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1

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 Juan Gabriel Vásquez *Reputations*. ©2013 by Juan Gabriel Vásquez. Translation by Anne McLean. ©2016 by Anne McLean. The novel's main character, Javier Mallarino, is a political cartoonist who works for a newspaper in Bogotá, the capital city of Colombia.

It took just an instant to spot three people reading the paper, his paper, and he thought that all three would soon pass or had already passed their eyes over the letters of his name in print and then his signature, that clear uppercase letter that soon deteriorated into a chaos of curves and ended up disintegrating into a corner. Everyone knew the space where his cartoon had always been: in the very centre of the first page of opinion columns, that mythic place where Colombians go to hate their public figures or find out why they love them. It was the first thing anyone's eyes saw when they reached those pages. The black square, the slender strokes, the line of text or brief dialogue beneath the frame: the scene that left his desk each day and was praised, admired, commented on, misinterpreted, repudiated in a column of the same newspaper or another, in the irate letter of an irate reader, in a debate on some morning radio show. Yes, it was a terrible power. There was a time when Mallarino desired it more than anything else in the world; he worked hard to get it; he enjoyed it and exploited it conscientiously. And now that he was sixty-five, the very political class he'd so attacked and hounded and scorned from his redoubt, mocked without

consideration or respect for the ties of family or friendship (and he'd lost quite a few friends as a result, and even a few relatives), that very same political class had decided to put the gigantic

30 Colombian machinery of sycophancy into action to create a public homage, which for the first time in history, and perhaps for the last, would celebrate a cartoonist. ‘This is not going to happen again,’ Rodrigo Valencia, publisher of the newspaper for the 35 last three decades, said to him, when he called, diligent messenger, to tell him about the official visit he'd just received, the accolades he'd just heard, the intentions the organizers had just revealed. ‘It's an offer that's not going to be repeated. It would be silly 40 to turn it down.’

‘Who said I was going to turn it down?’ asked Mallarino.

‘Nobody,’ said Valencia. ‘Well, I did. Because I know you, Javier. And so do they, truth be told. If 45 not, why would they come here and ask me first?’

‘Oh, I see. You're the negotiator. You're the one who'll convince me.’

‘More or less,’ said Valencia. His voice was guttural and deep, one of those voices that give 50 orders naturally, or whose demands are accepted without a fuss. He knew it; he'd grown accustomed to choosing the words that best suited his voice. ‘They want to hold it in the Teatro Colón, Javier, imagine that. Don't let the chance slip by, don't be an idiot. Not for you, don't get me wrong, you don't matter to me. For the newspaper.’

Mallarino let out a snort of annoyance. ‘Well, let me think about it,’ he said.

CONTINUE

1**1**

'For the newspaper,' said Valencia.

60 'Call me tomorrow and we'll talk,' said Mallarino. And then: 'Would it be upstairs in the sala Foyer?'

'No, Javier, this is what I'm trying to tell you. They're going to have it on the main stage.'

65 'On the main stage?'

'That's what I'm telling you, man. This thing's serious.'

They confirmed it later—Teatro Colon, main stage, the thing was serious—and the place seemed 70 only appropriate: there, under the fresco of the six muses, behind the curtain where Ruy Blas and Romeo and Othello and Juliet shared the same enchanted space, on the same stage where he'd witnessed so many beautiful artifices since he was a 75 boy, from Marcel Marceau to *Life is a Dream*, he was now getting ready to play an artifice of his own creation: the favoured son, the honoured citizen, the illustrious compatriot with lapels wide enough to hold as many medals as necessary. That's why he'd 80 turned down the transport the Ministry had offered to put at his disposal. No, this afternoon Mallarino had come down to the city in his old car and left it in a car park at Fifth and Nineteenth: he wanted to arrive on foot to his own apotheosis, approach like 85 everybody else, appear suddenly at a corner and feel that his mere presence might send a tremor through the air, spark conversations, make heads turn; he wanted to announce, with this single gesture, that he hadn't lost a speck of his old independence.

1

Mallarino's observations about the newspaper in lines 1-20 primarily serve to

- A) suggest his belief in the wide reach of his work.
- B) highlight his pride in his skill as an artist.
- C) explain why his cartoons are more effective than print columns.
- D) convey his wish that readers would spend more time analyzing his art.

2

The narrator's use of the phrase "mythic place" (line 10) primarily serves to

- A) imply that the newspaper's editorial staff underestimates its popularity with its readers.
- B) suggest that the newspaper's editorial section is prominent in the national consciousness.
- C) indicate that editorials in the newspaper are generally written under assumed names.
- D) emphasize that editorials in the newspaper are less interesting than they used to be.

3

The passage indicates that Mallarino's political cartoons treat their subjects in a manner that is

- A) fearlessly critical.
- B) gently teasing.
- C) carefully objective.
- D) overtly flattering.

4

Based on the passage, it can reasonably be inferred that Mallarino regards the recognition by the government with

- A) unease, because it creates a rare disagreement between Mallarino and his publisher.
- B) bitterness, because Mallarino had hoped for official appreciation years ago.
- C) irritation, because it disrupts the anonymity in which Mallarino prefers to work.
- D) skepticism, because Mallarino believes that the Ministry's gesture is insincere.

CONTINUE 

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5

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

- A) Lines 13-19 (“The Black . . . show”)
- B) Lines 20-23 (“There . . . conscientiously”)
- C) Lines 23-33 (“And now . . . cartoonist”)
- D) Lines 33-38 (“This . . . revealed”)

6

In the passage, Valencia and Mallarino assume that Valencia was approached first by the Ministry because the officials

- A) believed that Mallarino would prefer receiving the news from a close acquaintance.
- B) suspected that Mallarino would turn down the offer without Valencia’s intervention.
- C) had some difficulty contacting Mallarino earlier in the day.
- D) were unwilling to communicate directly with ordinary citizens such as Mallarino.

7

As used in line 74, “witnessed” most nearly means

- A) recognized.
- B) observed.
- C) remembered.
- D) confirmed.

8

It can reasonably be inferred from the passage that in accepting the Ministry’s honor, Mallarino wants to demonstrate that

- A) his main goal is to enhance the reputation of his newspaper.
- B) he is attending the ceremony chiefly because he is nostalgic about the venue.
- C) his attitude remains unchanged despite the Ministry’s overtures.
- D) he expects the Ministry to prove that it is serious about the tribute.

9

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

- A) Lines 59-61 (“For the . . . Mallarino”)
- B) Lines 61-62 (“And then . . . Foyer”)
- C) Lines 81-83 (“No, this . . . Nineteenth”)
- D) Lines 87-89 (“he wanted . . . independence”)

10

As used in line 87, “spark” most nearly means

- A) aggravate.
- B) stimulate.
- C) illuminate.
- D) hasten.

CONTINUE

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1

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

This passage is adapted from "You're Less Persuasive Than You Think over Email." ©2016 by Association for Psychological Science.

You just got assigned a new project at work and you need to wrangle some help from the rest of your team. While it may be tempting to send out a mass mail asking for volunteers, new research suggests Line 5 you're much more likely to enlist help by actually asking people face-to-face.

Across two experiments, psychological scientists M. Mahdi Roghanizad (University of Waterloo) and Vanessa Bohns (Cornell University) found that 10 people tend to *overestimate* the persuasiveness of requests sent over email, while also *underestimating* the effectiveness of requests made in person.

"Overall, we find people are less influential than they think over email," Roghanizad and Bohns write. 15 Across several previous studies, Bohns has found that people consistently underestimate—by a large margin—their powers of persuasion. Across 12 experiments, Bohns and colleagues have asked study participants to make requests of more than 20 14,000 strangers: Whether it's asking to borrow a cell phone or soliciting a charitable donation, people misjudge the likelihood that strangers will say "yes" to a request.

Why? We're so focused on our own feelings of 25 discomfort when asking for a favor that we don't adequately account for the feelings of the person being asked.

"Targets feel awkward and uncomfortable saying 'no,' both because of what it might insinuate about 30 the requester, and because it feels bad to let someone down," Roghanizad and Bohns explain.

In the first experiment, 45 college students were each assigned to ask 10 strangers to fill out a short personality survey. Half of the requesters were 35 assigned to a face-to-face condition, approaching 10 unknown students on a college campus, while the other requesters sent emails to strangers chosen out of the university's directory. In both conditions, requesters used the same script to make the 40 request. Before they got started, requesters were asked how many people they thought they could get to fill out the survey.

The results confirmed the researchers' hypothesis: Those in the face-to-face condition underestimated 45 their persuasive powers while those in the email

condition overestimated their success rate. Both groups of requesters thought they could get around 5 people out of 10 to take the survey. While email requesters convinced around 10% of people to 50 comply with their request, face-to-face requests from a total stranger resulted in around a 70% success rate.

In a second study, 60 requesters were again randomly assigned to face-to-face or email conditions. This time, requesters approached 55 strangers who had already agreed to complete a questionnaire for \$1. Their task was to convince the strangers to complete an additional proofreading task for free. Again, before making their requests, participants were asked how many people out of 7 60 they thought would agree to taking on the second freebie task.

Targets, who had already agreed to complete the paid questionnaire, were asked whether they would be willing to complete the unpaid task. The paid 65 questionnaire was made up of questions about why targets had said yes or no to completing the second task.

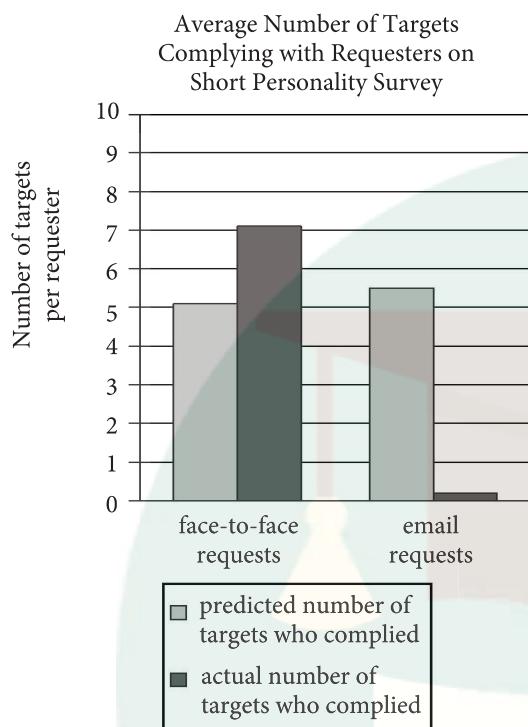
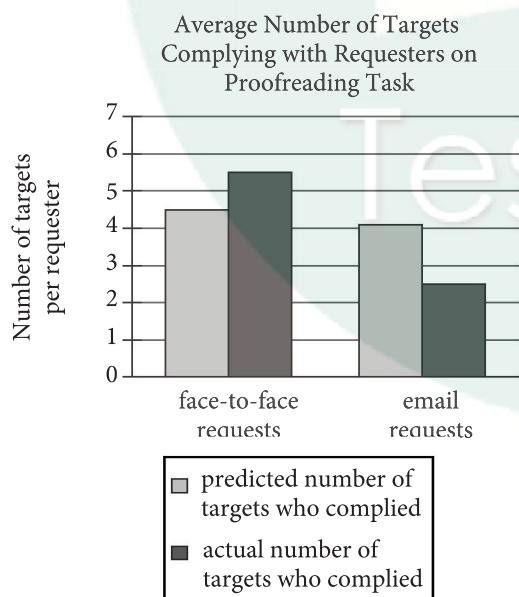
Again, requesters in both groups predicted the same success rates, but those in the face-to-face 70 condition met with far more success. One reason that face-to-face requests are so much more effective is that people feel more awkward and uncomfortable saying no in person.

