

# 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 Ruth Ozeki, *A Tale for the Time Being*. ©2013 by Ruth Ozeki Lounsbury. Ruth an American novelist, lives on a remote Canadian island with her artist husband, Oliver.

The home they bought in Whaletown was built in a meadowlark clearing that had been hacked from the middle of the dense temperate rain forest. A smaller cottage stood at the foot of the drive where her  
 5 mother would live on all sides, massive Douglas firs, red cedars, and bigleaf maples surrounded them, dwarfing everything human, When Ruth first saw these giant trees, she wept. They rose up around her, ancient time beings, towering a hundred or two  
 10 hundred feet overhead. At five feet five inches, she had never felt so puny in all her life.

“We’re nothing,” she said, wiping her eyes, “We’re barely here at all.”

“Yes,” Oliver said. “Isn’t it great? And they can  
 15 live to be a thousand years old.”

She leaned against him, tilting her head all the way back so she could see the treetops, piercing the sky.

“They’re impossibly tall,” she said.  
 20 “Not impossibly,” Oiver said, holding her so she wouldn’t fall. “It’s just a matter of perspective. If you were that tree, I wouldn’t even reach the bottom of your anklebone.”

Oliver was overjoyed. He was a tree guy and had  
 25 no use for tidy vegetable gardens or shallow-rooted annuals, like lettuce. When they first moved in, he

was still quite ill, prone to dizzy spells and easily tired, but he started a daily regimen of walking and soon he was running the trails, and it seemed to Ruth  
 30 as if the forest were healing him, as if he were absorbing its inexorable life force. As he ran through the dense understory, he could read the signs of arboreal intrigue the drama and power struggles as species vied for control over a patch of sunlight, or  
 35 giant firs and fungal spores opted to work together for their mutual benefit. He could see time unfolding here, and history, embedded in the whorls and fractal forms of nature, and he would come home, sweating and breathless and tell her what he’d  
 40 seen.

Their house was made of cedar from the forest. It was a whimsical two-story structure built by hippies in the 1970s. with a shake roof, deep eaves, and a sprawling front porch overlooking the small  
 45 meadow and encircled by the tall trees. The real estate agent had listed the house as having an ocean view, but the only glimpse of water it afforded was from a single window in Ruth’s office, where she could see a tiny patch of sea and sky through a  
 50 U-shaped notch in the treetops which looked like an inverted tunnel. The real estate agent pointed out that they could cut down the trees that were blocking their view, but they never did. Instead, they planted more.

In a futile attempt to domesticate the landscape,  
 55 Ruth planted European climbing roses around the house. Oliver planted bamboo. The two species quickly grew up into a densely tangled thicket, so that soon it was almost impossible to find the

60 entrance to the house if you didn't already know  
 where it was. The house seemed in danger of  
 disappearing, and by then, the meadow was  
 beginning to shrink, too, as the forest encroached  
 like a slow-moving coniferous wave, threatening to  
 65 swallow them completely.

Oiver wasn't worried. He took the long view.  
 Anticipating the effects of global warming on the  
 native trees, he was working to create a climate-  
 change forest on a hundred acres of clear-cut, owned  
 70 by a botanist friend. He planted groves of ancient  
 natives—metasequoia, giant sequoia, coast redwoods,  
*Juglans*, *Ulmus*, and ginkgo—species that had been  
 indigenous to the area during the Eocene Thermal  
 Maximum, some 55 million years ago.

75 “Imagine,” he said. “Palms and alligators  
 flourishing once again as far north as Alaska!”

This was his latest artwork, a botanical  
 intervention he called the NeoEocene. He described  
 it as collaboration with time and place, whose  
 80 outcome neither he nor any of his contemporaries  
 would ever live to witness, but he was okay with not  
 knowing. Patience was part of his nature, and he  
 accepted his lot as a short-lived mammal, scurrying  
 in and out amid the roots of the giants.

85 But Ruth was neither patient nor accepting,  
 and she really liked to know. After a few short years  
 (fifteen, to be exact—brief by his count, interminable  
 by hers), surrounded by all this vegetative rampancy,  
 she was feeling increasingly unsure of herself. She  
 90 missed the built environment of New York City.  
 It was only in an urban landscape, amid straight lines  
 and architecture, that she could situate herself in  
 human time and history. As a novelist she needed  
 this. She missed people. She missed human intrigue,  
 95 drama and power struggles. She needed her own  
 species.

1

According to the passage, what is Ruth's initial  
 reaction to encountering the forest of Whaletown?

- A) She is overwhelmed by its immensity.
- B) She is surprised by its diversity of species.
- C) She feels a sense of kinship.
- D) She wishes to return to the city.

2

In the context of the Passage, Oiver's replies in  
 lines 14-15 (“Yes ... old”) and lines 20-23 (“Not ...  
 anklebone”) can best be understood as

- A) rehearsed attempts to help Ruth take a more  
 positive view of the situation.
- B) neutral factual statements intended to teach  
 Ruth more about their new surroundings.
- C) casual observations inadequate to addressing  
 Ruth's level of concern.
- D) deliberate efforts to dismiss Ruth's feelings.

3

According to the passage, what was one initial  
 assumption Ruth and Oliver had about their new  
 house?

- A) It would have a better view of the ocean.
- B) It would be less isolated.
- C) It would not be surrounded by trees.
- D) It would need major repairs.

4

The description in the ninth paragraph (lines 55-65)  
 mainly serves to

- A) provide context for a discussion of the novel  
 Ruth is writing.
- B) suggest that Ruth and Oliver are naive in their  
 assumptions about nature.
- C) communicate the increasing intensity of nature's  
 presence in Ruth and Oliver's life.
- D) explain the reasoning behind Oliver's plan to  
 create his own forest.

5

Based on the passage, Oliver would most likely agree with which statement about works of art?

- A) They tend to be most original when they involve collaboration among multiple artists.
- B) They do not necessarily have to be confined to a formal setting.
- C) They are likely to appeal to a wide audience when they depict images from nature.
- D) They are often the creations of people who do not consider themselves artists.

6

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

- A) Lines 42-45 (“It was ... trees”)
- B) Lines 70-74 (“He planted ... ago”)
- C) Lines 78-82 (“He described ... knowing”)
- D) Lines 82-84 (“Patience ... giants”)

7

According to the passage, Ruth attempts to make her home environment more tolerable by

- A) introducing a certain species off plant.
- B) altering certain features of the house.
- C) encouraging people to visit her.
- D) obtaining a clearer view of the ocean.

8

As used in line 83, “lot”most nearly means

- A) wealth.
- B) division.
- C) fate.
- D) assignment.

9

Based on the passage, which choice most accurately characterizes Oliver and Ruth's relationship?

- A) It is based mainly on a shared appreciation of nature.
- B) It is plagued by quarrels about their respective artistic projects.
- C) It has grown stronger since Ruth started helping Oliver deal with his illness.
- D) It has become more challenging because Oliver and Ruth are opposites in certain respects.

10

It can most reasonably be inferred from the passage that Ruth might become more content with her life in Whaletown if she were able to

- A) cultivate the types of plants that are more commonly found in cities.
- B) persuade Oliver to spend more time with her.
- C) have more free time to work on her writing.
- D) socialize with various groups of people.

**Questions 11-21 are based on the following passage and supplementary material.**

This passage is adapted from Leon Neyfakh, "Why We Give to Charity." ©2011 by Boston Globe Media Partners, LLC.

Why anyone is ever selfless is a mystery that has fascinated, not to mention frustrated, scientists since Charles Darwin, who considered it a major problem for his theory of natural selection. If every creature  
 5 on earth was in competition with every other, then how to explain bees sacrificing themselves for the good of the hive, or men and women running into burning buildings to save the lives of strangers? These questions have led researchers to posit that  
 10 helping others, even when it costs us dearly, is simply part of being successful social animals: Despite our imperative to compete, we ultimately find it pays off to be generous.

Of course, it's one thing to explain why people in  
 15 general are inclined to help others, and another to examine how it plays out in the mind of an individual person. Studying charitable donation has been a valuable window into that process for researchers, because it allows them to quantify the  
 20 amount of good a person is doing, and how much he or she is giving up.

One dominant strain of thought among charity researchers is that our donations aren't chiefly driven by concern for others, or a principled sense of  
 25 altruism—that instead, it's largely a way for us to indulge the desire to feel virtuous and happy about our role in the world. This theory was formalized in 1989 by behavioral economist James Andreoni, who described the rush of self satisfaction and sense of  
 30 purpose one experiences after committing support to a worthy cause as a "warm glow." The reason we give money, Andreoni wrote, is that it makes us feel good—regardless of how much it benefits the people we're ostensibly trying to help.

Another prominent theory to emerge from the  
 35 research is that people give because of social pressure. We want to avoid appearing selfish or coldhearted, especially in front of people who are suffering or people whose opinions we care about.  
 40 We might feel this type of pressure when someone at the office asks if we'd like to participate in the companywide campaign for a particular charity.

Those aren't the reasons we like to think of ourselves as donating, but experimental research on  
 45 charity tends to support the notion that donating and thinking occupy separate realms. Jonathan Baron, a

psychologist at the University of Pennsylvania, asked a group of participants which charity they'd rather give to: one that achieved its goals so efficiently that  
 50 it could spend 20 percent of its money on advertising, or one that required more money to do the same amount of good, and thus spent less on promotion. Though the first charity was technically more efficient, people tended to favor the latter:  
 55 What mattered to them was seeing more of their own money at work, Baron concluded, rather than the amount of good it did.

This conclusion is bolstered by the findings of John List, an economist at the University of Chicago,  
 60 who tested the effectiveness of so-called matching programs, in which a major supporter agrees to match the contributions of individual donors. List expected to find that matching Programs enticed people to give, by creating the (correct) impression  
 65 that their money would go further. But List's results were curious: While charities that offered a matching program did inspire more people to give than charities that didn't, he was surprised to find that a higher matching ratio didn't lead to larger donations.  
 70 People whose donations would be quadrupled—a huge increase in the power of their gift—didn't donate any more money than people whose donations would simply be doubled. "People get utility or satisfaction out of giving to a good cause.  
 75 And they do not care how much public good is provided," List said.

