

**OCTOBER 7, 2017
INTERNATIONAL**

The SAT®

Test Book

IMPORTANT REMINDERS

1

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

2

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Test begins on the next page.

Reading Test

65 MINUTES, 52 QUESTIONS

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

DIRECTIONS

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

Questions 1-10 are based on the following passage.

This passage is adapted from Barbara Kingsolver, *Flight Behavior*. ©2012 by Barbara Kingsolver. Dellarobia is taking her son Preston to see a large population of monarch butterflies that has settled in a forest near their house.

They neared the fir forest and found the air above the path alive with butterflies.

Line 5 “Let’s get off and walk from here,” she said, relieved to cut the noisy engine and go on foot. She wanted to watch his upturned face. Despite the wet hair stuck to his forehead and raindrops stippling his wire-framed glasses, Preston was in heaven. “There-goes-King-Billy, there-goes-King-Billy!” he cried again and again, rolling the sentence out in the rapid-fire manner he used for yelling “Five-four-three-two-one-blastoff!” prior to launching flying objects. Soon there were too many kings for each one to get his own announcement, but Preston’s mouth still moved silently.

15 Today there were not so many flying around as before. Not a river of motion, but stragglers adrift. Careening down the trail, they looked a little drunk or crazed, somehow.

20 “They’re probably hungry too,” Preston said. “What do they eat?”

“I have no idea,” she confessed. He was right, they would surely need to eat, after hunkering in the rain for days without cease. She was embarrassed that her five-year-old was asking questions that had not

25 occurred to her. But she refused to be first in the long line of people who would shrug him off. “We’ll have to look that up.”

“Look it up where?”

“Google it, I guess.”

30 “Okay,” he said.

Googling a butterfly. It sounded comical, like tickling a catfish, but she knew it wouldn’t sound that way to Preston. He would clamber up to the computer and punch the keys, finding what he needed in there. Having children was not like people said. Forget training them in your footsteps; the minute they put down the teething ring and found the Internet, you were useless as a source of anything but shoes and a winter coat. But Preston still asked her questions. That touched her, that they were a team. Here in the looming forest he gripped her hand tightly, as if crossing a street, as they approached the trees where the butterflies hung in their droves.

Wings littered the ground. “Look up,” she said, pointing at the brown clusters drooping from the branches. These trees were completely filled now. Even the tree trunks wore butterfly pelts, all the way up, like the bristling hairy legs of giants. It was a whole butterfly forest, magically draped with dark, pendulous clusters masquerading as witchy tresses or dead foliage. She only knew what they really were because her eyes had learned the secret. Preston’s had not. It all waited for him, perfectly still and active. She watched his dark pupils dart up and around, puzzling this out, looking without yet seeing. *Mine,*

ours, her heartbeat thumped, making promises from the inside. This was better than Christmas. She couldn't wait to give him his present: sight.

"What is it?" he asked.

60 "That's the King Billies too. I know it looks weird, how they're all hanging down. But the whole thing is butterflies."

"Gaaa!" he cried, breaking free of her grip. He ran toward a monstrous bouquet that reached nearly to
65 the ground from above, some thirty feet long, dwarfing a tiny boy. Before she could warn him against it, he reached up to stroke it with his hand, causing it to writhe and awaken. Wings opened and jockeyed within the clump. The lowest piece of the
70 bristly string dropped off, landing with a plop on the ground. In slow motion, it exploded, individual butterflies flapping, lifting, dispersing.

Preston looked back at her, expecting a reprimand.

75 "It's okay. You can check them out. Just be gentle, I guess."

She walked closer so she could see this as her son was seeing it. She hadn't examined the clumps at close range, and even now it was hard to understand
80 how they were constructed. The butterflies didn't seem smashed or stuck to the wings of other butterflies, not like a hundred-car pileup, it was nothing so simple. They seemed to be holding on by their needle-thin front legs to some part of the tree
85 itself, bark or branch or needle, out to the very tips. The tree's basic shape was still visible underneath, the column of trunk and broomlike sweep of the branches, but all enlarged and exaggerated by the hangers-on. Only at the ends of the dangling clusters
90 did butterflies seem to be clinging to the legs of other butterflies. The insecure and the desperate, she thought. No world can be without them.

1

The narrator presents Preston as a child whose personality is distinguished by

- A) curiosity about the world around him.
- B) seriousness that renders him old beyond his years.
- C) placid acceptance of the unexpected.
- D) inattention when confronted by multiple stimuli.

2

It can reasonably be inferred from lines 12-14 that Preston begins to mouth words silently because he

- A) has been cautioned by his mother not to startle the butterflies.
- B) worries that speaking aloud will reveal his unfamiliarity with the forest environment.
- C) realizes the butterflies are so numerous that he cannot call attention to them individually.
- D) wishes to mimic the characteristic silence of the butterflies themselves.

3

Which choice best characterizes Dellarobia's expectations regarding Preston's future?

- A) He will desire to attain goals that are out of reach.
- B) He will face indifference and disregard from others.
- C) He will develop enthusiasm for trivial subjects.
- D) He will cease to cultivate his intellectual abilities.

4

It can reasonably be inferred from the passage that Dellarobia perceives which underlying tension in her relationship with Preston?