Roghanizad and Bohns also found a significant 75 interaction with trust and empathy between the two conditions; targets empathized with and trusted requesters more in the face-to-face condition compared to the email condition, although requesters predicted no difference between a brief 80 face-to-face encounter and an email.

CONTINUE 

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Figure 1**Figure 2**

Figures adapted from M. Mahdi Roghanizad and Vanessa K. Bohns, "Ask in Person: You're Less Persuasive Than You Think over Email." ©2016 by Elsevier Inc.

11

Which choice best supports the idea that people's inability to accurately estimate the persuasiveness of face-to-face requests holds true in a wide variety of contexts?

- A) Lines 13-14 ("Overall . . . write")
- B) Lines 20-23 ("Whether . . . request")
- C) Lines 24-27 ("Why . . . asked")
- D) Lines 28-31 ("Targets . . . explain")

12

As used in line 26, "account for" most nearly means

- A) consider.
- B) chronicle.
- C) budget.
- D) balance.

13

As used in lines 9 and 16, "found" most nearly means

- A) obtained.
- B) encountered.
- C) discovered.
- D) located.

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14

It can most reasonably be inferred from the passage that the first experiment was designed in such a way as to avoid the possibility that

- A) some requesters would be more comfortable working with strangers than other requesters would be.
- B) some requesters would be better able to assess the approachability of the strangers they selected than other requesters would be.
- C) the requesters in one condition would be more socially diverse than the requesters in the other condition would be.
- D) the requesters in one condition would be able to create a more convincing request than the requesters in the other condition would be.

15

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

- A) Lines 32-34 (“In the . . . survey”)
- B) Lines 34-38 (“Half . . . directory”)
- C) Lines 38-40 (“In both . . . request”)
- D) Lines 40-42 (“Before . . . survey”)

16

The eighth paragraph (lines 43-51) primarily serves to

- A) summarize the results of Roghanizad and Bohns’s first experiment.
- B) indicate that Roghanizad and Bohns correctly estimated the degree of participation by strangers.
- C) propose an explanation for Roghanizad and Bohns’s findings.
- D) present a challenge to critics of Roghanizad and Bohns’s hypothesis.

17

According to the passage, at which point in the second study did requesters attempt to convince targets to complete an additional task for free?

- A) Before targets agreed to complete a questionnaire for a small payment
- B) Before targets started the questionnaire but after they agreed to complete it
- C) After targets started the questionnaire but before the requesters made predictions
- D) After targets completed the questionnaire

18

Which conclusion about making a face-to-face request of a stranger is best supported by the passage?

- A) Being sensitive to a stranger’s feelings will have little effect on whether that stranger will agree to a request.
- B) Following up a face-to-face request with an email will likely make a stranger less willing to comply with a request.
- C) The personal nature of a face-to-face request may help generate positive feelings on the part of a stranger toward the requester.
- D) Adding various incentives to a face-to-face request may help to gain a stranger’s trust and empathy.

CONTINUE

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19

Based on the passage, which choice offers the most plausible explanation for the data in figure 1 representing email requests?

- A) The actual number of targets who complied was lower than predicted because the targets felt comfortable refusing the request.
- B) The actual number of targets who complied was lower than predicted because the targets wanted to avoid being asked to take an additional survey.
- C) The actual number of targets who complied was higher than predicted because the targets anticipated additional compensation for complying.
- D) The actual number of targets who complied was higher than predicted because the targets had not seen a detailed script when they agreed to comply.

20

Based on the passage, which choice most likely explains the difference between the actual email success rate in figure 1 and that in figure 2?

- A) The targets in the figure 1 study were randomly chosen from the student directory and were unacquainted with the requesters.
- B) The targets who participated in the figure 1 study were approached again to participate in the figure 2 study.
- C) The targets in the figure 2 study were initially unaware that they would be asked to perform a second, unpaid task.
- D) The targets in the figure 2 study had already agreed to participate in the study for a small payment.

TestDaily

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

This passage is adapted from Lee Alan Dugatkin, *Principles of Animal Behavior*. ©2009 by W. W. Norton & Company, Inc.

Mammals and birds tend to become better parents as they produce more and more offspring. Direct experience as a parent, however, is only one way to learn how to become a successful mother or father. Developmental factors early in life can also potentially affect future parental behavior. For example, in many species of birds and mammals, some individuals remain in their natal group, even after they themselves are capable of reproduction, and they often help their parents raise additional broods of offspring (that is, the younger siblings of the helpers). Is it possible that such developmental experience may affect subsequent parenting success in helpers who eventually leave their natal territory?

15 Susan Margulis and her colleagues examined this possibility in oldfield mice (*Peromyscus polionotus*).

Data on helping behavior among oldfield mice in natural settings are extremely difficult to gather, but a significant body of indirect evidence suggests that 20 some females remain at the nest and help their mothers raise the next clutch of young. For example, natural history data suggest that a mother can be both pregnant and nursing a brood of mice, while an older brood still remains at the nest, providing ample 25 opportunity for potential helpers to aid in rearing their younger siblings (Foltz, 1981). Margulis tested whether “experienced” females—that is, females that remained at their parents’ nest during the rearing of a litter of their younger siblings—were subsequently 30 better mothers to their own offspring than “inexperienced” females who did not remain at the nest while younger broods of siblings were being reared. Thus, they examined whether a 35 developmental trajectory involving helping one’s mother affected the helper’s own parenting behavior.

In order to avoid cause-and-effect problems (in interpreting the data), Margulis and her colleagues experimentally created inexperienced and experienced females by removing (or not removing) 40 females from their natal nests. They began their work using a large colony of mice housed at the Brookfield (Illinois) Zoo, and they used mice that were ten to fifteen generations removed from wild-caught individuals. Margulis and her team formed a series of 45 male-female pairs. Quickly thereafter, mating occurred, and pups were born. In the “inexperienced

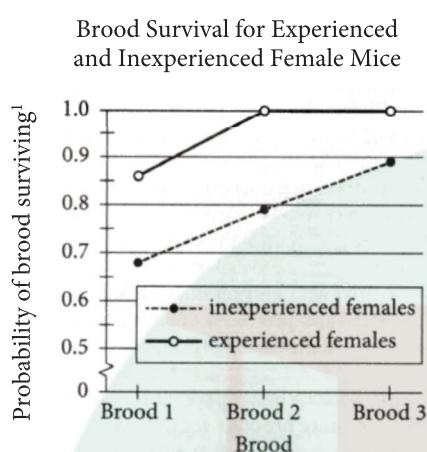
female” (IF) treatment, IF females were removed from the nest at twenty days of age and they were raised in all-female groups until the experiment 50 began. In the “experienced female” (EF) treatment, when EF females were twenty days old they were *not* removed from the nest but rather remained at the nest with their pregnant mother until she gave birth again and weaned a second brood. At that point, EF 55 females were removed from the nest and reared in an all-female group until the experiment began.

At the start of the experiment, IF and EF females were paired with inexperienced males, with whom they mated and produced offspring, and the females’ 60 parental activities and offspring survival were recorded. Results suggest that all females—both EF and IF—became better parents as they produced more and more broods over time, but the key comparison was between inexperienced and 65 experienced females at any given point in time. Here, Margulis and her colleagues found that the broods of experienced females survived with a higher probability than those of inexperienced females, in part due to the superior nest-building behavior 70 displayed by experienced females. The results indicate that the developmental experience of being present when ones mother raises a subsequent clutch of offspring has long-term consequences for parenting abilities.

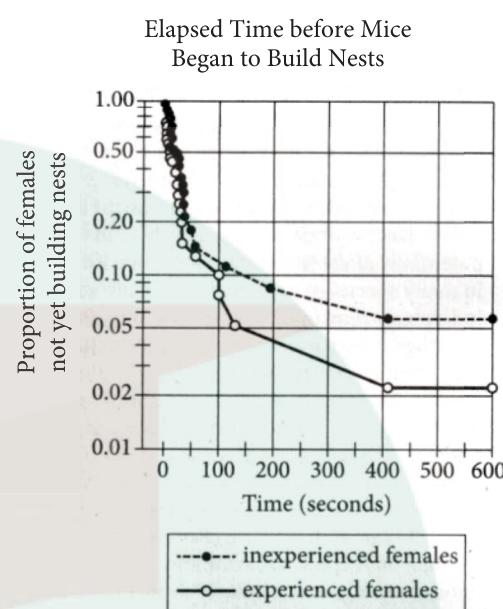
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Figure 1

¹A brood is considered to have survived if more than half of the offspring in that brood survived.

Figure 2

Figures adapted from Susan W. Margulis et al., "Effects of Early Experience on Subsequent Parental Behaviour and Reproductive Success in Oldfield Mice, *Peromyscus polionotus*." ©2004 by the Association for the Study of Animal Behaviour.

Elapsed time is measured from the point in time when nest-building materials were provided to the mice.

21

As used in line 3, "direct" most nearly means

- A) prompt.
- B) exact.
- C) firsthand.
- D) straightforward.

CONTINUE

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22

Which choice best supports the idea that scientists have found partial evidence of helping behavior in oldfield mice in the wild?

- A) Lines 21-26 (“For example . . . 1981”)
- B) Lines 26-33 (“Margulis . . . reared”)
- C) Lines 33-35 (“Thus . . . behavior”)
- D) Lines 36-40 (“In order . . . nests”)

23

The primary purpose of the passage is to

- A) discuss a factor that influences the parenting success of oldfield mice.
- B) resolve a controversy regarding the parenting behavior of oldfield mice.
- C) present a study of the genetics underlying the parenting traits of oldfield mice.
- D) explain an observed change in the parenting practices of oldfield mice.

24

The primary function of the third paragraph (lines 36-56) is to

- A) discuss the difficulties that Margulis’s team encountered when attempting to observe parenting behavior.
- B) contrast the experimental design used by Margulis’s team with those used in earlier studies of parenting behavior.
- C) describe how Margulis’s team created the groups of female mice whose parenting behavior the team observed.
- D) explain the significance of Margulis’s team’s main findings regarding parenting behavior.

25

Based on the passage, which of the following findings, if true, would most limit the scope of Margulis’s conclusions?

- A) Oldfield mice raised in captivity display different parenting behaviors than do oldfield mice raised in nature.
- B) Broods produced by a wild female oldfield mouse are typically fathered by the same individual.
- C) Whether captive or wild, female oldfield mice tend to live long enough to produce multiple broods.
- D) Oldfield mice young typically do not permanently leave their natal nests until at least twenty days after birth.

26

It can reasonably be inferred from the passage that the design of Margulis’s team’s experiment helped to exclude which possibility?

- A) Survival rates improved from brood to brood as a result of increased parental experience.
- B) Variations in survival rates reflect the fact that female offspring were more likely to survive to maturity than were male offspring.
- C) Differences in maternal nest-building behavior contributed to differences in offspring survival rates.
- D) Brood survival was influenced by variations in paternal parenting skill.

CONTINUE

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27

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

- A) Lines 54-56 (“At that . . . began”)
- B) Lines 57-61 (“At the . . . recorded”)
- C) Lines 61-65 (“Results . . . time”)
- D) Lines 66-70 (“Here . . . females”)

28

As used in line 69, “superior” most nearly means more

- A) luxurious.
- B) rarefied.
- C) distinguished.
- D) effective.

29

According to figure 1, what is the approximate probability that an experienced female’s first brood survived?