**Table 1**

Average Charitable Donation by Donation Match Ratio

Donation match ratio offered by fundraising letter	Average donation per letter (dollars)
\$1 donated by major supporter for every \$1 donated by Participant	0.94
\$2 donated by major supporter for every \$1 donated by participant.	1.03
\$3 donated by major supporter for every \$1 donated by participant	0.94
Average for all matching donation conditions	0.97
Control (no matching donation offered)	0.81

**Table 2**

Average Charitable Donation by Maximum Donation-Matching Amount

Maximum donation-matching amount offered by fundraising letter (dollars)	Average donation per letter (dollars)
25,000	1.06
50,000	0.89
100,000	0.90
Control (no matching donation offered)	0.81

Tables adapted from Dean Karlan and John A. List, "Does Price Matter in Charitable Giving? Evidence from a Large-Scale Natural Field Experiment." ©2007 by American Economic Review. [www.satqas.com](http://www.satqas.com)

11

It can most reasonably be inferred from the passage that researchers design their selflessness experiments with the assumption that

- A) participants will make larger donations if they know that they are being observed by others.
- B) charitable donors are more generous than people who do not make donations.
- C) the value of a monetary gift can be used to draw conclusions about the giver's intentions.
- D) the methods used to study charitable giving can be applied to study other selfless behaviors.

12

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

- A) Lines 14-17 ("Of course ...Person")
- B) Lines 17-21 ("Studying...giving up")
- C) Lines 22-27 ("One...world")
- D) Lines 27-31 ("This...glow")

13

As used in line 22, "dominant" most nearly means

- A) leading.
- B) overbearing.
- C) notorious
- D) effective.

14

Based on the passage, which statement best describes a belief held by charity researchers about the behavior of donors?

- A) They tend to donate based on the persuasiveness of an organization's advertising.
- B) They are less inclined to donate to local charities than to those outside their community.
- C) They are often reluctant to donate before researching an organization's background.
- D) They often make donations to help strengthen their own sense of benevolence.

15

Which statement, if true, is inconsistent with the theory described in the fourth paragraph (lines 35-42)?

- A) Large numbers of donors support charities that are valued by someone they know.
- B) Large numbers of donors give to charities that support people without housing.
- C) Large numbers of donors give to charities that have matching programs.
- D) Large numbers of donors make anonymous charitable donations.

16

Which choice best supports the conclusion that people choose to donate to maximize the impact of their donations?

- A) Lines 58-62("This...donors")
- B) Lines 63-65 ("List ...further")
- C) Lines 70-73("People whose... doubled")
- D) Lines 73-74("People get... cause")

17

The main purpose of the last paragraph is to

- A) describe the methods used in several research studies.
- B) present additional results that support a theory.
- C) discuss the usefulness of a research study.
- D) detail new results that settle a debate.

18

Which information appears in table 1 but not in table 2?

- A) The average donation amounts given when various matching ratios are offered
- B) The average donation amounts given when no matching donation condition is offered
- C) The average donation amounts given when the fundraising request is made by letter
- D) The average donation amounts given to fundraisers when there is a matching donation limit

19

According to table 2, the average donation per letter is closest in which two conditions?

- A) When the maximum matching donation amounts are \$25,000 and \$ 50,000
- B) In the control condition and when the maximum matching donation amount is \$25,000
- C) When the maximum matching donation amounts are \$50,000 and \$ 100,000
- D) In the control condition and when the maximum matching donation amount is \$100,000

20

AS used in line 66, "curious" most nearly means

- A) analytical.
- B) amusing.
- C) unexpected.
- D) inquisitive.

**Questions 21-30 are based on the following passage .**

This passage is adapted from Ed Yong: "The Gene That Paints Birds Red" ©2016 by The Atlantic Monthly Group.

In the 1300s, Spanish explorers discovered a small bird living in the islands off the Western coasts of Portugal and Morocco, with dull green feathers but a sweet lyrical voice. The bird became fashionable in the courts of Spain and England, and people started breeding it, gradually changing its plumage to a wide variety of colors, from dark black to bright yellow. It's the latter that the bird is most associated with. It is, of course, the canary.

Throughout those centuries of breeding canaries, one color remained elusive—red. The birds traversed the rainbow, but no hint of red had ever shown up in their feathers. So in the 1920s, German breeders decided to cross canaries with a closely related species—the red siskin of Venezuela. They then mated the hybrids with more canaries, selecting offspring with red feathers, but as few other siskin traits as possible. The result, after many generations, was the “red-factor canary”—a bird that looks exactly like a typical yellow canary, but with bright red plumes.

“The canary thus became the first animal that was purposely genetically modified by moving the genes from another species into it,” says Geoffrey Hill from Auburn University.

Decades later, his team, including Joseph Corbo from Washington-University School of Medicine and Miguel Carneiro from the University of Porto, have finally learned *which* gene the breeders moved across.

By sequencing and comparing the genomes of red siskins, red factor canaries, yellow canaries, and wild green canaries, the team identified over 15,000 genetic variants that are associated with red color, most of which are confined to two small stretches of DNA. One of these regions contains a gene called *CYP2J19*, which is switched on in the birds' skin and liver, and is a thousand times more active in the red canaries than the yellow ones. That's an important clue.

Red siskins and red factor canaries get their distinctive colors by converting yellow chemicals (carotenoids) in their food into red chemicals (ketocarotenoids) in their feathers. This

transformation is carried out by an enzyme called a ketolase, and it takes place mostly in the skin and liver. Given how active *CYP2J19* is in these organs, it's almost certainly the gene that makes the ketolase. It's what paints the birds red.

If that wasn't evidence enough, another team led by Nicholas Mundy at the University of Cambridge independently homed in on the *same gene* after studying zebra finches. These birds normally have red beaks, but some have yellow ones. As Mundy's team discovered, that's likely because of mutations in *CYP2J19* that stop the gene from activating in the beak.

Natasha Bloch from University College London notes that neither team actually disabled the *CYP2J19* gene to see if that de-reddened the birds. But they “have done all the proper experiments short of that, and left me with no doubt that they have found the proper gene responsible for the switch to red color,” she says.

“Is the *CYP2J19* gene responsible for all ketocarotenoid-based red coloration across birds. from flamingos to extinct pink-headed ducks?” asks Mary Caswell Stoddard from Harvard University. “Are parrots, which lack carotenoids in their feathers and instead use a unique pigmentation system to make red, missing the *CYP2J19* gene or is it merely turned off? These are the exciting questions we can now begin to explore.”

Other genes are probably involved too Hill's team found that the red color of siskins and canaries also depends on a cluster of genes involved in skin development. And *CYP2J19* isn't just a gene for making red feathers either. It's switched on in the retina of many other birds, where it produces a red pigment that helps the animals to distinguish between different colors.

So nearly all birds see red, and nearly all could be red. They have the basis of red feathers and beaks right there in their eyes, waiting to be repurposed. And yet, only a few species have done so. Why?

The answer probably involves mating. Red colors are a potent signal in the bird world. Their vibrancy is a reliable indicator of health, and females are most attracted to the reddest males. Bloch, who studies the evolution of color, says. “Finding the genes responsible for color brings us one step closer to understanding how male traits and female preferences co-evolve and whether they share a common genetic basis.”

21

It can most reasonably be inferred from the passage that canaries found on the islands off the western coasts of Portugal and Morocco in the 1300s were

- A) less difficult to capture than other types of birds.
- B) later discovered to be the ancestors of the red siskin of Venezuela.
- C) initially valued more for their voice than for their color.
- D) one of the only types of birds that could see the color red.

22

The passage most strongly suggests that without human intervention, wild canaries would most likely have

- A) been unable to survive outside the islands where they were first discovered.
- B) produced greater levels of ketolase in their skin and livers.
- C) had a uniform coloration throughout the species.
- D) shared an attraction with zebra finches for specific colors in feathers.

23

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

- A) Lines 4-7 (“The bird ... yellow”)
- B) Lines 22-25 (“The canary ... University”)
- C) Lines 60-64 (“But ... says”)
- D) Lines 78-81 (“It’s ... colors”)

24

Which choice best describes the overall structure of the passage?

- A) The author describes the trait that led to the popularity of canaries and then explains how scientists might determine what causes that trait.
- B) The author uses a historical example to introduce a discussion of scientific research into the mechanisms influencing a particular characteristic in birds.
- C) The author relates the discovery of a previously unknown species of canary and then explains the steps researchers took to discover this canary.
- D) The author presents a hypothesis about what causes red coloration in canary feathers and then summarizes recent data that contradicts this hypothesis.

25

As used in line 20, “typical” most nearly means

- A) expected.
- B) symbolic.
- C) boring.
- D) usual.

26

Which choice best supports the idea that it is possible for birds to have red coloration without an active CYP2J19 gene?

- A) Lines 31-36 (“By sequencing ... DNA”)
- B) Lines 54-57 (“As Mundy’s ... beak”)
- C) Lines 58-60 (“Natasha ... birds”)
- D) Lines 69-72 (“Are ... off”)



27

As used in line 35, “confined to” most nearly means

- A) resigned to.
- B) trapped in.
- C) restricted to.
- D) captured by.

28

Based on the passage, which statement about *CYP2J19* and birds is most likely true?

- A) Birds that do not have *CYP2J19* typically consume foods that contain low quantities of carotenoids.
- B) *CYP2J19* blocks the development of yellow pigments in birds with red features.
- C) The presence of *CYP2J19* in the DNA of birds does not guarantee that they will develop red features.
- D) *CYP2J19* is most active in birds that consume large quantities of ketocarotenoids.

29

The passage indicates that in some birds, *CYP2J19* most likely produces

- A) ketolase.
- B) yellow skin.
- C) carotenoids.
- D) green feathers.

30

In context, the quote from Bloch in lines 90-94 (“Finding ... basis”) mainly serves to

- A) assert that recent genetic studies of bird pigmentation have been too narrowly focused
- B) raise a question about the role of breeders in bird color selection.
- C) offer additional evidence that the gene responsible for pigmentation in birds has been identified.
- D) suggest that recent research into the color of birds can influence broader research topics.

**Questions 31-41 are based on the following passage.**

Passage 1 is adapted from a speech delivered in 1928 by Herbert Hoover. Passage 2 is adapted from Jean Toomer, "American Letter." ©1993 by Oxford University Press. Originally published in 1929. Hoover, a Republican, gave this speech during his successful campaign for president. Toomer was a novelist and poet during the Harlem Renaissance.

**Passage 1**

The foundations of progress and prosperity are dependent as never before upon the wise policies of government, for government now touches at a thousand points the intricate web of economic and social life. Under administration by the Republican Party in the last 7 1/2 years our country as a whole has made unparalleled progress. . . . Prosperity is no idle expression. It is a job for every worker, it is the safety and the safeguard of every business and every home. A continuation of the policies of the Republican Party is fundamentally necessary to the further advancement of this progress and to the further building up of this prosperity.