- A) His ignorance of natural phenomena versus her familiarity with such phenomena
- B) His adventurous spirit versus her concern that adventure is potentially dangerous for children his age
- C) His affection for her versus his unease about the intensity of her affection for him
- D) His need for guidance from her versus the independence she considers characteristic of modern childhood

5

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

- A) Lines 31-36 (“Googling . . . said”)
- B) Lines 36-41 (“Forget . . . team”)
- C) Lines 51-52 (“She only . . . secret”)
- D) Lines 63-66 (“Gaaa . . . boy”)

6

In lines 48-50, the phrases “bristling hairy legs of giants,” “magically draped,” and “masquerading as witchy tresses” primarily serve to

- A) suggest the setting’s otherworldly aspect.
- B) mock the characters’ flawed perception of reality.
- C) inject a sense of whimsy into serious subject matter.
- D) reflect the child’s active imagination.

7

It can reasonably be inferred from the passage that during the visit to the forest, Dellarobia feels compelled to

- A) relax her protectiveness so that Preston can explore freely on his own.
- B) narrow her field of observation in order to focus on nature’s intricacies.
- C) question the accuracy of her earlier understanding of butterfly behavior.
- D) temper her expectations about Preston’s reaction to their surroundings.

8

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

- A) Lines 41-43 (“Here . . . drove”)
- B) Lines 54-57 (“She watched . . . inside”)
- C) Lines 66-68 (“Before . . . awaken”)
- D) Lines 77-80 (“She walked . . . constructed”)

9

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

- A) modest.
- B) foolish.
- C) straightforward.
- D) innocent.

10

The last three sentences of the passage (lines 89-92) primarily serve to

- A) imply the solidity of the butterfly clusters despite their fragile appearance.
- B) contrast the butterflies’ helplessness with the boy’s confidence.
- C) suggest that an observation of nature applies to an aspect of the human condition.
- D) compare the mother’s anxiety to a phenomenon that occurs in nature.

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

This passage is adapted from Robert Kuttner, "Bretton Woods Revisited." ©2013 by The American Prospect.

On July 22, 1944, as allied troops were racing across Normandy to liberate Paris, representatives of 44 nations meeting at the Mount Washington resort in Bretton Woods, New Hampshire, created a financial and monetary system for the post-World War II era. It had taken three weeks of exhausting diplomacy. At the closing banquet, the assembled delegates rose and sang "For He's a Jolly Good Fellow." The fellow in question was John Maynard Keynes, leader of the British delegation and intellectual inspiration of the Bretton Woods design.

Lord Keynes, the world's most celebrated economist, was playing a tricky dual role. He had proposed a radical new monetary system to free the world from the deflationary pressures that had caused and prolonged the Great Depression. Bretton Woods, he hoped, would be the international anchor for the suite of domestic measures that came to be known as Keynesian—the use of public spending to cure depression and the regulation of financial markets to prevent downturns caused by failed private financial speculation.

Keynes was also hoping to restore Britain's prewar position as a leading industrial and financial power. His two roles overlapped, but far from perfectly. The Americans shared the British desire to restore world growth, but not to preserve Britain's empire or its protectionist system of preferential trade deals for nations that settled their accounts in pounds sterling.

Writing to a colleague after the conference ended, Keynes professed to be pleased. He wrote that in the new International Monetary Fund, "we have in truth got both in substance and in phrasing all that we could reasonably hope for." The new World Bank, Keynes declared, offered "grand possibilities. . . . The Americans are virtually pledging themselves to quite gigantic untied loans for reconstruction and development."

Yet in many respects, Bretton Woods was a rout for Keynes and the British. America today is often described as the sole surviving superpower, but in 1944 U.S. supremacy was towering. Germany and Japan were on the verge of ruin. Britain had gone massively into debt to prosecute the war, sacrificing more than a quarter of its national wealth. The

Russians had lost tens of millions of soldiers and civilians. America was unscathed, its casualties were modest by comparison, it held most of the world's financial reserves, and its industrial plant was mightier than ever.

Though Keynes inspired Bretton Woods, the Americans won the day. As leverage, Keynes had only his own brilliance and a fast-fading appeal to Anglo-American wartime solidarity. In most matters, a rival design by Keynes's American counterpart, Harry Dexter White, prevailed. White, a left-wing New Dealer serving as No. 2 man at the Treasury, shared Keynes's basic views on money. But the White plan provided a far more modest fund and bank. Instead of the generous extension of wartime lend-lease aid that Keynes was promoting, the British had to settle for an American loan, to be repaid with interest.

The Bretton Woods system was hailed as a vast improvement over both the rigid gold standard of pre-1914 and the monetary anarchy of the interwar period. For a quarter-century, Bretton Woods undergirded a rare period of steady growth, full employment, and financial stability. But in many respects, the vaunted role of the World Bank, the International Monetary Fund, and the Bretton Woods rules specifying fixed exchange rates was a convenient mirage. The system's true anchor was the United States—the U.S. dollar as de facto global currency; the U.S. economy as the residual consumer market for other nations' exports; and U.S. recovery aid in the form of the Marshall Plan, which dwarfed the outlays of the World Bank.

