CollegeBoard SAT®

**AUGUST 28, 2021**
**INTERNATIONAL**

# The SAT®

# Test Book

## IMPORTANT REMINDERS

**1**

**A No. 2 pencil is required for the test. Do not use a mechanical pencil or pen.**

**2**

**Sharing any questions with anyone is a violation of Test Security and Fairness policies and may result in your scores being canceled.**

**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 Carolina De Robertis, *Perla*. ©2012 by Carolina De Robertis. The narrator is in her last year of high school in Argentina.

My mother was given to sudden sprints of creativity. When she was young, she'd wanted to be an artist—she had not yet told me the whole story, but I'd seen the single frightening canvas in the attic.

I had never seen her take an interest in plants before, beyond providing general instructions to the gardener. The geraniums were different: they were not to be delegated to a mere professional. She repotted them herself. The operation took three days. She commandeered the backyard and transformed it into a flower factory, crowded with pots and plants and large bags of fertile soil. She enlisted my help, and we squatted in the backyard together, surrounded by the red and orange flowers (she had, I noticed, overwhelmingly chosen red), arranging roots in their elegant containers.

It was February, the ripe height of summer, and the sun cascaded over us in slow, humid waves. Mamá wore long gardening gloves over her manicured hands, and her fingers pressed soil into place with fastidiousness and even passion. She had bought me gloves too, but I refused to wear them.

"You'll get so dirty, Perla."

"I want to get dirty."

"Ay, Perla," she said, shaking her head. She said no more but beamed with irritation. After all, my refusal disturbed the plan for how the geranium days should go, mother and daughter tending flowers and don't they look picture perfect in their matching gloves? Such interesting gardening gloves, with their violet fleur-de-lis, what a find! For half an hour she would not talk to me, but then she thawed, so engrossed in the execution of her project that she forgot my transgression, or perhaps for fear that I might abandon the project altogether.

She needn't have worried. I didn't want to leave. I had protested this chore, but only mildly; it was a rare chance to spend time with my mother without the pressure of speaking to one another. We could crouch side by side, our attention on the plants, and I could taste the scent of her perfume and feel the rhythm of her breaths without having to find anything to say. We often struggled to find things to say to each other, beyond the essential *good morning* and *here's your breakfast* and *what time will you be home?* and *good night*, as though we were both foreigners who'd stumbled into this house from utterly different faraway lands, and had only just learned the rudiments of each other's languages. At that time, I still wanted to learn my mother's language (though I would not have told her that), if only to better understand her, and to increase the chances of her understanding me. There was so much I longed to tell her as I squatted beside her with my hands full of dirt, but I also feared that, if I started, other matters might leap out that were not meant to be spoken. Better not to risk the opening.





CONTINUE

Better not to attempt too much speech with my mother, especially on such flagrantly hot days on which it was impossible to rest your eyes on anything but geraniums and geraniums.

They were hardy little plants. The blooms themselves were bright and simple, relatively unassuming, but when gathered in such plentiful crowds they seemed to acquire an almost hypnotic power. The roots were much darker than the petals, and more twisted than the stems, a hidden half that exposed itself to my curious fingers in the journey from pot to pot. Strange, the body of a plant, with limbs never meant to be exposed to the sun. Every once in a while, over the course of our three days, Mamá hummed. The melody meandered, it was nothing I recognized, but it soothed me. At night, I would close my eyes for sleep and see a great geranium with its root bared in all its gnarled intricacy until my hands arrived full of soil to cover it back up.

When all the flowers were ready in their decorated pots, Mamá spent a fourth day distributing them through the house, moving a wooden stand here and now there, there and now here, now this pot with the shell motif, now the other pot with the Spanish tile, until at last every geranium had moved into the house and she collapsed onto the sofa in exhausted triumph. Flowers lurked at every turn.

**1**

Which statement best describes what happens in the passage?

A) Two characters attempt to carry out a plan that is eventually derailed by their disagreements.

B) Two characters work cooperatively to complete a task in spite of some tension between them.

C) One character is able to resolve a dispute with another character by providing assistance for several days.

D) One character reluctantly helps another character with a project and ultimately regrets the decision.

**2**

Based on the passage, Perla most likely views her mother's decision to repot the geraniums as

A) significant, because Perla's mother rarely undertakes new projects.

B) amusing, because Perla's mother has previously expressed a dislike of gardening.

C) unsurprising, because the decision is consistent with an aspect of Perla's mother's personality.

D) ill-conceived, because Perla's mother has miscalculated the level of effort required to implement the decision.

**3**

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

A) Lines 1-2 ("My mother . . . creativity")

B) Lines 5-7 ("I had . . . gardener")

C) Lines 7-8 ("The geraniums . . . professional")

D) Lines 10-12 ("She . . . soil")

**4**

The sentence in lines 43-49 ("We often . . . languages") mainly serves to

A) suggest that it is unlikely that Perla and her mother will ever be able to communicate effectively.

B) compare Perla's relationship with her mother to other relationships she has had in the past.

C) imply that Perla has not taken sufficient time to learn about her mother's background.

D) demonstrate the emotional distance that Perla feels from her mother even when they converse.





CONTINUE

5

Which statement about Perla's relationship with her mother is most strongly suggested by the passage?

A) Perla feels hurt by her mother's criticisms of her values and decisions.

B) Perla's mother believes that Perla is unwilling to try to understand her.

C) Perla's mother believes that her relationship with Perla is satisfactory.

D) Perla struggles to reconcile competing emotions about her mother.

6

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

A) Lines 53-57 ("There . . . spoken")

B) Lines 57-61 ("Better . . . geraniums")

C) Lines 70-73 ("Every . . . soothed me")

D) Lines 73-77 ("At night . . . back up")

7

As used in line 32, "thawed" most nearly means

A) defrosted.

B) dissolved.

C) relented.

D) agreed.

8

As used in line 60, "rest" most nearly means

A) close.

B) count.

C) settle.

D) recline.

9

The passage indicates that the red clusters of newly potted geranium flowers appear

A) elegantly festive.

B) oddly compelling.

C) distractingly chaotic.

D) abjectly nondescript.

10

According to the passage, when Mamá brings the geraniums into the house, she is

A) frustrated about having to arrange the pots by herself.

B) pleased with how much the plants brighten the house.

C) meticulous about the final placement of the plants.

D) eager for praise about her hard work with the plants.





CONTINUE

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

This passage and accompanying figure 2 are adapted from Benjamin K. Bergen, *Louder Than Words: The New Science of How the Mind Makes Meaning*. ©2012 by Benjamin K. Bergen. In the passage, "speakers" refers to people whose first language is the language being discussed.

Recently, people have started to ask whether it's possible that the direction you read and write affects how you understand language. For instance, suppose Line I tell you that yesterday I was in the park, and I saw a 5 guy in a purple track suit jog past me. Which way did you see him jogging in your mind's eye? In general, there's a lot of experimental evidence showing that you're more likely to have seen him going from your left to your right than any other direction. This has 10 led some researchers to hypothesize that people have a universal bias to simulate events as going from left to right. And that idea would certainly seem to be corroborated by work on people's mental representations of events, which have shown a 15 similar bias in English, Italian, and other European languages. But there's a problem. All these languages are written from left to right. So there's a confound here—we don't know whether English speakers and Italian speakers mentally represent events going from 20 left to right because there's a universal bias for left-to-right motion or because learning to read and write a language from left to right leads you to think about motion this way.

The way to tease these two possible explanations 25 apart is to ask what happens when you tell a speaker of Arabic or Hebrew (who writes from right to left) about the jogger. Will she see him go from left to right in her mind's eye, or right to left? If thinking of motion as going from left to right is a cognitive 30 universal that's pervasive across our species, then the Arabic or Hebrew speaker should act like an English speaker. But if the direction of your writing system accounts for how you think of lateral motion, then the Arabic or Hebrew speaker should have a mental 35 representation of lateral motion that's a mirror image of what English speakers see.

A pair of European researchers took this question on, in several ways. They asked speakers of Italian (which is written from left to right) and Arabic 40 (which, again, is written from right to left) to listen to sentences about actions, like *The girl pushes the boy.* The Italian and Arabic speakers then had to either (in a first experiment) draw the event described in the sentence or (in a second experiment) look at a 45 picture and decide if it depicted the event in the sentence. In the first experiment, the researchers measured whether the participants were more likely to draw the subject of the sentence (the girl in the sentence above) on the right or the left; in the second 50 experiment, they recorded how fast people responded when the subject was depicted on the right or the left.

The results seem to show that people who are used to reading and writing in a certain direction 55 tend to understand language about horizontal motion as going in the same direction. But we should tread cautiously here—other cultural practices could potentially correlate with writing direction, which could muddy the explanatory waters. For instance, it 60 could be that visual depictions of events that Italians see in comic books, cartoons, or movies tend to cast motion from left to right, but the ones made for Arabic speakers are more likely to go from right to left. No rigorous studies that I know of have been 65 done of the direction in which events are depicted in film across cultures. But differences in how people mentally represent events could in principle be due to how events are depicted, and not to writing direction per se. And to make things even more 70 complicated, it's even possible that people creating comic books and other artifacts depict horizontal events in different directions in different cultures because of their language's writing direction. This would introduce another link in the causal chain.

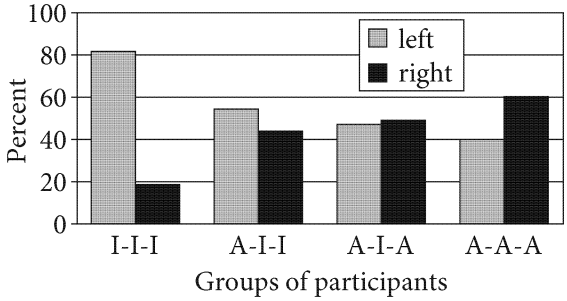




CONTINUE

**Figure 1**

Percentage of Drawings by Four Groups of Participants with the Sentence Subject Positioned on the Left or Right Side




Groups

I-I-I: Speakers of Italian as a first language studying in Italy and responding in Italian

A-I-I: Speakers of Arabic as a first language studying in Italy and responding in Italian

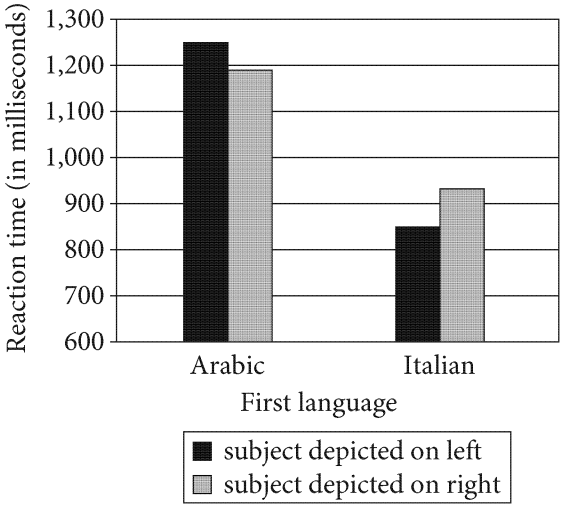
A-I-A: Speakers of Arabic as a first language studying in Italy and responding in Arabic

A-A-A: Speakers of Arabic as a first language studying in their home country and responding in Arabic

Adapted from Anne Maass and Aurore Russo, "Directional Bias in the Mental Representation of Spatial Events: Nature or Culture?" ©2003 by American Psychological Society.

**Figure 2**

Mean Time for Speakers of Arabic or Italian as a First Language to Determine Whether a Picture Matches the Event in a Sentence




In both conditions, the participants performed the task in Italian.

**11**

As used in line 13, "work on" most nearly means

A) investigations into.

B) production of.

C) struggle over.