- A) 0.95
- B) 0.85
- C) 0.75
- D) 0.65

30

The data in figure 1 illustrate a specific instance of the generalization made in which lines of the passage?

- A) Lines 1-2 (“Mammals . . . offspring”)
- B) Lines 6-12 (“For example . . . helpers”)
- C) Lines 15-16 (“Susan . . . *polionotus*”)
- D) Lines 17-21 (“Data . . . young”)

31

The data in figure 2 best support which of the following statements?

- A) Whether they were inexperienced or experienced, the majority of females started building nests within 50 seconds of being provided with nest-building materials.
- B) The typical experienced female took less time to finish building her nest than did the typical inexperienced female.
- C) The broods of both inexperienced and experienced females who did not start building nests within 600 seconds of being provided with nest-building materials tended not to survive.
- D) After 400 seconds of being provided with nest-building materials, the proportion of inexperienced females not yet building nests was the same as that of experienced females not yet building nests.

CONTINUE

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Questions 32-42 are based on the following passages.

This passage is adapted from a speech delivered in 1836 by James Forten, "An Address Delivered before the Ladies' Anti-Slavery Society of Philadelphia." Forten, a prominent African American abolitionist, gave this speech after the slave state of South Carolina officially requested that Northern free states suppress antislavery organizations and forbid the publication of antislavery literature.

There never was a request more unreasonable, more abominable—evincing in its tone the greatest insult that could be offered to a free and independent *Line* people. But what do the majority of the citizens in 5 the North about the matter? Why, I regret to have it in my power to say, that, with few exceptions, they are yielding to this daring presumption of the South; tamely acquiescing without venturing even as much as a word in reply. They ask of them to relinquish the 10 sacred and legitimate right to think and act as they please. Freemen are, in one sense, threatened with slavery; the chains are shaken in their faces, and yet they appear unwilling to resist them as becomes freemen. Such votaries are they at the shrine of 15 mammon¹ that they have not courage enough to join the standard of patriotism which their fathers reared, and with the dignity of a free and unshackled people, repel with scorn, this unheard of infringement upon their dearest rights—this death-blow to their own 20 liberties. My friends, do you ask why I thus speak? It is because I love America; it is my native land; because I feel as one should feel who sees destruction, like a corroding cancer, eating into the very heart of his country, and would make one struggle to save 25 her;—because I love the stars and stripes, emblems of our National Flag—and long to see the day when not a slave shall be found resting under its shadow; when it shall play with the winds pure and unstained by the blood of “captive millions.”

30 The South most earnestly and respectfully solicits the North to let the question of Slavery alone, and leave it to their bountiful honesty and humanity to settle. Why, honesty, I fear, has fled from the South, long ago; sincerity has fallen asleep there; pity has 35 hidden herself; justice cannot find the way; helper is not at home; charity lies dangerously ill; benevolence is under arrest; faith is nearly extinguished; truth has long since been buried, and conscience is nailed on the wall. Now, do you think it would be better to 40 leave it to the bountiful honesty and humanity of the South to settle? No, no. Only yield to them in this

one particular and they will find you vulnerable in every other. I can tell you, my hearers, if the North once sinks into profound silence on this momentous 45 subject, you may then bid farewell to peace, order and reform; then the condition of your fellow creatures in the southern section of our country will never be ameliorated. . . .

Cease not to do as you are now doing, 50 notwithstanding the invidious frowns that may be cast upon your efforts; regard not these—for bear in mind that the future prosperity of the nation rests upon the successful labours of the Abolitionists; this is as certain as that there is a God above. Recollect 55 you have this distinction—you have brought down upon your heads the anger of many foes for that good which you seek to do your country; you are insulted and sneered at because you feel for the proscribed, the defenceless, the down-trodden; you 60 are despised because you would raise them in the scale of beings; you are charged as coming out to the world with the Bible in one hand and a firebrand in the other. May you never be ashamed of that firebrand. It is a holy fire, kindled from every page of 65 that sacred chronicle.

You are called fanatics. Well, what if you are? Ought you to shrink from this name? God forbid. There is an eloquence in such fanaticism, for it whispers hope to the slave; there is sanctity in it, for 70 it contains the consecrated spirit of religion; it is the fanaticism of a Benezet, a Rush, a Franklin, a Jay,² the same that animated and inspired the heart of the writer of the Declaration of Independence. Then flinch not from your high duty; continue to warn the 75 South of the awful volcano they are recklessly sleeping over.

¹ *Votaries ...at the shrine of mammon:* Christian terminology to describe worshippers of wealth

² Prominent abolitionists of the late eighteenth and early nineteenth centuries

CONTINUE 

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32

- Forten's primary purpose in this passage is to
- convince his audience that slavery is immoral and contrary to American values.
 - outline for his audience the numerous challenges faced in the struggle against slavery.
 - rally a sympathetic audience to continue working against slavery.
 - explain to a skeptical audience why abolitionists should adopt new tactics.

33

In the passage, Forten suggests that Northerners' reaction to South Carolina's request is partly motivated by

- sympathy for some of the grievances mentioned in the request.
- fear of the economic consequences of resisting the request.
- concern that granting the request will set a dangerous precedent.
- distrust of the political leaders urging acceptance of the request.

34

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

- Lines 1-4 ("There . . . people")
- Lines 5-9 ("Why . . . reply")
- Lines 11-14 ("Freemen are . . . freemen")
- Lines 14-20 ("Such . . . liberties")

35

- In line 33, the word "settle" most nearly means
- resolve.
 - colonize.
 - prove.
 - compromise.

36

In the second paragraph (lines 30-48), Forten repeats the words "bountiful honesty" and "humanity" most likely to

- acknowledge that many people in the South recognize that slavery is morally indefensible.
- mock the notion that the South would act ethically regarding slavery without external pressure.
- highlight the qualities that have characterized abolitionists in their struggle against slaveholding interests in the South.
- preemptively deflect criticism that his argument is biased against the South.

37

In explaining the reasons for his speech, Forten presents himself primarily as a

- radical who sees his nation as inherently corrupt.
- reformer who is frustrated by the slow pace of progress.
- patriot who wants to protect his country from moral ruin.
- clergyman who rejects human law in favor of divine law.

CONTINUE

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38

Which choice best describes Forten's rhetorical technique in lines 33-39 ("Why... wall")?

- A) He provides a list of criticisms to illustrate the various ways in which South Carolina's request has harmed the North.
- B) He personifies numerous virtues in order to emphasize their disappearance from the South.
- C) He uses repetition to emphasize the righteousness of the abolitionists and their cause.
- D) He employs parallel clauses to imply that positive moral attributes are common to slaves and free people alike.

39

Forten suggests that if the North were to do what South Carolina asks, one consequence would be that

- A) the North would find it difficult to resist future demands from the South.
- B) governments in the North would try to eliminate other freedoms as well.
- C) slavery itself would eventually become legal in the North.
- D) opponents of slavery in the North would form new states where slavery is outlawed.

40

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

- A) Lines 30-33 ("The South . . . settle")
- B) Lines 39-41 ("Now . . . settle")
- C) Lines 41-43 ("Only . . . other")
- D) Lines 43-48 ("I can . . . ameliorated")

41

Based on the passage, which choice best describes how Forten uses criticisms that have been made of abolitionists to advance the cause of abolition?

- A) He presents those criticisms as signs of the justness of abolitionism.
- B) He exaggerates those criticisms to emphasize the strength of abolitionists' opponents.
- C) He accepts those criticisms and proposes a revised form of abolitionism in response to them.
- D) He shows that those criticisms of abolitionists contradict one another and thus cannot all be true.

42

One function of the image of the volcano in the last sentence of the passage is to

- A) illustrate the emotional intensity that Forten wants abolitionists to bring to their cause.
- B) liken the growing opposition to South Carolina's request to an unstoppable natural phenomenon.
- C) suggest that the North has grown complacent about the danger posed by a deeply divided country.
- D) convey a sense of foreboding about the eventual consequences of slavery to the South.

CONTINUE

1

1

Questions 43–52 are based on the following passages.

Passage 1 is adapted from Judith Hooper, *Of Moths and Men: An Evolutionary Tale*. ©2002 by Judith Hooper. Passage 2 is adapted from Judy Diamond and Alan B. Bond, *Concealing Coloration in Animals*. ©2013 by the President and Fellows of Harvard College. Based on an experiment he conducted in 1953, Bernard Kettlewell concluded that dark coloring spread through peppered moth populations in industrial areas because it made moths less conspicuous to birds when moths were resting on tree trunks darkened by pollution, a phenomenon called industrial melanism.

Passage 1

By the early 1990s, if not before, it was known to a small circle of scientists that what every textbook said about industrial melanism was untrue. There were some fundamental discrepancies, not least that birds may not be the major predators. The question is not whether a bird can be *trained* to eat a moth off a tree trunk—birds are known to be highly educable and those in Kettlewell’s aviary experiment in 1953 were “quick to learn” from experience—but whether in nature birds are major predators of peppered moths.

Equally damaging to the “authorized version” was the fact that moths do not normally rest on tree trunks. It is now universally acknowledged that the scientist Cyril Clarke, who laconically observed that in twenty-five years he had seen exactly two peppered moths resting on tree trunks, was right after all: the normal daytime resting place of peppered moths is *not* on tree trunks but in shaded areas under branches, where colour differences would be muted.

Additionally, the experimental densities were too high. In nature peppered moths are known to be very scarcely distributed, but Kettlewell set out at least four moths per tree, and then replaced them as soon as all of one type were eaten. Everyone now concedes that these densities were unnatural. Kettlewell was, in effect, creating a feeding tray, and the “intensity of predation” recorded in his experiments simply reflected a learned response by the local birds.

Furthermore, the method of release was faulty. Peppered moths fly at night and settle into their daytime resting places at dawn. Kettlewell released his moths in daylight because if he had released them

at night they would have made a beeline for the light traps. One morning he tried releasing them just around dawn, but this proved too laborious; they were so cold he had to warm them up over his car engine to get them going.

Passage 2

Many of the concerns of scientists regarding the Kettlewell conclusions were addressed in a careful replication of his research conducted by Michael Majerus, a professor of genetics at Cambridge University. Majerus collected peppered moths from woodlands to the west of Cambridge between 2001 and 2007, when the woods were recovering from coal smoke pollution. During the six years of his study, he found that the frequency of the dark form in these woodlands declined from 12 percent to just over 1 percent. The dark moths were essentially disappearing altogether. The question Majerus asked was whether this decrease could be attributed to bird predation. He captured local peppered moths and raised others in the laboratory. All the moths were released in an experimental plot near Madingley Wood. Improving on Kettlewell’s technique, Majerus released low densities of the moths, and the numbers of light and dark forms were close to their natural abundance. The moths were released on different parts of trees, in roughly the proportions that they used those locations in the wild. Although both lab-raised and wild-caught moths were used, their data were recorded and analyzed separately. Most importantly, the moths were released into large cages on the trees—one moth per cage—at sunset. The cages were removed forty minutes before sunrise the following morning, and each moth was watched for a subsequent four-hour period, recording all incidents of predation by birds.

Significantly more dark peppered moths than light ones were eaten by birds in the Cambridge forest. The birds’ bias toward dark moths, moreover, was a very close match to the overall decrease in dark moths in the population. Majerus had carefully addressed each criticism of Kettlewell’s design and had found that the change in numbers of light and dark moths in a single forest over six years could be fully accounted for by bird predation. Kettlewell’s results had shown that the coloration of the peppered moth was the product of natural selection. Majerus

CONTINUE ➔

1

1

80 had confirmed that the primary agency of selection was, in fact, visual predation by insect-eating birds, producing rapid evolution of color forms in synchrony with local environmental change.