In the early 1970s, the Bretton Woods system came crashing down when domestic inflation forced the United States to devalue its own currency and cease playing the hegemonic role. Monetary instability and slower growth followed. By the 1980s, laissez-faire was enjoying renewed prestige.

Mean Annual Rates of Inflation
by Monetary System

	United States	Britain
Gold standard (1881–1913)	0.3%	0.3%
Interwar period (1919–1938)	–1.8%	–1.5%
Bretton Woods (1946–1970)	2.4%	3.7%
Floating exchange (1974–1989)	5.6%	9.4%

Adapted from Michael Bordo, "The Gold Standard, Bretton Woods and Other Monetary Regimes: An Historical Appraisal." ©1993 by Michael Bordo.

11

The main purpose of the passage is to

- A) analyze an economic policy's role in causing a global financial crisis.
- B) summarize several types of postwar diplomacy and their results.
- C) evaluate an individual's contribution to the success of an economic policy.
- D) provide an account of the development of an economic system and its impact.

12

The quotations from Keynes in lines 32–38 ("we have . . . development") mainly serve to

- A) illustrate Keynes's expression of satisfaction with the outcome of Bretton Woods.
- B) articulate the agenda for monetary reform that Keynes presented at Bretton Woods.
- C) support the author's claim that the new World Bank was crucial for postwar reconstruction.
- D) argue that Keynes was more disappointed by the Bretton Woods system than he admitted.

13

The passage most strongly suggests that Keynes and White had differing views on

- A) the usefulness of economic regulations in postwar diplomatic relations.
- B) basic principles related to money and global financial regulations.
- C) the amount and type of funding that should be allocated to the World Bank.
- D) the risks posed by implementing regulations agreed upon at Bretton Woods.

14

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

- A) Lines 52–54 ("As leverage . . . solidarity")
- B) Lines 56–58 ("White, a left-wing . . . money")
- C) Lines 58–63 ("But the White . . . interest")
- D) Lines 69–73 ("But in . . . mirage")

15

The main idea of the seventh paragraph (line 64–78) is that

- A) in contrast to the chaos created under the gold standard, the Bretton Woods system was a success.
- B) the perceived success of the Bretton Woods system was largely due to several US economic influences.
- C) the Bretton Woods system succeeded in the US economy but had little impact elsewhere.
- D) under the Marshall Plan, the United States provided postwar recovery aid to numerous countries.

16

As used in line 72, “fixed” most nearly means

- A) stabilized.
- B) repaired.
- C) fastened.
- D) corrupted.

17

The author uses the phrase “convenient mirage” in line 73 mainly to

- A) provide an example of the ways countries benefited from the convenience of the World Bank.
- B) indicate that the ultimate success of Bretton Woods depended on the adoption of a Keynesian system.
- C) illustrate the types of misleading tactics Britain and the United States used during diplomatic negotiations.
- D) emphasize that the achievements of the Bretton Woods system weren’t as substantial as they seemed.

18

According to the table, the greatest disparity between the mean annual rate of inflation in Britain and that in the United States occurred under which monetary system?

- A) Gold standard
- B) Interwar period
- C) Bretton Woods
- D) Floating exchange

19

The years identified in the table as ones during which the average mean US inflation rate was near –2 percent are referred to in the passage as years of

- A) laissez-faire.
- B) a rare period of steady growth.
- C) monetary anarchy.
- D) the White plan.

20

Based on the passage and table, what was most likely occurring during the years between the Bretton Woods and the floating exchange systems?

- A) Inflation rates in the United States and Britain were returning to the rates of the interwar period.
- B) The US inflation rate was increasing to the point that the US dollar had to be devalued.
- C) The World Bank was losing the support of Keynesian economists.
- D) Britain’s inflation rate was surpassing that of the United States.

21

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

- A) Lines 1-6 (“On July . . . era”)
- B) Lines 64-67 (“The Bretton . . . interwar period”)
- C) Lines 79-82 (“In the early . . . role”)
- D) Lines 83-84 (“By the . . . prestige”)

Questions 22-32 are based on the following passage and supplementary material.

This passage is adapted from Sid Perkins, “Gold in Trees May Hint at Buried Treasure.” ©2013 by American Association for the Advancement of Science.

Money may not grow on trees, but gold does—or at least it accumulates inside of them. Scientists have found that trees growing over deeply buried deposits of gold ore sport leaves with higher-than-normal concentrations of the glittering element. The finding provides an inexpensive, excavation-free way to narrow the search for ore deposits.

Scientists have long had clues that trees and other vegetation pulled gold from the soil and transported it to their leaves, but the evidence wasn’t clear. The gold particles could have stuck to the leaves after being blown there as dust, for example. To bolster the case that the gold came from soil beneath the trees, researchers conducted a series of field studies and lab tests.

At one site in Western Australia, the scientists gathered leaves, twigs, and bark from eucalyptus trees growing above a known gold deposit. The deposit is about the size of a football field and lies 30 meters or more below ground, but at today’s gold prices it’s too small and sparse to be worth excavating. The team gathered the same parts from trees growing 200 meters away from the ore. Although background concentrations of gold in vegetation are typically less than 2 parts per billion (ppb), dried leaves from the trees growing above the ore deposit—but not those 200 meters away—had gold levels up to 80 ppb, says team member Mel Lintern, a geochemist in Kensington, Australia.