D) functions regarding.





CONTINUE

12

It can reasonably be inferred from the passage that one weakness of the research performed before the study the author discusses is that it

A) ignored evidence gathered by other scientists who were exploring similar questions.

B) failed to highlight experimental results that did not directly support a favored hypothesis.

C) disregarded the fact that certain groups of people cannot easily conceptualize motion.

D) overlooked the possibility of an untested variable contributing to an outcome.

13

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

A) Lines 12-16 ("And that . . . languages")

B) Lines 17-23 ("So there's . . . way")

C) Lines 24-27 ("The way . . . jogger")

D) Lines 28-32 ("If thinking . . . speaker")

14

As used in line 11, "simulate" most nearly means

A) falsify.

B) exaggerate.

C) disguise.

D) picture.

15

Which choice best supports the idea that when listening to someone describing a flock of birds flying over an open field, a speaker of English as a first language would be likely to imagine the birds moving from left to right?

A) Lines 37-38 ("A pair . . . ways")

B) Lines 53-56 ("The results . . . direction")

C) Lines 66-69 ("But differences . . . per se")

D) Lines 69-73 ("And to . . . direction")

16

Based on the passage, what sentence other than "*The girl pushes the boy*" (line 41) would most likely have been used in the study?

A) The dog chases the ball.

B) The rain starts to fall.

C) The girl raises her hand.

D) The man turns on the light.

17

Which possible theory regarding a potential "causal chain" (line 74) can most reasonably be inferred from the passage?

A) People are influenced in their mental representation of events by the writing direction of language, and this in turn determines the types of art cultures produce.

B) Writing direction of language influences how graphic artists depict horizontal motion, which in turn influences how people mentally represent events.

C) Graphic artists from different cultures do not depict horizontal motion in the same way, but readers tend to ignore those differences in their mental representations.

D) Writing direction of language is an important factor in how readers mentally represent horizontal motion, and this factor is taken into account by graphic artists creating comic books.





CONTINUE

18

According to figure 1, which group showed the greatest difference in the percentage of drawings produced in which the subject was positioned on the left relative to those in which the subject was positioned on the right?

A) Speakers of Italian as a first language studying in Italy and responding in Italian

B) Speakers of Arabic as a first language studying in Italy and responding in Italian

C) Speakers of Arabic as a first language studying in Italy and responding in Arabic

D) Speakers of Arabic as a first language studying in their home country and responding in Arabic

19

What question is not discussed in the passage but can be answered with data presented in figure 1?

A) Did the differences in the likelihood of drawing the subject of the sentence on the left between speakers of Arabic as a first language and speakers of Italian as a first language become more pronounced over time?

B) Did people used to reading language from left to right respond differently to the drawing than people used to reading language from right to left?

C) Were speakers of Arabic as a first language more or less likely to draw the subject of the sentence on the left than speakers of Italian as a first language were?

D) Did speakers of Arabic as a first language studying in Italy draw the subject of the sentence on the left more often than speakers of Arabic as a first language studying in their home country did?

20

According to figure 2, when the subject was depicted on the right, the reaction time of speakers of Arabic as a first language was closest to

A) 850 milliseconds.

B) 920 milliseconds.

C) 1,200 milliseconds.

D) 1,250 milliseconds.





CONTINUE

**Questions 21-31 are based on the following passage and supplementary material.**

This passage is adapted from Patrick Monahan. "How 3D Printing Unraveled the *Dracula* Orchid's Disguise." ©2016 by American Association for the Advancement of Science. 3D printing is a manufacturing process that uses computers to produce three-dimensional objects.

Instead of enticing their pollinators with nectar like other flowering plants, many orchids attract them with masterful disguises that mimic food, rivals, or even mates. The misled insects then carry pollen from one flower to another, unintentionally helping the orchids reproduce. Now—using models from a 3D printer—researchers have shown how one such orchid tricks fungus-loving flies by mimicking the sight and smell of their favorite mushrooms.

Flowers come in a dizzying array of colors, shapes, and smells. With these multifaceted advertisements, it's hard to pin down exactly what parts of a flower are actually attracting pollinators. One way scientists break down this complexity into more manageable pieces is by using artificial flowers: By adding different odors to artificial flowers that look and feel the same, for example, scientists can see how a pollinator reacts to smell alone. Such fake flowers are usually made of simple materials such as construction paper, cotton balls, or test tubes with cotton wicks. "We'd just walk through a dollar store and see what we could use," says Tobias Policha, a plant ecologist at the University of Oregon, Eugene, and lead author of the study.

But for *Dracula lafleuri*, a complex, showy flower found in the cloud forest of Ecuador, Policha needed something more durable, and more realistic. These orchids—which have a single petal that resembles the fungi that live nearby—attract flies that typically congregate around, and sometimes breed on, the mushrooms. It's hard to mimic that look with construction paper, which would disintegrate quickly in the wet forest anyway. So Policha and colleagues worked with artist Melinda Barnadas to develop a technique for creating artificial *Dracula* orchids. After a long process of casting, 3D-scanning, and digitally refining, Barnadas and the team 3D printed gypsum molds from which they could create silicone orchids in whatever color patterns they wanted. This gave them unparalleled flexibility in making their counterfeit flowers.

The team hung the artificial flowers next to actual *Dracula* orchids in the cloud forest. They modified both the fakes and the real flowers, changing the colors and patterns, and adding or removing scents. They even made several "Frankenstein" flowers, pieced together from artificial and natural flower parts. Then they watched to see which blossoms got more attention from the flies.

It turns out that the orchids need both the right look and the right smell to pull off their swindle. The artificial flowers—even those that were perfect mimics—attracted fewer flies than the real blooms. Only when the researchers applied scents from natural orchids were just as many flies attracted to the mimics as to the real flowers, the team reports. Still, the fakes aren't perfect, Policha says. Flies landed less often on these printed blossoms than on real flowers—they'd fly close, but veer away at the last second.

The orchid's labellum—the center petal that looks conspicuously like a mushroom—is key to its disguise. A real flower with a fake labellum attracted flies no better than an orchid made entirely of silicone. This petal is also where the orchid's mushroom smell is concentrated, a scent the researchers attribute mostly to a type of alcohol that can also be found in 80% of mushrooms living nearby.

But the showy, white-and-maroon-speckled sepal[1] plays a role, too. Researchers tested different color patterns, and found that flies were convinced only by orchids with spots. These flies tend to hang out on mushrooms in huge numbers—so Policha says that these flies might see the maroon dots as a fly party.

[1] Sepals are leaflike structures.





CONTINUE

**Figure 1**

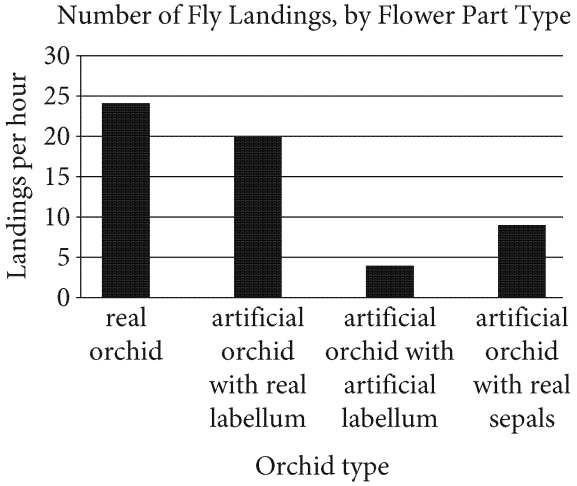
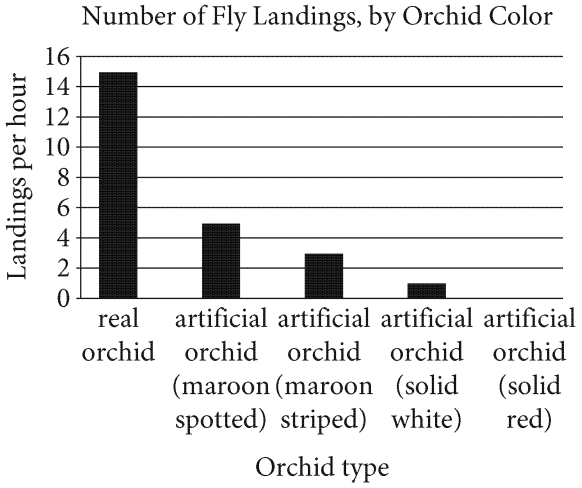



**Figure 2**




Figures adapted from Tobias Policha et al., "Disentangling Visual and Olfactory Signals in Mushroom-Mimicking *Dracula* Orchids Using Realistic Three-Dimensional Printed Flowers." ©2016 by Tobias Policha et al.

**21**

The main purpose of the passage is to

A) describe a study making use of an innovative technology and discuss its findings.

B) explain a new manufacturing process and explore its potential applications.

C) present a hypothesis about insect behavior and cite evidence from a relevant experiment.

D) consider a newly identified flower species and recount its discovery.

**22**

According to the passage, some species of orchids differ from other flower species in that they

A) exhibit dramatic variation in color and shape.

B) release powerful odors to attract insects.

C) lure pollinators without the use of nectar.

D) inhabit a relatively narrow geographic range.

**23**

The passage suggests that, compared with real flowers, artificial flowers are useful to researchers because they are

A) less vulnerable to contamination due to environmental influences.

B) less likely to produce random effects on insect behavior in different climates.

C) more consistent in their overall attractiveness to different species of insects.

D) more helpful in isolating the effects of particular floral features on pollinators.

**24**

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

A) Lines 10-11 ("Flowers . . . smells")

B) Lines 13-15 ("One . . . flowers")

C) Lines 18-21 ("Such . . . wicks")

D) Lines 25-27 ("But . . . realistic")





CONTINUE

25

The passage implies that in considering the suitability of paper flowers for their study, Policha and colleagues took which factor into consideration?

A) The need to obtain enough material for the construction of paper flowers
B) The likelihood that paper flowers would face adverse environmental conditions
C) The possibility that paper flowers might serve to repel insects
D) The difficulty of adding different scents to paper flowers

26

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

A) Lines 31-33 ("It's . . . anyway")
B) Lines 36-39 ("After . . . wanted")
C) Lines 43-45 ("They . . . scents")
D) Lines 48-49 ("Then . . . flies")

27

When the author uses the phrase "unparalleled flexibility" (line 40) in regard to 3D-printing techniques, he most likely means that 3D printers

A) provide scientists with a wide range of unusual materials to work with.
B) are especially useful to scientists in creating subtle bending forms.
C) allow scientists to modify artificial flowers over the course of an experiment.
D) enable scientists to construct artificial flowers with great precision and variety.

28

Which choice provides the best evidence for the conclusion that flies can distinguish between real and silicone orchids?

A) Lines 46-48 ("They . . . parts")
B) Lines 57-60 ("Flies . . . second")
C) Lines 65-69 ("This . . . nearby")
D) Lines 71-73 ("Researchers . . . spots")

29

The data presented in figure 1 most clearly support which statement from the passage?

A) Lines 27-31 ("These . . . mushrooms")
B) Lines 42-43 ("The team . . . forest")
C) Lines 54-56 ("Only . . . reports")
D) Lines 61-63 ("The orchid's . . . disguise")

30

Based on the data represented in figure 2, which statement about fly landing patterns is accurate?

A) Flies were more likely to land on maroon-striped artificial orchids than on maroon-spotted artificial orchids.
B) Flies were more likely to land on any type of artificial orchid than on real orchids.
C) Flies were less likely to land on solid white artificial orchids than on solid red artificial orchids.
D) Flies were less likely to land on solid white artificial orchids than on maroon-spotted artificial orchids.

31

As used in line 49, "attention" most nearly means

A) civility.
B) contemplation.
C) interest.
D) diligence.