43

According to Passage 1, in the daytime, peppered moths tend to be found

- A) on trees not darkened by pollution.
- B) in areas where color distinctions are obvious.
- C) in the shaded sections of tree trunks.
- D) on the underside of tree branches.

44

The author of Passage 1 most strongly suggests that the data Kettlewell collected were

- A) derived from a sample that was too small to support generalizations about typical behavior.
- B) so different from data collected in previous studies that they should have been regarded with suspicion.
- C) influenced by the experimental conditions such that they were not indicative of natural patterns.
- D) manipulated to fit a favored hypothesis rather than used to evaluate that hypothesis objectively.

45

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

- A) Lines 1-3 (“By the . . . untrue”)
- B) Lines 26-29 (“Kettlewell . . . birds”)
- C) Lines 31-32 (“Peppered . . . dawn”)
- D) Lines 35-38 (“One . . . going”)

46

The author of Passage 1 uses the phrases “every textbook” (line 2) and “authorized version” (line 11) most likely to

- A) indicate that Kettlewell’s account of industrial melanism was based on broadly held assumptions.
- B) suggest that Kettlewell’s account of industrial melanism has been universally rejected.
- C) highlight the widespread acceptance of Kettlewell’s account of industrial melanism at one time.
- D) imply that Kettlewell’s account of industrial melanism overturned seemingly established theories.

47

Information in Passage 2 best supports which statement about the relationship between pollution in the woods west of Cambridge and the moths living there?

- A) Both light and dark moths encountered increasing numbers of predators as pollution declined.
- B) Dark moths became increasingly visible to predators as the woods recovered from pollution.
- C) Both the proportion and total number of light moths rose significantly as the woods became less polluted.
- D) The woods are largely still too polluted to support substantial populations of either light or dark moths.

48

As used in line 79, “product” most nearly means

- A) substance.
- B) combination.
- C) commodity.
- D) outcome.

CONTINUE

1

1

49

Based on the passages, Clarke (Passage 1) would most likely regard the placement of the cages in Majerus's experiment (Passage 2) with

- A) admiration, because he doubted whether moths' resting locations could be adequately controlled by experimenters.
- B) approval, because he thought Kettlewell's experiment failed to reflect moths' natural tendencies in selecting resting locations.
- C) skepticism, because he believed that scientists could not confidently identify moths' preferred resting locations.
- D) dissatisfaction, because he criticized Kettlewell for not recognizing the wide variation in moths' typical resting locations.

50

Which choice best describes a problem with Kettlewell's experimental method mentioned in Passage 1 that Majerus (Passage 2) tried to avoid?

- A) Kettlewell released too many dark moths relative to light moths.
- B) Kettlewell did not realize how quickly birds can adapt to changes in moth coloring.
- C) Kettlewell overestimated the typical density of moths beneath tree branches.
- D) Kettlewell released too many moths during the observation period.

51

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

- A) Lines 39-43 ("Many . . . University")
- B) Lines 46-49 ("During . . . 1 percent")
- C) Lines 55-58 ("Improving . . . abundance")
- D) Lines 64-68 ("The cages . . . birds")

52

It can reasonably be inferred from the passages that Majerus (Passage 2) prevented the possibility described in lines 32-35 ("Kettlewell . . . traps") by

- A) keeping the moths in cages until just before dawn.
- B) letting the moths fly free during most daylight hours.
- C) releasing only wild-caught moths before sunrise.
- D) using the same numbers of light and dark moths.



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STOP

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

2

2

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 and supplementary material.

A Haven under the Snow

A snow-covered landscape may appear inhospitable to most forms of life. **1** but looks can be deceiving. The subnivium, a narrow band of space between the snowpack and the soil, is home to a complex ecosystem that scientists are only beginning to understand. Not only does it shield a variety of organisms from the harsh conditions of winter, but it also prevents the roots of shrubs from freezing, preserving an important food source for animals.

1

Which choice provides the best transition to the information that follows in the paragraph?

- A) NO CHANGE
- B) and scientists have confirmed the truth of this observation.
- C) yet some plants thrive in the cold.
- D) and, in fact, many animals hibernate during the winter.

CONTINUE 

2

The temperature of the subnivium is able to remain stable—just below 32°F (0°C)—because heat rising from the ground gets trapped due to the insulating properties of snow. In cold climates, the subnivium is often considerably warmer than the ambient temperature (the temperature of air above the snowpack). That same heat can also melt some of the snowpack, **2** creating pockets of loosened snow. The relatively mild temperatures can protect hibernating frogs from the dangerous cold, and the loose snow **3** enable animals such as shrews to move freely and even raise litters within it.

2

2

- A) NO CHANGE
- B) leading to the creation of pockets of loosened snow.
- C) resulting in pockets of loosened snow, a phenomenon that is caused by melting.
- D) creating areas of loosened snow that one could call pockets.

3

- A) NO CHANGE
- B) enables
- C) are enabling
- D) have been enabling

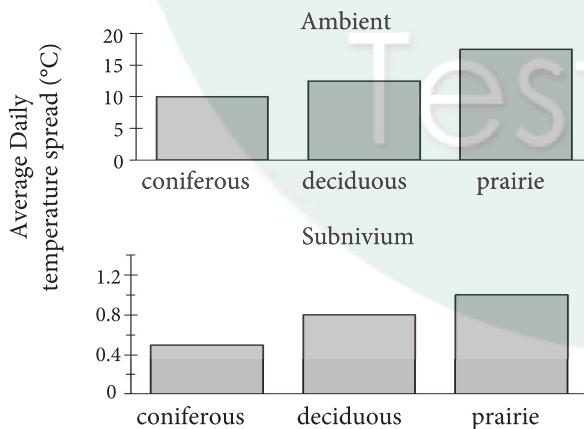
CONTINUE 

2

2

The subnivium's stability varies **4** dependent on the type of land cover. University of Wisconsin researchers studied three different land covers to determine which was most conducive to subnivean stability. Temperatures in the subnivia of coniferous forests were more stable than those in the subnivia of deciduous forests, because the greater undergrowth in coniferous forests shields the snowpack. Prairies, which have little such protective vegetation, showed the greatest spread in subnivean temperature. In all cases, however, the temperature spread in the subnivium was **5** about the same as that in the ambient environment. On prairies, for example, the researchers found an average daily ambient temperature spread of about **6** 10°C ; the subnivean temperature spread, in contrast, was less than one degree.

Average Daily Temperature Spread in Ambient and Subnivean Environments for Three Land Cover Types



Adapted from Sonia K. Petty, Benjamin Zuckerberg, and Jonathan N. Pauli, "Winter Conditions and Land Cover Structure the Subnivium, A Seasonal Refuge beneath the Snow." ©2015 by Sonia K. Petty, Benjamin Zuckerberg, and Jonathan N. Pauli.

4

- A) NO CHANGE
- B) depending
- C) to depend
- D) depend

5

Which choice accurately represents the information in the graph?

- A) NO CHANGE
- B) barely above
- C) much smaller than
- D) roughly half of

6

Which choice offers accurate information from the graph?

- A) NO CHANGE
- B) 1.2°C ;
- C) 5°C ;
- D) 17°C ;

CONTINUE

2

2

Changes in temperature can significantly disrupt the layer, however. The researchers demonstrated this using a small greenhouse with a roof that automatically opens when it 7 snows. Allowing the greenhouse to create a subnivium while remaining several degrees warmer than the ambient environment. The researchers found that, 8 similarly, subnivean temperatures inside the greenhouse were actually lower than those outside. This result occurs because warmer ambient temperatures lead to thinner and denser 9 snowpacks. The thinner and denser snowpacks have weaker insulating properties. Thus, a warmer environment actually leads to a colder, less welcoming subnivium.

7

- A) NO CHANGE
- B) snows, allowing
- C) snows, this allowed
- D) snows; and allowing

8

- A) NO CHANGE
- B) therefore,
- C) finally,
- D) counterintuitively,

9

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

- A) snowpacks, and weaker insulating properties is what they have.
- B) snowpacks, which have weaker insulating properties.
- C) snowpacks, in which the insulating properties that they have are weaker.
- D) snowpacks; as a result, these snowpacks have weaker insulating properties.

CONTINUE ➔

2

2

The subnivium is both a rich ecological treasure and
10 potentially vulnerable ones. Scientists are 11 hopeful
that with further research and conservation efforts, they
will be able to better understand and protect this wintry
refuge.

10

- A) NO CHANGE
- B) ones that are potentially vulnerable.
- C) a potentially vulnerable one.
- D) potentially vulnerable.

11

- A) NO CHANGE
- B) hopeful, that:
- C) hopeful, that,
- D) hopeful; that

CONTINUE 

| 2

2 |

Questions 12–22 are based on the following passage.

Breaking the Mold in Research

In scientific research, interdisciplinary approaches are relatively rare—but they are 12 important.

Researchers who consult scholars 13 within their own fields are taking crucial steps toward tackling the issues at hand. Thus, interdisciplinary cooperation should be encouraged by universities and other organizations that support scientific research.

12

- A) NO CHANGE
- B) important, researchers
- C) important researchers
- D) important; and, researchers

13

Which choice most effectively sets up the discussion that follows in the passage?

- A) NO CHANGE
- B) such as biologists and computer experts are able to harness the unique properties of an unusual type of mold.
- C) outside their own field are able to approach problems from a fresh perspective.
- D) from universities in other countries are privileged to work in a rewarding international environment.

TestDaily

CONTINUE ➔

2

2

Collaborations between disparate **14** fields, though few have been successful. In a 2015 study, for instance, a team of archaeologists interested in analyzing the vast road systems of the Roman Empire in the Balkan region of southeastern Europe consulted with computer scientists and **15** biologists, to make a model of the systems. The team, composed of researchers from Greece and the United Kingdom, used an unlikely method in the form of a humble slime mold, *Physarum polycephalum*. Study coauthor Dr. Andrew Adamatzky knew that in previous studies, *P. polycephalum* had been used to model transportation networks. The slime mold is adept at finding the most efficient way to transport nutrients from one location to another, essentially functioning as a road does.

14

- A) NO CHANGE
- B) fields, though few,
- C) fields though few,
- D) fields though, few

15

- A) NO CHANGE
- B) biologists
- C) biologists:
- D) biologists—

CONTINUE →

| 2

2 |

16 To conduct their experiment, the team placed samples of *P. polycephalum* on agar plates that had oat flakes, a food source for the mold, set in seventeen locations corresponding to the sites of ancient cities. This strategy encouraged the mold to find its way to these locations in the most **17** direct and straightforward way that was possible, as the Romans likely did. Sure enough, the mold extended its protoplasmic tubes across the plate to reach the food, connecting the city sites and creating a network that nearly matched the actual one used by the Romans. The mold's simulation was more accurate than the simulations of sophisticated computer programs, "even tracing out paths of relatively unknown and obscure roads," according to science journalist Kelsey D. Atherton. **18** He also states that "the mold was placed initially on the oat flake for Thessaloniki, a city in the northern Aegean region."

16

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

- A) NO CHANGE
- B) In their eagerness to collaborate,
- C) Despite having only one form of mold to use,
- D) Desiring to learn more about the construction of roads,

17

- A) NO CHANGE
- B) straightforward way that the mold possibly could,
- C) direct, straightforward, and possible way,
- D) straightforward way possible,

18

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

- A) Kept, because it helps to explain the sequence of events described earlier in the paragraph.
- B) Kept, because it demonstrates the comprehensive knowledge of the research team.
- C) Deleted, because it offers details that are not relevant to the results of the experiment.
- D) Deleted, because it contradicts a statement made earlier in the passage.