Likewise, field tests by Lintern’s group at a site in southern Australia showed that eucalyptus trees growing above a deposit lying 35 meters underground had 20 times more gold in the gummy substances coating their leaves than did trees that grew 800 meters away. Previous studies had noted anomalous concentrations of gold in the leaf-coating substances, Lintern says, but researchers couldn’t discount the possibility that the tiny particles of the metal had stuck to the leaves after being carried there by winds.

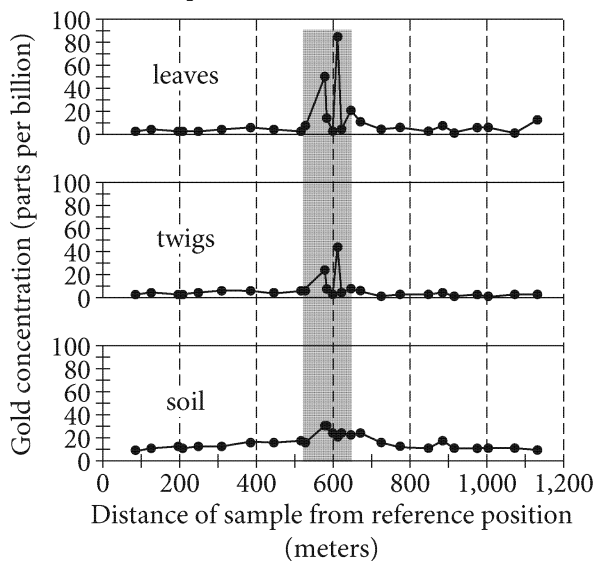
That’s where the team’s new study gleams. By growing seedlings in greenhouses insulated from airborne dust and watering them with gold-laced solutions, the researchers demonstrated that trees actually pick up the metal from soil and deposit it within their leaves.

The new research provides “a conclusive set of evidence . . . from a very nicely constructed set of experiments,” says Clifford Stanley, a geochemist at Acadia University in Wolfville, Canada. “The tree is a conveyor belt bringing gold to the surface,” he notes. Like other such elements in the earth, gold gets sucked up by the plant as it absorbs nutrients in the soil. Then, as a dissolved mineral, it gets transported throughout the tree, although the highest concentrations are typically found in leaves. “When you see the particles of gold *inside* the plants,” Stanley says, “all doubt goes away.”

Don’t think about mining trees, however. Average concentrations of gold in the leaves are much higher than normal, but individual particles of the metal are still very small, few, and far between. Even the largest particles—which Lintern and his team have jokingly dubbed “phytonuggets”—were no more than 8 micrometers across, about half the diameter of the finest human hair. The trees don’t have a biological need for the element, Lintern says; indeed, it may be toxic to them. “To the trees, gold may be just another heavy metal to be got rid of.”

Though the phytonuggets are too small to be collected and mined, they can serve as a sign that gold deposits may lie within the reach of a tree’s roots.

Gold Concentration in *Eucalyptus* and Soil Samples from Western Australian Site



□ samples above buried gold deposit

Adapted from Melvyn Lintern et al., "Natural Gold Particles in *Eucalyptus* Leaves and Their Relevance to Exploration for Buried Gold Deposits." ©2013 by Macmillan Publishers Limited.

22

As used in line 4, "sport" most nearly means

- A) amuse.
- B) engage.
- C) display.
- D) mock.

23

The author would most likely agree that the research conducted by Lintern's group may benefit the mining industry by

- A) making previously inaccessible gold deposits available for mining.
- B) rendering small particles of gold a viable ore source for mining operations.
- C) simplifying the process used to locate gold deposits suitable for commercial mining.
- D) reducing the number of tests needed to determine the concentration of gold in field samples.

24

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

- A) Lines 2-5 ("Scientists . . . element")
- B) Lines 5-7 ("The finding . . . deposits")
- C) Lines 12-15 ("To bolster . . . tests")
- D) Lines 18-22 ("The deposit . . . excavating")

25

In line 42, the author uses the word "gleams" to

- A) point out an unexpectedly humorous aspect of the experiment carried out by Lintern's team.
- B) draw an analogy between Lintern's team's research and research done in another field of study.
- C) characterize the problem that Lintern's team's experiment was intended to address.
- D) emphasize the most compelling aspect of the research conducted by Lintern's team.

26

In the sixth paragraph (lines 48-59), the author includes quotations from Stanley primarily to

- A) provide expert corroboration of the conclusions reached by Lintern's group.
- B) cast doubt on a theory proposed by Lintern's group.
- C) account for facts that Lintern's group could not explain.
- D) concede the legitimacy of other scientists' criticisms of Lintern's group's findings.

27

The passage best supports which claim about eucalyptus trees?

- A) They are often damaged by absorbing excessive amounts of heavy metals such as gold from the soil.
- B) They absorb elements such as gold from the soil regardless of whether those elements are beneficial.
- C) They typically thrive in areas where gold is available in the soil along with various nutrients.
- D) They are unusual in being able to dissolve gold and transport it throughout the tree.