. . . The first necessity of any nation is the smooth functioning of the vast business machinery for employment, feeding, clothing, housing and providing luxuries and comforts to people. Unless these basic elements are properly organized and function, there can be no progress in business, in education, literature, music or art. There can be no advance in the fundamental ideals of a people. A people cannot make progress in poverty. . . .

My conception of America is a land where men and women may walk in ordered freedom in the independent conduct of their occupations; where they may enjoy the advantages of wealth, not concentrated in the hands of the few but spread through the lives of all, where they build and safeguard their homes, and give to their children the fullest advantages and opportunities of American life; where every man shall be respected in the faith that his conscience and his heart direct him to follow; where a contented and happy people, secure in their liberties, free from poverty and fear, shall have the leisure and impulse to seek a fuller life.

Some may ask where ail this may lend beyond mere material progress. It leads to a release of the energies of men and women from the dull drudgery

of life to a wider vision and a higher hope. It leads to the opportunity for greater and greater service, not alone from man to man in our own land, but from our country to the whole world.

**Passage 2**

[The election of Herbert Hoover] means that the direction we have taken since the World War will be continued and accelerated. Personally, I think this is a hopeless direction. . . . I am basing my opinion on the testimony of those who outwardly support this direction and appear to profit by it. For these same people, in their sincere inner lives and feelings, reject it and know they are not profiting by it. Yes, any number of business men like business as a game. It is good sport. But there are many who feel that it is a dirty game, a burden, a thing to be rid of as quickly as possible. . . . Thousands of business men impatiently await the day when they can quit. . . . This is not the attitude of one who values a thing. On the contrary. This is the attitude of one who hates a thing. . . .

The election also means that Business will increase its domination over all other forms of American life. The arts, sciences, and professions, will be even more constrained to take the tempo and technique of commerce, industry finance, and advertising. . . .

Bernard Shaw<sup>1</sup> has pointed out that business in its proper sphere is, as it were, quite all right; but that when it assumes the role of governing, as in America it is a source of destructive behavior. Well, we are on the way to seeing business not only assume the role of governing, but be the government, more, be America. Soon we will say, America is Business.

We have some literature. We have great quantities of literary-business. We have some art. Quantities of art-business. We have some excellent physicians and dentists. We have a great deal of medical and dental business. And so on. Education, science, religion, philosophy, in short, all professions and all forms of culture are coming to be but branches of Big Business.

The majority of the American people appear to wish just this.

Also, it seems, the majority of us wish another war. At any rate, we are not willing to risk the loss of five dollars in order to avert another war. We know quite well that we are over-producing. We also know that over- production, together with a surplus of capital, leads necessarily to the establishment of

foreign markets; and that competition for these markets brings nations to war. But over-production is, it appears, an inevitable part of our Prosperity. At all costs, we must have Prosperity.

<sup>1</sup> Irish playwright

31

As used in line 8, “idle” most nearly means

- A) empty.
- B) still.
- C) wasted.
- D) lazy.

32

Based on Passage 1, Hoover would probably agree that if he were defeated in the 1928 US presidential election, one likely outcome for the nation would be that

- A) industries would start to prioritize the manufacture of luxuries over that of basic goods.
- B) corruption in business enterprises would increase and threaten the nation's well-being.
- C) the range of occupations pursued by US residents would begin to narrow.
- D) the economy would not grow at the rate that it did prior to the election.

33

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

- A) Lines 1-5 (“The foundations ... life”)
- B) Lines 10-13 (“A continuation ... prosperity”)
- C) Lines 14-17 (“The first ... people”)
- D) Lines 23-25 (“My conception ... occupations”)

34

Which choice from Passage 2 best supports the idea that Toomer recognizes that his views regarding the new administration may be unpopular?

- A) Lines 48-50 (“For... by it”)
- B) Lines 59-61 (“The election ... life”)
- C) Lines 76-79 (“Education... Business”)
- D) Lines 80-81 (“The majority ...this”)

35

Based on Passage 2, Toomer would most likely favor a political candidate who aims to

- A) provide incentives for businesses to sponsor artistic enterprises.
- B) support the expansion of artistic professions other than that of scientific professions.
- C) break up business enterprises that have generated high profits.
- D) use the government's power to limit the influence of business interests.

36

As used in line 67, “assumes” most nearly means

- A) undertakes.
- B) pretends.
- C) supposes.
- D) expects.

37

In context, the tone of Toomer’s remark in line 91 of Passage 2 (“At all.... Prosperity”) is best described as one of

- A) acceptance, since he recognizes that the pursuit of profit is necessary.
- B) scorn, since he disdains the relentless pursuit of profit.
- C) resolve, since he knows that prosperity cannot be achieved without sacrifice.
- D) resignation, since he believes that his views on prosperity are generally misunderstood.

38

Which statement best describes the relationship between the passages?

- A) Passage 1 cautions against the adoption of a view that Passage 2 presents in favorable terms.
- B) Passage 1 offers a comprehensive remedy for a problem that Passage 2 considers to be insoluble.
- C) Passage 1 supports the continuation of a social pattern that Passage 2 challenges.
- D) Passage 1 celebrates as unique a national characteristic that Passage 2 finds to be commonplace.

39

Based on Passage 2, Toomer would challenge Hoover’s claim in lines 37-39 (“It leads ... hope”) most likely by citing the

- A) public’s expression of hopelessness upon the election of Hoover.
- B) opinions of many businessmen regarding the prospect of retirement.
- C) opposition among artists to Hoover’s candidacy for the presidency.
- D) public’s newfound anxiety regarding the prospect of international war.

40

Which choice from Passage 2 provides the best evidence for the answer to the previous question?

- A) Lines 45-46 (“Personally ... direction”)
- B) Lines 54-55 (“Thousands ... quit”)
- C) Lines 72-74 (“We have some ... art-business”)
- D) Lines 83-84 (“At any ... war”)

41

Which statement is an assumption made in Passage 1 by Hoover about a flourishing business environment that Toomer (Passage 2) would likely dispute?

- A) It is ultimately beneficial to the nation’s cultural life.
- B) It is dependent on the cooperation of management and labor.
- C) It is likely to increase the availability of goods to the general public.
- D) It is highly regarded by politicians regardless of affiliation.

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

This passage is adapted from Oswald J. Schmitz, *The New Ecology: Rethinking a Science for the Anthropocene*. ©2017 by Princeton University Press.

In the early 1990s, Gary Polis, a professor at the University of California at Davis who studied how food webs were regulated, began to question the notion that ecosystems are self-contained when the facts from his own research on oceanic island ecosystems off Baja California did not conform to the prevailing theory. For example, oceanic island ecosystems are sharply separated from each other and from the mainland by large distances and a seemingly impermeable saltwater barrier. These inhospitably arid islands, being mostly covered by *Opuntia* cactus, had low primary productivity. Herbivorous insect species were accordingly rare. The islands nevertheless supported extraordinarily high abundances of spider predators; more so on smaller than on larger islands. This didn't make sense in light of reigning ecological principles. Larger island and intact mainland ecosystems should be more likely to support longer food chains and greater abundances because they are more productive and provide more living space.

Polis and colleagues discovered that island ecosystems are not self-contained, self-supporting entities and that the internal working of an island ecosystem closely involves the size of the island and what flows across its boundary. Instead of concentrating solely within the island ecosystem, they focused on the flow of nutrients and materials across the island boundary. This led to the discovery that the boundary of the island—the shoreline—was not impermeable. Dead algae and drowned animal carcasses that washed up onto the shore from oceanic drift provided important subsidies for the island economies. The shoreline sustained high abundances of detritivorous insect species that consumed the algae and scavenged the decomposing carcasses. The detritivorous insects became an abundant resource that sustained the predatory spiders and scorpions. The detritus subsidy from the ocean propped up the island economy.

The smaller islands supported more predators because of their physical properties. Smaller islands have a higher ratio of perimeter to area, meaning that they have more shoreline relative to their overall area than do larger islands. This allows consumers from

all over the small island to access the subsidy. By contrast, individuals living in the middle of the larger islands have a lower likelihood of encountering the subsidy. That is, the heterogeneous spatial arrangement of species and resources across the islands mattered considerably. This challenged another classical view: that resources and species are evenly—homogeneously—arranged in space within self-contained ecosystems.

The abnormally high abundance of predators led to a feedback in which the abundant predator trophic level controlled the abundance of the island's herbivorous insects, thereby further contributing to their rarity on the islands. This lessens the insect damage to plants. Hence the effects of the subsidy reverberate throughout the entire island food web.

The lesson here is that two very different kinds of ecosystems can be inextricably linked through resource flows across their boundaries. The amount of subsidy provided and its attendant ecosystem-wide effects depend on the spatial arrangement of the donor and recipient ecosystems and on the species interactions within both of them. If, for example, marine production is altered by environmental impacts, or from species imbalances in the marine food chain due to, say, overfishing, then the amounts of algae and animal carcasses that subsidize the island economies become altered too. Shut off the marine subsidy completely and the island ecosystem is likely to collapse to a barren desert.

**Table 1**  
Number of Spiders per Cubic Meter of Cactus  
and Total Length of Insects per Trap per Day  
in Baja California Area

Area surveyed	Number of spiders per cubic meter of cactus	Millimeters of insects per trap per day
Small islands (<0.5 square kilometers)	25.5	13.4
Large islands (>0.5 square kilometers)	6.7	7.9
Mainland	0.3	4.0

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**Table 2**

Number of Spiders per Square Meter of Land Surface Area and Total Length of Insects per Trap per Day in Shoreline and Inland Areas of Baja California Islands

Region surveyed	Number of spiders per square meter of land surface area	Millimeters of insects per trap per day
Shoreline	0.155	175.8
Inland (100-200 meters from shoreline)	0.025	1.6

Figures adapted from Gary A. Polis and Stephen D. Hurd, "Extraordinarily High Spider Densities on Islands: Flow of Energy from the Marine to Terrestrial Food Webs and the Absence of Predation." ©1995 by National Academy of Sciences.

42

The main purpose of the passage is to

- A) present research that supports the view that large ecosystems tend to support greater species diversity than do small ecosystems.
- B) discuss a study that shows how a seemingly independent ecosystem can be influenced by another ecosystem.
- C) describe findings that resolve a long-standing debate about the permeability of boundaries between ecosystems.
- D) explain the leading ecological theory regarding island ecosystems and present the data supporting that theory.