CONTINUE

**Questions 32-42 are based on the following passages.**

Passage 1 is adapted from a speech delivered in 1848 by Elizabeth Cady Stanton at the Seneca Falls Convention. Passage 2 is adapted from a speech delivered in 1893 by Frances E. W. Harper, "Woman's Political Future." In Passage 1, Stanton speaks on behalf of women's rights activists. Harper was an author and civil rights activist. At the times Stanton and Harper spoke, women had not yet secured the right to vote in the United States.

**Passage 1**

We have no objection to discuss the question of equality [of men and women], for we feel that the weight of argument lies wholly with us, but we wish the question of equality kept distinct from the question of rights, for the proof of the one does not determine the truth of the other. All white men in this country have the same rights however they may differ in mind, body or estate.[1] The right is ours. The question now is, how shall we get possession of what rightfully belongs to us. We should not feel so sorely grieved if no man who had not attained the full stature of a Webster, Clay, Van Buren, or Gerrit Smith[2] could claim the right of the elective franchise [right to vote]. But to have the rights of . . . idiots . . . and silly boys fully recognized, while we ourselves are thrust out from all the rights that belong to citizens, it is too grossly insulting to the dignity of woman to be longer quietly submitted to. The right is ours. Have it, we must. Use it, we will. The pens, the tongues, the fortunes, the indomitable wills of many women are already pledged to secure this right. The great truth, that no just government can be formed without the consent of the governed, we shall echo and re-echo in the ears of the unjust judge, until by continual coming we shall weary him.

But, say some, would you have woman vote? What, refined, delicate woman at the polls, mingling in such scenes of violence and vulgarity? Most certainly. Where there is so much to be feared for the pure, the innocent, the noble, the mother surely should be there to watch and guard her sons, who must encounter such stormy dangerous scenes at the tender age of twenty-one. Much is said of woman's influence, might not her presence do much towards softening down this violence, refining this vulgarity? Depend upon it, the places that by their impure atmosphere, are unfit for women, cannot but be dangerous to her sires and sons.

1 At the time, citizenship rights in the United States were largely restricted to white people.

2 Political figures in the United States during the nineteenth century

**Passage 2**

Today women hold in their hands influence and opportunity, and with these they have already opened doors which have been closed to others. By opening doors of labor woman has become a rival claimant for at least some of the wealth monopolized by her stronger brother. In the home she is the priestess, in society the queen, in literature she is a power, in legislative halls law-makers have responded to her appeals, and for her sake have humanized and liberalized their laws. The press has felt the impress of her hand. In the pews of the church she constitutes the majority; the pulpit has welcomed her, and in the school she has the blessed privilege of teaching children and youth. To her is apparently coming the added responsibility of political power; and what she now possesses should only be the means of preparing her to use the coming power for the glory of God and the good of mankind; for power without righteousness is one of the most dangerous forces in the world.

Political life in our country has plowed in muddy channels, and needs the infusion of clearer and cleaner waters. I am not sure that women are naturally so much better than men that they will clear the stream by the virtue of their womanhood; it is not through sex but through character that the best influence of women upon the life of the nation must be exerted.

I do not believe in unrestricted and universal suffrage for either men or women. . . . I do not believe that the most ignorant and brutal man is better prepared to add value to the strength and durability of the government than the most cultured, upright, and intelligent woman. I do not think that willful ignorance should swamp earnest intelligence at the ballot-box, nor that educated wickedness, violence, and fraud should cancel the votes of honest men. . . . The ballot in the hands of woman means power added to influence. How well she will use that power I can not foretell. Great evils stare us in the





CONTINUE

face that need to be throttled by the combined power of an upright manhood and an enlightened womanhood; and I know that no nation can gain its full measure of enlightenment and happiness if one-half of it is free and the other half is fettered.

**32**

In Passage 1, Stanton stresses which aspect of the right to vote in the United States?

A) It is often considered the most important right that citizens possess.

B) It has gradually been granted to more of the population than it was originally.

C) It belongs to all citizens, regardless of their individual characteristics.

D) It is a source of national pride for both male and female citizens.

**33**

In line 24, the phrase "echo and re-echo" has the main effect of

A) condemning politicians for their repeated refusals to listen to advocates for women's right to vote.

B) characterizing advocates for women's right to vote as tireless in pursuit of their goal.

C) alluding to the beneficial effects that will result from extending the right to vote to women.

D) stressing that the public is becoming increasingly vocal in its support for women's right to vote.

**34**

Over the course of Passage 2, the main focus shifts from the

A) social advantages women derive from their current status to the additional social advantages they will have after gaining the right to vote.

B) role of women in the national culture to the ways the culture may change if women gain the right to vote.

C) social influence women presently wield to the political authority they could wield upon gaining the right to vote.

D) negative effects of delaying woman suffrage to the positive effects that will result if women gain the right to vote.

**35**

In Passage 2, Harper most strongly implies that negative consequences will result if women engage in which behavior in the future?

A) Using their newfound political power to amass wealth that is comparable to the wealth possessed by men

B) Attempting to exercise undue influence over the voting decisions of others

C) Advocating for the right to vote to be extended to individuals who do not possess it

D) Casting votes that are not informed by consideration of whether those votes would benefit society as a whole

**36**

As used in line 67, "universal" most nearly mean

A) all-inclusive.

B) inescapable.

C) well-rounded.

D) collective.





CONTINUE

37

Based on Passage 2, Harper would most likely agree that denying women the right to vote may have the undesirable effect of

A) discouraging civic-minded individuals from engaging in activism.

B) undermining the well-being of all citizens, regardless of gender.

C) exacerbating political uncertainty at a crucial time in national history.

D) intensifying tensions over the role personal morality should play in politics.

38

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

A) Lines 59-61 ("Political . . . waters")

B) Lines 61-66 ("I am . . . exerted")

C) Lines 76-78 ("The ballot . . . foretell")

D) Lines 78-83 ("Great . . . fettered")

39

Which choice best identifies a difference in how Stanton (Passage 1) and Harper (Passage 2) view the prospects for woman suffrage?

A) Stanton suspects that it may take many years for women to attain suffrage, while Harper predicts that they will attain it in the near future.

B) Stanton feels that women can attain suffrage through their own efforts, while Harper believes that they can do so only with the shared efforts of men.

C) Stanton worries that women may never attain voting rights comparable to those possessed by men, while Harper is confident that women will attain full suffrage.

D) Stanton believes that woman suffrage can be attained only through active political struggle, while Harper regards woman suffrage as virtually inevitable.

40

Based on Passage 1, how would Stanton most likely respond to Harper's assertion in lines 68-72 ("I do not believe that . . . woman")?

A) She would agree that campaigning for the right to vote is the most effective way for women to demonstrate their capacity to make intelligent political decisions.

B) She would dismiss concerns that woman suffrage could have the unintended effect of eroding certain social privileges that women currently possess.

C) She would assert that not only is it unwise to deny responsible women the right to vote when irresponsible men may exercise it, but it is also fundamentally unjust.

D) She would express hope that woman suffrage will influence men to approach the act of voting with greater dignity and self-control than they currently display.

41

Which choice in Passage 1 provides the best evidence for the answer to the previous question?

A) Lines 14-18 ("But to . . . submitted to")

B) Lines 22-25 ("The great . . . him")

C) Lines 26-29 ("But, say . . . certainly")

D) Lines 29-33 ("Where . . . twenty-one")

42

Based on the passages, both Stanton and Harper regard political culture in the United States as being characterized by

A) preferential treatment of wealthy individuals.

B) extreme and objectionable behavior.

C) feigned concern for women's well-being.

D) indifference about the nation's future.





CONTINUE

**Questions 43-52 are based on the following passage.**

This passage is adapted from Charles Menzel, "Solving Ecological Problems." ©2012 by The University of Chicago. Macaques are a widespread genus of monkeys.

It is possible that macaques (and other animals) organize their searches for food partly by the spatial proximity of food items to environmental structures. I call this the "structure-guided" search method. The class of structures the animal inspects might vary depending on where the animal has discovered an initial food item. For example, if a macaque finds a piece of highly preferred food within a streambed, it might restrict its subsequent search to locations within the same streambed. Alternatively, if it finds a new type of highly preferred food next to a fern, then it might inspect other ferns in preference to rocks, trees, or logs. In the natural habitat of macaques, foods can be associated spatially with visible borders such as stream edges or forest edges, or with discrete structures such as trees of a particular species.

Alternatively, macaques and other primates might organize their searches by distance from the food location. According to what I have labeled the "spatial gradients" search method, available space is homogeneous and unstructured. It is an undifferentiated area around a reinforcer. The animal allocates its search effort to concentric rings around a food item according to some decreasing function of the distance from the item. After finding food, the animal might slow down, turn more quickly, and inspect any location that lies within a reasonable distance of an initial find, regardless of the position of visible environmental structures. For example, after a crow encounters an eggshell on the beach, it will search in a meandering walk up to about two meters from the site of its original find. Other birds, fish, and insects also show increased turning and area-restricted search after finding a resource.

To test whether macaques use the structure-guided method, I studied the searching behavior of captive-born long-tailed macaques in an 880-square-meter outdoor enclosure at the Bokengut field station, University of Zürich. The enclosure contained tree trunks, grass fields, rock fields, elevated walkways, and visual barriers. Food was hidden in the macaques' enclosure according to one of several different types of rules. If macaques used the structure-guided method, they were expected to extrapolate their search within dimensions of environmental structure that in their natural environment would normally be correlated with the distribution of food, such as along visible borders, within visible surface areas, within particular height levels, and within discrete visible objects of the same type.

I found that if a macaque detected a single visible pile of food next to a continuous visible border, such as a border between a grass field and a sand field or between a sand field and a stone field, the animal restricted much of its subsequent manual inspections to other locations along the same border. Significantly, the animals searched along visible borders and found hidden food from the very first trial in the experiment, thus indicating that they were not relying on slow, gradual learning within the experiment to solve novel problems of this general type. If an animal found food next to a single discrete visible object (e.g., a log, a stone, or a vertical pole) it might walk several meters to another object of the same general type and inspect it manually. Again, the monkeys extended their search from a single baited object to other, similar-looking objects from the very first trial in their experiment. Moreover, if the macaques found a favored food, banana, next to a single object of type A (e.g., a yellow stone), and found a less favored food, carrot, next to a single object of type B (e.g., a low post), they inspected other locations of type A more often than they inspected other locations of type B. Macaques also found hidden food items much more quickly when the items were hidden according to a "natural" rule, along a visible border or next to visible matching objects, than when they were hidden according to a relatively "unnatural" rule—that is, at regular intervals of one meter or three meters along an arbitrarily oriented, invisible straight line. Further tests showed that the macaques extended their search within visible surface areas, within specific height levels, and in directions associated with a change in food visibility. These results are in strong agreement with the structure-guided hypothesis.





CONTINUE

**43**

Which choice best states the central claim of the passage?

A) Macaques circle predefined areas carefully and methodically in order to locate highly preferred foods.

B) Macaques improve the success rate of their search for food in proximity to natural landmarks over time.

C) Macaques concentrate on finding food near environmental structures similar to ones that have yielded food in the past.

D) Macaques restrict their search for food to particular geographical areas that contain the greatest amount of highly preferred produce.

**44**

Which choice best states the relationship between the first paragraph (lines 1-16) and the second paragraph (lines 17-35) of the passage?

A) The second paragraph offers empirical support for the theory outlined in the first paragraph.

B) The second paragraph proposes a different explanation than the proposition presented in the first paragraph.

C) The second paragraph provides a series of research results that question the assumptions of the first paragraph.

D) The second paragraph describes in detail the nature of the environments briefly alluded to in the first paragraph.