28

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

- A) Lines 55-57 ("Then . . . leaves")
- B) Lines 57-59 ("When . . . away")
- C) Lines 61-63 ("Average . . . between")
- D) Lines 67-70 ("The trees . . . rid of")

29

The sentence in line 60 ("Don't . . . however") serves mainly to

- A) imply that a course of action recommended by Lintern's group may have serious environmental consequences.
- B) advise against certain actions that might be taken as a result of the findings of Lintern's group.
- C) concede that the research conducted by Lintern's group will likely be misunderstood by nonspecialists.
- D) note that the conclusions reached by Lintern's group are of limited relevance to other subjects of scientific inquiry.

30

According to the graph, the gold concentrations in leaf samples from positions that were not immediately above the gold deposit were between

- A) 0 and 20 parts per billion.
- B) 30 and 50 parts per billion.
- C) 60 and 70 parts per billion.
- D) 80 and 90 parts per billion.

31

The data in the graph most strongly suggest that it is possible for a eucalyptus tree growing above a gold deposit to

- A) cease absorbing gold from the soil when the concentration inside the tree has reached a harmful level.
- B) have a higher concentration of gold in its leaves than is found in the surrounding soil.
- C) decrease the concentration of gold in its leaves by returning gold to the surrounding soil.
- D) adjust the rate at which gold is distributed to its leaves over time.

32

According to the graph, the average concentration of gold in twigs between 200 and 400 meters from the reference position is closest to the average concentration of gold in

- A) leaves between 500 and 700 meters from the reference position.
- B) soil between 200 and 400 meters from the reference position.
- C) twigs between 500 and 700 meters from the reference position.
- D) twigs between 800 and 1,000 meters from the reference position.

Questions 33-42 are based on the following passages.

Passage 1 is adapted from Frederick Douglass, "Oration in Memory of Abraham Lincoln," delivered in 1876 at the unveiling of the Freedmen's Monument, Lincoln Park, Washington, DC. Passage 2 is adapted from Booker T. Washington, "An Abraham Lincoln Memorial Address in Philadelphia," delivered in 1899.

Passage 1

Truth is proper and beautiful at all times and in all places, and it is never more proper and beautiful in any case than when speaking of a great public man whose example is likely to be commended for honor
 5 and imitation long after his departure to the solemn shades, the silent continents of eternity. It must be admitted, truth compels me to admit, even here in the presence of the monument we have erected to his memory, Abraham Lincoln was not, in the fullest
 10 sense of the word, either our man or our model. In his interests, in his associations, in his habits of thought, and in his prejudices, he was a white man.

He was pre-eminently the white man's President, entirely devoted to the welfare of white men. He was
 15 ready and willing at any time during the first years of his administration to deny, postpone, and sacrifice the rights of humanity in the colored people to promote the welfare of the white people of this country. In all his education and feeling he was an
 20 American of the Americans. He came into the Presidential chair upon one principle alone, namely, opposition to the extension of slavery. His arguments in furtherance of this policy had their motive and mainspring in his patriotic devotion to the interests
 25 of his own race. To protect, defend, and perpetuate slavery in the States where it existed Abraham Lincoln was not less ready than any other President to draw the sword of the nation. He was ready to execute all the supposed constitutional guarantees of
 30 the United States Constitution in favor of the slave system anywhere inside the slave States. . . . Knowing this, I concede to you, my white fellow-citizens, a pre-eminence in this worship at once full and supreme. First, midst, and last, you and yours were
 35 the objects of his deepest affection and his most earnest solicitude. You are the children of Abraham Lincoln. We are at best only his step-children; children by adoption, children by forces of circumstances and necessity. To you it especially
 40 belongs to sound his praises, to preserve and perpetuate his memory, to multiply his statues, to

hang his pictures high upon your walls, and commend his example. . . . But while in the abundance of your wealth, and in the fullness of your just and patriotic devotion, you do all this, we entreat
 45 you to despise not the humble offering we this day unveil to view; for while Abraham Lincoln saved for you a country, he delivered us from a bondage, according to Jefferson, one hour of which was worse
 50 than ages of the oppression your fathers rose in rebellion to oppose.

Passage 2

You ask one whom the Great Emancipator found a piece of property and left an American citizen to speak of Abraham Lincoln. My first acquaintance
 55 with our hero and benefactor is this: Night after night, before the dawn of day, on an old slave plantation in Virginia, I recall the form of my sainted mother, bending over a batch of rags that enveloped my body, on a dirt floor, breathing a fervent prayer
 60 to Heaven that “Marsa Lincoln” might succeed, and that one day she and I might be free; and so, on your invitation, I come here to-night to celebrate with you the answer to those prayers. But be it far from me to revive the bitter memories of the past, nor would I
 65 narrow the work of Abraham Lincoln to the black race of this county; rather would I call him the Emancipator of America—the liberator of the white man North, of the white man South; the one who, in unshackling the chains of the Negro, has turned
 70 loose the enslaved forces of nature in the South, and has knit all sections of our country together by the indissoluble bonds of commerce. To the man in the North who cherished hatred against the South, Lincoln brought freedom. To the white man who
 75 landed at Jamestown years ago, with hopes as bright and prospects as cheering as those who stepped ashore on Plymouth Rock, Lincoln, for the first time, gave an opportunity to breathe the air of unfettered freedom—a freedom from dependence on others’
 80 labor to the independence of self-labor; freedom to transform unused and dwarfed hands into skilled and productive hands; to change labor from drudgery into that which is dignified and glorified; to change local commerce into trade with the world;
 85 to change the Negro from an ignorant man into an intelligent man; to change sympathies that were local and narrow into love and good-will for all mankind; freedom to change stagnation into growth, weakness into power; yea, to us all, your race and mine,
 90 Lincoln has been a great emancipator.