CONTINUE →

2

2

The success of experiments like this one demonstrates the benefits of interdisciplinary collaboration, which can be applied to many fields. The team **19** speculated that archaeologists could use the slime mold to predict the location of future excavation sites. Studying the slime mold's behavior could also lead to improvements in computer simulations of transportation networks, which **20** may in turn have helped engineers design such networks more efficiently.

21 The recent success of such projects is remarkable. There are few funding sources to support these projects and few guidelines for the sharing of responsibilities, data, costs, or **22** to credit work when researchers from different departments collaborate. Nevertheless, given the success of projects like the slime mold experiment, it is clear that more funding support should be directed toward research collaborations across fields.

19

- A) NO CHANGE
- B) imagined
- C) contemplated
- D) mused

20

- A) NO CHANGE
- B) will in turn have helped
- C) is in turn helping
- D) may in turn help

21

Which choice most effectively introduces the information that follows in the paragraph?

- A) NO CHANGE
- B) Yet impediments to interdisciplinary research remain.
- C) Still, the slime mold project had its own share of obstacles to overcome.
- D) Future researchers will enjoy a great deal of freedom in designing experiments.

22

- A) NO CHANGE
- B) giving credit for
- C) crediting
- D) credit for

CONTINUE

| 2

2 |

Questions 23–33 are based on the following passage.

Durable Beauty: A Costume Designer’s Work for the Stage

Korean American costume designer Willa Kim

23 was a veritable grand doyenne of the theatrical arts.

Having studied painting and illustration in college, she initially pursued work as a designer in the film industry in Hollywood before being inspired to relocate to New York City to create costumes for the stage. **24** Some of Kim’s most famous designs featured unconventional elements influenced by her roots in visual art. At the same time, whether unexpected or more traditional, her costumes uniformly reflected a deep sense of practicality, tailored to the specific demands of live performance.

23

Which choice is most consistent with the tone and style of the passage as a whole?

- A) NO CHANGE
- B) soared aloft in her chosen field.
- C) was a master of her craft.
- D) just couldn’t be topped.

24

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

At the time of Kim’s move, Hollywood, California, was the center of the film and television industries in the United States, but New York City was also attracting its share of filmmakers and TV producers.

Should the writer make this addition here?

- A) Yes, because it provides a rationale for Kim’s decision to relocate from Hollywood to New York City.
- B) Yes, because it illustrates the shifting demographics of the two industries with which the passage is primarily concerned.
- C) No, because it presents information that is given elsewhere in the passage.
- D) No, because it blurs the paragraph’s focus on Kim’s background and designs.

CONTINUE

2

2

Costumes for film and television can be constructed with wide allowances for fit and comfort because actors can adjust their costumes between periods of filming. But Kim primarily designed for theater, where live performers execute complex movements in the staging of a play or musical, and for dance, where they regularly spin, leap, and run. In both cases, the garments Kim created had to work in tandem with **25** performer's body's without requiring adjustments or causing **26** undo discomfort. Rather than feeling limited by the reality of designing for bodies in continuous motion, Kim found it inspiring, saying she got her "ideas from a certain twist of the body, ... a particular movement." Throughout the construction of her garments and the multiple fittings required to ensure that each garment was impeccably suited **27** to its wearer, Kim stayed true to her **28** inspiration. What inspired her was to create costumes that brought out the movement of the bodies that she dressed.

25

- A) NO CHANGE
- B) performers' bodies'
- C) performers' bodies
- D) performers bodies'

26

- A) NO CHANGE
- B) undue
- C) overdue
- D) overdo

27

- A) NO CHANGE
- B) from
- C) with
- D) by

28

- Which choice most effectively combines the sentences at the underlined portion?
- A) inspiration, creating
 - B) inspiration and also created
 - C) inspiration, and the costumes she created were
 - D) inspiration; her inspiration was to create

CONTINUE

2

2

29 Because they bring out performers' movement, costumes for live performance must also be long lasting—much more so than regular clothing and generally more so than costumes created for film and television. Screen actors may wear a particular costume for just a few days of filming, in **30** that case the garment needs to be cleaned only a few times and is therefore unlikely to deteriorate. In live productions, however, it is not uncommon for a performer to **31** wear the same costume as often as eight times per week, for weeks or months on end.

29

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

- A) NO CHANGE
- B) Successful live productions can last for years, so
- C) Beyond their responsiveness to movement,
- D) Additionally, it is important to remember that

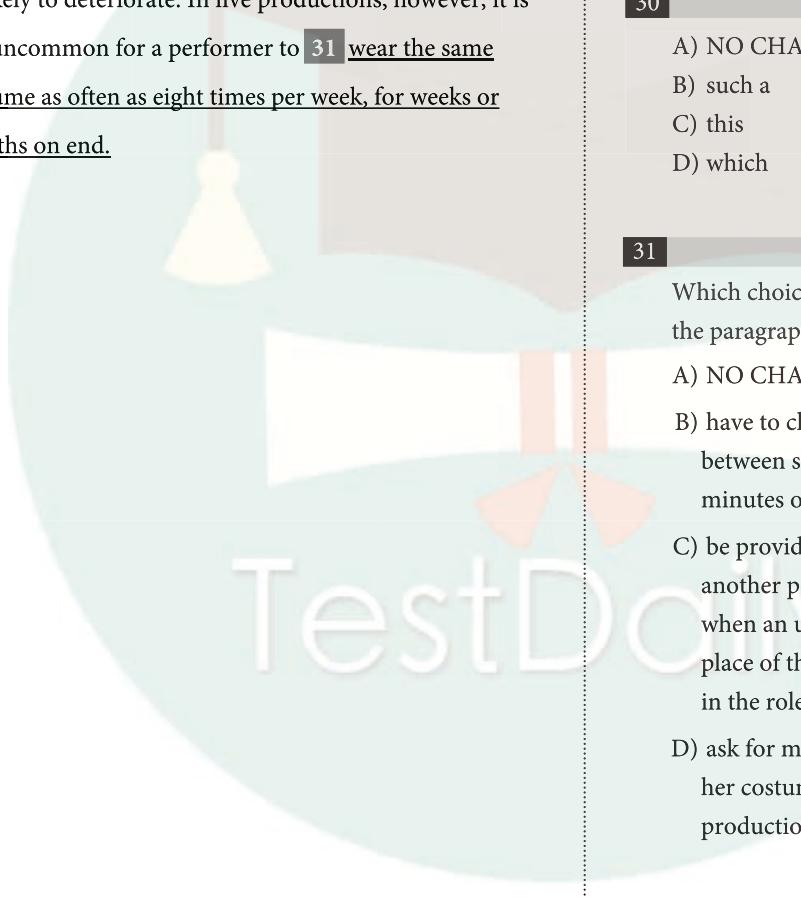
30

- A) NO CHANGE
- B) such a
- C) this
- D) which

31

Which choice best supports the contrast presented in the paragraph?

- A) NO CHANGE
- B) have to change costumes hastily backstage between scenes, sometimes in a matter of minutes or even seconds.
- C) be provided with a costume originally fitted to another performer's body, especially in cases when an understudy is called upon to perform in place of the person normally scheduled to appear in the role.
- D) ask for minor adjustments to be made to his or her costume over the course of an especially long production run.


CONTINUE →

2

2

Kim was noted for devising new strategies to accomplish her vision without sacrificing the durability of her costumes. In the mid-1960s, for example, 32 she worked on an off-Broadway play, she decided to design costumes with political cartoons drawn on them. The idea was as unusual at the time as it was untested. Kim's early attempts saw the cartoons quickly fade after repeated cleanings. Searching for fabric that would hold color longer, she eventually discovered that stretch material "takes paint beautifully" and incorporated it into her work. 33 The extent of her talents is evident in the bevy of honors she received, including two Tony Awards for Best Costume Design and two Drama Desk Awards for Outstanding Costume Design.

32

- A) NO CHANGE
- B) Kim was working
- C) while working
- D) and while working

33

Which choice provides the best conclusion to the paragraph and the passage?

- A) NO CHANGE
- B) Were it not for her background in the visual arts, Kim may never have experimented with painting on her garments at all.
- C) It was this unwavering focus on utility, combined with her artistry, that cemented Kim's reputation in the costume-design world.
- D) The realities of designing costumes for the stage can indeed be challenging, but with enough ingenuity, these challenges can be overcome.

CONTINUE

| 2

2 |

Questions 34-44 are based on the following passage.

James Reese Europe's Pioneering Sound

— 1 —

In 1904, the musician James Reese Europe moved from Washington, DC, where he had studied under concert violinist Joseph Douglass, to New York City. In his new home, Europe found his musical interests shifting from classical music to the mixture of ragtime, blues, and other styles that New York musicians were then experimenting with and **34** it would eventually develop into modern jazz music. Europe would play a crucial role in introducing this music to the broader public.

34

- A) NO CHANGE
- B) as it would
- C) that would
- D) DELETE the underlined portion.

TestDaily

CONTINUE ➔

2

2

— 2 —

Europe developed his skills in popular musical styles by working as a pianist and composer for Broadway musicals. When opportunities for employment in musical theater declined, he turned to composing and conducting dance music. Europe's works were among the first to use a modified orchestra to play **35** songs. These songs featured the cadences and melodic structures of folk songs and other traditional African American musical forms. **36** Audiences in attendance were captivated by Europe's driving rhythms and novel instrumentation, which featured banjos, saxophones, and other instruments **37** that were unusual in orchestral arrangements. Dance bands headed by Europe became a major draw at dance parties, hotels, and restaurants in the city.

35

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

- A) songs featuring
- B) songs, and these songs featured
- C) songs with the featuring of
- D) songs; additionally, these songs featured

36

- A) NO CHANGE
- B) Audiences were captivated and entranced
- C) Entranced audiences were captivated
- D) Audiences were captivated

37

The writer is considering deleting the underlined portion, adjusting the punctuation as needed. Should the underlined portion be kept or deleted?

- A) Kept, because it expands on the sentence's claim that the instrumentation was novel.
- B) Kept, because it clarifies what is meant by the sentence's mention of driving rhythms.
- C) Deleted, because it introduces an aspect of orchestral arrangements that goes unexplained.
- D) Deleted, because it does not logically set up the information about dance bands in the sentence that follows in the paragraph.

CONTINUE

2

— 3 —

Seeking opportunities for himself and fellow jazz musicians to perform for a wider audience, **38** the Clef Club was founded in 1910 with Europe's help. This organization for African American musicians provided rehearsal space, booked venues for **39** concerts; and crucially formed a jazz orchestra of more than one hundred members with Europe as **40** its conductor. With ten pianos providing harmony, and mandolins, harp guitars, and other folk instruments supplementing the traditional instruments of a symphony orchestra, Europe's Clef Club Orchestra was poised to take the popularity of jazz to a new level.

2

38

- A) NO CHANGE
- B) 1910 saw the founding of the Clef Club with the help of Europe.
- C) Europe's help led to the founding of the Clef Club in 1910.
- D) Europe helped found the Clef Club in 1910.

39

- A) NO CHANGE
- B) concert, and, crucially,
- C) concerts and, crucially
- D) concerts and crucially,

40

- A) NO CHANGE
- B) there
- C) they're
- D) its

CONTINUE 

2

2

— 4 —

It was unlike anything the audience had heard before: the instruments and syncopated beats of early jazz music had been transferred from the dance hall to the concert hall, acquiring the sound of a massive symphony orchestra along the way. As the writer James Weldon Johnson later recalled, concert goers were thrilled by this new sound: **41** “The effect can be imagined,” he wrote.