43

In the first paragraph, the author most likely mentions the climate of the Baja California islands and the main plant found there in order to

- A) illustrate how the islands have been affected by the ecological subsidy that they receive.
- B) contrast the environment of the islands with that of the nearby mainland.
- C) provide context that helps suggest why the islands abundance of predatory spiders needed explanation.
- D) offer potential reasons why predatory spiders are more abundant on small islands than on large islands.

44

Based on the passage, Polis's results would have been more consistent with prevailing ecological principles at the time of his study if he had found that the

- A) number of predatory spiders increased in relation to the Size of the ecosystem being observed.
- B) abundance of predatory spiders was greater on large islands than on the mainland.
- C) islands with low primary productivity supported the greatest number of predatory spiders.
- D) length of island food chains did not vary with the abundance of predatory spiders.

45

As used in line 51, "challenged" most nearly means

- A) stimulated.
- B) dared.
- C) required proof of.
- D) called into question.

46

Based on the passage, a decline in the abundance of predatory spiders on the Baja California islands would most likely lead to

- A) an imbalance in the marine food chain.
- B) an increase in plant damage caused by insects.
- C) a rise in resource flows across ecosystem boundaries.
- D) a reduction in the subsidy received by detritivorous insects.

47

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

- A) Lines 55-60 (“The abnormally ... plants”)
- B) Lines 62-64 (“The lesson ... boundaries”)
- C) Lines 64-68 (“The amount ... them”)
- D) Lines 69-73 (“If, for ... too”)

48

As used in line 38, “sustained” most nearly means

- A) nourished.
- B) survived.
- C) confirmed.
- D) prolonged.

49

Which choice provides a likely explanation for the differences in the data collected from the small islands and the large islands in table 1 that is consistent with information found in the passage?

- A) The total amount of shoreline is greater on the Small islands than it is on the large islands.
- B) More ocean detritus washes up on the small islands than washes up on the large islands.
- C) The small island ecosystems have lower primary productivity than do the ecosystems of the large islands.
- D) Insects on the small islands have more relative access to ocean detritus than do insects on the large islands.

50

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

- A) Lines 34-38 (“The shoreline ... scorpions”)
- B) Lines 39-40 (“The detritus ... economy”)
- C) Lines 42-46 (“Smaller ... subsidy”)
- D) Lines 51-54 (“This ... ecosystems”)

51

According to table 2, what is the number of spiders per square meter of land surface area in the shoreline regions of the Baja California islands?

- A) 0.025
- B) 0.155
- C) 1.6
- D) 175.8

52

The data presented in table 2 most directly support which claim about the Baja California islands that is advanced in the passage?

- A) Small islands support higher numbers of both predators and prey than do large islands.
- B) Species and resources are unevenly arranged in space within the island ecosystems.
- C) The greater abundance of predators on small islands lessened the damage to plants on these islands.
- D) Large islands have less shoreline relative to area than do small islands.

**STOP**

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



# Writing and Language Test

35 MINUTES, 44 QUESTIONS

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

## DIRECTIONS

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

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

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

Questions 1-11 are based on the following passage.

### Whose Adagio Is It Anyway?

As the story goes, it was 1948, and musicologist Remo Giazotto was about to **1** junk a stack of unneeded documents from his research on **2** Venetian composer, Tomaso Albinoni when a stray scrap of paper fell to the floor. On the Paper, Giazotto claimed, was a

1

- A) NO CHANGE
- B) do away with
- C) banish
- D) discard

2

- A) NO CHANGE
- B) Venetian composer Tomaso Albinoni
- C) Venetian, composer Tomaso Albinoni,
- D) Venetian composer: Tomaso Albinoni,

fragment of notated music **3** dating at the early 1700s and written by Albinoni himself. Anxious to bring this lost piece of music back to life, Giazotto set to work on a creative reconstruction that he would eventually publish in 1958 under the title *Adagio in G Minor for Strings and Organ on Two Thematic Ideas and on a Figured Bass by Tomaso Albinoni*. The popularity of *Albinoni's Adagio*, as it would come to be known, would elevate the Venetian composer from relative obscurity and assign Albinoni's name to one of the most ubiquitous pieces of classical music of the last hundred years.

To reconstruct the piece, Giazotto needed to work **4** as both a composer and historian. He wrote new material where the fragment broke off while remaining faithful to the Baroque style of Albinoni's time, which favored high contrasts, prominent string sections, and a unified mood throughout each piece. The mood Giazotto set for Albinoni's fragment is somber and pierced with yearning. The *Adagio* begins with the double bass (the lowest of the stringed instruments) marking a brooding, dirge-like rhythm, while the pipe organ **5** play a gentle introductory tune above it. When the rest of the ensemble—violins, violas, and **6** cellos—joins in, the melody cascades in an emotionally evocative torrent of sound.

3

- A) NO CHANGE
- B) dated with
- C) dating to
- D) dated by

4

Which choice best sets up the information in the next sentence?

- A) NO CHANGE
- B) as carefully as possible.
- C) in his home office in Italy.
- D) tirelessly and for months on end.

5

- A) NO CHANGE
- B) are playing
- C) plays
- D) have played

6

- A) NO CHANGE
- B) cellos;
- C) cellos,
- D) cellos

7 Albinoni considered himself a musical dilettante, meaning that he dabbled in several musical genres for his own personal pleasure. The piece has provided the musical backdrop to dozens of films, from *Flashdance* (1983) to *Manchester by the Sea* (2016). 8 In fact, it has saturated the soundtracks of so many movies that *New Yorker* film critic Anthony Lane jested that the work should be banned on-screen altogether. While its use in films may border on cliché, the *Adagio* has become the most well-known piece of music associated with Albinoni.

7

Which choice most effectively establishes the main idea of the paragraph?

- A) NO CHANGE
- B) The high drama of the *Adagio* proved to be popular, especially in the film industry.
- C) The *Adagio* has since been adapted into nonclassical versions, including one by the rock band the Doors.
- D) Other ensemble combinations, featuring guitars and clarinets, have also performed the popular *Adagio*.

8

- A) NO CHANGE
- B) Even so,
- C) In addition,
- D) All the while,

Curiously, though, Giazotto never could furnish that original scrap of paper on which he had based the famous *Adagio*, leading scholars to question if any of *Albinoni's Adagio* was Albinoni's at all. Additionally, musicologist Carolyn Gianturco revealed in 1982 that other scholarship of Giazotto's is suspect—littered with falsified sources and misleading claims. **9** Because Giazotto had long maintained that the *Adagio* was an inspired tribute, he finally admitted that he was indeed its only author. **10** In contrast, *Adagio in G Minor* is now attributed solely to Giazotto. With decades of mislabeled recordings perpetuating the **11** error; however, the fiction of Giazotto's great discovery lives on.

9

- A) NO CHANGE
- B) When
- C) While
- D) Since

10

- A) NO CHANGE
- B) Nevertheless,
- C) Furthermore,
- D) Consequently,

11

- A) NO CHANGE
- B) error, however,
- C) error. However,
- D) error, however;

Questions 12-22 are based on the following passage.

### Foreign Service, at Home and Abroad

To foster and maintain international relations, many countries appoint diplomats, individuals who represent and advocate for their respective countries on the world stage. One such person is Ana Escrogimi, a diplomat at the United States Department of State. **12** Escrogima took a trip overseas to France. That trip to France ignited her passion for overseas travel, which is why ever since then Escrogima has nurtured her interests in Arabic language and public diplomacy to work as a Foreign Service Officer (FSO).

12

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

- A) A trip to France she made that ignited her passion for overseas travel is the reason why ever since Escrogima
- B) By Escrogima taking a trip to France, her passion for overseas travel was ignited, and ever since she
- C) Ever since a trip to France ignited her passion for overseas travel, Escrogima
- D) What ignited Escrogima's passion for overseas travel was a trip to France, therefore, ever since then, she

[1] It was after a study-abroad trip to Paris,

**13** which she met people from both French-and Arabic-speaking communities, that she decided to make Arabic her fourth language. [2] With her newfound interest in Arabic language and culture, Escrogima sought out and held an internship with the US Foreign Service at the US embassy in Cairo, Egypt. [3] There, she would not only hone **14** her skills when it comes to Arabic language abilities, but in addition she would also get a taste of diplomacy in action. **15**

**13**

- A) NO CHANGE
- B) where
- C) but yet
- D) DELETE the underlined portion.

**14**

- A) NO CHANGE
- B) her ability in Arabic language skills and fluency but
- C) her Arabic language skills but
- D) the skills and competence she had with the Arabic language but she further would

**15**

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

Born in New York to parents who immigrated from the Dominican Republic, Escrogima grew up speaking English and Spanish, and she studied French in high school.

The most logical placement for the sentence is

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

In 2003, after completing her master's degree in international affairs at Columbia University, Escrogima secured a full-time position in the State Department. Officers in the US Foreign Service pursue one of five career paths: they become consular, economic, management, political, or public diplomacy officers. Escrogima chose public diplomacy, and, **16** consistent with such professions, hers required superior communication skills.

Over the next four years **17** Escrogima would serve in Tunisia, Syria, and Iraq before spending three years at the State Department's Dubai Regional Media Hub in the

16

Which choice provides the best transition to the next paragraph?

- A) NO CHANGE
- B) like most FSOs' careers, hers took her around the world and back.
- C) following in her parents' footsteps, she devoted her life to public service.
- D) several years later, she would teach a graduate-level course on diplomacy as well.

17

- A) NO CHANGE
- B) Escrogima would serve in Tunisia, Syria, and Iraq, this was before
- C) Escrogima, who would serve in Tunisia, Syria, and Iraq before
- D) Escrogima would serve in Tunisia, Syria, and Iraq. Before

United Arab Emirates. **18** In 2011, she met with the Advisory Board of the Institute for the Study of Diplomacy to discuss her experience at an invitation-only leadership seminar held at Georgetown University. Her next postings took her back to the **19** US; first to Washington, DC, as an advisor to Undersecretary for Political Affairs Wendy Sherman on issues related to Iran and the Middle East, and then home to New York, where she was appointed Diplomat in Residence at City College of New York. In the latter **20** one, she worked as a Liaison to the public, teaching classes on diplomacy in the Middle East and **21** entertaining information sessions to help educate others about the broader mission of the State Department.

18

Which choice best supports the development of the paragraph's narrative?

