . friendly")

C) Lines 59-63 ("Some . . . rewards")

D) Lines 75-76 ("We're hitting . . . socially")

28

According to the passage, the discovery that some genes in domestic cats influence the migration of neural crest cells is important because neural crest cells are

A) likely to be overlooked in analyses regarding the evolution of domestic animals.

B) potentially responsible for domestic animals' ability to thrive in harsh environments.

C) thought to be fundamental to the overall process of the domestication of animals.

D) considered to be critical to domestic animals' reproduction.

29

As used in line 83, "common traits" most nearly means

A) widespread mannerisms.

B) inferior qualities.

C) familiar habits.

D) similar features.

30

The author most likely includes the quotation in the last sentence of the passage to

A) offer an alternative to generally accepted beliefs about the domestication of cats.

B) suggest a potential explanation for the distinct way in which domestic cats developed.

C) provide a possible reason for the continual changes to the cat genome.

D) qualify previously discussed findings about domestic animals.

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Questions 31-41 are based on the following passages.

Passage 1 is adapted from a speech delivered in 1854 by Stephen Douglas, "Defense of the Kansas-Nebraska Bill." In 1854, Douglas, a senator from Illinois, proposed a bill allowing voters in the new territories of Kansas and Nebraska to decide whether slavery should be permitted there. When enacted, the bill would effectively repeal the Missouri Compromise of 1820, which prohibited slavery in these territories. Passage 2 is adapted from a speech delivered in 1856 by Charles Sumner, "The Crime against Kansas." Sumner was a senator from Massachusetts.

Passage 1

The argument of [my opponents] is predicated upon the assumption that the policy of the fathers of the republic was to prohibit slavery in all the territory ceded by the old states to the Union and made United States territory for the purpose of being organized into new states. I take issue upon that statement. . . .

[Y]ou find upon the statute books under Washington and the early Presidents provisions of law showing that in the southwestern territories the right to hold slaves was clearly implied or recognized, while in the northwest territories it was prohibited. The only conclusion that can be fairly and honestly drawn from that legislation is that it was the policy of the fathers of the republic to prescribe a line of demarcation between free territories and slaveholding territories by a natural or a geographical line, being sure to make that line correspond, as near as might be, to the laws of climate, of production, and probably of all those other causes that would control the institution and make it either desirable or undesirable to the people inhabiting the respective territories. . . .

Now I ask the friends and the opponents of this measure to look at it as it is. Is not the question involved the simple one, whether the people of the territories shall be allowed to do as they please upon the question of slavery, subject only to the limitations of the Constitution? That is all the bill provides; and it does so in clear, explicit, and unequivocal terms. . . . I do not wish to deal in any equivocal language. If the principle is right, let it be avowed and maintained. If it is wrong, let it be repudiated. Let all this quibbling about the Missouri Compromise, about the territory acquired from France, about the act of 1820, be cast behind you; for the simple question is—Will you allow the people to legislate for themselves upon the subject of slavery? Why should you not?

Passage 2

[T]he Nebraska Bill was in every respect a swindle. It was a swindle by the South of the North. It was, on the part of those who had already completely enjoyed their share of the Missouri Compromise, a swindle of those whose share was yet absolutely untouched. . . . It was a swindle of a broad territory, thus cheated of protection against slavery. It was a swindle of a great cause, early espoused by Washington, Franklin, and Jefferson, surrounded by the best fathers of the republic. Sir, it was a swindle of God-given inalienable rights. Turn it over; look at it on all sides, and it is everywhere a swindle; and, if the word I now employ has not the authority of classical usage, it has, on this occasion, the indubitable authority of fitness. No other word will adequately express the mingled meanness and wickedness of the cheat.

Its character was still further apparent in the general structure of the bill. Amid overflowing professions of regard for the sovereignty of the People in the Territory, they were despoiled of every essential privilege of sovereignty. They were not allowed to choose their governor, secretary, chief justice, associate justices, attorney, or marshal—all of whom are sent from Washington; nor were they allowed to regulate the salaries of any of these functionaries, or the daily allowance of the legislative body, or even the pay of the clerks and doorkeepers; but they were left free to adopt slavery.

And this was called popular sovereignty! Time does not allow, nor does the occasion require, that I should stop to dwell on this transparent device to cover a transcendent wrong. Suffice it to say that slavery is in itself an arrogant denial of human rights, and by no human reason can the power to establish such a wrong be placed among the attributes of any just sovereignty. In refusing it such a place, I do not deny popular rights, but uphold them; I do not restrain popular rights, but extend them. And, sir, to this conclusion you must yet come, unless deaf, not only to the admonitions of political justice, but also to the genius of our own Constitution, under which, when properly interpreted, no valid claim for slavery can be set up anywhere in the national territory.

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CONTINUE

1

31

As used in line 12, "recognized" most nearly means

A) formally acknowledged.
B) publicly commended.
C) plainly confessed.
D) accurately recalled.

32

In Passage 1, Douglas implies that legislators' consideration of the bill he has proposed has been clouded by the

A) moral dilemmas inherent in the issue of slavery.
B) emphatic language that characterizes the text of the bill.
C) discussion of issues that are fundamentally beside the point.
D) preexisting loyalties and rivalries present among legislators.

33

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

A) Lines 25-29 ("Is not . . . Constitution")
B) Lines 29-32 ("That . . . language")
C) Lines 32-33 ("If the . . . repudiated")
D) Lines 33-36 ("Let all . . . you")

34

The repetition of "swindle" in the first paragraph of Passage 2 has the main effect of creating

A) a skeptical tone that reveals Sumner's distrust of his fellow senators.
B) an outraged tone that expresses Sumner's indignation over the Kansas-Nebraska Bill.
C) a pessimistic tone that reflects Sumner's conviction that the Kansas-Nebraska Act cannot be repealed.
D) an aggrieved tone that shows Sumner's sense of betrayal over the founding fathers' support for slavery.

35

One of Sumner's central claims in Passage 2 is that the Kansas-Nebraska Bill had the effect of

A) disrupting the balance of authority between slaveholding and nonslaveholding territorial governments.
B) depriving a federal policy that enjoyed widespread popularity of its legitimacy.
C) disenfranchising citizens in territories where the Missouri Compromise had yielded no obvious benefits.
D) giving the impression that the rights of citizens in certain territories were being expanded when they were in fact being curtailed.

36

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

A) Lines 45-46 ("It was . . . slavery")
B) Lines 58-61 ("Amid . . . of sovereignty")
C) Lines 72-76 ("Suffice . . . sovereignty")
D) Lines 78-83 ("And, sir . . . territory")

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37

In Passage 2, Sumner indicates that under the Kansas-Nebraska Bill, the national government had the authority to

A) regulate commerce in the territories.

B) enforce territorial laws concerning slavery.

C) mediate disputes between territorial governments.

D) appoint officials to territorial posts.

38

In the context of Sumner's argument, lines 76-77 ("In refusing . . . them") serve primarily to

A) reiterate that he shares certain fundamental values with supporters of slavery.

B) provide an explanation for his claims about the historical legacy of slavery.

C) rephrase an opinion on abolition that he offered earlier in his speech.

D) argue that his position on slavery constitutes authentic popular sovereignty.

39

Which choice best identifies a distinction in how Douglas and Sumner characterize the Kansas-Nebraska Bill?

A) Douglas characterizes it as straightforward in its intent, while Sumner characterizes it as fundamentally deceptive.

B) Douglas sees it as safeguarding the interests of the slaveholding territories, while Sumner sees it as unfairly burdening those territories.

C) Douglas characterizes it as progressive in its treatment of the issue of slavery, while Sumner characterizes it as upholding the status quo.

D) Douglas regards it as deeply relevant to key national concerns, while Sumner regards it as largely irrelevant to those concerns.

40

Sumner would most likely fault the "simple question" (lines 36-37) proposed by Douglas in Passage 1 for being

A) biased, since it places the interests of territories over those of established states.

B) irrelevant, since territorial citizens already have the freedom to legislate on local matters.

C) misleading, since it fails to acknowledge that certain provisions of the Kansas-Nebraska Bill are unrelated to territorial sovereignty.

D) immoral, since it focuses on the political rights of territorial citizens at the expense of the human rights of slaves.

41

Which choice best identifies a key difference in how Douglas and Sumner make use of the Constitution?

A) Douglas suggests that the Constitution must be adapted to address the present circumstances of slavery, whereas Sumner contends that the Constitution requires no alteration.

B) Douglas suggests that the Constitution's provisions for slavery are open to interpretation, whereas Sumner asserts that the Constitution's stance on slavery is unambiguous.

C) Douglas suggests that the Constitution's restrictions on slavery do not apply to the territories, whereas Sumner argues that the Constitution treats states and territories equally.

D) Douglas suggests that slavery may be permitted in the territories without violating the Constitution, whereas Sumner insists that slavery is not compatible with the ideals of the Constitution.

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CONTINUE

Questions 42-52 are based on the following passage and supplementary material.

This passage and accompanying figure are adapted from Sandra M. Faber et al., "Staring Back to Cosmic Dawn." ©2014 by F+W Media, Inc.

The Hubble Space Telescope (HST) is a time machine, staring not only billions of light-years into the depths of space but also billions of years back in time. With its extraordinarily sensitive detectors above Earth's shrouding and blurring atmosphere, HST can witness the peak of star formation at cosmic high noon, which ended about 5 billion years after the Big Bang. And at the outer limits of its capabilities, we wondered if it could detect the faintest candles of creation: the earliest galaxies made of the earliest stars at cosmic dawn, when the universe was less than a billion years old.