**45**

The author uses the phrase "highly preferred" in lines 8 and 11 primarily to

A) clarify the method macaques use when establishing habitats.

B) emphasize similarities between the behavior of macaques and that of other animals.

C) specify the circumstances in which a particular macaque behavior can be expected.

D) indicate how macaques process certain visible features of their habitats.

**46**

The main purpose of the third paragraph (lines 36-52) is to

A) explain the rationale for the design of an experiment.

B) present evidence in support of a scientific explanation.

C) outline the details of a future research study.

D) compare two ways of approaching a scientific puzzle.

**47**

It can reasonably be inferred from the passage that the outdoor enclosure was suitable for the author's experiment because it

A) had been utilized successfully for prior research.

B) offered areas in which food was easy to locate.

C) contained a variety of natural structures.

D) attracted both macaques and other mammals.

**48**

Based on the second paragraph (lines 17-35), spatial gradients searches can best be described as

A) distracted.

B) orderly.

C) cautious.

D) urgent.





CONTINUE

49

Which choice represents an aspect of the author's experiment that was fundamental to reaching his conclusions?

A) The different foods used as bait in the experiment needed to tempt macaques to different degrees.

B) The macaques needed to be exposed to the enclosure prior to the experiment.

C) A researcher collecting data in the experiment needed prior experience observing macaques in the wild.

D) The environments used in the experiment needed to be able to support the nutritional needs of multiple macaques.

50

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

A) Lines 1-3 ("It is . . . structures")

B) Lines 13-16 ("In the . . . species")

C) Lines 42-44 ("Food . . . rules")

D) Lines 70-76 ("Moreover . . . locations of type B")

51

According to the passage, the efficiency with which macaques locate food is improved if the food is located

A) near an object similar in color to the food.

B) next to a discernible natural boundary.

C) at predictable distances in an environment.

D) close to the center of a visual barrier.

52

As used in line 88, "strong" most nearly means

A) near total.

B) severe.

C) highly effective.

D) aggressive.

# STOP

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

# 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.**

### The Art of Translation

Translators perform the extraordinary feat of metamorphosing a piece of writing from one language to another. This act, as German 1 philosopher Walter Benjamin argued in his 1921 essay "The Task of the Translator," is an art form of its own. Technological advancements in machine-translation software, however, have concerned some translators about the future of the translation industry. Machine translators, such as Google Translate or Microsoft Translator, may be able to translate a text in mere seconds, but when it comes to more creative projects, machine translators fall short in

**1**

A) NO CHANGE
B) philosopher, Walter Benjamin,
C) philosopher—Walter Benjamin—
D) philosopher: Walter Benjamin





CONTINUE

crafting the kinds of works of art that Benjamin had in mind; 2 more human translators should learn from Benjamin's ideas about art.

2

Which choice most effectively sets up the main argument of the passage?

A) NO CHANGE

B) experienced human translators are still the only ones who possess the ability to make truly artful translations.

C) there is a concern about whether translators know how to properly use the technology.

D) machine translation software would likely need to be constantly updated to stay relevant.





CONTINUE

The translator's task is rife with complex decisions, 3 but introducing more technology-based classes in translation degree programs may help meet these demands. This expertise, according to linguistics professor Adrian 4 Buzo. Is vital to using a language within appropriate tonal and cultural contexts. To translate literary or discipline-specific works—such as novels, movie dialogue, or scholarly articles—the translator must consider the degree of formality, the intended audience, and the 5 cost-effectiveness of human versus machine translators and choose the best approximation within the target language to replicate not only the precise content but also the personality of the writing.

**3**

Which choice provides the most effective introduction to the paragraph?

A) NO CHANGE
B) as it can be difficult to predict which books in translation will be commercially successful.
C) and these challenges sometimes necessitate the services of machine translators.
D) many of which require advanced sociolinguistic skills.

**4**

A) NO CHANGE
B) Buzo and is
C) Buzo, which is
D) Buzo, is

**5**

Which choice provides a supporting example that is most similar to the examples already in the sentence?

A) NO CHANGE
B) given deadline of the assignment
C) historical moment of the original text
D) type of software that translation programs use



CONTINUE

Machine translators, on the other hand, are still notoriously bad at making such dynamic sociolinguistic choices. This is in part because current machine translators base their decisions largely on the frequency with which a word or phrase has been translated in a particular way within their databases, not necessarily on what is most appropriate to the specific text at hand. As a result, machine translations are often laughably awkward and outright 6 misleading. They are especially awkward and misleading when ambiguous words or phrases are used.

6

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

A) misleading: ambiguous words or phrases especially cause these two things when they

B) misleading—it is especially awkward and misleading when ambiguous words or phrases

C) misleading, and this happens especially when ambiguous words or phrases

D) misleading, especially when ambiguous words or phrases





CONTINUE

[1] Of course, as technology continues to improve, the translation field will undoubtedly experience some changes. [2] Sung Hee Kirk, a professor of English language and literature, 7 predict that the role of translator will increasingly become that of the editor of machine-translated texts. [3] To reiterate Benjamin's point, translators are artists, and therefore 8 their work should be valued as such. [4] As long as there is demand for quality translations—ones that 9 capture not only the precise meaning but also the personality of an original text—the skills of living, breathing human translators 10 will continue to be needed. 11

**7**

A) NO CHANGE
B) are predicting
C) have predicted
D) predicts

**8**

A) NO CHANGE
B) there
C) it's
D) its

**9**

A) NO CHANGE
B) seize
C) occupy
D) obtain

**10**

A) NO CHANGE
B) will have continued
C) are continuing
D) had continued

**11**

The writer wants to add the following sentence to the paragraph.

> While such may become the case with simpler translation projects, the role of the translator of creative and literary works will always be more than that of a proofreader.

The best placement for the sentence is

A) before sentence 1.
B) after sentence 2.
C) after sentence 3.
D) after sentence 4.





CONTINUE

**Questions 12-22 are based on the following passage.**

**Dusting Off Family History**

— 1 —

In 1975 screenwriter and filmmaker Julie Dash began taking notes on the stories she **12** has heard from her family members who were part of the Gullah **13** community. Dash refined these notes into a movie script that, through a series of nonlinear vignettes, **14** it told the tale of a Gullah family preparing to migrate to the mainland and adopt a new way of life. Though her script was undeniably brilliant, Dash would have to overcome a string of challenges over the course of almost ten years to bring her **15** project *Daughters of the Dust*, to theaters.

**12**

A) NO CHANGE
B) hears
C) heard
D) will hear

**13**

The writer is considering revising the underlined portion to the following.

> community—a group of African Americans who live on the islands of South Carolina and Georgia and are known for their adherence to the spiritual and cultural practices of West Africa.

Should the writer make this revision?

A) Yes, because it provides relevant context about the primary subject matter of the film discussed in the passage, *Daughters of the Dust*.
B) Yes, because it provides a detail that is essential to understanding the paragraph's discussion of the challenges Dash faced in her filmmaking.
C) No, because it introduces information about the Gullah community that blurs the paragraph's main focus on Dash's movie script.
D) No, because it fails to explain why the Gullah community continues to adhere to West African practices in South Carolina and Georgia.

**14**

A) NO CHANGE
B) telling
C) told
D) it was telling

**15**

A) NO CHANGE
B) project,
C) project:
D) project—





CONTINUE

— 2 —

Her film's episodic, dreamlike plot and lingering close-up camera shots of characters and food dishes served to memorialize a way of 16 life. They did this instead of advancing the story. This ambition didn't appeal to the more action-oriented preferences of the film studios. 17 "In independent film, we are never able to pay top salaries," Dash explained. "We do it to create the work. We do it to sharpen our skills." It wasn't until a chance meeting in 1988 that Dash finally found a backer in the public television series *American Playhouse*.

**16**

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

A) life, instead of having the story advance.
B) life rather than advance the story.
C) life; they did it rather than advancing the story.
D) life; this was done instead of advancing the story.

**17**

Which quotation from Julie Dash's book *Daughters of the Dust: The Making of an African American Woman's Film* best supports the point made in the previous sentence?

A) NO CHANGE
B) "For the most part, the crew and actors all worked in the same spirit, everyone appreciating that we were doing something different, something special," Dash said.
C) "They thought the film would be unmarketable, Dash said. "Every major studio either passed on it or didn't respond at all."
D) "One of the ongoing struggles of African American filmmakers is the fight against being pushed, through financial and social pressure, into telling only one kind of story," Dash explained.



CONTINUE

— 3 —

Though financing was 18 nailed down, Dash encountered another challenge once she started filming the full movie on a South Carolina island: the island's environmental restrictions prohibited the use of the generator she required for proper lighting. 19 Given that the crew had only 28 days to film, this technical constraint influenced one of cinematographer Arthur Jafa's most celebrated decisions—using natural sunlight. The resulting beachfront scenes of Dash's black female characters in flowing white dresses are some of the film's most iconic, the natural light suffusing them with a warm, ethereal glow. This effect perfectly suited Dash's creative aim to, as the *Los Angeles Times* put it, "convey the very look, feel and texture of something that is about to be lost forever."

**18**

A) NO CHANGE
B) guaranteed beyond a shadow of doubt,
C) in the bag,
D) secured,

**19**

Which choice provides the most effective transition from the previous sentence to the information that follows in this sentence?

A) NO CHANGE
B) Though the film would face other trials,
C) With production already delayed because of bad weather,
D) An obstacle at first,





CONTINUE

— 4 —

Dash entered the completed *Daughters of the Dust* into film 20 festivals. Where its popularity led to a 1992 theatrical debut that made her the first African American woman filmmaker to have a theatrical release for a feature-length film. Since then, the film has captivated viewers and provided inspiration to many, with director Ava DuVernay citing it as a major influence and recording artist Beyoncé drawing on many of 21 it's motifs in her visual album *Lemonade*. *Daughters of the Dust*'s theatrical debut marked the end of Dash's decade-long struggle and the beginning of her filmmaking legacy.

**Question 22 asks about the previous passage as a whole.**

**20**

A) NO CHANGE
B) festivals,
C) festivals, where
D) festivals; where

**21**

A) NO CHANGE
B) their
C) they're
D) its

**Think about the previous passage as a whole as you answer question 22.**

**22**

The writer wants to add the following sentence to the passage.

> In 1987 Dash shot a segment of her movie and sent it to film studios with the hope of receiving financial support, but her own originality worked against her.

To make the passage most logical, the sentence should be placed at the beginning of

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





CONTINUE

**Questions 23-33 are based on the following passage.**

**Curating the African American Experience**

When Lonnie Bunch accepted the job of founding director at the National Museum of African American History and Culture (NMAAHC) in 2005, he 23 made the decision to leave his previous job at the Chicago Historical Society. Some museum stakeholders 24 could be interested in building a museum that would highlight inspiring and uplifting images of African American achievement. Others envisioned a museum that reckoned more directly with the suffering caused by slavery and segregation. Bunch, 25 therefore, rejected both approaches in favor of a different one altogether. He decided that the NMAAHC should use the experiences of African Americans as a 26 lens. He made this decision with the thought that through such a lens, one can view American culture as a whole.

**23**

Which choice most effectively establishes the main topic of the passage?

A) NO CHANGE
B) took the first step in realizing a long-held vision.
C) was faced with a challenging curatorial task.
D) brought with him over a decade of experience as a museum curator.