- A) NO CHANGE
- B) Between 2005 and 2017, she served under three different secretaries of state—Cordoleezza Rice from 2005 to 2009, Hillary Clinton from 2009 to 2013, and John Kerry from 2013 to 2017.
- C) In Dubai, she worked as an Arabic-language spokesperson, often appearing on local and pan-Arab television as a representative of the US government.
- D) In Tunisia, she was visited by her mother, who Escrogima says "has a very adventurous spirit," and together they toured Syria and Jerusalem.

19

- A) NO CHANGE
- B) US: first
- C) US first,
- D) US first

20

- A) NO CHANGE
- B) position,
- C) country,
- D) of those,

21

- A) NO CHANGE
- B) emceeding
- C) hosting
- D) accommodating



Soon, Escrogima would return overseas, holding senior diplomatic positions at US embassies for Algeria and then Yemen. Whether at home or abroad, though, Escrogima says she is energized by the constant adventure of working in the US Foreign Service: she has the opportunity to meet new people, learn about various cultures, and **22** assist the State Department in recruiting officers that better "reflect the broad spectrum of American society."

22

The writer wants to incorporate a quotation from Escrogima's City College of New York interview that supports the central idea of the passage. Which choice most effectively accomplishes this goal?

- A) NO CHANGE
- B) bear the bold responsibility of being "the face of America to the world."
- C) teach at college "dedicated to inspiring leadership, excellence, and opportunity for all."
- D) help American diplomatic relations by providing "policy advice to senior government officials."

Questions 23-33 are based on the following passage and supplementary material.

### Caught on Camera

Conservation ecologists and biologists need effective methods of collecting information about animal populations. Traditional methods for gathering these data include using **23** humane box traps to capture animals, but recent technological advances have made camera trapping—a data-collection method in which remote cameras are triggered by animals' presence or set to take pictures at regular intervals—a viable alternative. In a study published in 2017, Texas A&M University researchers performed an experiment to compare the two methods.

23

- A) NO CHANGE
- B) benevolent
- C) civilized
- D) kind

[1] For the first part of their study, **24** with the researchers setting box traps in two locations within Texas's Sabine National Forest. [2] The next fall, the research team removed the box traps and **25** would mount digital cameras traps, each of which took a picture every 30 seconds (a frequency that would enable the cameras to capture images of any reptiles passing by their lenses), in the same two locations. [3] The researchers left the cameras in place for 56 days, and at the end of the period they analyzed the 166,840 pictures that had been produced. [4] Over 51 days, the **26** researcher's checked the trap's every three days to identify and tally all scaled reptiles, such as snakes, caught in the traps. **27**

24

- A) NO CHANGE
- B) as the researchers set
- C) the researchers setting
- D) the researchers set

25

- A) NO CHANGE
- B) mounts
- C) had mounted
- D) mounted

26

- A) NO CHANGE
- B) researcher's checked the traps
- C) researchers checked the traps
- D) researchers checked the trap's

27

To make this paragraph most logical, sentence 4  
Should be placed

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

Comparing the population data collected using box traps **28** with the camera traps, the researchers found that the camera traps were able to provide information about more species of reptiles than the box traps did. The box traps were able to capture just **29** 7 species, all of which were lizards. In contrast, the camera traps detected **30** 144 species of lizards, 6 species of snakes, and 150 total reptiles. Although the camera traps were unable to detect some of the snake species identified using the box traps, they were able to provide information on several lizard species that researchers suspected were able to evade the box traps.

Reptiles by Box Trap Captures  
and Camera Trap Detections

Species	Box trap captures	Camera trap detections
Green anole	0	27
Prairie lizard	0	95
Six-lined racerunner	0	21
Coal skink	0	1
Total lizards	0	144
Coachwhip	5	5
Cottonmouth	0	1
Copperhead	1	0
Corn snake	1	0
Total snakes	7	6
Total reptiles	7	150

Adapted from Connor S. Adams et al., "Evaluating Effectiveness and Cost of Time-Lapse Triggered Camera Trapping Techniques to Detect Terrestrial Squamate Diversity." ©2017 by Society for the Study of Amphibians and Reptiles. [www.satqas.com](http://www.satqas.com)

28

- A) NO CHANGE  
 B) with the data collected using camera traps,  
 C) and camera traps,  
 D) DELETE the underlined portion, adjusting the punctuation as needed.

29

Which choice provides the most accurate description of the information in the table?

- A) NO CHANGE  
 B) 3 species of lizards.  
 C) 7 reptiles, including a combination of snakes and lizards.  
 D) 3 species, all of which were snakes, and 7 total reptiles.

30

The writer wants to use accurate data from the table to support the comparison between box traps and camera traps. Which choice best accomplishes this goal?

- A) NO CHANGE  
 B) 4 species of lizards, 6 species of snakes,  
 C) 6 species, including both snakes and lizards,  
 D) 27 lizards, 6 species of snakes,

Despite the attractiveness of camera trapping for gathering information, the researchers cautioned that the benefits of using box traps, **31** likewise, should not be disregarded. Among other advantages, box traps allow scientists to inspect animals more closely, perform health screenings, and collect genetic data. Depending on how often box traps are checked, camera trapping may also be more **32** expensive, especially for short-term studies. This is because initial start-up costs for camera traps are high. However, the experiment with the two types of traps **33** show that camera trapping can be an efficient tool for researchers to learn about an area's animal populations.

31

- A) NO CHANGE
- B) therefore,
- C) for example,
- D) DELETE the underlined portion, adjusting the punctuation as needed.

32

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

- A) expensive (since initial start-up costs for camera traps are high), especially for short-term studies.
- B) expensive, especially for short-term studies, which is because of the high initial start-up costs associated with camera traps.
- C) expensive because of the high initial start-up costs of camera traps, and this is especially true for short-term studies.
- D) expensive, and moreover this is especially true for short-term studies, because camera traps come with high initial start-up costs.

33

- A) NO CHANGE
- B) have shown
- C) shows
- D) were showing

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

### Uncanny Valley: Fact or Fiction?

In 1970, **34** roboticist, Masahiro Mori proposed a hypothesis to account for an emerging challenge in his field—namely, that **35** you will experience a sense of unease if you encounter a robot that looks too much like a human. The problem, he argued, is that a robot's likability has a nonlinear relationship with the degree to which it resembles a human. That is, robots **36** baring little or no resemblance to humans illicit little response, and as robots resemble humans more closely, their likability increases, with moving robots that completely resemble humans being the most likable. However, Mori

34

- A) NO CHANGE
- B) roboticist Masahiro Mori,
- C) roboticist Masahiro Mori
- D) roboticist, Masahiro Mori,

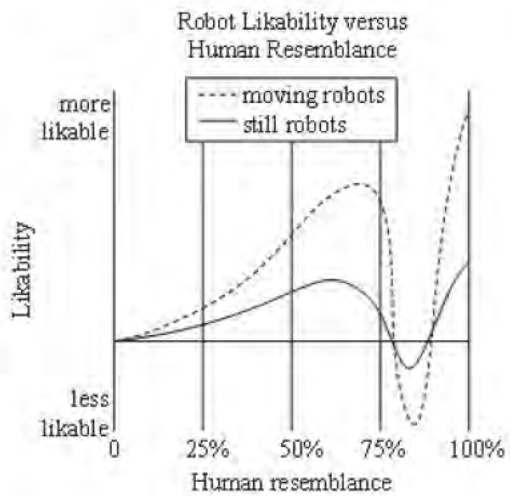
35

- A) NO CHANGE
- B) if a robot looks a whole lot like a real human, it makes folks' skin crawl.
- C) when a robot doth a human resemble, the beholder must assuredly tremble.
- D) people react negatively to robots that closely resemble human beings.

36

- A) NO CHANGE
- B) baring little or no resemblance to humans elicit
- C) bearing little or no resemblance to humans illicit
- D) bearing little or no resemblance to humans elicit

speculated that likability plummets for robots in the 75 to 90 percent human resemblance range **37** but that the drop occurs only if the robots are moving. Mori's name for this proposed zone of decreased likability—the uncanny valley—alludes to the eeriness and unfamiliarity evoked by **38** his uncanny valley hypothesis.



Adapted from Masahiro Mori, "The Uncanny Valley." ©1970 by Masahiro Mori. More sat tests : [www.satqas.com](http://www.satqas.com)

37

Which choice most accurately represents the information in the graph?

- A) NO CHANGE
- B) and that the drop is more pronounced for moving robots.
- C) but that the change in likability is identical for moving and still robots.
- D) and that still robots in this range are the least likable.

38

- A) NO CHANGE
- B) it.
- C) that.
- D) these almost-but-not-quite-human robots.

Though Mori's hypothesis initially received little **39** attention that the concept has crept into popular culture, mainly to explain why computer-generated imagery (CGI) in movies sometimes alienates audiences. One reviewer of the 2017 film *Justice League*, for instance, invoked the hypothesis to criticize the **40** filmmakers' decision to hide an actor's mustache under a clean-shaven CGI mouth, writing that the actor had "an uncanny-valley thesis statement resting on his top lip." **41** Although *The Polar Express* is another film often used as an example of the uncanny valley, critics who casually employ the concept should remember that Mori's original graph does not represent actual data collected in a scientific study. In fact, those who have conducted such studies have reached an important conclusion: the uncanny valley might not exist.

39

- A) NO CHANGE
- B) attention,
- C) attention because
- D) attention, while

40

- A) NO CHANGE
- B) filmmakers' decision to hide an actors'
- C) filmmaker's decision to hide an actors
- D) filmmakers decision to hide an actor's

41

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

- A) NO CHANGE
- B) While *Justice League* also featured other CGI characters who were less "uncanny,"
- C) Even though the idea of the uncanny valley has become a convenient shorthand for describing off-putting CGI,
- D) Given that Mori's hypothesis was first published in 1970,



Psychologists from Emory University conducted an extensive review of existing research on the uncanny valley, finding "mixed and at times contradictory" evidence supporting its existence. **42** Without consistent terminology, it is likely that studies are measuring different—though related—phenomena. The Emory team concluded that, while the hypothesis is plausible, the empirical evidence is ultimately inconclusive about whether a robot's likability and its human resemblance share the relationship proposed by Mori.

42

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

Importantly, they found that *shinwakan*, a Japanese term used by Mori, has been inconsistently translated as "likability," "affinity," and "familiarity" across studies.

Should the writer make this addition here?

- A) Yes, because it provides necessary context to understand the discussion of "consistent terminology" later in the paragraph.
- B) Yes, because it illustrates how scientific terminology can change over time.
- C) No, because it does not specify which studies translate *shinwakan* as "familiarity."
- D) No, because it repeats information about Mori's hypothesis presented earlier in the passage.