Those were the hopes of two of us authors (Faber and Ferguson) after NASA astronauts installed HST's Wide-Field Camera 3 (WFC3) in 2009, which enabled Hubble to survey the infrared sky about 30 times faster than before. Within a few months, Hubble pointed the new camera at the Hubble Ultra-Deep Field (HUDF)—a tiny region in the constellation Fornax only a tenth the diameter of the full Moon—and took exposures totaling about three days. Those deep HUDF images revealed some of the most distant galaxies ever found, which look very different than nearby galaxies. But the HUDF represented just a pinprick poke at the universe.

So we began an ambitious program at visible and near-infrared wavelengths as a natural successor to HUDF: the Cosmic Assembly Near-infrared Deep Extragalactic Legacy Survey (CANDELS), pronounced "candles." We designed CANDELS primarily to document the first one-third of galaxy evolution. The program also would enable astronomers to search for the most distant Type Ia supernovae—exploding white dwarf stars that are the best-known standard candles for measuring the universe's recent expansion rate. CANDELS could thus test whether Type Ia supernovae are also a valid yardstick for the early universe.

CANDELS became the largest observing program ever undertaken by Hubble. The telescope devoted 600 hours—fully 10% of its observing time—to CANDELS for three years, surveying an area of sky 60 times larger than the HUDF, albeit to brighter limiting magnitudes (about 27 for CANDELS compared to 30 for the HUDF). CANDELS targeted five patches of the northern and southern skies, each about one-fourth the angular size of the Orion Nebula (M42). Each patch has been well studied from radio to X rays, giving plenty of complementary data across the electromagnetic spectrum.

Because remote galaxies are so faint, the five target areas were away from our Milky Way's star-studded plane. Much as pollsters and medical researchers learn about the human population as a whole by studying carefully selected samples of a small number of individuals, we chose the five target areas because they're physically representative of the universe at large.

Depending on the field, CANDELS took multiple images with exposure times ranging from 40 minutes to roughly 3 hours through each of two or three infrared filters. Although CANDELS surveyed a total area only about that of the full Moon, the long exposures looked so deep into the cosmos that they recorded roughly a quarter-million ancient galaxies in enough detail to reveal their sizes, shapes, and even gross internal structures. Such a rich treasure trove provides powerful new data for statistical studies of galaxy growth and evolution.

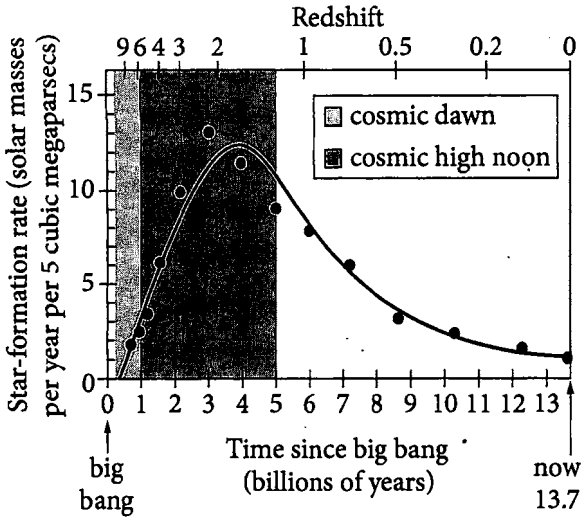
Astrophysicists will continue to analyze the wealth of observations for years to come. The data have already led to new findings and mysteries about the early universe.

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CONTINUE

1

Star-Formation Rate since the Big Bang



Masses of stars are expressed in units of solar masses, where one solar mass equals the mass of the Sun. The redshift is a measurement of distance and corresponds to the time when an object emitted the light we observe.

42

Over the course of the passage, the main focus shifts from

A) an example of data collected using the HST to a discussion of design flaws that led to replacing several instruments on the HST.

B) an explanation of a new theory of star formation to an experiment using the HST designed to test the validity of that theory.

C) a list of the authors' accomplishments to a description of a new experiment using the HST to investigate how galaxies form.

D) an overview of the capabilities of the HST to a discussion of research undertaken that utilized those capabilities.

43

Which choice best supports the conclusion that the first galaxies formed less than 1 billion years after the big bang?

A) Lines 1-4 ("The Hubble . . . time")

B) Lines 4-8 ("With its . . . Bang")

C) Lines 8-12 ("And at . . . old")

D) Lines 22-24 ("Those . . . galaxies")

44

Based on the passage, what can reasonably be inferred about galaxies billions of years ago?

A) They looked very different from galaxies today.

B) They were dominated by Type Ia supernovae.

C) They were grouped together in one location in the sky.

D) They were much larger than astronomers had expected.

45

As used in line 31, "document" most nearly means

A) produce.

B) define.

C) record.

D) construct.

46

In the context of the research described in the passage, Type Ia supernovae may be useful because they could allow astronomers to

A) determine the expansion rate of the universe soon after the big bang.

B) more accurately calibrate other methods of measuring distance.

C) better understand what causes white dwarf stars to explode.

D) catalog the earliest known galaxies according to their physical properties.

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CONTINUE

47

As used in line 48, "patch" most nearly means

A) connection.
B) allotment.
C) covering.
D) region.

48

Based on the passage, the authors would most likely say that conducting deep all-sky surveys to obtain information about ancient galaxies is

A) practical.
B) unnecessary.
C) justified.
D) incomplete.

49

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

A) Lines 39-45 ("CANDELS . . . for the HUDF")
B) Lines 51-53 ("Because . . . plane")
C) Lines 53-58 ("Much . . . large")
D) Lines 67-69 ("Such . . . evolution")

50

The reference to the full Moon in line 63 primarily serves to

A) give readers a sense of the size of the area investigated by CANDELS.
B) identify the direction the HST was directed while collecting data for the HUDF.
C) help readers understand how images are processed by the Wide-Field Camera 3.
D) show how much farther away from Earth ancient galaxies are than the Moon is.

51

According to the figure, which choice is a possible redshift of a galaxy made of stars that formed during cosmic dawn?

A) 1.0
B) 1.8
C) 5.0
D) 9.0

52

Astronomers estimate that the Sun formed about 8.5 billion years after the big bang. According to the figure, what was the star formation rate, in solar masses per year per 5 cubic megaparsecs, at the time the Sun formed?

A) About 1.0
B) About 1.5
C) About 4.0
D) About 6.5

STOP

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

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Writing and Language Test

35 MINUTES, 44 QUESTIONS

Turn to Section 2 of your answer sheet to answer the questions in this section.

DIRECTIONS

Each passage below is accompanied by a number of questions. For some questions, you will consider how the passage might be revised to improve the expression of ideas. For other questions, you will consider how the passage might be edited to correct errors in sentence structure, usage, or punctuation. A passage or a question may be accompanied by one or more graphics (such as a table or graph) that you will consider as you make revising and editing decisions.

Some questions will direct you to an underlined portion of a passage. Other questions will direct you to a location in a passage or ask you to think about the passage as a whole.

After reading each passage, choose the answer to each question that most effectively improves the quality of writing in the passage or that makes the passage conform to the conventions of standard written English. Many questions include a "NO CHANGE" option. Choose that option if you think the best choice is to leave the relevant portion of the passage as it is.

Questions 1-11 are based on the following passage.

Parks and Re-creation

In US cities, open space is difficult to come by. In New York, 1 likewise, nearly half of the districts have less than 1.5 acres of parkland per 1,000 residents. For this reason, cities must creatively use what is available, including repurposing landfills. Transforming landfills into parks has its pitfalls, 2 however, it is well worth the effort for communities to invest in these spaces.

1

A) NO CHANGE
B) on the other hand,
C) in addition,
D) for example,

2

A) NO CHANGE
B) but
C) nonetheless
D) however

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2

3 There is no official count of the number of parks built on landfills nationwide, but it could be as many as 1,000. Land formerly used for garbage is usually inexpensive to buy. It is also 4 prolific: the Environmental Protection Agency estimates that the United States has at least 10,000 closed municipal landfills. By restoring the landscape, these parks also hold

3

Which choice best introduces the main idea of the paragraph?

A) NO CHANGE

B) For many environmental and logistical reasons, not all landfills can be repurposed as parks.

C) Reclaiming landfills for park space offers multiple advantages to urban areas.

D) Americans generated 251 million tons of trash in 2012, only 34.5 percent of which was recycled.

4

A) NO CHANGE

B) abundant:

C) magnanimous:

D) excessive:

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tremendous benefits for the environment; because they transform a blemish into an attractive asset, they have the added benefit of raising property values. A recent paper published by the Trust for Public Land notes that parks are a boon to communities in terms of both health and social development. Exercise, 5 play, and exposure to green space have all been linked to improved health. 6 The report also notes that community spaces, such as gardens and sports fields, are linked to reduced crime and a stronger bond among neighborhood residents.

5

A) NO CHANGE
B) play, and,
C) play, as well as
D) play; and

6

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

> Interest in urban parks declined around the mid-twentieth century but has been revived during the past few decades.

Should the writer make this addition here?

A) Yes, because it provides a detail that supports the main claim of the paragraph.
B) Yes, because it effectively sets up the sentence that follows in the paragraph.
C) No, because it includes information that contradicts the main idea of the paragraph.
D) No, because it distracts from the focus of the paragraph by introducing irrelevant information.

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2

One example of a successful landfill 7 park, is Freshkills, a space on the coast of Staten Island, New York, that was once a 2,200-acre dump. The park offers many recreational opportunities largely unavailable in the 8 city; these occur on layers of plastic, soil, and grass atop the garbage. Coastline restoration introduces water-absorbing plants, protecting residential areas from flood damage. 9 Its design also features a solar station that will produce enough energy 10 to power more than 2,000 homes.