**24**

A) NO CHANGE
B) were
C) are
D) will be

**25**

A) NO CHANGE
B) however,
C) similarly,
D) moreover,

**26**

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

A) lens through which to view
B) lens; through this lens, one views
C) lens, with the view of
D) lens, and through it, to view





CONTINUE

The museum's *Slavery and Freedom* exhibit 27 takes visitors chronologically through relics from the eras of slavery and emancipation. The display features a wall engraved with quotations about 28 freedom; including parts of the Declaration of Independence and of an 1808 sermon preached by African American minister Absalom Jones upon the abolition of the transatlantic slave trade. More quotations, as well as artifacts—including a Union army recruitment poster from the Civil War and a training plane piloted by the Tuskegee Airmen—showcase African American emancipation and progress as American history unfolds. Bunch explains that the expansion of African American freedom coincides with the expansion of freedom in the United States more generally. 29 "Museums that specialize in a given ethnic group usually focus solely on an insider's perspective of that group," he asserted in a 2016 article in *Smithsonian* magazine.

**27**

Which choice provides the best transition from the previous paragraph to this one?

A) NO CHANGE
B) exemplifies Bunch's approach of situating the experiences of African Americans within the broader context of American culture.
C) encompasses large artifacts, from a cabin that once housed enslaved people to a Jim Crow–era segregated railcar.
D) is located underground, three stories beneath the building's striking exterior.

**28**

A) NO CHANGE
B) freedom: including
C) freedom (including
D) freedom, including

**29**

Which quotation from Lonnie Bunch's article best supports the point made in the previous sentence?

A) NO CHANGE
B) "At times I took some flak, but if I was arguing that we were telling the quintessential American story, then I needed a variety of perspectives,"
C) "If you're interested in American notions of freedom, if you're interested in the broadening of fairness, opportunity and citizenship, then regardless of who you are, this is your story, too,"
D) "One [objective of the museum] was to harness the power of memory to help America illuminate all the dark corners of its past,"



CONTINUE

The choices Bunch has made for displaying the NMAAHC's collection 30 has been well-received by visitors. Since opening in 2016, the museum has become one of the most popular of the Smithsonian museums on the National Mall in Washington, DC. Bunch's methodology is not without its critics, however. Writing in the *New Yorker* magazine, 31 Vinson Cunningham argues that the effort to tell a broad story about America through African American culture runs the risk of seeming incoherent. The museum, Cunningham 32 advises, "reduces history to a scattering of bright but unconstellated stars."

Bunch stands by his decision to present a history of the United States through the prism 33 of their lives. He notes that the NMAAHC displays inspirational instances of progress alongside powerful memorials to hardship, allowing visitors to interpret what they see for themselves. "Ultimately," Bunch says, "I trust that our visitors will draw sustenance, inspiration and a commitment from the lessons of history to make America better."

**30**

A) NO CHANGE
B) was
C) have been
D) is

**31**

A) NO CHANGE
B) an article by Vinson Cunningham argues that the effort to tell a broad story about America through African American culture runs the risk of seeming incoherent.
C) it runs the risk of seeming incoherent to tell a broad story about America through African American culture, Vinson Cunningham argues.
D) the effort to tell a broad story about America through African American culture runs the risk of seeming incoherent, argues Vinson Cunningham.

**32**

A) NO CHANGE
B) lectures,
C) urges,
D) cautions,

**33**

A) NO CHANGE
B) of those lives.
C) of the lives of African Americans.
D) DELETE the underlined portion and end the sentence with a period.



CONTINUE

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

**Deer on the Move**

34 Because of their digestive anatomy, mule deer are selective in their diet and feed mostly on various weeds, leaves, and twigs. The vegetation they feed on at high elevations in the spring and summer provides the deer with the sustenance they need to survive winters in a barren (though warmer) desert environment. However, roadways have obstructed the three-hundred-mile round-trip journey of the deer, prompting researchers and Wyoming state officials 35 for adopting a clever strategy to ensure the migration is not disrupted.

34

Which choice introduces the passage most effectively?

A) NO CHANGE

B) Because of a continued population decline in Wyoming's mule deer population, multiple conservation efforts are now under way to protect them from extinction.

C) Every year some of Wyoming's mule deer migrate between their summer ranges in the mountain slopes of the Hoback Basin and winter ranges in the Red Desert.

D) Named for their large, mule-like ears, mule deer are social animals that usually live in multigenerational groups of related females and their offspring.

35

A) NO CHANGE

B) to adopt

C) adopt

D) in the adoption of





CONTINUE

In 2001, to aid mule deer migration and prevent road accidents that 36 dangerously put motorists and deer at risk, state authorities installed KP49, a concrete box culvert (tunnel) approximately 60 feet long, 19 feet wide, and 10 feet high that runs beneath a highway in the mule deer winter range and migration route. Tall fences were constructed along 3.4 miles of highway on either 37 side of these tunnels to channel migrating deer into it. Several additional 38 underpasses, and another six miles of fencing were constructed in 2008. Beginning that December, a research team launched a 39 study. The team wanted to determine whether deer did in fact use the underpasses over three annual migratory cycles (lasting until May 2011). They installed digital infrared cameras in each underpass, allowing them to count the number of deer that came close to the culverts and the number that actually traveled through them to cross the highway. The average passage rate for a given migratory cycle was calculated by dividing the number of deer that successfully used an underpass by the total number of deer that approached within roughly 200 feet of it.

**36**

A) NO CHANGE
B) put motorists and deer at risk,
C) expose motorists and deer to risky accidents,
D) threaten motorists and deer by putting them at risk,

**37**

A) NO CHANGE
B) sides of this tunnel
C) side of this tunnel
D) sides of these tunnels

**38**

A) NO CHANGE
B) underpasses;
C) underpasses—
D) underpasses

**39**

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

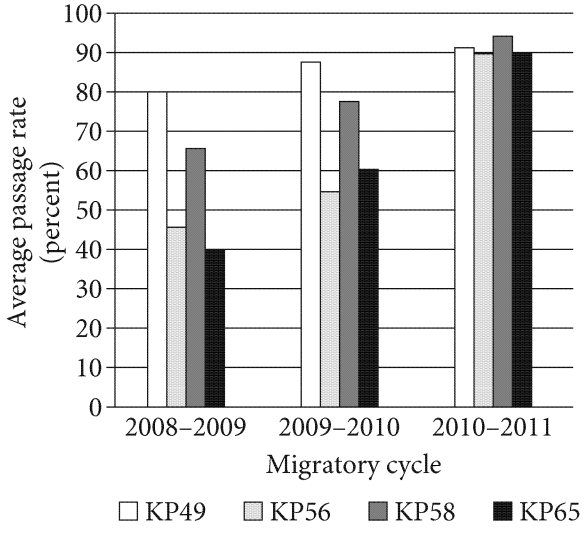
A) study to determine
B) study determining
C) study whose goal was the determination of
D) study that was initiated to determine



CONTINUE

During the first year of the study, researchers found that approximately 80 percent of the deer that came within range of underpass KP49 passed through it successfully. By contrast, at the KP58 site the rate was about 65 percent, and at KP65 it was only 40 percent. Passage rates **40** fluctuated widely throughout the study, however, and by the third year the **41** passage rates at every underpass had climbed to approximately 90 percent. Researchers concluded that the deer needed time to habituate to these new landscape **42** features, once the underpasses were familiar, deer used them without hesitation. This accounts for the higher-than-average passage rates at KP49 in the first migratory cycle. **43** In contrast, greater migratory use of underpasses coincided with an 81 percent decrease in collisions between vehicles and deer.

Average Passage Rate of Mule Deer through Highway 30 Underpasses over a Three-Year Period




Adapted from Hall Sawyer et al., "Mitigating Roadway Impacts to Migratory Mule Deer—A Case Study with Underpasses and Continuous Fencing." ©2012 by The Wildlife Society.

**40**

Which choice offers an accurate interpretation of the data in the graph?

A) NO CHANGE
B) remained near constant for some sites,
C) at all sites increased over time,
D) dropped for at least one site,

**41**

Which choice most effectively uses information from the graph to support the point made in the next sentence of the paragraph?

A) NO CHANGE
B) passage rate for the oldest underpass, KP49, had leveled off.
C) KP58 site had, by a small margin, the highest passage rate of all.
D) success rate of KP65 was consistent with those of the other three sites.

**42**

A) NO CHANGE
B) features
C) features: in that
D) features;

**43**

A) NO CHANGE
B) Specifically,
C) Generally,
D) Crucially,





CONTINUE

The Wyoming project demonstrated that mule deer can adapt to underpasses, 44 but this improves safety outcomes for both deer and humans. Researchers hope that their results can be used to produce more effective measures to protect this and other species, keeping human and animal travelers out of each other's way.

44

A) NO CHANGE
B) improving
C) yet improving
D) this improves

# STOP

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

# Math Test – No Calculator

## 25 MINUTES, 20 QUESTIONS

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

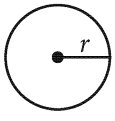
**DIRECTIONS**

**For questions 1-15**, solve each problem, choose the best answer from the choices provided, and fill in the corresponding bubble 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.

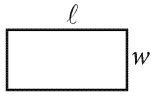
**NOTES**

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.

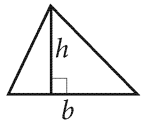
**REFERENCE**



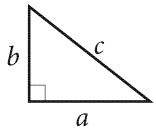

$A = \pi r^2$
$C = 2\pi r$



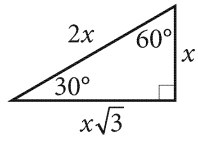

$A = \ell w$

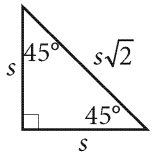



$A = \frac{1}{2}bh$

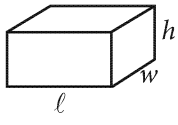



$c^2 = a^2 + b^2$

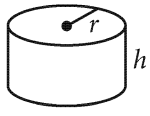


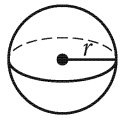

Special Right Triangles



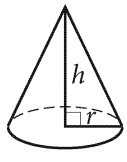

$V = \ell wh$



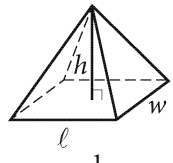

$V = \pi r^2 h$




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




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




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

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





CONTINUE

**1**

The sum of a number $x$ and 5 is twice as large as a number $y$. The number $y$ is 4 less than the number $x$. Which system of equations describes this situation?

A) $x + 5 = 2y$
$y = x - 4$

B) $x + 5 = 2y$
$y = 4 - x$

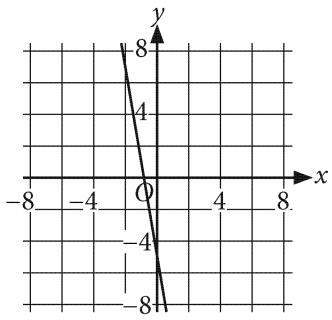
C) $2(x + 5) = y$
$y = x - 4$

D) $2(x + 5) = y$
$y = 4 - x$

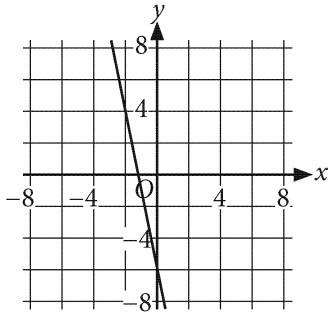
**2**

What is the graph of $y = -5x - 6$ ?