That film critics uncritically accept the uncanny valley as a proven fact is not surprising given the many misconceptions about human psychology that **43** soak popular culture. Still, as CGI and robots increasingly become fixtures of society, those who discuss such matters **44** can increase their knowledge by reading Sigmund Freud's essay "The Uncanny."

43

- A) NO CHANGE
- B) drench
- C) submerge
- D) permeate

44

Which choice provides the best conclusion to the passage?

- A) NO CHANGE
- B) have the obligation to heed the evidence.
- C) should advocate for more realistic CGI in movies.
- D) might want to spend more time around humanoid robots.

**STOP**

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



# Math Test – No Calculator

25 MINUTES, 20 QUESTIONS

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

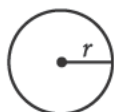
## DIRECTIONS

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

## NOTES

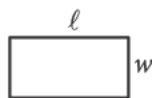
- The use of a calculator **is not permitted**.
- All variables and expressions used represent real numbers unless otherwise indicated.
- Figures provided in this test are drawn to scale unless otherwise indicated.
- All figures lie in a plane unless otherwise indicated.
- Unless otherwise indicated,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

## REFERENCE

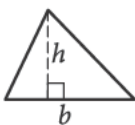


$$A = \pi r^2$$

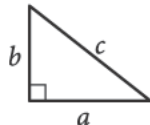
$$C = 2\pi r$$



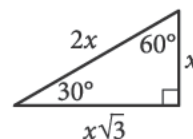
$$A = \ell w$$



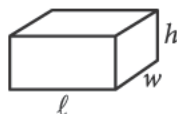
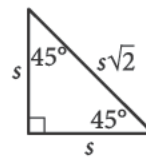
$$A = \frac{1}{2}bh$$



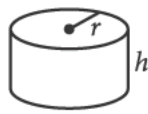
$$c^2 = a^2 + b^2$$



Special Right Triangles



$$V = \ell wh$$



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



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



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



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

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

The number of radians of arc in a circle is  $2\pi$ .

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



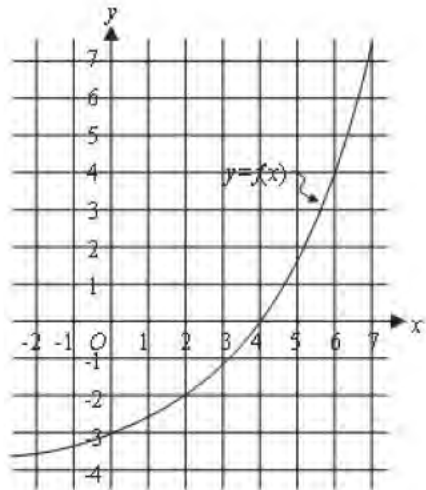
1

$x$	$y$
5	14
10	24
15	34

The table shows some values of  $x$  and their corresponding values of  $y$ . There is a linear relationship between  $x$  and  $y$ . Which of the following equations represents this relationship?

- A)  $y = \frac{1}{2}x + 2$
- B)  $y = \frac{1}{2}x - 2$
- C)  $y = 2x + 4$
- D)  $y = 2x - 4$

2



The graph of the exponential function  $f$  is shown. For what value of  $x$  is  $f(x) = 0$ ?

- A) -4
- B) -3
- C) 0
- D) 4

3

$$x - 6 = 50$$

What value of  $x$  is the solution to the given equation?

- A) -10
- B) 44
- C) 55
- D) 56



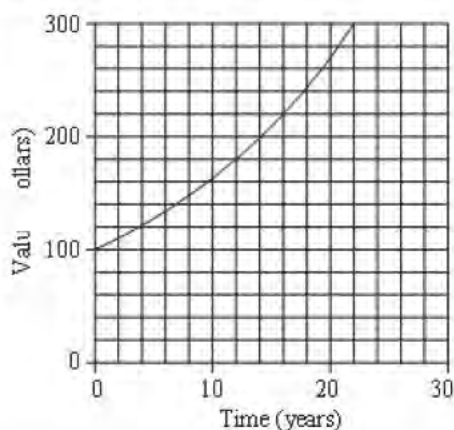
4

The function  $g$  is defined by  $g(x) = 2x + 1$ .  
What is the value of  $g(x)$  when  $x = 1$ ?

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

5

The graph shown models the value, in dollars, of an investment account over time, in years, after an original amount is deposited.

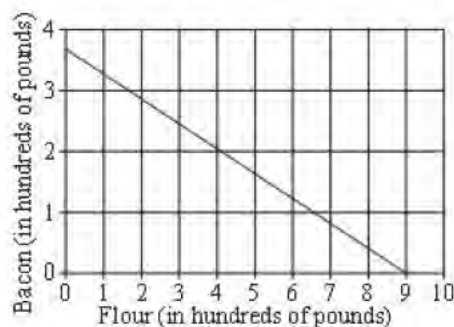


According to the graph, how many years does it take for the value of the investment account to double?

- A) 2
- B) 3
- C) 7
- D) 14

6

In 1845, a family had \$18.00 to purchase flour and bacon for their trip along the Oregon Trail to California. The graph shows the possible combinations of flour and bacon, in hundreds of pounds, they could purchase.



Based on the graph, what was the price of 100 pounds of flour?

- A) \$1.00
- B) \$2.00
- C) \$2.50
- D) \$5.00



7

$$r^q = t^s$$

The given equation relates the distinct positive real numbers  $q$ ,  $r$ ,  $s$  and  $t$ . Which equation correctly expresses  $t$  in terms of  $q$ ,  $r$ , and  $s$ ?

- A)  $t = r^{\frac{q}{s}}$
- B)  $t = r^{\frac{s}{q}}$
- C)  $t = r^{q-s}$
- D)  $t = \frac{r^q}{s}$

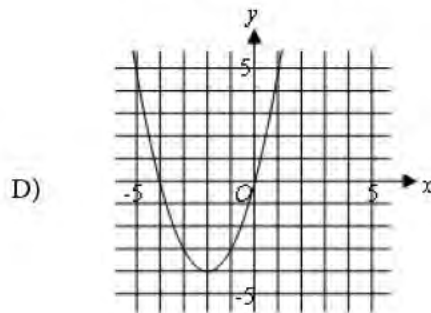
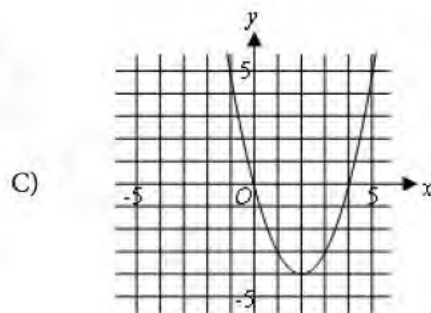
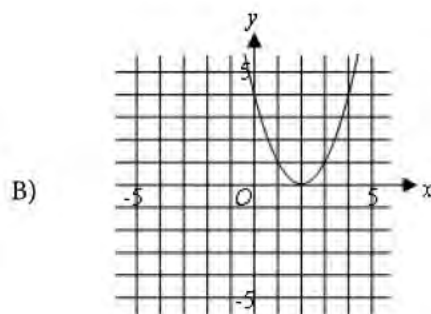
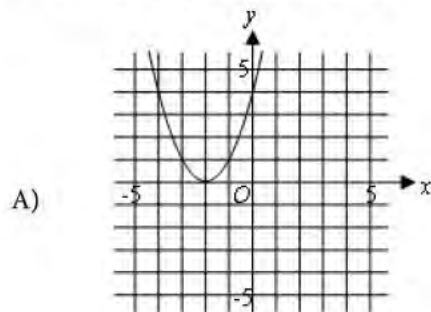
8

Which polynomial is equivalent to  $(x^2 + 7)(12x^3 - 6)$ ?

- A)  $12x^6 - 42$
- B)  $12x^3 + x^2 + 1$
- C)  $12x^5 + 84x^3 - 6x^2 - 42$
- D)  $12x^6 + 84x^3 - 6x^2 - 42$

9

What is the graph of the equation  $y = (x + 2)^2 - 4$ ?





10

$$p(x) = (x + 1)(x + 2)(x + 3)$$

If the given function  $p$  is graphed in the  $xy$ -plane,  
Where  $y = p(x)$ , what is an  $x$ -intercept of the graph ?

- A)  $(-6, 0)$
- B)  $(-3, 0)$
- C)  $(3, 0)$
- D)  $(6, 0)$

11

$$y = 3x + 12$$

One of the two linear equations in a system is given.  
The system has no solution. Which equation could  
be the second equation in the system ?

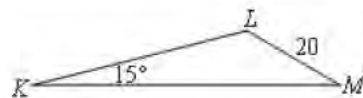
- A)  $y = 3(x + 3)$
- B)  $y = 3(x + 4)$
- C)  $y = 4(x + 3)$
- D)  $y = 4(x + 4)$

12

Which expression is equivalent to  $\sin 50^\circ$  ?

- A)  $\cos 50^\circ$
- B)  $\cos 40^\circ$
- C)  $\tan 50^\circ$
- D)  $\sin 40^\circ$

13



Triangle  $KLM$  (shown) is similar to triangle  $RST$  (not shown). For these triangles  $\angle R$  and  $\angle S$  correspond to  $\angle K$  and  $\angle L$ , respectively and  $RS = 3KL$ . Which of the following statements is(are) true ?

- I. The measure of  $\angle R$  is  $45^\circ$ .
- II.  $ST = 60$

- A) I only
- B) II only
- C) I and II
- D) Neither I nor II



14

Kiara uses her propane grill for an average of 11 hours each week. Her grill can run an average of 18 hours per 20-pound tank. Kiara would like to reduce her weekly expenditure on propane by \$5. Assuming propane costs \$16 per 20-pound tank, which equation can Kiara use to determine how many fewer average hours,  $h$ , she should use her grill each week?

- A)  $\frac{18}{16}h = 6$
- B)  $\frac{18}{16}h = 5$
- C)  $\frac{16}{18}h = 6$
- D)  $\frac{16}{18}h = 5$

15

Which of the following expressions is equivalent to  $(2\sqrt{x} - \sqrt{y})^{\frac{2}{5}}$ , where  $x > y$  and  $y > 0$ ?