33

The figurative language in lines 5-6 (“his . . . eternity”) is intended to refer to Lincoln’s

- A) fame.
- B) achievements.
- C) isolation.
- D) death.

34

As used in line 24, “interests” most nearly means

- A) titles.
- B) concerns.
- C) attentions.
- D) profits.

35

According to Douglass in Passage 1, which statement best describes Lincoln’s position on slavery early in his presidency?

- A) Slavery should be legally abolished throughout the United States as quickly as possible.
- B) Slavery should be tolerated as an unfortunate but necessary element of the United States economy.
- C) Slavery should not be challenged in states where it is already established, but it should not be permitted beyond those states.
- D) Slavery should be eliminated gradually in states where it currently exists and should not be extended to more states.

36

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

- A) painful memory to a scholarly analysis.
- B) vivid description to a spirited criticism.
- C) sentimental image to a startling proposal.
- D) poignant recollection to a glowing tribute.

37

According to Washington in Passage 2, white Southerners benefited from the abolition of slavery by

- A) attaining a more powerful position in American society.
- B) realizing greater monetary profits than they had previously.
- C) becoming independent of the needs and ambitions of white Northerners.
- D) experiencing for themselves the rewards of their own hard work.

38

Which choice best supports the conclusion that Washington believed that the abolition of slavery had international economic implications?

- A) Lines 79-80 (“a freedom . . . self-labor”)
- B) Lines 80-82 (“freedom to . . . productive hands”)
- C) Lines 82-84 (“to change labor . . . world”)
- D) Lines 85-86 (“to change the . . . man”)

39

The main purpose of both passages is to

- A) honor Lincoln for championing the rights of black American citizens.
- B) discuss what Lincoln’s presidency meant for different groups of Americans.
- C) suggest that some of the typical praise for Lincoln may ultimately be unjustified.
- D) outline certain accomplishments of Lincoln’s that had been largely overlooked.

40

In Passages 1 and 2, Douglass and Washington differ in their attitudes toward Lincoln in that Douglass

- A) views Lincoln with cool indifference, whereas Washington sees Lincoln through a nostalgic lens.
- B) envies Lincoln the acclaim he has received, whereas Washington believes that Lincoln has received insufficient credit from black Americans.
- C) finds Lincoln’s actions to be offensive and demeaning, whereas Washington considers Lincoln’s actions to be practical and helpful.
- D) perceives Lincoln as having shown clear partiality, whereas Washington regards Lincoln as a benefactor of all.

41

Based on Passage 2, it can reasonably be inferred that Washington would have responded to the idea in lines 47-51 (“for while . . . oppose”) in Passage 1 by arguing that

- A) Douglass’s words were ineffective because they appealed to the audience’s reason, whereas the audience felt an emotional connection to Lincoln as a national hero.
- B) Douglass unjustly ignored the fact that many white Americans cared deeply about the issue of slavery, and their support helped Lincoln emancipate the slaves.
- C) Douglass implied that Lincoln’s contributions to black Americans and to the United States as a whole could be viewed separately, but freeing the slaves transformed the entire nation economically.
- D) Douglass emphasized Lincoln’s importance to black Americans rather than to white Americans, despite the fact that he was speaking to a predominantly white audience.

42

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

- A) Lines 66-72 (“rather . . . commerce”)
- B) Lines 72-74 (“To the man . . . brought freedom”)
- C) Lines 74-79 (“To the white . . . unfettered freedom”)
- D) Lines 86-87 (“to change sympathies . . . mankind”)

Questions 43-52 are based on the following passage.

This passage is adapted from Eric Hand, "Seafloor Grooves Record the Beat of the Ice Ages." ©2015 by American Association for the Advancement of Science.

Line With a little training, it's easy to see how ice age
glaciers sculpted the land, scouring valleys and
heaping up debris. Recently, researchers revealed that
the ancient cycles of ice left their mark on the sea
5 floor, thousands of meters below the ocean surface.

The evidence comes from seafloor spreading
centers: sites throughout the ocean where plates of
ocean crust move apart and magma erupts in
between, building new crust onto the plates' trailing
10 edges. Parallel to these spreading centers are "abyssal
hills": long, 100-meter-high ridges on the diverging
plates, separated by valleys. On bathymetric maps of
seafloor topography, they look like grooves on a
record. These grooves, it now turns out, play the tune
15 of Earth's ice ages.

During ice ages, which are mainly driven by
rhythmic variations in Earth's orbit and spin that
alter sunlight in the Northern Hemisphere, growing
ice caps and glaciers trap so much frozen water on
20 land that sea levels can drop a hundred meters or
more. As the pressure on the ocean floor eases,
magma erupts more readily at the spreading centers,
thickening the plates and creating the abyssal hills,
say the authors of two new studies.