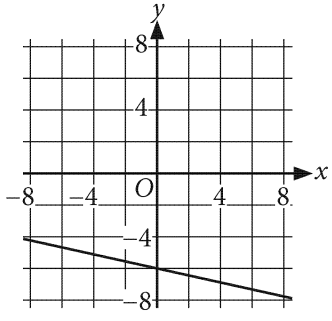
A)



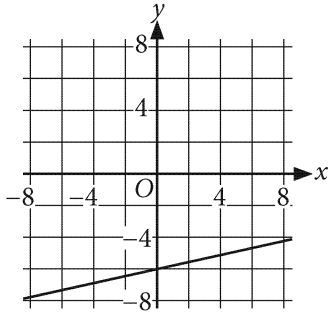

B)




C)




D)

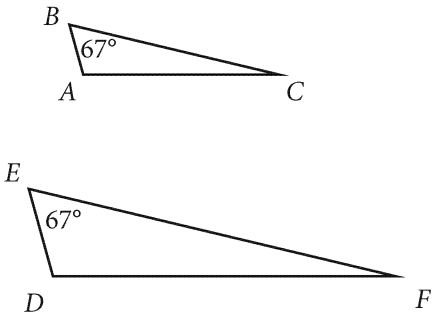







CONTINUE

## 3




Triangles $ABC$ and $DEF$ each have an angle measuring 67°, as shown. Which additional piece of information is sufficient to determine whether triangle $ABC$ is similar to triangle $DEF$ ?

A) The measure of angle $D$

B) The measures of angles $C$ and $F$

C) The length of line segment $DE$

D) The lengths of line segments $AB$ and $DE$

## 4

An astronaut on the International Space Station experimented with droplets of water to understand how static electricity affects the behavior of large and small droplets. Each large droplet had a volume of 180 cubic millimeters ($mm^3$), and each small droplet had a volume of 6 $mm^3$. The astronaut used a total of 2,700 $mm^3$ of water to make 14 large droplets and several small droplets. How many small droplets did the astronaut make?

A) 6

B) 30

C) 180

D) 420

## 5

Which expression is equivalent to $a(ab^2c)$ ?

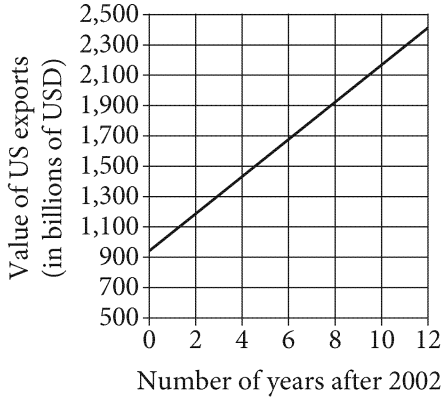
A) $a^2b^2c$

B) $ab^{2a}c$

C) $2ab^2c$

D) $b^2c$

## 6




The graph shown models the value of US exports, in billions of US dollars (USD), from 2002 to 2014. The value of US exports grew by approximately how many billions of dollars each year?

A) 25

B) 50

C) 100

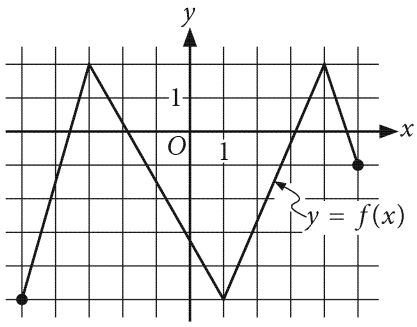
D) 200





CONTINUE

**7**




The complete graph of the function $f$ is shown in the $xy$-plane above. How many solutions does the equation $f(x) = 0$ have?

A) One
B) Two
C) Three
D) Four

**8**

Which expression is equivalent to $x^{\frac{5}{6}}$, where $x > 0$ ?

A) $\frac{1}{\sqrt[5]{x^6}}$

B) $\frac{1}{\sqrt[6]{x^5}}$

C) $\sqrt[5]{x^6}$

D) $\sqrt[6]{x^5}$

**9**

The number of bacteria in a population is modeled by the function $f(x) = 50{,}000(2)^{\frac{x}{4}}$, where $x$ is the time in hours. Based on the model, how many hours does it take for the number of bacteria to double?

A) 1
B) 2
C) 4
D) 8

**10**

A historian estimates that during the Boston Tea Party, a total of 90,000 pounds of tea was thrown into Boston Harbor. The tea consisted of $x$ large boxes of tea, each weighing 400 pounds, and $y$ small boxes of tea, each weighing 100 pounds. The equation $400x + 100y = 90{,}000$ represents this relationship. The historian estimates that 156 small boxes of tea were thrown into the harbor. Based on the estimate, how many large boxes of tea were thrown into the harbor?

A) 156
B) 171
C) 186
D) 264





CONTINUE

**11**

In the complex number system, which number is equivalent to $\frac{4+3i}{2-i}$ ? (Note: $i = \sqrt{-1}$)

A) $1 + 2i$

B) $1 - 2i$

C) $\frac{2i+11}{3}$

D) $\frac{10i-5}{3}$

**12**

What is the $y$-intercept of the graph of $y = -(5)^x - 2$ in the $xy$-plane?

A) $(0, -7)$

B) $(0, -3)$

C) $(0, -2)$

D) $(0, -1)$

**13**

$$3x^2 + 5x - 7 = 0$$

One solution to the given equation can be written as $\frac{-5+\sqrt{z}}{6}$, where $z$ is a constant. What is the value of $z$ ?

A) 59

B) 84

C) 94

D) 109





CONTINUE

14

How many solutions does the equation $2(x + 3) = 5x - 3x + 6$ have?

A) Zero

B) Exactly one

C) Exactly two

D) Infinitely many

15

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

For the given function $f$, at what value of $x$ does the maximum value of $f(x)$ occur?

A) $-2$

B) $1$

C) $3$

D) $5$

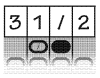




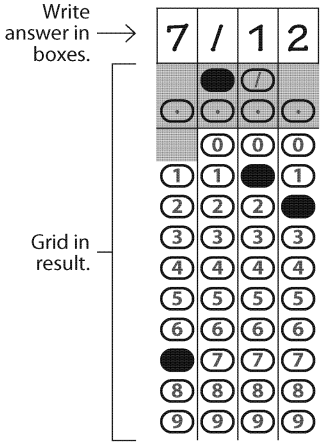
CONTINUE

**DIRECTIONS**

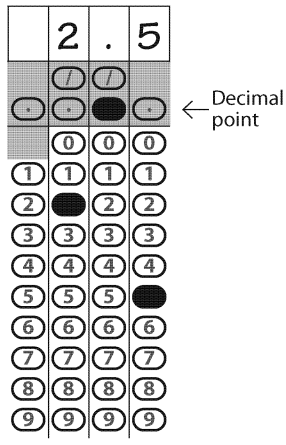
**For questions 16-20**, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

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 bubbles accurately. You will receive credit only if the bubbles are filled in correctly.
2. Mark no more than one bubble 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.

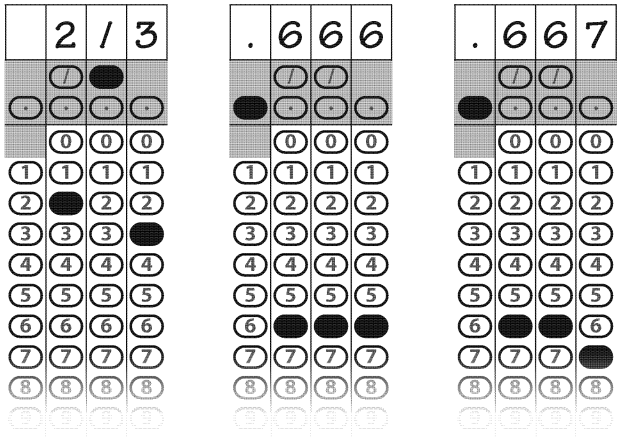
**Answer: $\frac{7}{12}$**



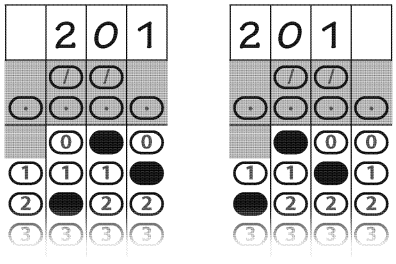

**Answer: 2.5**




**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.





CONTINUE

16

What value of $p$ is the solution to the equation $20p = 180$ ?

17

$$3x^2 - 12x = 0$$

What is a solution to the given equation?

18

$$y = \frac{1}{3}x - 7$$
$$y = -x + 9$$

The solution to the given system of equations is $(x, y)$. What is the value of $x$ ?

19

In the $xy$-plane, the graph of $x^2 + y^2 - 4x - 6y - 3 = 0$ is a circle. The center of this circle is $(h, k)$, where $h$ and $k$ are constants. What is the value of $k$ ?

20

$$|\, 20 - x \,| = 40$$

What is the positive solution to the given equation?

# STOP

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

# Math Test – Calculator

## 55 MINUTES, 38 QUESTIONS

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

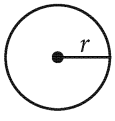
**DIRECTIONS**

**For questions 1-30**, solve each problem, choose the best answer from the choices provided, and fill in the corresponding bubble 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.

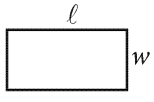
**NOTES**

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.

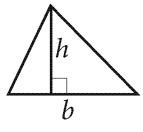
**REFERENCE**



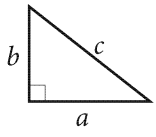

$A = \pi r^2$
$C = 2\pi r$



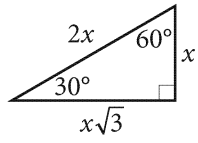

$A = \ell w$

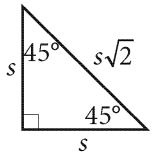



$A = \frac{1}{2}bh$

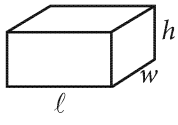



$c^2 = a^2 + b^2$

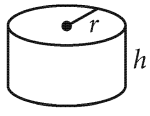


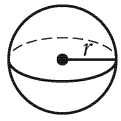

Special Right Triangles



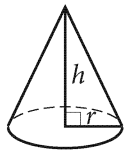

$V = \ell wh$



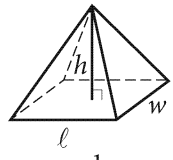

$V = \pi r^2 h$




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




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




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

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





CONTINUE

**1**

A boat is sailing at a speed of 20 kilometers per hour. What is the boat's speed, in knots? (Use 0.54 knot = 1 kilometer per hour.)

A) 2.7

B) 10.8

C) 19.5

D) 37.0

**2**

For a scale drawing of a room, a length of 2 inches represents an actual length of 4 feet. The length of the scale drawing is 12 inches. What is the actual length of the room, in feet?

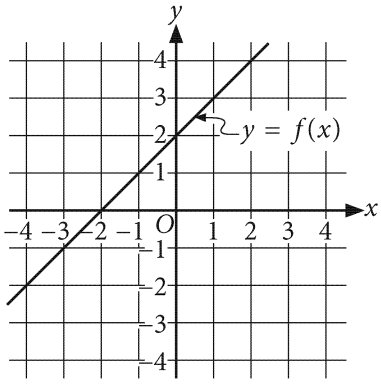
A) 3

B) 6

C) 24

D) 48

**3**




The graph of the linear function $f$ is shown. What is the $y$-intercept of the graph of $f$ ?