- A)  $(4x - y)^5$
- B)  $\sqrt[5]{4x - y}$
- C)  $(4x - 4\sqrt{xy} + y)^{\frac{1}{5}}$
- D)  $\sqrt[5]{4x - 4xy + y}$



**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 bubbles accurately. You will receive credit only if the bubbles are filled in correctly.
- Mark no more than one bubble 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  $7/2$ . (If  $\begin{array}{|c|c|c|c|} \hline 3 & 1 & / & 2 \\ \hline \text{Ⓢ} & \text{Ⓢ} & \text{Ⓢ} & \text{Ⓢ} \\ \hline \end{array}$  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
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
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Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ

← Fraction line

Grid in result. →

Answer: 2.5

	2	.	5
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ

← Decimal point

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

	2	/	3
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ

.	6	6	6
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ

.	6	6	7
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
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Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ

Answer: 201 – either position is correct

	2	0	1
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
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Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ

2	0	1	
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
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Ⓢ	Ⓢ	Ⓢ	Ⓢ
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Ⓢ	Ⓢ	Ⓢ	Ⓢ
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Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ

**NOTE:**

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



16

$$2|4-x| + 3|4-x| = 25$$

What is the positive solution to the given equation?

17

The function  $f$  is defined by  $f(x) = -2x + 8$ . The  $x$ -intercept of the graph of  $y = f(x)$  in the  $xy$ -plane is  $(x, 0)$ . What is the value of  $x$ ?

18

$$6x - y = -4$$

$$9x - y = -3$$

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

19

$$x^2 - 3x + 1 = 0$$

One solution to the given equation can be written

as  $\frac{3 - \sqrt{n}}{2}$ , where  $n$  is a constant. What is the

value of  $n$ ?

20

The measure of angle  $A$  is  $\frac{7}{12}\pi$  radians greater than

the measure of angle  $B$ . How much greater is the measure of angle  $A$  than the measure of angle  $B$ ,

in degrees? (Disregard the degree symbol when entering your answer.)

**STOP**

**If you finish before time is called, you may check your work on this section only.**

**Do not turn to any other section.**



# Math Test – Calculator

55 MINUTES, 38 QUESTIONS

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

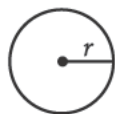
## DIRECTIONS

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

## NOTES

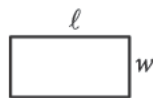
1. The use of a calculator **is permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated,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

## REFERENCE

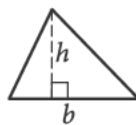


$$A = \pi r^2$$

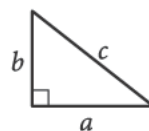
$$C = 2\pi r$$



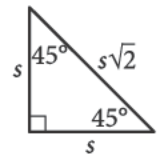
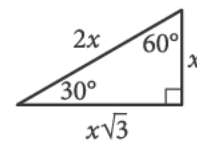
$$A = \ell w$$



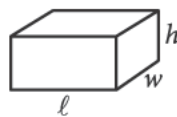
$$A = \frac{1}{2}bh$$



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



Special Right Triangles



$$V = \ell wh$$



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



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



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



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

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

The number of radians of arc in a circle is  $2\pi$ .

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



1

A school choir has 42 members: 8 freshmen, 11 sophomores, 14 juniors, and 9 seniors. If one member of the choir is selected at random to sing a solo, what is the probability of selecting a senior?

- A)  $\frac{1}{9}$
- B)  $\frac{9}{42}$
- C)  $\frac{9}{33}$
- D)  $\frac{33}{42}$

2

An object is kicked from a platform. The equation  $h = -4.9t^2 + 15t + 5$  represents this situation, where  $h$  is the height of the object above ground, in meters,  $t$  seconds after it is kicked. Which number represents the height, in meters, of the platform?

- A) 0
- B) 4.9
- C) 5
- D) 15

3

If  $m\%$  of 300 is 150, what is  $m\%$  of 180?

- A) 45
- B) 90
- C) 120
- D) 360

4

Which expression is equivalent to  $2x^5(x^3 + 5x)$ ?

- A)  $3x^8 + 7x^6$
- B)  $3x^{15} + 7x^5$
- C)  $2x^8 + 10x^6$
- D)  $2x^{15} + 10x^5$

5

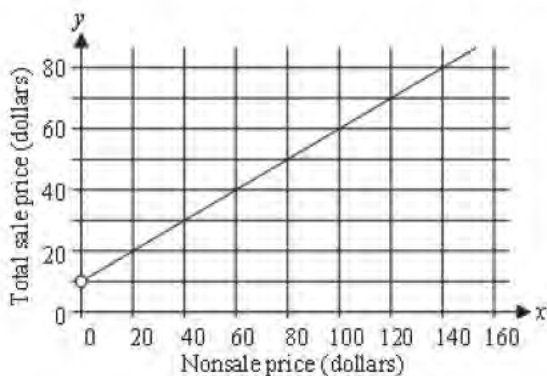
If  $4x + 16 = 24$ , what is the value of  $2x + 8$ ?

- A) 14
- B) 12
- C) 10
- D) 8



6

The given graph shows the relationship between the prices during an online sale, where  $x$  is the nonsale price, in dollars, of an item and  $y$  is the total sale price, in dollars, of the item, including a shipping fee.

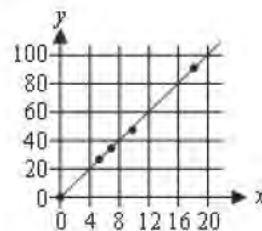


Which equation represents the relationship between  $x$  and  $y$ ?

- A)  $y = 2x + 10$
- B)  $y = 2x - 10$
- C)  $y = \frac{1}{2}x + 10$
- D)  $y = \frac{1}{2}x - 10$

7

The scatterplot shows the relationship between two variables,  $x$  and  $y$ . A line of best fit is also shown.



What is an equation for the line of best fit shown?

- A)  $y = 0.2x$
- B)  $y = 4.9x$
- C)  $y = 0.2 + x$
- D)  $y = 4.9 + x$

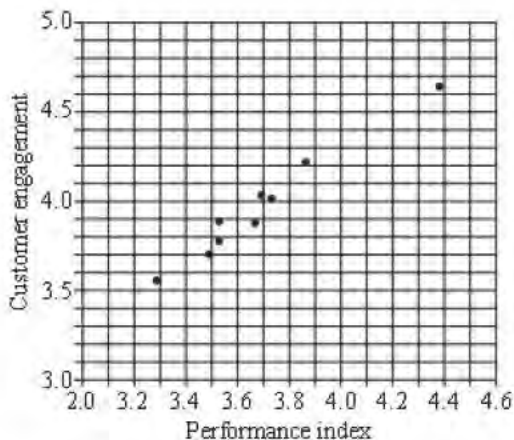


8

A solution is formed by adding  $m$  grams of propylene glycol to 100 grams of water. For this solution, the freezing point, in kelvins, is modeled by the function  $T(m) = 273.2 - 0.327m$ . Which of the following is the best interpretation of the statement " $T(22)$  is approximately equal to 266" in this context?

- A) A solution formed by adding 22 grams of propylene glycol to 100 grams of water has an estimated freezing point of 266 kelvins.
- B) A solution formed by adding 266 grams of propylene glycol to 100 grams of water has an estimated freezing point of 22 kelvins.
- C) For every 22 grams of propylene glycol added to 100 grams of water, the freezing point of the solution is estimated to decrease by 266 kelvins.
- D) For every 266 grams of propylene glycol added to 100 grams of water, the freezing point of the solution is estimated to decrease by 22 kelvins.

9



The scatterplot shows the performance index and score for customer engagement for 9 restaurant chains. How many of these chains have a performance index greater than 4.0?

- A) 8
- B) 5
- C) 4
- D) 1

10

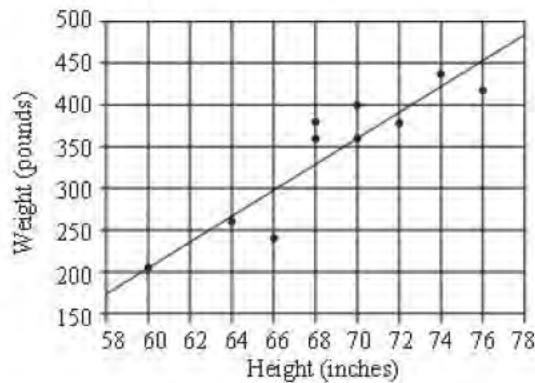
If each side of a larger square is three times as long as each side of a smaller square, how does the perimeter of the larger square compare to that of the smaller square?

- A) It is 3 times as long.
- B) It is 6 times as long.
- C) It is 9 times as long.
- D) It is 12 times as long.



Questions 11 and 12 refer to the following information.

Each data point on the scatterplot gives the height  $x$ , in inches, and weight  $y$ , in pounds, for a llama in a sample of 10 llamas. A line of best fit is also shown.



11

What is the range of the heights for the sample of 10 llamas?

- A) 16 inches
- B) 20 inches
- C) 136 inches
- D) 230 inches

12

Which of the following best approximates the equation for the line of best fit shown?

- A)  $y = -706 + 15.3x$
- B)  $y = -15.3 + 706x$
- C)  $y = 15.3 - 706x$
- D)  $y = 706 - 15.3x$

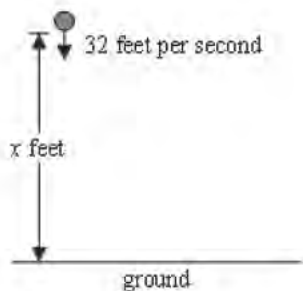
13

Based on the data from a random sample of a population, the mean value of the population was estimated to be 5.1, with an associated margin of error of 0.2. Which of the following is a plausible value for the mean of the population?

- A) 4.7
- B) 4.8
- C) 5.2
- D) 5.5



Questions 14 and 15 refer to the following information.



When a ball is thrown straight down with an initial speed of 32 feet per second, the ball hits the ground and bounces up. The equation  $y = \frac{1}{2}x + 8$  represents the relationship between the ball's initial height  $x$ , in feet, and the maximum height  $y$ , in feet, that the ball reaches after bouncing once.

14

If the initial height is 24 feet, what is the maximum height, in feet, the ball reaches after bouncing once?

- A) 12
- B) 16
- C) 20
- D) 32

15

If the maximum height the ball reaches after bouncing once is also  $x$  feet, what is the value of  $x$ ?

- A) 4
- B)  $\frac{16}{3}$
- C) 8
- D) 16

16

The Sun converts 589 million metric tons of hydrogen into helium each second. Which of the following is closest to the number of slugs of hydrogen, in millions, that are converted by the Sun each second? (1 metric ton = 68.52 slugs)

- A) 8.60
- B) 9.82
- C) 35,300
- D) 40,400





17

During an experiment, the number of phytoplankton in a population doubled each day. There were 300 phytoplankton at the start of the experiment. Which function represents the population size,  $P(x)$ ,  $x$  days after the start of the experiment?