The process of converting landfills into parks presents some challenges, but they are surmountable. When buried waste decomposes, it releases flammable gases such as methane, causing a potential health hazard. Also, while landfills are inexpensive to purchase, maintenance costs can be high. However, technological advances allow park designers to address both concerns. Turning the 11 disgusting problem into an advantage, Freshkills uses a gas-collection system that converts methane into enough energy to heat 22,000 homes, a process that will generate $12 million in revenue to offset the cost of park construction. Clearly, the advantages of converting landfills into parks dramatically outweigh the drawbacks. With such innovations in place, there is little reason for communities not to create a park from what would otherwise be a wasteland.

7

A) NO CHANGE
B) park is
C) park is,
D) park is:

8

Which version of the underlined portion provides the most relevant examples for the sentence?

A) NO CHANGE
B) city, such as horseback riding, nature trails, and kayaking.
C) city; the park's wetlands include coastal grassland and marshes.
D) city, among such plants as switchgrass, purple coneflowers, and bugbane.

9

A) NO CHANGE
B) It's
C) Their
D) The park's

10

A) NO CHANGE
B) so that it powers
C) for powering of
D) powering

11

A) NO CHANGE
B) noxious
C) gross
D) foul

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CONTINUE

Questions 12-22 are based on the following passage.

A Swan Song for Sherlock Holmes

When Arthur Conan Doyle introduced the brilliant and eccentric London detective Sherlock Holmes in the 1887 novel *A Study in Scarlet*, relatively few readers took notice. Beginning in 1891, though, a steady stream of short stories published in the London magazine *The Strand* caused Holmes's fan base to grow exponentially, and by 1893, the character was an international sensation. With Holmes at the height of his popularity, readers who purchased *The Strand*'s December 1893 issue were taken aback by the shocking conclusion of the latest installment: 12 Holmes, having plunged from a waterfall in Switzerland while fighting his enemy Moriarty, was dead.

12

A) NO CHANGE
B) Holmes, having plunged,
C) Holmes; having plunged
D) Holmes having plunged

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CONTINUE

2

13 Having introduced Moriarty in the same story, Conan Doyle in fact had long desired to end the series. 14 "I am weary of his name," the author declared: devising the intricate plots of the stories took a great deal of time and effort, and Conan Doyle wanted to dedicate 15 one's energies elsewhere. Believing the Holmes stories to be lowbrow work, 16 instead, a focus on writing historical epics was what he wanted. Lucrative publishing contracts had made it difficult to walk away from the series, but by 1893 the author had made up his mind. "If I had not killed him, he would certainly have killed me," Conan Doyle remarked ominously.

13

Which choice provides the best transition from the previous paragraph?

A) NO CHANGE
B) Having given Holmes the ability to adopt a variety of costumes and disguises,
C) Not knowing that his works would later be adapted for stage and screen,
D) Though Holmes's death seemed sudden to readers,

14

Which choice provides a quotation from Conan Doyle that best sets up the information that follows in the paragraph?

A) NO CHANGE
B) "It was still the Sherlock Holmes stories for which the public clamored," the author complained:
C) "He takes my mind from better things," the author lamented of Holmes:
D) "I was amazed at the concern expressed by the public," the surprised author declared:

15

A) NO CHANGE
B) his
C) its
D) their

16

A) NO CHANGE
B) focusing on writing historical epics was what he wanted to do instead.
C) writing historical epics was what he wanted to focus on instead.
D) he wanted to focus on writing historical epics instead.

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CONTINUE

17 Young readers were especially saddened at the loss of their hero. Making headlines around the world, the death of such a beloved character spurred a public outcry. The author received an abundance of angry letters petitioning for Holmes's return, and 18 they were not enough to make him change his mind. It is even said that Londoners donned 19 black armbands in solidarity. Such armbands are a traditional symbol of mourning. Conan Doyle's decision was a serious blow not only to the public but also to the magazine—*Strand* editors panicked as 20,000 people canceled 20 it's subscriptions.

17

Which choice best introduces the topic of this paragraph?

A) NO CHANGE
B) The periodicals of the time played an important role in expressing the public's *feelings.*
C) It had been only eighteen months since *The Strand* published its first Holmes story, but the magazine's success was already dependent on the detective.
D) While Conan Doyle was more than ready to part with the character, legions of fans were not.

18

Which choice provides an additional example that is most similar to the one already in the sentence?

A) NO CHANGE
B) "Keep Holmes Alive" clubs formed.
C) those writing to him came from all parts of society.
D) he turned his attention to other forms of writing.

19

Which choice best combines the sentences at the underlined portion?

A) such black armbands in solidarity, a traditional symbol of mourning.
B) black armbands, these being a traditional symbol of mourning, in solidarity.
C) black armbands, a traditional symbol of mourning, in solidarity.
D) traditionally symbolic black armbands in mourning and solidarity.

20

A) NO CHANGE
B) its
C) there
D) their

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CONTINUE

After nearly eight years, however, Conan Doyle 21 caved. *The Hound of the Baskervilles*, a novel set before Holmes's death, was serialized in *The Strand* from August 1901 to April 1902. Soon after, exorbitant sums offered by the magazine convinced Conan Doyle to reverse Holmes's death sentence and continue the series indefinitely. In "The Adventure of the Empty House," he wrote that Holmes had actually faked his death and spent several years traveling. "The explanation may be thin, / But . . . we don't care a pin," proclaimed P. G. Wodehouse in a comic poem hailing the detective's return. Readers were thrilled to have Holmes back. Though Conan Doyle would always harbor ambivalence about the 22 series, but it is the large body of Holmes stories and countless adaptations for stage and screen that have been responsible for the author's lasting legacy.

21

Which choice best maintains the tone of the passage?

A) NO CHANGE
B) sold out.
C) loosened up.
D) relented.

22

A) NO CHANGE
B) series;
C) series,
D) series, while

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Questions 23-33 are based on the following passage.

Ancient Acoustics

Built in southern Greece in the fourth century BCE and rediscovered in the late nineteenth century CE, the outdoor amphitheater of Epidaurus is renowned for allowing performers' voices to carry even to the last of its fifty-five rows. The source of this acoustic quality, 23 therefore, has long been misunderstood. It 24 is not until 2007 that a study by Nico Declercq and Cindy Dekeyser of the Georgia Institute of 25 Technology demonstrated that the theater's seating arrangement is the source of its excellent acoustics.

23

A) NO CHANGE
B) however,
C) instead,
D) consequently,

24

A) NO CHANGE
B) had not been
C) would not have been
D) was not

25

A) NO CHANGE
B) Technology—
C) Technology. It
D) Technology, which

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Before Declercq and Dekeyser's study, many explanations had been proposed for the sound quality at the Epidaurus theater. Observers speculated that the direction in which the wind blows, the rhythm of performances in ancient Greece, or the amplifying properties of actors' masks allowed sound from the stage to reach the entire audience. But while these factors may have had some effect, 26 the Greek soprano Maria Callas performed at the theater in 1960, and actors have performed there without special enunciation or augmentation. Since actors remained audible under all of these 27 conditions and circumstances, the mystery of the theater's acoustics endured.

26

Which choice most effectively addresses the theories presented in the previous sentence?

A) NO CHANGE
B) the theater provides a fitting venue for the annual Epidaurus Festival, which features stagings of ancient Greek classics,
C) audience members continue to enjoy the beautiful view of a lush landscape beyond the stage,
D) modern plays have been staged at Epidaurus on windless days,

27

A) NO CHANGE
B) conditions and in these situations,
C) conditions and were able to be heard,
D) conditions,

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28 In considering the primary source of the theater's sonic properties, Declercq and Dekeyser suspected that the key might be the way sound waves reflect or break apart when they encounter ridged surfaces. Applying mathematical models derived in part from Declercq's earlier research, which had examined the ways sound waves reflect off a step pyramid at Chichén Itzá in Mexico, they found that the tiered rows of limestone benches in the Epidaurus theater affect sound waves in an unusual way. 29 The waves encounter the theater's seats. As this happens, sounds with frequencies lower than 500 hertz are significantly dampened while higher-frequency sounds are reflected with little diminution.

28

Which choice most effectively introduces the information in the paragraph?

A) NO CHANGE
B) Sensing that the ancient Greeks and Romans had admired the theater's design,
C) Even though evidence suggests that the Greek builders of the theater did not understand the acoustic principles that account for the quality of sound in the theater,
D) Curious about the effects of background noise on the sound quality of an ancient outdoor venue such as the Epidaurus theater,

29

Which choice most effectively combines the sentences at the underlined portion?

A) After an encounter between the waves and the theater's seats,
B) When the waves encounter the theater's seats,
C) The waves happen to encounter the theater's seats, and
D) The waves encounter the theater's seats—thus,

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CONTINUE

2

[1] This filtering effect explains why performers are so easy to hear in the theater. [2] Low-frequency sounds such as wind, rustling trees, and other noises coming from the area around the theater are reduced when they bounce off the seats, whereas the high-frequency sounds coming from the actors remain relatively unchanged. [3] Performers' voices also contain low tones, and these too are muted by the theater's seats. [4] But this sound reduction doesn't impair actors' audibility because of a neurological phenomenon called "virtual pitch." [5] This capacity helps people hear human voices more clearly than 30 hearing less important sounds. [6] When exposed to speech that lacks 31 their typical lower tones, the human brain automatically reconstructs the missing frequencies. [7] At Epidaurus, the combination of virtual pitch and the sound-dampening effect of the seats 32 allow performers' voices to be heard fully and clearly from any seat. 33

30

A) NO CHANGE
B) less
C) having heard less
D) those of less

31

A) NO CHANGE
B) it's
C) its
D) they're

32

A) NO CHANGE
B) have been allowing
C) are allowing
D) allows

33

To make this paragraph most logical, sentence 7 should be placed

A) where it is now.
B) before sentence 1.
C) after sentence 1.
D) after sentence 2.

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CONTINUE

Questions 34-44 are based on the following passage and supplementary material.