41

Which quotation from a 1912 book by James Weldon Johnson best supports the claim made earlier in the sentence?

- A) NO CHANGE
- B) “The applause became a tumult,”
- C) “The instrumentation was augmented by the voices,”
- D) “It was an unorthodox combination,”

CONTINUE 

2

2

— 5 —

After the Carnegie Hall performance, Europe and other Clef Club members were flooded with requests to perform and record their music. **42** Despite Europe's busy schedule, the concert brought attention and prestige to the nascent art form of jazz. For this and Europe's other contributions to the **43** genre. Jazz historian Gunther Schuller declared Europe, "along with Jelly Roll Morton, the most important figure in the prehistory of jazz."

Questions 44 asks about the previous passage as a whole.



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42

Which choice provides the most effective transition to the information that follows in the paragraph?

- A) NO CHANGE
- B) Because the group had practiced extensively,
- C) Even more importantly,
- D) Though their other shows were inspiring as well,

43

- A) NO CHANGE
- B) genre, jazz
- C) genre; therefore, jazz
- D) genre and jazz

Think about the previous passage as a whole as you answer question 44.

44

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

Europe and the Clef Club Orchestra found their chance at a Carnegie Hall performance on May 2, 1912.

To make the passage most logical, the sentence should be placed

- A) at the beginning of paragraph 1.
- B) at the beginning of paragraph 3.
- C) at the beginning of paragraph 4.
- D) at the beginning of paragraph 5.

STOP

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

3



3

Math Test – No Calculator

25 MINUTES, 20 QUESTIONS

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

DIRECTIONS

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

NOTES

- The use of a calculator is not permitted.
- All variables and expressions used represent real numbers unless otherwise indicated.
- Figures provided in this test are drawn to scale unless otherwise indicated.
- All figures lie in a plane unless otherwise indicated.
- 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

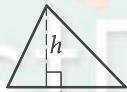


$$A = \pi r^2$$

$$C = 2\pi r$$



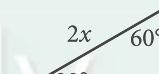
$$A = lw$$



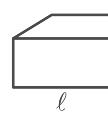
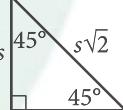
$$A = \frac{1}{2}bh$$



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



Special Right Triangles



$$V = lwh$$



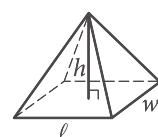
$$V = \pi r^2 h$$



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



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



$$V = \frac{1}{3}lwh$$

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

The number of radians of arc in a circle is 2π .

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

CONTINUE

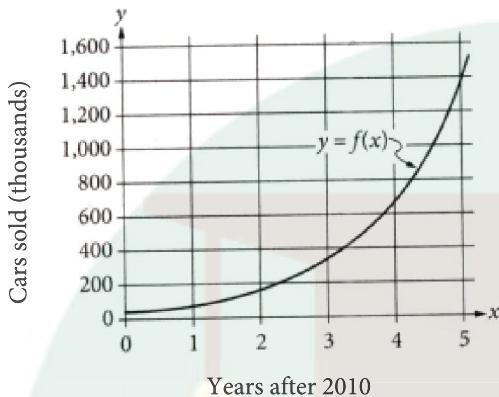
3



3

1

Number of Electric Cars
Sold Worldwide, 2010-2015



The graph of the exponential function f shown gives the estimated number of electric cars, in thousands, that were sold worldwide x years after 2010. Which of the following equations best models the function $f(x)$?

- A) $f(x) = 2.05(37.6)^x$
- B) $f(x) = 2.05(37.6)^{-x}$
- C) $f(x) = 37.6(2.05)^x$
- D) $f(x) = 37.6(2.05)^{-x}$

2

$$\begin{aligned}y &= 36 \\y &= x^2\end{aligned}$$

If (x, y) is a solution to the system of equations above and $x > 0$, what is the value of x ?

- A) 6
- B) 9
- C) 18
- D) 72

3

$$\frac{5}{x+1} = \frac{5}{8}$$

What is the solution to the given equation?

- A) 7
- B) $\frac{39}{5}$
- C) 9
- D) 35

CONTINUE

3



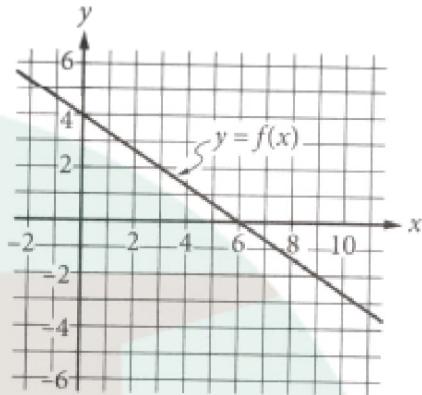
3

4

Nathaniel is shopping online. In order to receive free shipping, Nathaniel must spend at least \$50 before taxes. He currently has a \$30 candle holder in his online shopping cart. The inequality $10x + 3 \geq 50$ represents this situation, where x is the number of candles Nathaniel will add to his cart to receive free shipping. Which of the following is the best interpretation of the number 10 in this context?

- A) The total number of products he will add to his cart
- B) The total number of candles he will add to his cart
- C) The price, in dollars, of all the products in his cart
- D) The price, in dollars, of one candle that will be added to his cart

5



The graph of the linear function f is shown in the xy -plane above. Which of the following defines f ?

- A) $f(x) = -\frac{2}{3}x + 4$
- B) $f(x) = \frac{1}{3}x + 4$
- C) $f(x) = -\frac{3}{2}x + 6$
- D) $f(x) = -\frac{1}{2}x + 6$

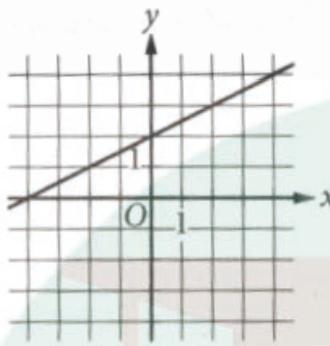
CONTINUE →

3



3

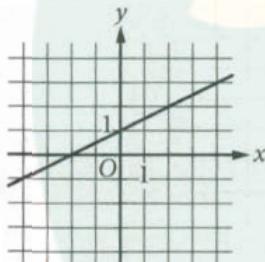
6



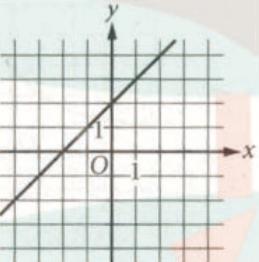
The graph of the equation $y = mx + b$, where m and b are constants, is shown in the xy -plane above.

Which of the following is the graph of the equation $y = 2(mx + b)$?

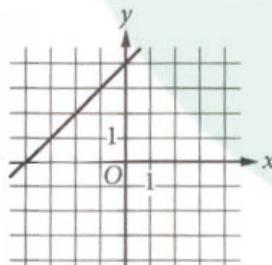
A)



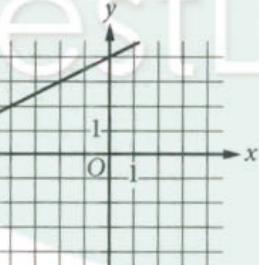
B)



C)



D)



7

In triangle ABC , one angle measures 20° and another angle measures 50° . If the length of each side of triangle ABC is doubled, which of the following is the measure of one of the angles in the resulting triangle?

- A) 30°
- B) 50°
- C) 70°
- D) 100°

CONTINUE →

3



3

8

Last week, Rosa played x hours of video games on Saturday and a total of y hours of video games for the other 6 days of the week. If she played a total of 15 hours of video games last week, which of the following equations shows a relationship between x and y ?

- A) $x - y = 15$
- B) $x + y = 15$
- C) $x + 6y = 15$
- D) $6x - y = 15$

9

$$v(t) = 11t + 5$$

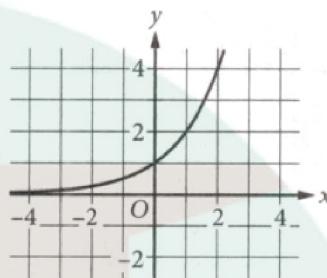
The given equation models the relationship between a car's speed v , in feet per second, and the number of seconds, t , after the driver started accelerating, where $0 \leq t \leq 8$. Which of the following is the best interpretation of $v(5) = 60$ in this context?

- A) Five seconds after the driver started accelerating, the speed of the car was 60 times its initial speed.
- B) Sixty seconds after the driver started accelerating, the speed of the car was 5 times its initial speed.
- C) Sixty seconds after the driver started accelerating, the speed of the car was 5 feet per second.
- D) Five seconds after the driver started accelerating, the speed of the car was 60 feet per second.

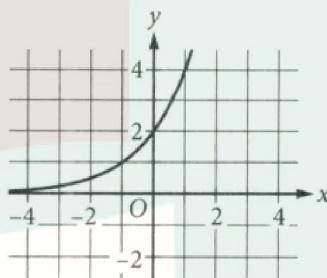
10

Which of the following is the graph of $y = 2^{x+1}$ in the xy -plane?

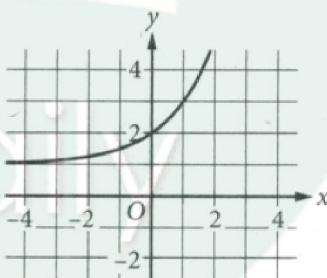
A)



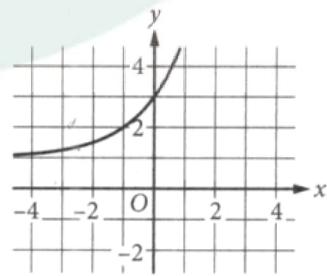
B)



C)



D)



CONTINUE →

3



3

11

Which of the following is equivalent to $(\sqrt{45})(\sqrt[3]{40})$?

- A) $5(\sqrt[5]{5^4})$
- B) $5(\sqrt[6]{5^5})$
- C) $6(\sqrt[5]{5^4})$
- D) $6(\sqrt[6]{5^5})$

12

$$p(t) = -159(t - 9)^2 + 102,000$$

The number of pieces of first-class mail, in millions, processed by the US Postal Service each year from 1992 to 2007 can be modeled by the given function p , where t is the number of years after 1992. Based on the model, which year from 1992 to 2007 had the greatest number of pieces of first class mail processed?

- A) 1999
- B) 2000
- C) 2001
- D) 2002

13

The function f is graphed in the xy -plane, where $y = f(x)$. The graph contains the points $(0, 3)$, $(6, 0)$, and $(9, 0)$. Which of the following CANNOT be true?

- A) $f(9) < 0$
- B) $f(3) < 0$
- C) $f(3) > 0$
- D) $f(0) < 9$

CONTINUE →

3



3

14

If $k^2 + 6k - 10 = 0$, which of the following is a possible value of $k + 3$?

- A) 2
- B) $\sqrt{10}$
- C) $\sqrt{19}$
- D) 5



15

R: $x^2 + y^2 = 36$
T: $x^2 + (y - 3)^2 = 36$

The equations of circles R and T are given above. Which of the following transformations of the graph of R in the xy -plane results in the graph of T?

- A) A shift of 3 units to the right
- B) A shift of 3 units to the left
- C) A shift of 3 units up
- D) A shift of 3 units down

CONTINUE

3



3

DIRECTIONS

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

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

Write answer
in boxes.

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

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

Grid in result.