25 "Step back and think about this: Small variations
in the orbital parameters of the Earth—tilt and
eccentricity and wobble—are recorded on the sea
floor," says Richard Katz, a geodynamicist at the
University of Oxford in the United Kingdom and
30 co-author of one of the papers. "It kind of blows my
mind." Outside scientists are also impressed.
"Their data provides evidence that the link is real,"
says David Lund, a paleoceanographer at the
University of Connecticut, Avery Point. "I'm very
35 excited about it."

The studies suggest that the bursts of seafloor
volcanism could in turn affect climate—and even
play a role in bringing each ice age to an abrupt end.
They may also change some minds about the origin
40 of the abyssal hills. Ever since scientists discovered
the hills more than half a century ago, many thought
they resulted from cracks in Earth's crust, or faults.

As new oceanic crust is made in the spreading
centers (the story went), it cools, fractures, and slips
45 along faults, creating downward-dropped blocks that
could be responsible for the ridge-and-valley
topography.

Scientists still agree that faults play a role in
shaping the seafloor topography, but the new work
50 emphasizes the importance of volcanism in creating
the hills in the first place, Lund says. "Faulting could
be a secondary process as opposed to a primary one,"
he says.

Katz's study was based on fresh ocean-floor data
55 gathered by a Korean icebreaker ship during 2011
and 2013 surveys across the Australian-Antarctic
ridge, a spreading center south of Tasmania. In a
transect representing more than a million years of
seafloor spreading, the researchers found
60 topographic highs and lows that seemed to have
formed in synchrony with all three of Earth's
astronomical cycles, which have periods of 23,000,
41,000, and 100,000 years.

Wondering whether the climate cycles might
65 somehow be boosting seafloor volcanism at regular
intervals, the researchers created a computer model
to test the idea. When sea level drops during ice ages,
they found, the decreased pressure on the mantle
through the thin ocean floor would increase the rate
70 of mantle melting. That would boost the delivery of
magma to the seafloor surface by just enough to
explain the bands of thicker crust that form the
abyssal hills. Paul Asimow, an igneous petrologist at
the California Institute of Technology in Pasadena,
75 says the model is physically plausible. "It's additional
confirmation that the basic [sea level] signal is felt by
the mantle," he says.

43

The primary purpose of the passage is to

- A) present an overview of two theories about the effects of glaciers on ocean levels.
- B) discuss research that provides a new explanation for the origin of abyssal hills.
- C) analyze the relationship between the occurrence of ice ages and shifts in Earth's orbit.
- D) summarize the researcher's observations about the characteristic features of faults in the seafloor.

44

The author states that a small amount of training will make which of the following relationships apparent?

- A) Ocean plates reduce in thickness as a result of flowing magma.
- B) Earth's orbit and spin often shift following an ice age.
- C) Sea levels increase following the formation of abyssal hills.
- D) Land valleys can result from the movement of glaciers.

45

The author's statement that the grooves "play the tune of Earth's ice ages" (lines 14-15) most likely means that the hills' formation

- A) indicates rumblings beneath Earth's ocean floor.
- B) precedes eruptions of volcanoes beneath Earth's surface.
- C) reveals unusual similarities to Earth's glaciers.
- D) coincides with significant shifts in Earth's climate.

46

Which choice provides the best evidence that Earth's movements influence its climate?

- A) Lines 16-21 ("During . . . more")
- B) Lines 25-30 ("Step . . . papers")
- C) Lines 64-67 ("Wondering . . . idea")
- D) Lines 70-73 ("That . . . hills")

47

As used in line 21, "eases" most nearly means

- A) advances.
- B) maneuvers.
- C) lessens.
- D) simplifies.

48

The comments by Lund (lines 32-35) and Asimow (lines 75-77) primarily serve to

- A) introduce two competing explanations for some of Katz's findings.
- B) challenge critics who claim that Katz's conclusions are unfounded.
- C) bolster the author's observation that other scientists find Katz's results credible.
- D) reinforce the point that seafloor research is becoming more common.

49

Which claim does the author LEAST explain or support in the passage?

- A) During ice ages, pressure on the ocean floor is reduced.
- B) Cracks in Earth's surface play a role in shaping the seafloor.
- C) Activity of seafloor volcanoes could trigger a shift out of an ice age.
- D) Lower sea levels can lead to more magma spreading over the seafloor.

50

The passage suggests that scientists now would most likely critique the long-held theory relating abyssal hills to seafloor faults because that theory

- A) fails to address variations in the heights of seafloor abyssal hills.
- B) does not give sufficient weight to the influence of magma eruptions.
- C) places insufficient importance on the effect of the cooling magma on the seafloor.
- D) challenges the new findings about the effect of climate cycles on seafloor topography.

51

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

- A) Lines 39-40 (“They . . . hills”)
- B) Lines 43-47 (“As new . . . topography”)
- C) Lines 48-51 (“Scientists . . . Lund says”)
- D) Lines 57-63 (“In a . . . years”)

52

Based on the passage, it can be inferred that between ice ages on Earth, the higher sea levels

- A) apply increased pressure to the ocean floor and reduce the rate of mantle melting.
- B) flood low-lying land areas and gouge out deep valleys.
- C) cause an acceleration in the movement of ocean crust plates.
- D) increase the likelihood of ocean floor faults and more frequent volcanoes.