A Ray of Sunshine for the US Economy

The solar-power industry in the United States has seen dramatic growth during recent years as energy consumers have sought to become more self-sufficient, diminish their environmental 34 impact. And lowering their energy bills. As a result of increased demand for solar energy, the solar-power industry now offers one of the fastest-growing career paths in the country. From 2010 to 2014, the overall number of solar jobs in the US economy 35 held steady, with the addition of approximately 80,000 jobs in manufacturing, sales and distribution, installation, and more.

34

A) NO CHANGE
B) impact, plus they can lower their
C) impact—with lower
D) impact, and lower their

35

Which choice most effectively interprets data from the table to set up the information provided in the rest of the sentence?

A) NO CHANGE
B) increased at a rate of 72 percent,
C) skyrocketed by nearly 86 percent,
D) fluctuated between 30 and 121 percent,

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Comprising just over half of solar jobs in 2014, installation is the largest single sector of the solar-power industry. Job opportunities in installation have soared: from 2010 to 2014, the number of solar-installation jobs increased 121 percent, 36 to 20,185 jobs in 2014, more than the number of manufacturing jobs. These jobs are open to people at a variety of experience levels. While many solar installers have taken courses at technical schools or community colleges, the only requirement beyond a high school diploma is usually an apprenticeship or other on-the-job training. 37 With California leading the country in solar jobs, jobs in this sector of the solar industry are quite profitable. In 2013, solar installers' wages averaged $23.63 per hour, comparable to 38 those of skilled electricians and plumbers.

Solar Jobs by Sector, 2010–2014

Sector	2010	2012	2014	Growth rate, 2010–2014
Installation	43,934	57,177	97,031	121%
Manufacturing	24,916	29,742	32,490	30%
Sales and distribution	11,744	16,005	20,185	72%
Project development	N/A	7,988	15,112	N/A
Other	12,908	8,105	8,989	N/A
Total	93,502	119,016	173,807	85.9%

Changes in the number of jobs in "Other" over the years are not necessarily a reflection of actual increases or decreases in employment but may instead be due to changes in the types of jobs included in this category.

Adapted from The Solar Foundation, National Solar Jobs Census 2014. ©2015 by The Solar Foundation.

36

Which choice most effectively uses data from the table to support the point made in the first part of the sentence?

A) NO CHANGE
B) from 43,934 jobs in 2010 to 97,031 jobs in 2014.
C) less than the growth rate for jobs in manufacturing.
D) from 11,744 jobs in 2010 to 15,112 jobs in 2014.

37

Which choice best introduces the material that follows in the paragraph?

A) NO CHANGE
B) In addition to being abundant and accessible,
C) Though they are less plentiful in some areas,
D) Also requiring some knowledge of maintenance,

38

A) NO CHANGE
B) a skilled electrician or plumber.
C) wages earned by a skilled electrician and plumbers.
D) skilled electricians and plumbers.

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The rapid proliferation of well-paying jobs in solar installation 39 are largely attributable 40 to: the falling price of solar energy. Technological innovation has made components less expensive, while tax subsidies and other governmental incentive programs have offset some of the costs of installation for businesses and individuals. Also, the efficiency of solar-installation companies has increased as the industry has matured, reducing costs still further. All of these factors have driven down the cost of equipment and installation for solar-power systems, which fell by more than 50 percent between 2010 and 2013. Solar power is now competitive with other energy sources in many 41 markets. This leads corporations, utility companies, and private homeowners to use it. Indeed, the primary reason most consumers cite for installing new solar-power systems is not to benefit the environment but to save money.

39

A) NO CHANGE
B) have been
C) is
D) are being

40

A) NO CHANGE
B) to,
C) to
D) to—

41

Which choice most effectively combines the sentences at the underlined portion?

A) markets, a development that has led
B) markets, an aspect of solar power that has led
C) markets; such competition has led
D) markets, with this competition leading

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CONTINUE

42 Because some power companies don't provide information about saving money over helping the environment, technological and economic developments in the solar-power industry ensure they are doing both. Consumers are not the only ones for whom solar power is a win-win scenario, 43 though as a result of their own efforts, industry employees can meet demand for an environmentally friendly service while 44 also making a good living for themselves.

42

Which choice provides the best transition from the previous paragraph?

A) NO CHANGE
B) Even though consumers of solar-power systems may prioritize
C) While it remains unclear whether people in urban areas prefer
D) Since just installing solar panels doesn't immediately guarantee that people will prioritize

43

A) NO CHANGE
B) though, as a result,
C) though: as a result
D) though—as a result,

44

A) NO CHANGE
B) they also, meanwhile, make a good living for themselves.
C) simultaneously making a good living for themselves at the same time.
D) making a good living for themselves is something they can do at the same time.

STOP

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

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Math Test – No Calculator

25 MINUTES, 20 QUESTIONS

Turn to Section 3 of your answer sheet to answer the questions in this section.

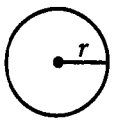
DIRECTIONS

For questions 1-15, solve each problem, choose the best answer from the choices provided, and fill in the corresponding circle on your answer sheet. **For questions 16-20**, solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 16 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

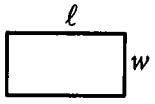
NOTES

1. The use of a calculator **is not permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated, the domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

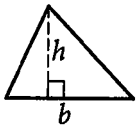
REFERENCE



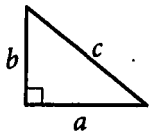
$A = \pi r^2$
$C = 2\pi r$



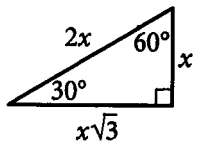
$A = \ell w$

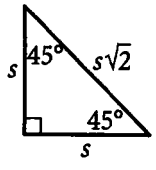


$A = \frac{1}{2}bh$

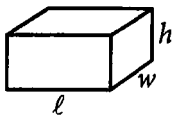


$c^2 = a^2 + b^2$

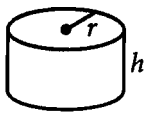




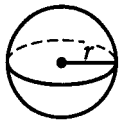
Special Right Triangles



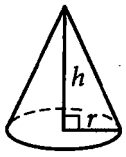
$V = \ell wh$



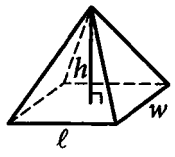
$V = \pi r^2 h$



$V = \frac{4}{3}\pi r^3$



$V = \frac{1}{3}\pi r^2 h$



$V = \frac{1}{3}\ell wh$

The number of degrees of arc in a circle is 360.
The number of radians of arc in a circle is 2π.
The sum of the measures in degrees of the angles of a triangle is 180.

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1

Lardarius spent a total of $200 to lease snowboard equipment at Winter Mountain during his vacation. Each day of his vacation, he purchased a lift ticket for $44. If Lardarius purchased t lift tickets, how much money, in dollars, did Lardarius spend during his vacation at Winter Mountain on snowboard equipment and lift tickets?

A) $44t$

B) $200 + 11t$

C) $200 + 44t$

D) $200 + 176t$

2

Which of the following expressions is equivalent to $3q^2 + r^3 + 5r - 8q + 2(q^2 + r)$?

A) $7r^3 - 3q^4$

B) $r^3 + 5q^2 - qr$

C) $r^3 + 5q^2 - 8q + 6r$

D) $r^3 + 5q^2 - 8q + 7r$

3

Which of the following equations represents the line in the xy-plane that passes through $(0, 3)$ and has a slope of -3 ?

A) $y = -3x$

B) $y = -3x + 3$

C) $y = 3x - 3$

D) $y = 3x + 3$

4

$$2(x + b) = ax + c$$

In the equation above, a, b, and c are constants. If the equation has infinitely many solutions, which of the following must be equal to c ?

A) a

B) b

C) $2a$

D) $2b$

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5

Which of the following is equivalent to $(2x+4)^2 - 4x^2$?

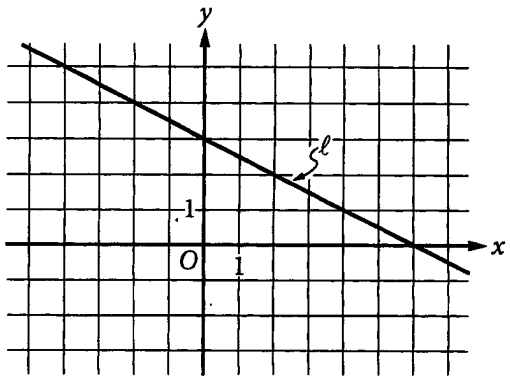
A) $16(x+1)$

B) $8(x+2)$

C) $4(4x+1)$

D) $2(8x+1)$

6



Line ℓ is shown in the xy-plane above. Which of the following is an equation of line ℓ ?

A) $x + 2y = 6$

B) $2x - y = 6$

C) $6x + 3y = 0$

D) $6x - 3y = 0$

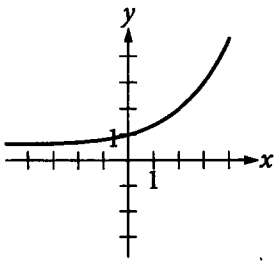
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7

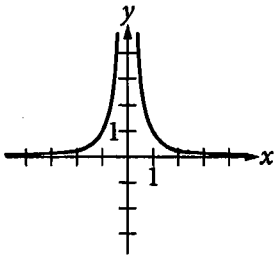
x	$f(x)$
1	a
2	b
3	c

For the function f, the table above shows some values of x and their corresponding values of $f(x)$ in terms of the constants a, b, and c. If $a < b < c$, which of the following could NOT be the graph of $y = f(x)$ in the xy-plane?