Answer: 2.5

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

← Decimal point

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

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

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

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

Answer: 201 – either position is correct

2	0	1
0	0	0
1	1	1
2	2	2
3	3	3

2	0	1
0	0	0
1	1	1
2	2	2
3	3	3

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

CONTINUE →

3



3

16

$$3x + 4 + 2x + 6 = 14$$

What is the solution to the equation above?

17

$$2x + y = 28$$

$$3y = 60$$

If (x, y) is the solution to the system of equations above, what is the value of x ?

18

Sphere A and right circular cylinder C both have radius r . The height of cylinder C is 12 units. For what value of r will the volume of sphere A be twice the volume of cylinder C?

19

$$k - 2 + 6x = 2(3x + 4)$$

In the equation above, k is a constant. If the equation has an infinite number of solutions, what is the value of k ?

20

The expression $10x(x^2 + 9)$ is equivalent to $ax^b + cx$, where a , b , and c are constants. What is the value of abc ?



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STOP

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

4



4

Math Test – Calculator

55 MINUTES, 38 QUESTIONS

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

DIRECTIONS

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

NOTES

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

REFERENCE



$$A = \pi r^2$$

$$C = 2\pi r$$



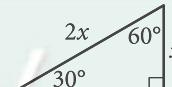
$$A = \ell w$$



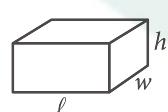
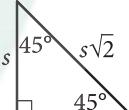
$$A = \frac{1}{2} bh$$



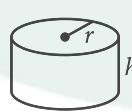
$$c^2 = a^2 + b^2$$



Special Right Triangles



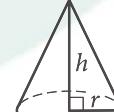
$$V = \ell wh$$



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



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



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



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

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

The number of radians of arc in a circle is 2π .

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

CONTINUE

4

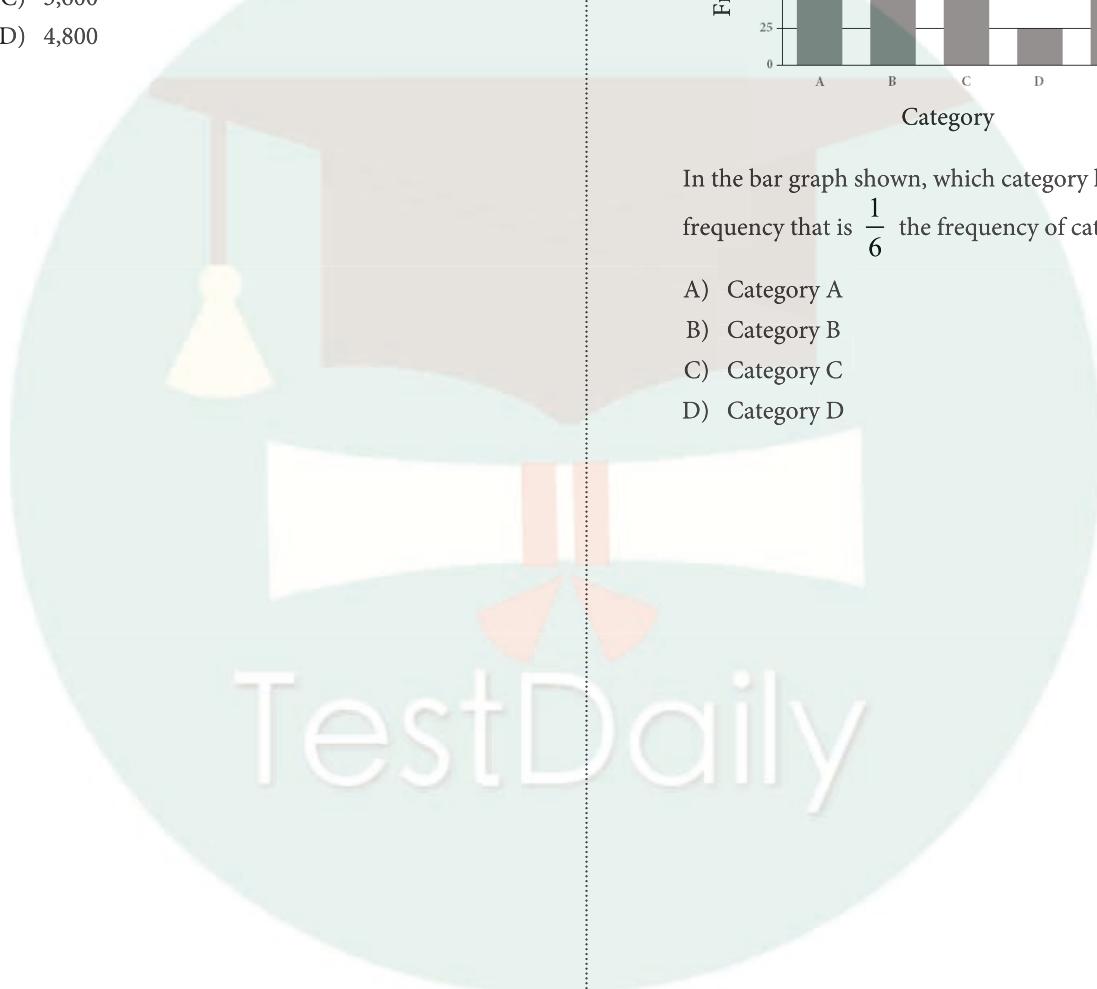


4

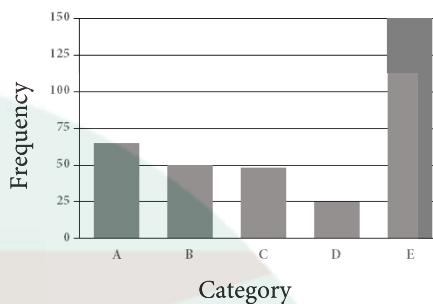
1

The ratio of a to b is 3 to 4 . If the value of a is 1,200, what is the value of b ?

- A) 900
- B) 1,600
- C) 3,600
- D) 4,800



2



In the bar graph shown, which category has a frequency that is $\frac{1}{6}$ the frequency of category E ?

- A) Category A
- B) Category B
- C) Category C
- D) Category D

CONTINUE

4**4****Questions 3 and 4 refer to the following information.**

A research company selected a random sample of 1,270 working adult residents of a city and asked them about the number of hours they work each week. The results of the survey are summarized in the table.

Number of hours reported	Fewer than 35	From 35 to 50	More than 50
Number of people	100	940	230

3

What fraction of the people surveyed reported working from 35 to 50 hours each week?

- A) $\frac{10}{127}$
- B) $\frac{23}{127}$
- C) $\frac{33}{127}$
- D) $\frac{94}{127}$

4

One person who participated in the survey will be selected at random. What is the probability, to the nearest hundredth, of selecting a person who reported working more than 50 hours each week?

- A) 0.74
- B) 0.22
- C) 0.18
- D) 0.08

CONTINUE

4



4

5

A metal rod is 1,000 centimeters long. How long is the rod, in meters? (1 meter = 100 centimeters)

- A) 10
- B) 100
- C) 10,000
- D) 100,000

6

In the xy -plane, the graph of the linear equation $y = kx + c$, where k and c are constants, contains the points $(0, 0)$ and $(4, 8)$. What is the value of k ?

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

7

In the xy -plane, the graph of $y = f(x)$ is a line that passes through $(0, 20)$ and has a slope of 3. Which of the following defines f ?

- A) $f(x) = 20x$
- B) $f(x) = 20x + 3$
- C) $f(x) = 3x$
- D) $f(x) = 3x + 20$

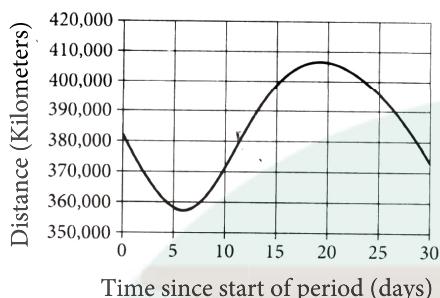
CONTINUE

4



4

8



The graph shows the distance between the Moon and the North Pole during a 30-day period. Which of the following is closest to the total number of days that the Moon was less than 370,000 kilometers from the North Pole during this period?

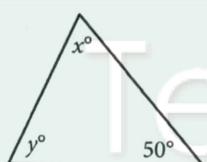
- A) 2
- B) 8
- C) 10
- D) 20

10

If $\sin(23^\circ) = \cos(y^\circ)$, and $0^\circ < y < 90^\circ$, what is the value of y ?

- A) 23
- B) 46
- C) 67
- D) 69

9



In the triangle shown, which of the following represents y in terms of x ?

- A) $y = 40 + x$
- B) $y = 50 + x$
- C) $y = 130 - x$
- D) $y = 230 - x$

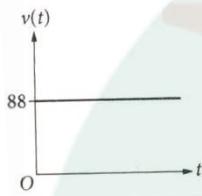
CONTINUE

4**4****11**

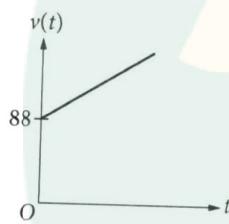
$$v(t) = 88 - at$$

The speed, in feet per second, of a car t seconds after the brakes are applied can be modeled by the function v above, where a is a positive constant. Which of the following could represent the graph of the function v ?

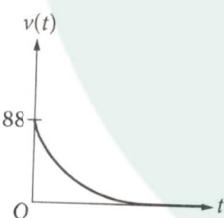
A)



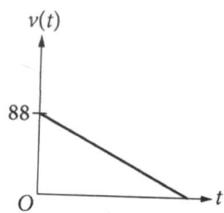
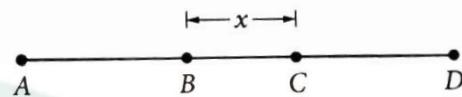
B)



C)



D)

**12**

Note: Figure not drawn to scale.

For segment AD shown, $AB = 2x$ and $CD = AB + 1$. If $AD = 26$, which of the following equations represents this situation?

- A) $26 = 4x + 1$
- B) $26 = 4x - 1$
- C) $26 = 5x + 1$
- D) $26 = 5x - 1$

13

If $3x - 12 = 18$, what is the value of $3x$?

- A) 30
- B) 10
- C) 6
- D) 2

CONTINUE

4



4

14

The frequency table shows the age distribution (rounded down to the nearest year) of 2,401 elephants that are monitored by an elephant conservation program.

Age (years)	Number of elephants
0 to 9	708
10 to 19	402
20 to 29	533
30 to 39	466
40 to 49	219
50+	73
Total	2,401

Which age interval contains the median age of these elephants?

- A) 10 to 19
- B) 20 to 29
- C) 30 to 39
- D) 40 to 49

15

In the xy -plane, line l contains the point $(6, -4)$ and is perpendicular to the line $y = -3x + 5$. Which of the following is an equation of line l ?

- A) $y = \frac{1}{3}x - 22$
- B) $y = \frac{1}{3}x - 6$
- C) $y = -\frac{1}{3}x - 2$
- D) $y = -\frac{1}{3}x + 14$

CONTINUE

4**4****17**

Questions 16-17 refer to the following information.

A farmer in Manitoba, Canada, is deciding, based on the information in the table, which of two crops to grow on 500 acres of land.

Crop	Cost per acre (Canadian dollars)	Market price per bushel (Canadian dollars)
Oats	190	3.00
Corn	340	4.50

The farmer uses the given functions to model the profit, in Canadian dollars, from growing each crop, where x is the yield per acre, in bushels, for the crop.

$$\text{Oats: } f(x) = 500(3x - 190)$$

$$\text{Corn: } g(x) = 500(4.5x - 340)$$

(Profit = revenue - costs. A negative profit is a loss.)