A) $(-2, 0)$

B) $(2, 0)$

C) $(0, 2)$

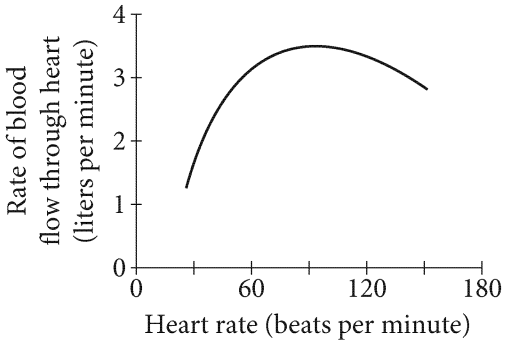
D) $(0, -2)$





CONTINUE

4

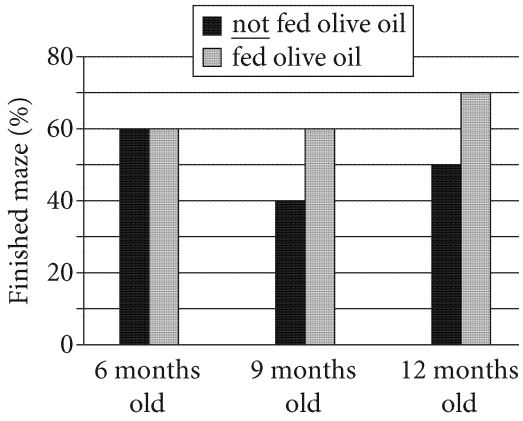



The graph shows the rate, in liters per minute, of blood flow through a dog's heart as a function of the dog's heart rate, in beats per minute. Which of the following is closest to the heart rate, in beats per minute, at which the maximum rate of blood flow through the dog's heart occurs?

A) 3
B) 25
C) 90
D) 155

**Questions 5 and 6 refer to the following information.**

A psychologist conducted an experiment to see if feeding mice olive oil had an effect on the mice finishing a maze. The mice were randomly assigned to one of two groups, each consisting of 20 mice. The mice in one group were fed olive oil as part of their diet, and the mice in the other group were not fed olive oil as part of their diet. The psychologist recorded the percentage of mice in each group that finished the maze at 6, 9, and 12 months old. The results of the study are shown in the bar graph.




5

What is the ratio of the number of mice that were fed olive oil to the total number of mice in the study?

A) 1 to 20
B) 1 to 40
C) 20 to 20
D) 20 to 40





CONTINUE

**6**

How many 6-month-old mice that were fed olive oil finished the maze?

A) 8

B) 12

C) 20

D) 40

**7**

A rectangle has an area of 40 square meters. Its width is 3 meters greater than its length. What is the width of the rectangle, in meters?

A) 3

B) 5

C) 6

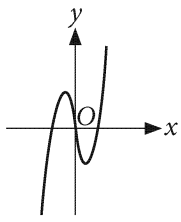
D) 8

**8**

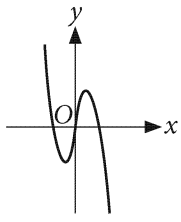
| $x$ | $-2$ | $-1$ | $0$ | $1$ | $2$ |
|---|---|---|---|---|---|
| $f(x)$ | $0$ | $3$ | $0$ | $-3$ | $0$ |

For a polynomial function $f$ with degree at most 4, the table shows several values of $x$ and their corresponding values of $f(x)$. Which of the following could be the graph of $y = f(x)$ in the $xy$-plane?

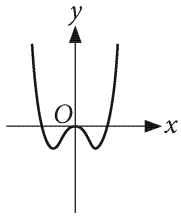
A)



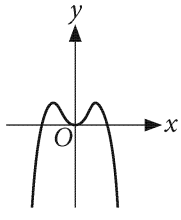

B)




C)




D)








CONTINUE

9

Line $\ell$ is defined by $y = 6x - 4$. Line $k$ is parallel to line $\ell$ in the $xy$-plane. What is the slope of line $k$ ?

A) $-6$

B) $-\frac{1}{6}$

C) $\frac{1}{6}$

D) $6$

**Questions 10 and 11 refer to the following information.**

| | Car Service A | Car Service B |
|---|---|---|
| Initial fee | \$2.75 | \$$x$ |
| Fee per minute | \$0.15 | \$0.00 |
| Fee per mile | \$0.85 | \$2.30 |

Ms. Cheng will be traveling 30 miles from her home to the airport using one of three car services. The table shows all fees that Car Service A and Car Service B charge per ride. The total charge, in dollars, for Car Service C is represented by the function $g(t) = 0.10t + 32.70$, where $t$ is the time, in minutes, the 30-mile trip would take.

10

Ms. Cheng chooses Car Service B and is charged a total of \$71.70 in fees for the ride. What is the initial fee that Car Service B charges?

A) \$2.39

B) \$2.70

C) \$4.69

D) \$6.90





CONTINUE

**11**

Which function $f$ gives the total fees, in dollars, or Car Service A in terms of the time $t$, in minutes, that the ride will take?

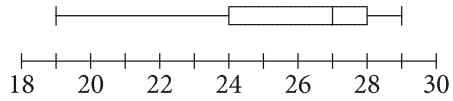
A) $f(t) = 0.85t + 7.25$

B) $f(t) = 0.85t + 2.75$

C) $f(t) = 0.15t + 28.25$

D) $f(t) = 0.15t + 3.50$

**12**




The box plot shown summarizes the values in a data set. What is the median value of the data set?

A) 10

B) 19

C) 24

D) 27

**Questions 13 and 14 refer to the following information.**

$$E(t) = 35 - 0.14t$$

A psychologist studied the relationship between the reaction time of participants performing a task and the number of errors the participants made. The relationship can be modeled by the equation shown, where $E(t)$ is the predicted number of errors, $t$ is the reaction time per task, in milliseconds (ms), and $0 \leq t \leq 250$.

**13**

What is the number of errors predicted by the equation for a reaction time of 100 ms?

A) 14

B) 21

C) 26

D) 56

**14**

What is the interpretation of $E(150) = 14$ in this context?

A) The model predicts 14 errors are made when the reaction time is 150 ms.

B) The model predicts 150 errors are made when the reaction time 14 ms.

C) The model predicts that for every additional 14 ms in reaction time, 150 fewer errors are made.

D) The model predicts that for every additional 150 ms in reaction time, 14 fewer errors are made.





CONTINUE

15

The table summarizes the types of prairie plants collected from an ecosystem.

| | Spring-flowering | Fall-flowering | Total |
|---|---|---|---|
| Grass | 4 | 2 | 6 |
| Non-grass | 8 | 6 | 14 |
| Total | 12 | 8 | 20 |

If a prairie plant is selected at random from this collection, what is the probability of selecting a fall-flowering grass plant?

A) 0.1

B) 0.2

C) 0.3

D) 0.4

16

For a school competition, each student in the sixth, seventh, and eighth grades is assigned to either the red team or the blue team. The table shows the distribution of grade and team for the students in the school.

| | Red team | Blue team | Total |
|---|---|---|---|
| Sixth grade | 48 | 42 | 90 |
| Seventh grade | 49 | 36 | 85 |
| Eighth grade | 38 | 50 | 88 |
| Total | 135 | 128 | 263 |

A student from the competition will be selected at random. What is the probability of selecting a student who is in the sixth or seventh grade, given that the student is on the blue team?

A) $\frac{78}{263}$

B) $\frac{78}{128}$

C) $\frac{175}{263}$

D) $\frac{50}{128}$

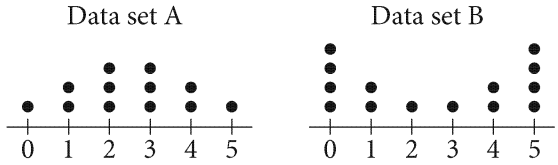




CONTINUE

## 17

Each dot plot shown represents a data set.




Which of the following statements correctly compares the means of the two data sets?

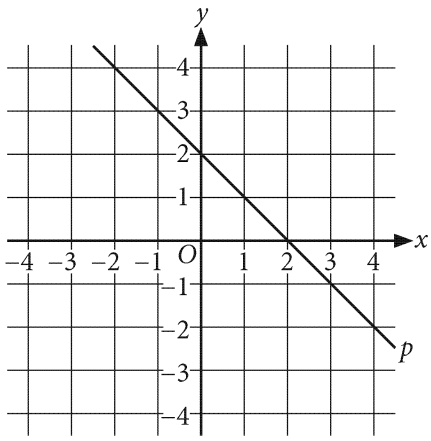
A) The mean of data set A is greater than the mean of data set B.

B) The mean of data set A is less than the mean of data set B.

C) The means of the data sets are equal.

D) There is not enough information to compare the means.

## 18




Line $p$ shown is shifted downward 10 units to produce line $m$. Which of the following is an equation of line $m$ ?

A) $y = -x - 8$

B) $y = x - 8$

C) $y = -x - 10$

D) $y = x - 10$

## 19

The measure of angle $B$ is 40° and $\cos(B) - \sin(C) = 0$, where $0° < C < 90°$. What is the measure of angle $C$ ?

A) 30°

B) 40°

C) 50°

D) 60°





CONTINUE

20

For which of the following situations is the number of books Kembé owns modeled by a decreasing exponential function?

A) Each month he buys 2 more books.

B) Each month he sells 2 of his books.

C) Each month he increases the number of books he owns by 10%.

D) Each month he reduces the number of books he owns by 10%.

21

$$9x^2 - y^2 = 119$$
$$3x - y = 17$$

The solution to the given system of equations is $(x, y)$. What is the value of $3x + y$ ?

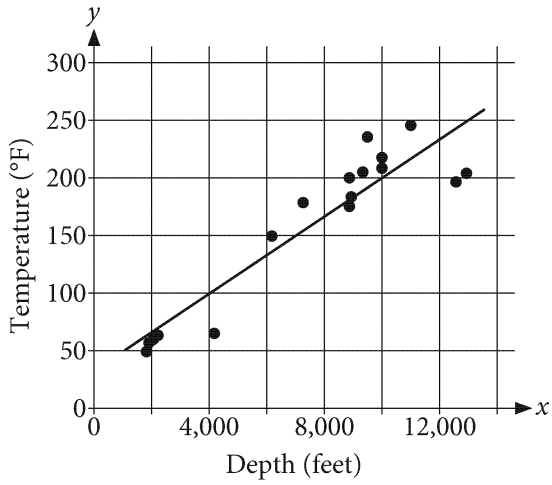
A) $-8$

B) $-7$

C) $7$

D) $8$

22




The scatterplot shows the relationship between the temperature $y$, in degrees Fahrenheit (°F), and the depth $x$, in feet, of 17 production wells in the North Slope field of Alaska. A line of best fit for the data is also shown. Which of the following is closest to the slope of the line of best fit, in °F per foot?

A) 0.017

B) 0.17

C) 1.7

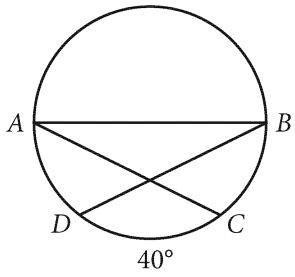
D) 170





CONTINUE

## 23




Note: Figure not drawn scale.

In the circle shown, $\overline{AB}$ is the diameter and arc $\overset{\frown}{BC}$ is congruent to arc $\overset{\frown}{AD}$. What the measure of $\angle BAC$ ?

A) 20°

B) 35°

C) 40°

D) 80°

## 24

Each frequency table shown summarizes the values in a data set.

Data Set A

| Value | Frequency |
|---|---|
| 6 | 4 |
| 7 | 3 |
| 8 | 4 |

Data Set B

| Value | Frequency |
|---|---|
| 8 | 4 |
| 9 | 3 |
| 10 | 4 |

Which of the following statements correctly compares the medians of the two data sets?

A) The medians of the data sets are equal.

B) The median of data set A is greater than the median of data set B.

C) The median of data set A is less than the median of data set B.

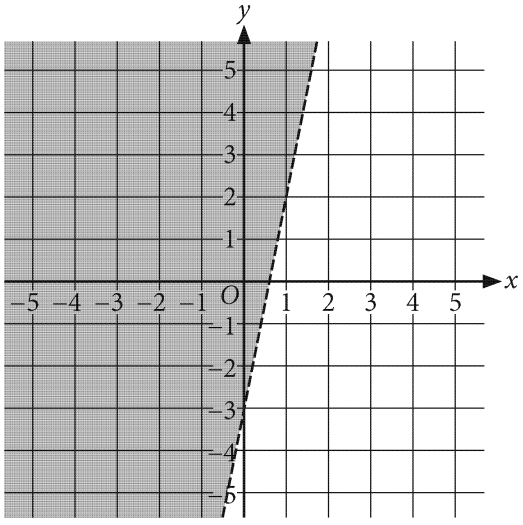
D) There is not enough information to compare the medians.