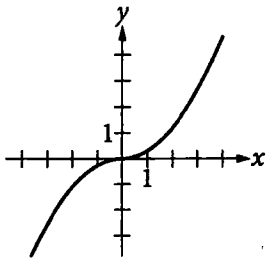
A)



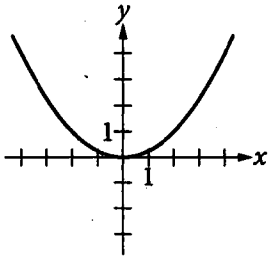
B)



C)



D)



8

If $3x - 6y = 9z$, which of the following expressions is equivalent to $x^2 - 4xy + 4y^2$?

A) $9z$

B) $3z^2$

C) $9z^2$

D) $81z^2$

9

$$x^2 - 4x + 2 = 0$$

Which of the following is a solution to the equation above?

A) $x = -2 + \sqrt{2}$

B) $x = -2 + \sqrt{6}$

C) $x = 2 + \sqrt{2}$

D) $x = 2 + \sqrt{6}$

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CONTINUE

10

$$f(n) = 5.77(0.98^n)$$

The function above can be used to estimate the number of farms, $f(n)$, in millions, in the United States for $0 \le n \le 72$, where n is the number of years after 1940. Which of the following is the best interpretation of the number 5.77 in this context?

A) The estimated number of farms, in millions, in 1940

B) The estimated number of farms, in millions, n years after 1940

C) The estimated decrease in the number of farms, in millions, each year after 1940

D) The estimated percent by which the number of farms decreased from each year to the next after 1940

11

$$y = x^2$$
$$y = 2x + 3$$

The system of equations above is graphed in the xy-plane. The graphs of the equations intersect at a point (x, y) where $x > 0$ and $y > 0$. What is the y-coordinate of this point of intersection?

A) 1

B) 3

C) 5

D) 9

12

Which of the following is a solution to the equation $4x^2 + 4x - 3 = 0$?

A) -1.5

B) -0.5

C) 1

D) 3

13

The equation $p = 14.7 + 0.439d$ approximates the pressure p, in pounds per square inch, exerted on a diver at a depth of d feet (ft) below the surface of the water. What is the increase in depth that is necessary to increase the pressure by 1 pound per square inch?

A) $\frac{1}{0.439}$ ft

B) $\frac{1}{14.7}$ ft

C) 0.439 ft

D) 14.7 ft

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CONTINUE

14

If $\frac{4x+4x+4x+4x}{4} = 4$, what is the value of $4x$?

A) 16

B) 4

C) 1

D) $\frac{1}{4}$

15

In the xy-plane, the points $(2, 4)$ and $(-2, -4)$ are the endpoints of a diameter of a circle. Which of the following is an equation of the circle?

A) $(x-2)^2 + (y+4)^2 = 80$

B) $(x-2)^2 + (y+4)^2 = 20$

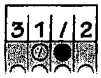
C) $x^2 + y^2 = 80$

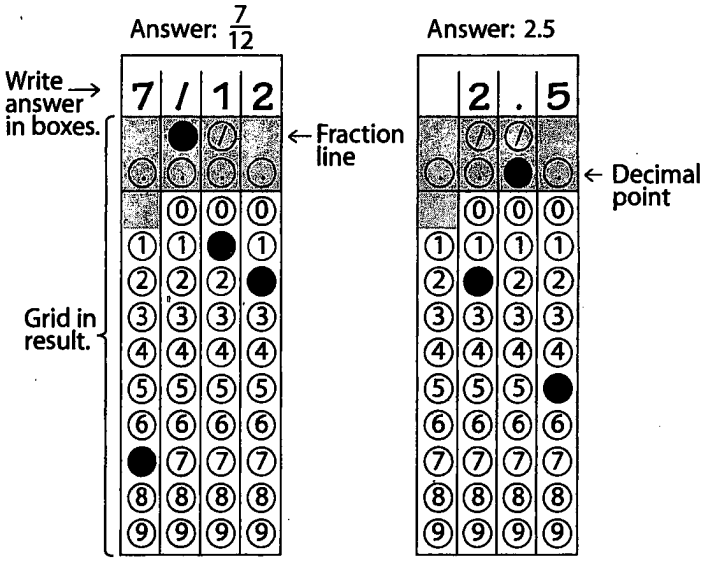
D) $x^2 + y^2 = 20$

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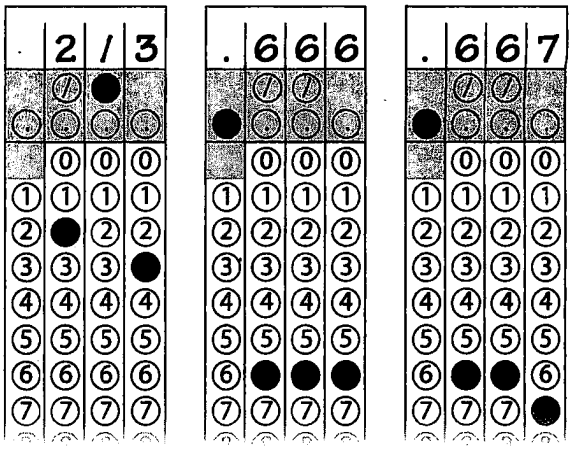
DIRECTIONS

For questions 16-20, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

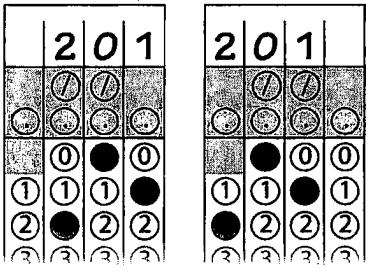
1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
2. Mark no more than one circle in any column.
3. No question has a negative answer.
4. Some problems may have more than one correct answer. In such cases, grid only one answer.
5. **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If  is entered into the grid, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)
6. **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.



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



Answer: 201 – either position is correct



NOTE: You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.

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CONTINUE

16

In the xy-plane, line k passes through the point $(3, 1)$ and is parallel to the line with equation $y = \frac{5}{2}x - \frac{7}{2}$. What is the slope of line k ?

17

$$2x + 3y = 4$$
$$y = 2x$$

If the ordered pair (x, y) satisfies the system of equations above, what is the value of x ?

18

$$\frac{1}{x-8} = -\frac{1}{x-9}$$

What value of x satisfies the equation above?

19

The two acute angles of a right triangle have degree measures of x and y. If $\sin x = \frac{5}{13}$, what is the value of $\cos y$?

20

$$(15 - 4i)(6 - 3i) = a + bi$$

In the equation above, a and b are real numbers and $i = \sqrt{-1}$. What is the value of a ?

STOP

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

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Math Test – Calculator

55 MINUTES, 38 QUESTIONS

Turn to Section 4 of your answer sheet to answer the questions in this section.

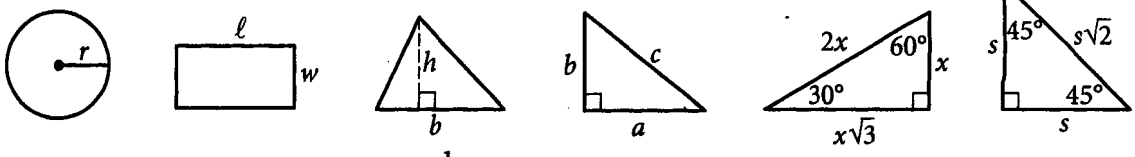
DIRECTIONS

For questions 1-30, solve each problem, choose the best answer from the choices provided, and fill in the corresponding circle on your answer sheet. **For questions 31-38**, solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 31 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

NOTES

1. The use of a calculator **is permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated, the domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE



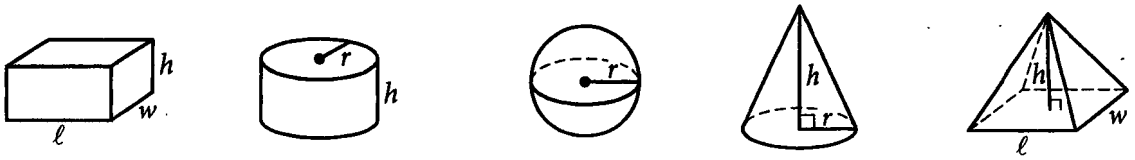
$A = \pi r^2$
$C = 2\pi r$

$A = \ell w$

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

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

Special Right Triangles



$V = \ell wh$

$V = \pi r^2 h$

$V = \frac{4}{3}\pi r^3$

$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3}\ell wh$

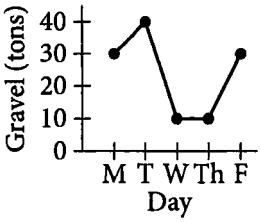
The number of degrees of arc in a circle is 360.
The number of radians of arc in a circle is 2π.
The sum of the measures in degrees of the angles of a triangle is 180.

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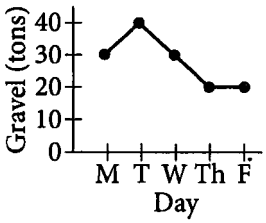
1

A gravel company had 30 tons of gravel in stock at the end of the day on Monday. On Tuesday the company shipped 10 tons of gravel and received no deliveries. On Wednesday the company made no shipments and received a delivery of 20 tons of gravel. On Thursday the company made no shipments and received no deliveries. On Friday the company shipped 20 tons of gravel and received no deliveries. Which of the following represents the number of tons of gravel the company had in stock at the end of each day?

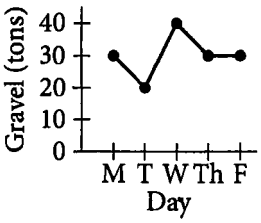
A)



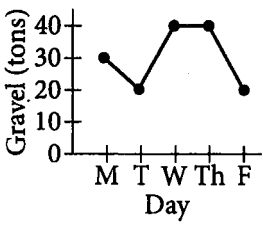
B)



C)



D)



2

If $\sqrt{2x} = 8$, what is the value of x ?