If $y = g(x)$ is graphed in the xy -plane, which of the following is the best interpretation of the x -coordinate of the x -intercept in this context?

- A) The yield per acre of corn, in bushels, that would result in a profit of 0 Canadian dollars
- B) The yield per acre of corn, in bushels, that would result in the maximum profit
- C) The loss, in Canadian dollars, if the yield per acre of corn, in bushels, were 0
- D) The maximum possible profit, in Canadian dollars, from growing corn

16

If the yields per acre x , in bushels, of corn and oats are equal and the predicted profits $f(x)$ and $g(x)$, in Canadian dollars, are equal, what is the value of x ?

- A) 60
- B) 70
- C) 100
- D) 150

CONTINUE

4

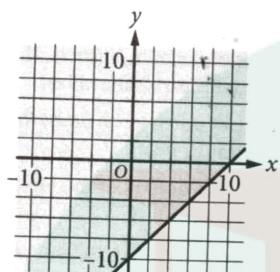


4

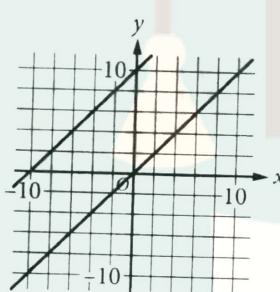
18

Which of the following shaded regions represents the solutions to the inequality $x - y \leq 10$?

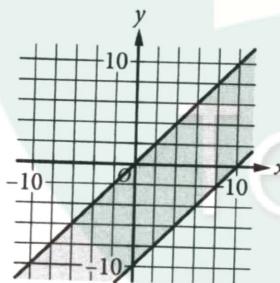
A)



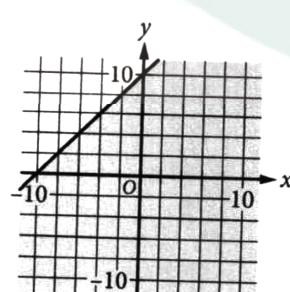
B)



C)



D)



19

$$b = kc$$

The equation above shows a relationship between the variables b and c , where k is a constant. Which of the following is equivalent to $4b$?

- A) $\frac{1}{4}c$
- B) $4c$
- C) $\frac{k}{4}c$
- D) $4kc$

20

Which of the following represents the value of d increased by 67%?

- A) $0.33d$
- B) $0.67d$
- C) $1.33d$
- D) $1.67d$

CONTINUE →

4**4****21**

The positive number c is 20% less than the positive number k . Which of the following is equivalent to c ?

- A) $0.02k$
- B) $0.08k$
- C) $0.20k$
- D) $0.80k$

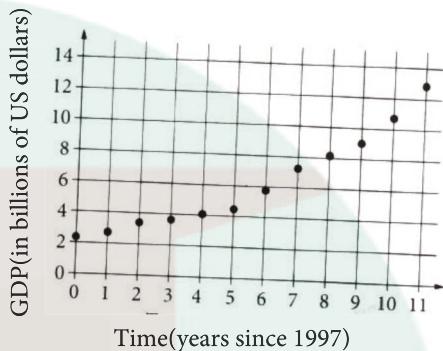
22

Moore's law predicts that the number of transistors that can fit on an integrated circuit doubles about every 2 years. If Moore's law is modeled by a function M that gives the predicted number of transistors, $M(t)$, that can fit on an integrated circuit as a function of time t , in years, which of the following describes the function M ?

- A) Decreasing exponential
- B) Increasing exponential
- C) Decreasing linear
- D) Increasing linear

23

The scatterplot shows the gross domestic product (GDP), in billions of US dollars, of Albania each year from 1997 to 2008.



Of the following, which equation best models the GDP y , in billions of US dollars, of Albania, where x is the number of years since 1997?

- A) $y = 0.2^x$
- B) $y = 1.2^x$
- C) $y = 2.3(0.2^x)$
- D) $y = 2.3(1.2^x)$

CONTINUE

4



4

24

$$A(t) = 55,000(0.79)^t$$

An antibiotic is introduced to a certain culture of bacteria. After t days, the number of bacteria per milliliter, $A(t)$, remaining can be modeled by the function A shown. Which of the following expressions represents the predicted number of bacteria remaining in each milliliter of the culture x hours after the antibiotic is introduced?

- A) $55,000(0.79)^x$
- B) $55,000(0.79)^{x+24}$
- C) $55,000(0.79)^{\frac{x}{24}}$
- D) $55,000(0.79)^{24x}$

25

Data set A consists of 30 data values. The minimum value is 40, and the maximum value is 60. Data set B consists of the 30 values in data set A and one additional value x . Which of the following values of x will result in the mean of data set B being less than the mean of data set A and the range of data set B being greater than the range of data set A?

- A) 1
- B) 40
- C) 50
- D) 100

26

$$4x^2 + 12x = c$$

In the equation above, c is a constant. If the equation has exactly one solution, what is the value of c ?

- A) -9
- B) -3
- C) 3
- D) 9

CONTINUE

4**4****27**

$$W = 0.016t + 1.2$$

$$G = 0.036t + 0.4$$

The equations above model the colony diameters, W and G , in millimeters (mm), of two colonies of a particular species of mold t hours (hr) after both colonies began to grow. Based on the models, at the time when the colony diameters are the same, which of the following is true?

- A) The diameter of each colony is 40 mm.
- B) Each colony has been growing for 40 hr.
- C) The growth rate of each colony's diameter is 40 mm/hr.
- D) Each colony's diameter has increased by 40 mm since both colonies began to grow.

28

If $x > 2$, for what value of a is $\frac{5x^2 + ax - 8}{x - 2}$

equivalent to $5x + 4$?

- A) -6
- B) -2
- C) 2
- D) 4

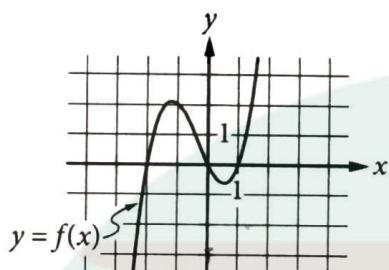
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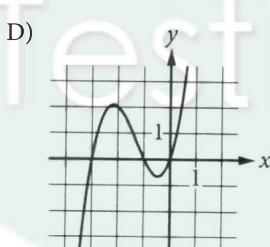
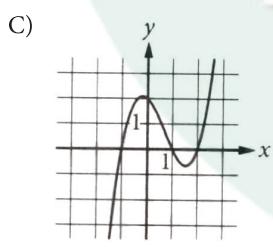
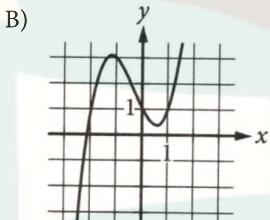
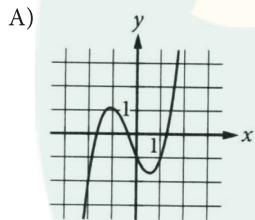


4

29



The graph of the function f , defined by $f(x) = (x + a)(x + b)(x + c)$, is shown in the xy -plane, where a , b , and c are constants. If each of the values a , b , and c is decreased by 1 to create a new function g , which of the following represents the graph of g ?



30

The exponential function f decreases by 40% for each increase by 1 in the value of x . If $f(0) = 2$, then which of the following could define f ?

- A) $f(x) = 0.4 \cdot (2^x)$
- B) $f(x) = 0.6 \cdot (2^x)$
- C) $f(x) = 2 \cdot (0.4^x)$
- D) $f(x) = 2 \cdot (0.6^x)$

CONTINUE →

4



4

DIRECTIONS

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

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

Write →
answer
in boxes.

Grid in
result.

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

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

Fraction line

Answer: 2.5

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

Decimal point

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

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

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

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

Answer: 201 – either position is correct

2	0	1
0	0	0
1	1	1
2	2	2
3	3	3

2	0	1
0	0	0
1	1	1
2	2	2
3	3	3

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

CONTINUE 

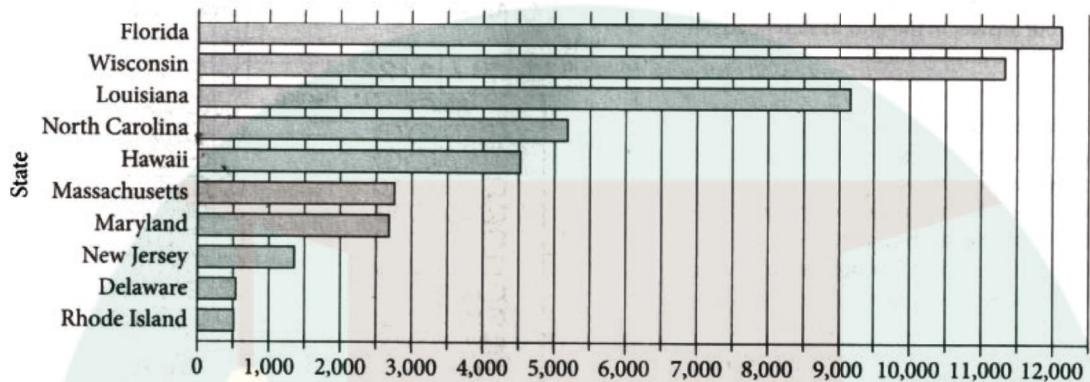
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4

31

The bar graph shows the area covered by water, in square miles, for 10 US states.



Based on the given information, how many of these states have an area covered by water of between 1000 and 6000 square miles?

32

$$t^2(t - 3) + 6(t - 3) = 0$$

What is the real value of t that satisfies the given equation?

34

$$bx - 12b = 8b$$

In the equation above, b is a positive constant. What value of x satisfies the equation?

33

Both the length and width, in feet, of a rectangular garden are integers. If the perimeter of the garden is 24 feet, what is the greatest possible area, in square feet, of the garden?

35

An integer from 1 to 20 is to be selected at random. If the number is a multiple of 3, what is the probability that it is also a multiple of 5? (Grid your answer as a fraction or decimal, not as a percent.)

CONTINUE

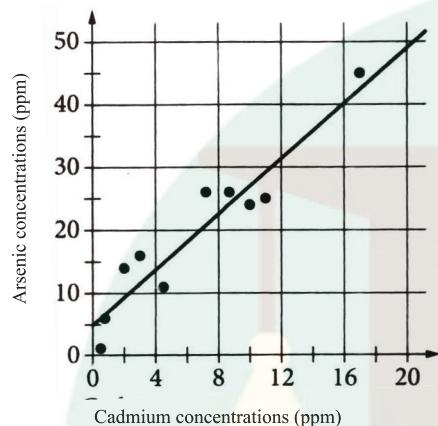
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4

Questions 36 and 37 refer to the following information.

Contaminant Concentrations in
Upper Columbia River Valley Sediment



A researcher collected 10 different sediment samples from lakes and watersheds in the upper Columbia River Valley. The researcher measured the cadmium concentration and arsenic concentration, both in parts per million (ppm), of each sample. The data are shown in the scatterplot along with a line of best fit.

36

To the nearest whole number, what is the arsenic concentration, in ppm, predicted by the line of best fit for a sediment sample with a cadmium concentration of 16 ppm?

37

Of the 10 sediment samples, $p\%$ have a cadmium concentration less than 12 ppm. What is the value of p ?

38

On circle P , an arc measures 30° and has a length of 16 centimeters. What is the circumference of circle P , in centimeters?



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STOP

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