- A)  $P(x) = 2^{300x}$
- B)  $P(x) = 300^{2x}$
- C)  $P(x) = 2(300)^x$
- D)  $P(x) = 300(2)^x$

18

The ratio of children to adults at a restaurant is 1 to 12. If there are  $x$  children at the restaurant, what expression represents the number of adults at the restaurant?

- A)  $x + 12$
- B)  $12x$
- C)  $\frac{x}{12}$
- D)  $\frac{12}{x}$

Questions 19 and 20 refer to the following information.

A certificate of deposit (CD) is an investment account in which money is deposited for a specific amount of time, called the term. The investment earns a guaranteed yearly interest during the term.

The table shows the annual percentage yields (APY) for CDs with a term of 18 months and the total interest earned on an initial deposit of \$2,000 at four different banks. Interest is calculated on the total balance of the account and added to the account after each day.

Bank	APY	Total interest earned in 18-month term
A	2.00%	\$60.91
B	1.35%	\$40.91
C	1.00%	\$30.23
D	0.65%	\$19.60

19

What is the range of the total interest earned in an 18-month term by the CDs at the banks represented in the table?

- A) \$19.60
- B) \$37.91
- C) \$41.31
- D) \$60.91



20

The total interest earned in the 18-month term at Bank B is what percentage greater than the total interest earned in the 18-month term at Bank C ?

- A) 1.4%
- B) 10.7%
- C) 26.1%
- D) 35.3%

21

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

- A) Zero
- B) Exactly one
- C) Exactly two
- D) Infinitely many

22

$$4x - 8y = -1$$

$$x + 6y = -10$$

The solution to the given system of equations is  $(x, y)$ . What is the value of  $5x - 2y$  ?

- A) 10
- B) 9
- C) -9
- D) -11

23

$$x^2 - 8x + 20 = 0$$

How many distinct real solutions does the given equation have ?

- A) Zero
- B) Exactly one
- C) Exactly two
- D) Infinitely many



24

Teachers and students will participate in a tutoring seminar, and each teacher will lead a group of no more than 8 students. The room for the seminar can hold a maximum of 58 teachers and students. If  $t$  represents the number of teachers and  $s$  represents the number of students, which system of inequalities describes the possible numbers of teachers and students who can participate in the seminar?

A)  $t + s \geq 58$

$t \leq 8s$

B)  $t + s \leq 58$

$t \geq 8s$

C)  $t + s \geq 58$

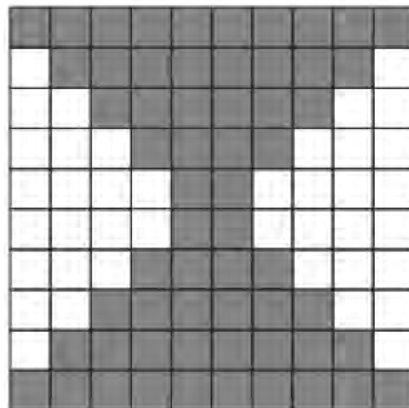
$t \geq \frac{s}{8}$

D)  $t + s \leq 58$

$t \geq \frac{s}{8}$

25

The figure shown is divided into 100 squares of equal area, where 60 squares are shaded.



If one of these squares is selected at random how much greater is the probability of selecting a shaded square than the probability of selecting a square that is not shaded?

A) 0.20

B) 0.40

C) 0.60

D) 0.80



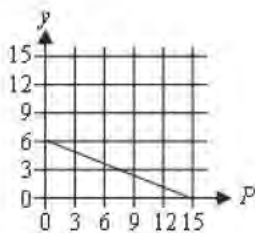
26

What is the  $y$ -intercept of the graph of  $y = a(17)^x - c$  in the  $xy$ -plane, where  $a$  and  $c$  are positive constants?

- A)  $(0, a)$
- B)  $(0, -c)$
- C)  $(0, -ac)$
- D)  $(0, a-c)$

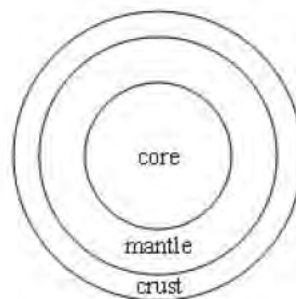
27

Alia sells nature photos and videos. She receives a fixed amount for each photo she sells and a different fixed amount for each video she sells. The graph models the possible numbers of photos  $p$ , and videos,  $v$ . Alia can sell to receive \$300. Which equation represents this situation?



- A)  $pv = 300$
- B)  $20p + 50v = 300$
- C)  $50p + 20v = 300$
- D)  $15p + 6v = 300$

28



Note: Figure not drawn to scale.

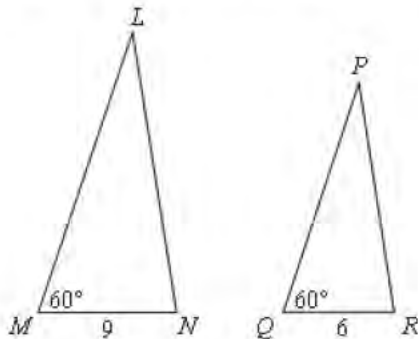
A cross section of the planet Mars is shown. Each of the three layers is spherical. The radius of Mars is approximately 3,390 kilometers and the radius of the core is about  $\frac{1}{2}$  the radius of Mars. Which of the following is closest to the total volume, in cubic kilometers of the mantle and crust combined?

- A) 27,100,000
- B) 20,390,000,000
- C) 45,500,000,000
- D) 143,000,000,000



29

Triangle  $LMN$  and triangle  $PQR$  each have an angle measuring  $60^\circ$  and a given side length, as shown.



Note: Figure not drawn to scale.

For triangles  $LMN$  and  $PQR$ , which additional piece of information is sufficient to prove that the triangles are similar?

- I. The length of line segment  $PQ$  is  $\frac{2}{3}$  the length of line segment  $LM$ .
- II. The length of line segment  $PR$  is  $\frac{2}{3}$  the length of line segment  $LN$ .
- A) I is sufficient but II is not.  
 B) II is sufficient but I is not.  
 C) I is sufficient and II is sufficient.  
 D) Neither I nor II is sufficient.

30

Value	Frequency
10	4
15	3
20	2
25	5
30	6

Which of the following statements best compares the mean and the median of the data shown in the frequency table?

- A) The median is 5 greater than the mean.  
 B) The median is 3.5 greater than the mean.  
 C) The median is equal to the mean.  
 D) The median is 1.5 less than the mean.

**DIRECTIONS**

For questions 31-38, 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 bubbles accurately. You will receive credit only if the bubbles are filled in correctly.
- Mark no more than one bubble 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  $7/2$ . (If  $\begin{array}{|c|c|c|c|} \hline 3 & 1 & / & 2 \\ \hline \bullet & \bullet & \bullet & \bullet \\ \hline \end{array}$  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. →

Grid in result. →

← Fraction line

← Decimal point

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

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

**Answer: 2.5**

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

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

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

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

Answer: 201 – either position is correct

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

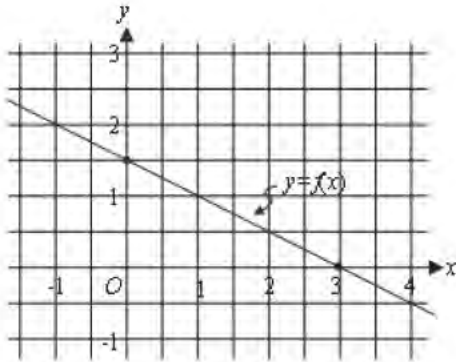
	2	0	1
•	•	•	•
	•	0	0
1	1	•	1
•	2	2	2
3	3	3	3

**NOTE:**

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

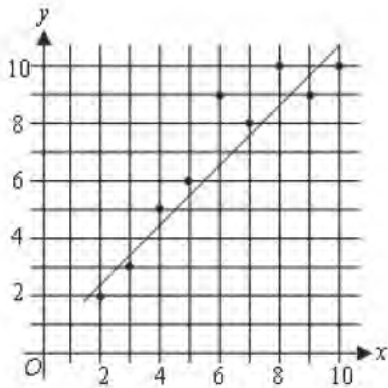


31



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

32



The scatterplot shows the relationship between two variables,  $x$  and  $y$ . A line of best fit is also shown. For how many of the data points does the line of best fit predict a greater  $y$ -value than the actual  $y$ -value?

33

The line with equation  $y = ax + b$ , where  $a$  and  $b$  are constants, has a slope of  $-2$  and passes through the point  $(3, 8)$  in the  $xy$ -plane. What is the value of  $b$ ?

34

What is 19% of 200?

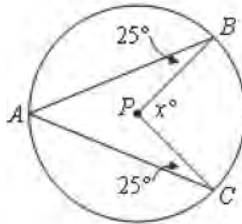
35

$$2 | x - 9 | = 20$$

What is the sum of the solutions to the given equation?



36



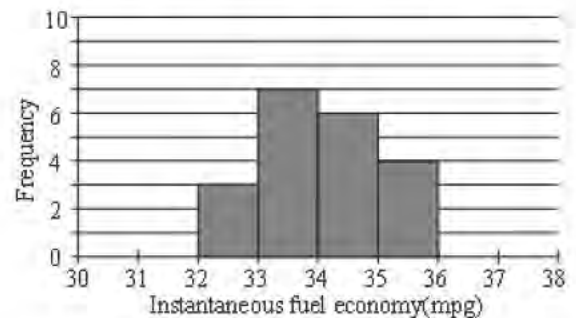
Point  $P$  is the center of the circle in the figure shown. What is the value of  $x$ ?

37

A quadratic function can be used to model the height, in feet, of an object above the ground in terms of the time, in seconds, after the object was launched. According to the model, an object was launched into the air from a height of 0 feet and reached its maximum height of 25 feet 1.25 seconds after it was launched. Based on the model, what was the height, in feet, of the object 1.00 seconds after it was launched?

38

During a car trip, a passenger recorded the car's instantaneous fuel economy, in miles per gallon (mpg), 20 different times. The histogram summarizes the distribution of these data. The first bar represents an instantaneous fuel economy of at least 32 mpg but less than 33 mpg. The second bar represents an instantaneous fuel economy of at least 33 mpg but less than 34 mpg, and so on.



During the trip, how many times did the passenger record an instantaneous fuel economy of at least 34 mpg but less than 36 mpg?

## STOP

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