A) 4

B) 8

C) 32

D) 64

3

If $10 = 2x + 14$, which of the following must be true?

A) $4x = 8$

B) $10x = 16$

C) $8x = -16$

D) $12x = -144$

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CONTINUE

4

The hardcover books produced by a publisher have pages that are 0.1 millimeter thick and a front cover and a back cover that each are 2 millimeters thick. Which of the following gives the total thickness $f(n)$, in millimeters, of a closed book that has n pages?

A) $f(n) = 4 + 0.1n$

B) $f(n) = 2 + 0.1n$

C) $f(n) = 0.4 + 0.1n$

D) $f(n) = 0.2 + 0.1n$

5

A teacher has signed up for a program that automatically delivers books for the classroom library. The classroom library currently consists of 48 books. If the program delivers 12 books a month, how many books will the classroom library consist of after 5 months?

A) 240

B) 108

C) 65

D) 60

6

The area enclosed by a circle is 25π square inches. What is the length, in inches, of the radius of the circle?

A) 2.5

B) 5

C) 10

D) 12.5

7

An analysis of a random sample of a type of laptop computer battery estimated that the mean working time was 4.7 hours with a margin of error of 0.7 hours. Which of the following is the most appropriate conclusion based on this analysis?

A) This type of laptop computer battery has a mean working time of at least 4.7 hours.

B) This type of laptop computer battery has a mean working time of at least 5.7 hours.

C) This type of laptop computer battery has a mean working time of between 4.0 and 5.4 hours.

D) This type of laptop computer battery has a mean working time of between 0.0 and 0.7 hours.

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CONTINUE

8

$$y = 2x + 7$$

An equation of line ℓ in the xy-plane is shown above. Another line, k, has a slope equal to double the slope of ℓ and a y-intercept equal to double the y-intercept of ℓ. At which point (x, y) do lines ℓ and k intersect?

A) $\left(-\frac{7}{2}, 0\right)$

B) $\left(-\frac{2}{7}, 0\right)$

C) $\left(0, \frac{2}{7}\right)$

D) $\left(0, \frac{7}{2}\right)$

9

In normal weather conditions, a particular type of jet burns an average of 2.4 gallons of fuel per nautical mile flown. The distance from New York to Los Angeles is about 2,100 nautical miles. Approximately how many gallons of fuel will the jet burn for a trip from New York to Los Angeles in normal weather conditions?

A) 900

B) 1,200

C) 5,000

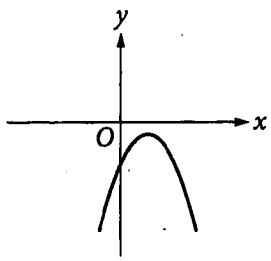
D) 7,000

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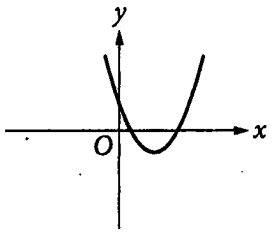
10

The quadratic function f is defined by $f(x) = 2(x+2)^2 - 1$. In the xy-plane, which of the following could be the graph of $y = f(x)$ shifted 3 units to the right?

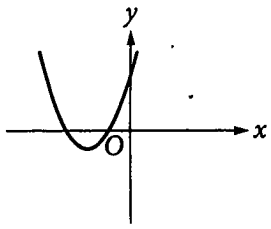
A)



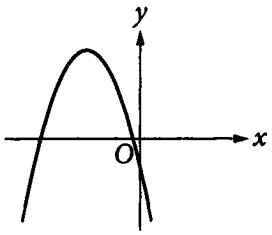
B)



C)



D)



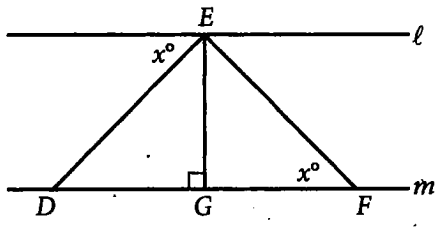
11

$$5x + 2y = 22$$
$$4x + y = 17$$

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

A) 5
B) 4
C) 3
D) 2

12



Note: Figure not drawn to scale.

In the figure above, line ℓ is parallel to line m. If $x = 40$, what is the measure of $\angle DEF$?

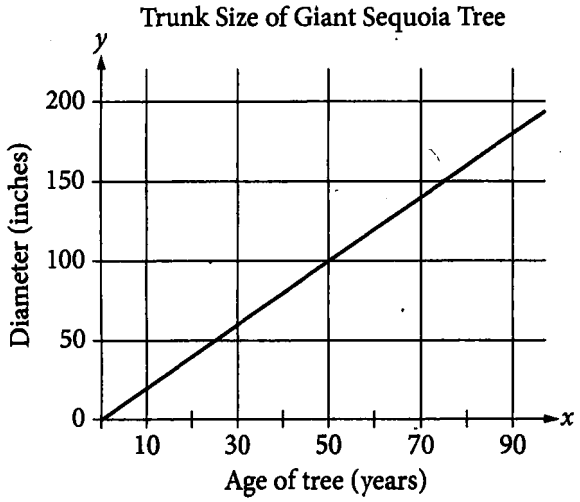
A) 140°
B) 100°
C) 80°
D) 50°

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CONTINUE

Questions 13-15 refer to the following information.

Under the right conditions, giant sequoia trees are the fastest-growing conifer on Earth. In good growing conditions, a giant sequoia tree will form a 1-inch growth ring each year, increasing the size of its trunk diameter by 2 inches per year. This relationship is represented in the graph below. A giant sequoia tree can also grow 4 feet vertically every three years.



13

Which of the following equations represents the relationship between the diameter, in inches, of a giant sequoia tree's trunk and that tree's age, in years?

A) $y = x - 2$

B) $y = x + 2$

C) $y = \frac{1}{2}x$

D) $y = 2x$

14

Assuming good growing conditions, how many years old is a giant sequoia tree with a trunk diameter of 19 feet? (1 foot = 12 inches)

A) 9.5

B) 38

C) 114

D) 494

15

The linear model $z = \frac{4}{3}w$ can be used to find the height, in feet, of a giant sequoia tree. What does w represent?

A) The age of the tree, in years

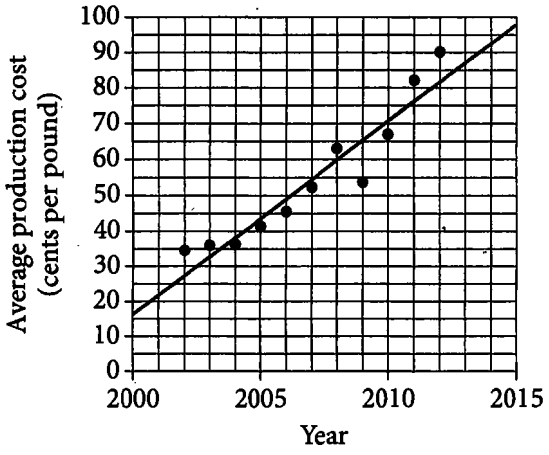
B) The height of the tree, in feet

C) The amount, in feet, the tree grows in one year

D) The amount, in feet, the tree grows in three years

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16



The scatterplot above shows the average production cost, in cents per pound, of coffee in Ecuador for the years from 2002 to 2012. A line of best fit is also drawn. Which of the following is closest to the difference, in cents per pound, between the actual average production cost in 2012 and the average production cost in 2012 predicted by the given line of best fit?

A) 4
B) 8
C) 16
D) 50

17

Emma mows grass at a constant rate of 1.5 acres per hour. She mowed 2 acres before lunch and plans to spend t hours mowing after lunch. If Emma wants to mow at least 8 acres of grass today, which of the following inequalities best represents this situation?

A) $1.5t \geq 8$
B) $1.5t - 2 \geq 8$
C) $1.5t + 2 \geq 8$
D) $2t + 1.5 \geq 8$

18

$$kx + y = 1$$
$$y = -x^2 + k$$

In the system of equations above, k is a constant. When the equations are graphed in the xy-plane, the graphs intersect at exactly two points. Which of the following CANNOT be the value of k ?

A) 3
B) 2
C) 1
D) 0

19

Of 100 people who played a certain video game, 85 scored more than 0 but less than 10,000 points, 14 scored between 10,000 and 100,000 points, and the remaining player scored 5,350,000 points. Which of the following statements about the mean and median of the 100 scores is true?

A) The mean is greater than the median.
B) The median is greater than the mean.
C) The mean and the median are equal.
D) There is not enough information to determine whether the mean or the median is greater.

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CONTINUE

Questions 20-22 refer to the following information.

In spring 2015, three separate studies on the fitness level of tenth graders were conducted in the city of Mistwick. In each study, every student in a group of tenth graders took the same fitness test and received a score on it. The possible scores on the fitness test are the whole numbers from 50 to 100, inclusive. The distribution of the scores for each of the studies is shown in the table below.

Score range	Study I	Study II	Study III
50–59	24	50	88
60–69	36	67	67
70–79	22	52	65
80–89	11	14	41
90–100	7	17	39
Mean score	68.6	68.7	70.4
Total number of participants	100	200	300

The participants for the studies were selected as follows.

- For Study I, 100 tenth graders were selected at random from all tenth graders in Mistwick.
- For Study II, 200 tenth graders were selected at random from all tenth graders in Mistwick.
- For Study III, 300 tenth graders from Mistwick volunteered to participate.

No tenth grader participated in more than one of the three studies.

20

What percent of all the scores reported in the three studies were in the 50–59 range?

A) 24%

B) 25%

C) 26%

D) 27%

21

Which of the following could be the median score in Study III?