CONTINUE

## 25




The shaded region shown represents the solutions to which inequality?

A) $y < 3x - 5$

B) $y > 3x - 5$

C) $y < 5x - 3$

D) $y > 5x - 3$

## 26

Which expression is equivalent to

$$\frac{y+3}{x-1} + \frac{y(x-1)}{x^2y - xy} \text{ ?}$$

A) $\dfrac{xy^2 + 4xy - y}{x^2y - xy}$

B) $\dfrac{xy^2 + 4xy - y}{x^3y - 2xy - xy}$

C) $\dfrac{xy + y + 2}{x^3y - 2x^2y - xy}$

D) $\dfrac{xy + 2y + 3}{x^2y - xy + x - 1}$

## 27

The mass of the radioactive isotope americium-241 remaining at the end of every period of 432.2 years is half of the mass at the beginning of the period. If the initial mass of americium-241 is 5 grams, which equation represents the mass $y$, in grams, of americium-241 remaining after $x$ years?

A) $y = 5(432.2)^x$

B) $y = 5(432.2)^{\frac{x}{2}}$

C) $y = 5\left(\dfrac{1}{2}\right)^{432.2x}$

D) $y = 5\left(\dfrac{1}{2}\right)^{\frac{x}{432.2}}$





CONTINUE

**28**

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

In the given equation, $k$ is a constant. The equation has no real solutions. What is a possible value of $k$ ?

A) $\frac{3}{4}$

B) 1

C) $\frac{5}{4}$

D) 2

**29**

A researcher selected a random sample of 25 three-year-old children for a study on child development. Each child was given the same eight-piece puzzle to complete without help. The researcher reported that the mean time it took a child to complete the puzzle was 7 minutes, with an associated margin of error of 1 minute. If the researcher performs the same experiment again with a different random sample of 50 three-year-old children, which of the following statements is most likely to be true?

A) The margin of error associated with the mean time for the new sample will be less than 1 minute.

B) The margin of error associated with the mean time for the new sample will be greater than 1 minute.

C) The margin of error associated with the mean time for the new sample will be equal to 1 minute.

D) There will be no margin of error associated with the mean time for the new sample.

**30**

Which system of linear equations has no solution?

A) $4x - 6y = 16$
$-2x + 3y = 8$

B) $2x - 3y = 8$
$-2x + 3y = -8$

C) $2x - 3y = 8$
$-6x + 9y = -24$

D) $2x - 3y = 8$
$3x + 4y = 9$

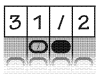


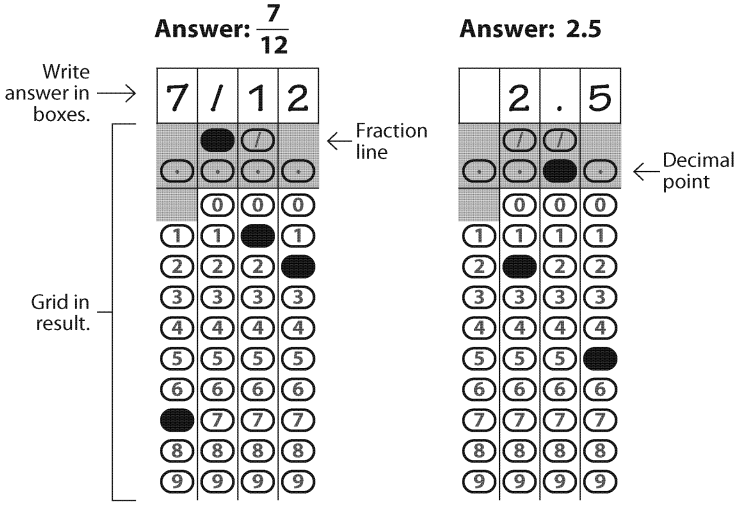


CONTINUE

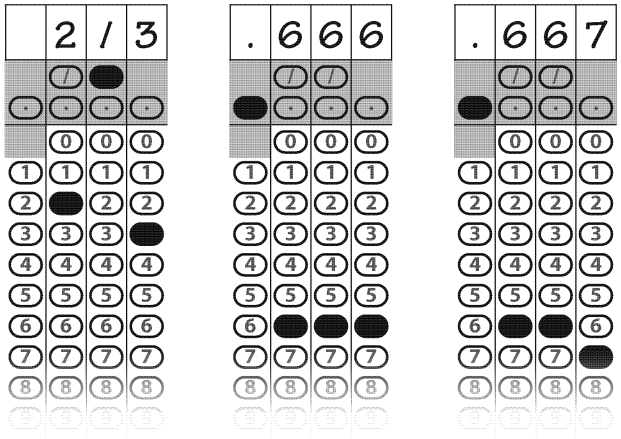
**DIRECTIONS**

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

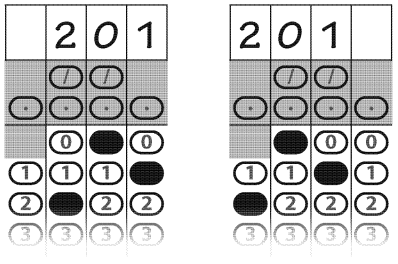
1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the bubbles accurately. You will receive credit only if the bubbles are filled in correctly.
2. Mark no more than one bubble in any column.
3. No question has a negative answer.
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**



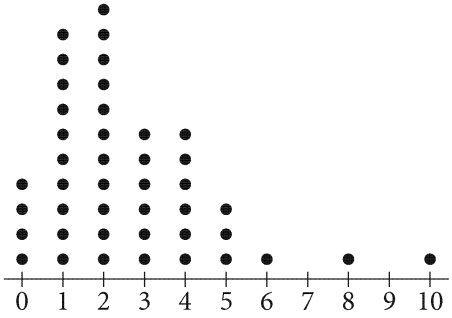
**NOTE:**
You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.





CONTINUE

**31**




Number of justices appointed to the US Supreme Court

The dot plot shows the number of justices appointed to the US Supreme Court for each of the 43 presidents from 1789 to 2010. What is the median number of justices appointed by the 43 presidents?

**32**

$$2w = 8t - 3$$
$$3w = -8t + 5$$

The solution to the given system of equations is $(t, w)$. What is the value of $w$ ?

**33**

The function $m$ is defined by $m(x) = \sqrt{x + 23}$.

What is the value of $m(2)$ ?

**34**

If $3(x + 4) - 5 = 16$, what is the value of $x + 4$ ?

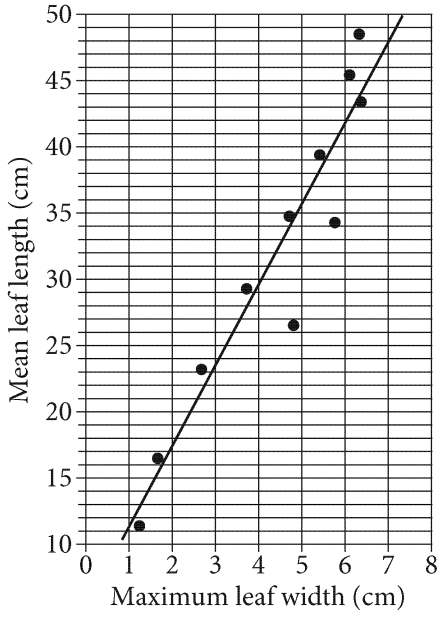




CONTINUE

**Questions 35 and 36 refer to the following information.**

The scatterplot shows the maximum leaf width, in centimeters (cm), and the mean leaf length, in cm, for 11 individual sorghum leaves 40 days after planting. A line of best fit for the data is also shown.




**35**

If $p$% of the 11 leaves have a mean leaf length larger than 30 cm, what is the value of $p$, rounded to the nearest tenth? (Disregard the % sign when entering your answer. For example, if your answer 39.5%, enter 39.5)

**36**

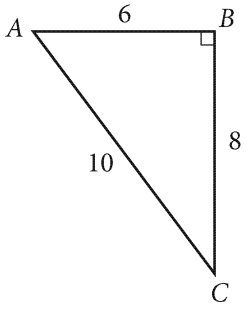
For how many of the 11 leaves does the line of best fit shown predict a mean leaf length greater than the actual mean leaf length?





CONTINUE

37




In the figure, the length of line segment $BC$ can be represented as $k \tan A$. What is the value of $k$ ?

38

If $y\%$ of $x$ is $6x$, and $x$ is a positive number, what is the value of $y$ ?

# STOP

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

# August 28, 2021 International

## ANSWER KEY

### Reading Test Answers

| | | | | |
|---|---|---|---|---|
| 1 B | 12 D | 23 D | 34 C | 45 C |
| 2 C | 13 B | 24 B | 35 D | 46 A |
| 3 A | 14 D | 25 B | 36 A | 47 C |
| 4 D | 15 B | 26 A | 37 B | 48 B |
| 5 D | 16 A | 27 D | 38 D | 49 A |
| 6 A | 17 B | 28 B | 39 D | 50 D |
| 7 C | 18 A | 29 D | 40 C | 51 B |
| 8 C | 19 D | 30 D | 41 A | 52 A |
| 9 B | 20 C | 31 C | 42 B | |
| 10 C | 21 A | 32 C | 43 C | |
| 11 A | 22 C | 33 B | 44 B | |

READING TEST RAW SCORE (NUMBER OF CORRECT ANSWERS)

### Writing and Language Test Answers

| | | | |
|---|---|---|---|
| 1 A | 12 C | 23 C | 34 C |
| 2 B | 13 A | 24 B | 35 B |
| 3 D | 14 C | 25 B | 36 B |
| 4 D | 15 B | 26 A | 37 C |
| 5 C | 16 B | 27 B | 38 D |
| 6 D | 17 C | 28 D | 39 A |
| 7 D | 18 D | 29 C | 40 C |
| 8 A | 19 D | 30 C | 41 A |
| 9 A | 20 C | 31 A | 42 D |
| 10 A | 21 D | 32 D | 43 D |
| 11 B | 22 B | 33 C | 44 B |

WRITING AND LANGUAGE TEST RAW SCORE (NUMBER OF CORRECT ANSWERS)

### Math Test – No Calculator Answers

| | |
|---|---|
| 1 A | 11 A |
| 2 B | 12 B |
| 3 B | 13 D |
| 4 B | 14 D |
| 5 A | 15 C |
| 6 C | 16 9 |
| 7 D | 17 0, 4 |
| 8 D | 18 12 |
| 9 C | 19 3 |
| 10 C | 20 60 |

MATH TEST – NO CALCULATOR RAW SCORE (NUMBER OF CORRECT ANSWERS)

### Math Test – Calculator Answers

| | | | |
|---|---|---|---|
| 1 B | 11 C | 21 C | 31 2 |
| 2 C | 12 D | 22 A | 32 .4, 2/5 |
| 3 C | 13 B | 23 B | 33 5 |
| 4 C | 14 A | 24 C | 34 7 |
| 5 D | 15 A | 25 D | 35 54.5 |
| 6 B | 16 B | 26 A | 36 4 |
| 7 D | 17 C | 27 D | 37 6 |
| 8 A | 18 A | 28 D | 38 600 |
| 9 D | 19 C | 29 A | |
| 10 B | 20 D | 30 A | |

MATH TEST – CALCULATOR RAW SCORE (NUMBER OF CORRECT ANSWERS)