A) 59

B) 68

C) 70

D) 82

22

The results of which of the studies can appropriately be generalized to all tenth graders in Mistwick in spring 2015?

A) Study III only

B) Studies I and II only

C) Studies II and III only

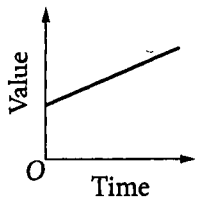
D) Studies I, II, and III

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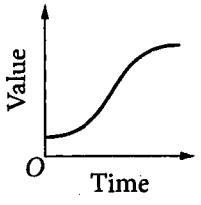
23

In 1789, Benjamin Franklin gave an amount of money to Boston, Massachusetts. The money was to be invested for 100 years in a trust fund. If the value of the trust fund doubled every n years, which of the following graphs best models the value of the trust fund over time for the 100 years?

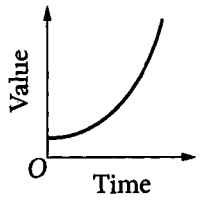
A)



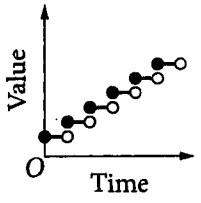
B)



C)



D)



24

$$x(x+1)+2(x+1)=ax^2+bx+c$$

In the equation above, a, b, and c are constants. If the equation is true for all values of x, what is the value of $a+b+c$?

A) 6

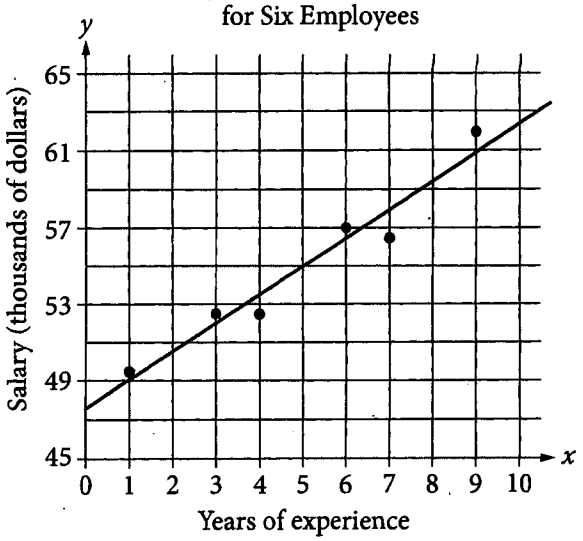
B) 5

C) 4

D) 3

25

Salary and Years of Experience for Six Employees



The scatterplot above represents the salary y, in thousands of dollars, and the number of years of experience, x, for each of six employees at a company. A line of best fit for the data is also shown. Which of the following could be an equation of the line of best fit?

A) $y=\frac{3}{2}x$

B) $y=\frac{3}{2}x+\frac{95}{2}$

C) $y=\frac{2}{3}x+\frac{95}{2}$

D) $y=\frac{2}{3}x+55$

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CONTINUE

26

$$y = (x-h)^2(x+h)(x+k)$$

The equation above is graphed in the xy-plane. If h and k are positive constants and $h \neq k$, how many distinct x-intercepts does the graph have?

A) 1
B) 2
C) 3
D) 4

27

A signal from a spacecraft orbiting Mercury travels to Earth at a speed of 3×10^8 meters per second. If the distance between Earth and the spacecraft is 2.0221×10^8 kilometers, which of the following is closest to the number of minutes it will take for a signal from the spacecraft to reach Earth?
(1 kilometer = 1,000 meters)

A) 1
B) 5
C) 11
D) 67

28

$$a(-3x-1)+x = 7x-2$$

The equation above has no solutions, and a is a constant. What is the value of a ?

A) $-\frac{7}{3}$

B) -2

C) 0

D) 2

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29

The table below shows the number of lakes in the United Kingdom classified by alkalinity and depth.

Depth class	Alkalinity class			
	Low	Medium	High	Total
Shallow	87	61	209	357
Moderate	227	86	110	423
Deep	130	35	21	186
Total	444	182	340	966

If a lake has high alkalinity, which of the following is closest to the probability that the lake also has a shallow depth?

A) 0.22

B) 0.37

C) 0.59

D) 0.61

30

Radioactive substances decay over time. The mass M, in grams, of a particular radioactive substance d days after the beginning of an experiment is shown in the table below.

Number of days, d	Mass, M (grams)
0	120.00
30	103.21
60	88.78
90	76.36

If this relationship is modeled by the function $M(d) = a \cdot 10^{bd}$, which of the following could be the values of a and b ?

A) $a = 12$ and $b = 0.0145$

B) $a = 12$ and $b = -0.0145$

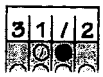
C) $a = 120$ and $b = 0.0022$

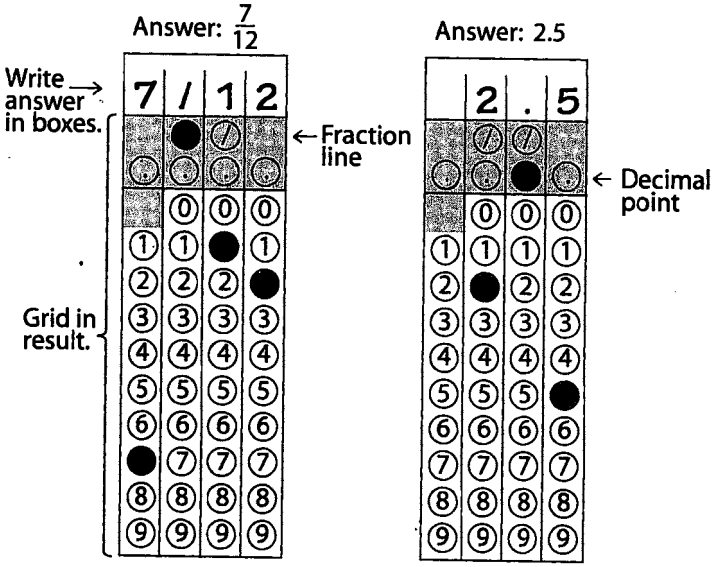
D) $a = 120$ and $b = -0.0022$

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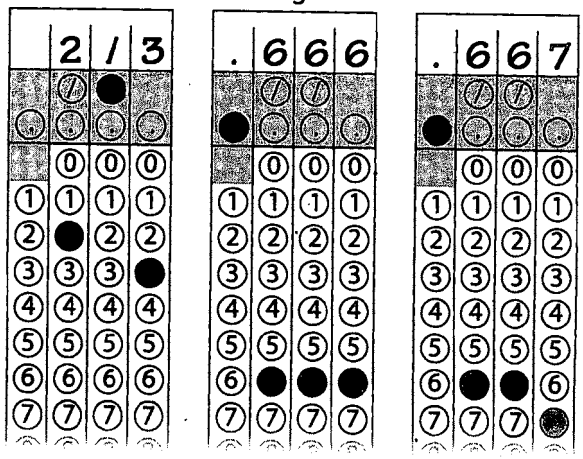
DIRECTIONS

For questions 31-38, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

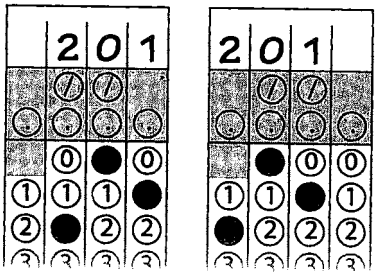
1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
2. Mark no more than one circle in any column.
3. No question has a negative answer.
4. Some problems may have more than one correct answer. In such cases, grid only one answer.
5. **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If  is entered into the grid, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)
6. **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.



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



Answer: 201 – either position is correct



NOTE: You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.

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31

A scale drawing of a room uses the scale 2 centimeters = 1 foot. In the drawing, one wall has a length of 22 centimeters. What is the actual length, in feet, of this wall?

32

The function f has the property that, for all x, $3f(x) = f(3x)$. If $f(6) = 12$, what is the value of $f(2)$?

33

$$p = 9n - (2n + k)$$

The profit p, in dollars, from producing and selling n units of a certain product is given by the equation above, where k is a constant. If 200 units are produced and sold for a profit of $1275, what is the value of k ?

34

The numbers of people, in millions, who visited Amusement Park A and Amusement Park B in 2009 through 2013 are listed in the table below. What is the positive difference between the mean number of people, in millions, who visited Amusement Park B and the mean number of people, in millions, who visited Amusement Park A during those years? (Round your answer to the nearest tenth.)

Location	2009	2010	2011	2012	2013
Amusement Park A	15.7	15.2	14.4	14.1	12.3
Amusement Park B	15.9	16.0	16.1	16.0	16.2

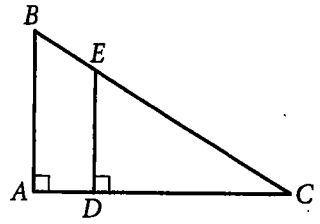
35

Lines t and w are parallel in the xy-plane. The equation of line t is $4x + 7y = 14$, and line w passes through $(-3, 8)$. What is the value of the y-intercept of line w ?

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CONTINUE

36



Note: Figure not drawn to scale.

In the figure above, ABC and DEC are right triangles. If $CD = 20$ and the tangent of angle ABC is 2.5, what is the length of segment ED ?

Questions 37 and 38 refer to the following information.

Recommended Daily Intake of Potassium

Age	Potassium (mg)
0–6 months	400
7–11 months	700
1–3 years	3,000
4–8 years	3,800
9–13 years	4,500
14–17 years	4,700
18 years and up	4,700

The table above shows the recommended amount of potassium, in milligrams (mg) per day, for people of all ages according to the National Academy of Medicine.

37

Andrea's recommended daily intake of potassium is 50% greater than that of her two-year-old brother. What is the least possible age, in years, of Andrea?

38

The recommended daily intake of potassium for an eight-month-old child is what fraction of that recommended for a two-year-old child?

STOP

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

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Essay

DIRECTIONS

The essay gives you an opportunity to show how effectively you can read and comprehend a passage and write an essay analyzing the passage. In your essay, you should demonstrate that you have read the passage carefully, present a clear and logical analysis, and use language precisely.

Your essay must be written on the lines provided in your answer booklet; except for the Planning Page of the answer booklet, 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.

REMINDERS

1. **Do not write your essay in this booklet.** Only what you write on the lined pages of your answer booklet will be evaluated.
2. **An off-topic essay will not be evaluated.**

You have 50 minutes to read the passage and write an essay in response to the prompt provided inside this booklet.

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As you read the passage below, consider how the *Los Angeles Times* editorial board uses

- evidence, such as facts or examples, to support claims.
- reasoning to develop ideas and to connect claims and evidence.
- stylistic or persuasive elements, such as word choice or appeals to emotion, to add power to the ideas expressed.

Adapted from the *Los Angeles Times* editorial board, "Base Food Labeling on Fact, Not Fear." ©2014 by Los Angeles Times. Originally published May 5, 2014.

1 The scientific evidence on genetically engineered food, which has been around for two decades, indicates that it is as safe for human consumption as any other food. A California bill[1] that would require the labeling of bioengineered food—whose DNA has been modified in the laboratory to introduce certain traits—caters to a scare campaign that is not based on solid evidence.

2 If a consumer has personal concerns about genetically modified food, there are other ways to avoid it. Trader Joe's, for example, has announced that food sold under its label contains no genetically engineered ingredients. There are apps and Internet sites to inform consumers about other foods. And companies that do not bioengineer their foods are certainly free to say so on their labels. But the science does not support mandatory labeling.

3 [California] State Sen. Noreen Evans (D-Santa Rosa) has said that her bill doesn't make judgments about whether genetically engineered food is inherently good or bad but merely informs consumers. Yet the wording says otherwise. It's full of negative declarations about such food, with no mention of the positives. "United States government scientists have stated that the artificial insertion of genetic material into plants via genetic engineering can increase the levels of known toxicants or allergens in foods and create new toxicants or allergens with consequent health concerns," the bill says. It doesn't note that hundreds of studies, many by independent scientists who took no industry money, have found no credible evidence that bioengineered food has actually done any of those things, or is dangerous in any way to human health. Reviews by the American Medical Association [AMA], the Food and Drug Administration, the World Health Organization and the National Academy of Sciences have all concluded that genetically engineered food appears to be as safe as any other.

4 That's not to say there are no downsides. Studies have raised legitimate concerns, for instance, that bioengineered crops designed to withstand the herbicide glyphosate, more commonly known by the Monsanto brand name Roundup, encourage farmers to overuse it, fostering the growth of resistant weeds. The AMA, though it has said that genetically engineered food should not be labeled, has also called on the federal government to require more safety testing before new bioengineered products can be marketed.

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[1] State Senate Bill 1381 would require all food offered for retail sale in California that contains any genetically engineered ingredients to be labeled as such.

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5 These issues are worth consideration, but labeling would not resolve either one. Most farms use pesticides, including some more dangerous than glyphosate, but their products don't have to be labeled accordingly. Labeling requirements should have logical consistency; the campaign to label genetically engineered foods doesn't.

6 SB 1381 [the proposed bill] would require conspicuous yet imprecise labels notifying consumers that the food contains some genetically engineered ingredients, without making it clear what the engineering was meant to accomplish. Food companies are developing products for reasons other than to make pesticide use easy, such as building resistance into crops, like oranges, that are threatened by disease, or creating non-allergenic forms of some grains. But the labels wouldn't give these details. They would serve mainly to frighten grocery shoppers by implying that there is something wrong with the food, without making them better informed. And the labels would be so ubiquitous as to be almost meaningless; it's widely estimated that 70% to 80% of the packaged food in conventional supermarkets contains genetically engineered ingredients.

7 There are more worrisome agricultural practices that do affect human health, especially the overuse of antibiotics in livestock. "There is strong evidence that some antibiotic resistance in bacteria is caused by antibiotic use in food animals," the U.S. Centers for Disease Control and Prevention reports. Yet no one has been campaigning for labels on meat that comes from antibiotic-treated livestock. As with bioengineered food, this is best dealt with by appropriate safety regulations, not labels.

8 There's a limit to what manufacturers can tell consumers about their food—labels can't enumerate every possible or perceived concern. Labeling laws should set a priority on providing information that significantly affects consumer health. They should be based on facts, not fear.

Write an essay in which you explain how the *Los Angeles Times* editorial board builds an argument to persuade its audience that foods that contain genetically engineered ingredients should not be required to have special labels. In your essay, analyze how the editorial board uses one or more of the features listed in the box above (or features of your own choice) to strengthen the logic and persuasiveness of its argument. Be sure that your analysis focuses on the most relevant features of the passage.

Your essay should not explain whether you agree with the *Los Angeles Times* editorial board's claims, but rather explain how the editorial board builds an argument to persuade its audience.

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As you read the passage below, consider how Julia Gillard and Cate Blanchett use

- evidence, such as facts or examples, to support claims.
- reasoning to develop ideas and to connect claims and evidence.
- stylistic or persuasive elements, such as word choice or appeals to emotion, to add power to the ideas expressed.

Adapted from Julia Gillard and Cate Blanchett, "Educate Women and Their Community Will Prosper. Deny Them Education and the World Will Suffer." ©2014 by Guardian News and Media Limited. Originally published in the *Guardian*, September 30, 2014.

1 "If you educate a man, you educate one person. If you educate a woman, you educate a nation". It's an often heard quote in development circles,[1] and the eve of the opening of the 69th session of the UN General Assembly is a good time to pause and consider what it really means.

2 We know that educating boys *and* girls, men *and* women, is morally right. But educating girls and women is especially effective because when we educate them, the benefits are felt throughout the whole community. It's a magic multiplier in the development equation.

3 The positive relationship between female education and overall development outcomes is well established. However, it is the dynamic that underpins that correlation which merits drawing out.

4 An educated woman is better able to educate her own children who, in turn, will be more likely to receive school education themselves. The family will likely be healthier, with a lower prospect of infant mortality and better maternal nutrition, including while pregnant and nursing.

5 An educated woman's household is more likely to prosper as a result of a higher overall income. Just one extra year of secondary education can increase a woman's income as much as 25% a year. By participating in the labour market, an educated woman helps boost economic productivity, leading to greater wealth for her community as well.

6 It is an attractive proposition: invest in women and girls, and the benefits flow not only to them but everyone around them, too. Sadly, the reverse is also true. Deny girls and women education and the whole community suffers, not just them as individuals.

7 Tragically, over 60 million girls remain out of school around the world. Even where significant progress has been made to get girls into school, they are often deprived strong groundings in the education essentials of literacy and numeracy. This has a negative compound effect, making it hard for them to progress beyond primary school even where such opportunities are available.

[1] People involved in improving the lives of those who live in developing nations

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8 Not only the human but also the economic cost of this educational deprivation of girls and women is huge, and the cost to individual economies can be as high as $1 billion a year. Plan's Children in Focus report puts the global economic price of failing to educate girls to the same level as boys at $92 billion each year. To put this in perspective, that figure falls just short of the combined annual overseas aid budgets of the world's developed countries.

9 The world cannot afford this any longer. We must commit to giving girls an education, girls who are not presently receiving one, and also commit to give those girls who are receiving one, the opportunity to progress to and complete their secondary education.

10 Getting girls enrolled in and completing primary school is the threshold task, followed by the even greater challenge of ensuring girls' secondary education. Women with a sound education will not only earn more themselves, they will contribute more to their household and national economies. They will also be less likely to fall victim to the scourge of human trafficking and forced child marriages, and be better able to protect themselves from contracting preventable diseases like HIV.

11 Under the aegis of the Clinton Global Initiative, Girls CHARGE was launched with the purpose of raising the global ambition for girls' education. Spearheaded by the Center for Universal Education at the Brookings Institution and Hillary Clinton's No Ceilings Initiative, these issues will be addressed directly, by raising global ambitions for girls to attend school and complete secondary education, acquiring the skills they need for work and life.

12 We both grew up in Australia. Education provided strong foundations for both of us to stride different stages with confidence: one of us becoming Australia's first female prime minister, the other a leading player in some of the major theatre and film productions of the world. Without a great education, these achievements would simply have not been possible. Millions of girls throughout the world are today denied the opportunity to meet their full potential. This is not a situation any thinking or feeling person can stand by and tolerate.

13 As the 69th session of the United Nations General Assembly begins, we urge the world's leaders to back this major push to tackle the unfinished business of giving girls a great education. Those of us who have benefitted so much from our educations should feel powerfully obliged to do so. It's what every girl and every community deserves, and it is in our hands to deliver.

Write an essay in which you explain how Julia Gillard and Cate Blanchett build an argument to persuade their audience that educating girls and women should be a worldwide priority. In your essay, analyze how Gillard and Blanchett use one or more of the features listed in the box above (or features of your own choice) to strengthen the logic and persuasiveness of their argument. Be sure that your analysis focuses on the most relevant features of the passage.

Your essay should not explain whether you agree with Gillard and Blanchett's claims, but rather explain how Gillard and Blanchett build an argument to persuade their audience.

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DUNG	NANG	SANG	VBNG
	NBNG	SJNG	VCNG
	NCNG		VKNG
	NJNG		VLNG
	NKNG		VNNG
	NLNG		VRNG
	NNNG		
	NRNG		
	NUNG		

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