STOP

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

No Test Material On This Page

Writing and Language Test

35 MINUTES, 44 QUESTIONS

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

DIRECTIONS

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

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

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

Questions 1-11 are based on the following passage.

The Net Effect of Online Journalism

1 With the increasing number of mergers in the newspaper industry, those who want to enter the field of journalism need a new set of skills. Aspiring journalists still must develop the **2** antique skills of gathering information and crafting concise sentences, but with the

1

Which choice best introduces the main topic of the passage?

- A) NO CHANGE
- B) With more journalism majors graduating every year,
- C) With the decline of reading in today’s culture,
- D) With the majority of news articles now appearing on the Internet,

2

- A) NO CHANGE
- B) antiquated
- C) traditional
- D) outdated

shift to the Internet, new skills have become increasingly important. **3** Today's journalists need to be proficient in all aspects of journalistic production, and they need to be ready to engage with their readers, who now provide a constant flow of feedback online.

Because the Internet is an open space in which an unlimited number of stories can be published, **4** content must be generated quickly and constantly. The new pace of journalism **5** means that one reporter is often asked to take on tasks that used to be distributed among many. The shift to online publication allows one

3

- A) NO CHANGE
- B) Today's journalists
- C) Today's' journalists
- D) Today's journalists'

4

Which choice most effectively sets up the information that follows in the next sentence?

- A) NO CHANGE
- B) it is important that reporters check their sources carefully.
- C) online security is a major concern.
- D) reporters may not receive credit for all their work.

5

- A) NO CHANGE
- B) means: that
- C) means that
- D) means that,

reporter to conduct research, collect pictures or create graphics, **6** writing an article, edit it, and lay it out on a computer screen, all without leaving his or her desk. This phenomenon has been labeled “multiskilling,” and it is now a central feature of the work many journalists do. One survey, in fact, revealed that as many as 60 percent of journalists in Sweden considered multiskilling to be central to their work. In addition, journalists may be expected to keep blogs, use Twitter or other forms of social media, compose lists of additional reading recommendations, provide behind-the-scenes videos, or **7** record interviews with people profiled in their articles. Those looking to enter this field should be encouraged to develop these particular skills.

6

- A) NO CHANGE
- B) write
- C) to write
- D) they write

7

Which choice gives an additional example that is most consistent with the examples already provided in the sentence?

- A) NO CHANGE
- B) guarantee the integrity of their publications.
- C) write several new articles a day.
- D) get out of the office to meet new contacts.

Similarly, prospective journalists need to **8** keep up with the latest developments in technology. In the online world, that feedback is **9** instantaneous, immediate, and interactive. Readers comment on articles, and then other readers respond, adding comments to those already provided. Journalists must be adept at dealing with this kind of layered feedback, especially as many online news **10** sights track data related to comments and avoid the kinds of articles that do not generate discussion. Therefore, journalists must learn how to write stories that will captivate readers and generate comments, without pandering to what readers want to hear at the expense of the facts of the story.

Multiskilled journalists can have more control over the entire look and feel of **11** his or her stories, and dealing with reader feedback can help them tailor their writing in new ways. The number of news organizations on the Internet and the constant demand for content mean that there will be a need for journalists with the variety of skills required to succeed in the new world of online news.

8

Which choice best sets up the information that follows in the paragraph?

- A) NO CHANGE
- B) know how the landscape of journalism is changing.
- C) be concerned with feedback from their peers.
- D) be prepared to deal with feedback from their readers.

9

- A) NO CHANGE
- B) instantaneous, interactive, and undelayed.
- C) instantaneous, interactive, and reciprocal.
- D) instantaneous and interactive.

10

- A) NO CHANGE
- B) cites trek
- C) sites track
- D) cites track

11

- A) NO CHANGE
- B) his
- C) one's
- D) their

Questions 12-22 are based on the following passage.

Working Hard Not to Play Too Hard

Like many other animals, canids, members of the family of mammals that includes dogs and wolves, need to play when they are young to become fully socialized. Play allows canids to bond with one **12** another, they learn how to act appropriately as adults. However, since struggles for dominance are often an important part of life in canid packs, it is critical that play activities **13** such as chasing and biting not be misinterpreted as aggression. By using particular behaviors and signals to indicate their intentions, **14** it helps guarantee that an enjoyable, welcome romp does not devolve into a dangerous, unwanted fight.

12

- A) NO CHANGE
- B) another and to learn
- C) another; learning
- D) another; and to learn

13

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

- A) Kept, because it explains why play is a necessary element of canid social bonding.
- B) Kept, because it gives examples of play activities that might be misinterpreted as aggression.
- C) Deleted, because it distracts from the paragraph's focus on canid socialization.
- D) Deleted, because it makes a distinction between behaviors that is irrelevant to the issue of canid play.

14

- A) NO CHANGE
- B) they help
- C) young canids at play help
- D) it helps young canids at play

A canid stronger than **15** their playmates often uses behaviors that biologists refer to as role reversing and self-handicapping so that the other animals feel secure. **16** Self-handicapping occurs when a canid does not use its full strength during play. Biologists have **17** observed and noticed that coyote cubs will limit the vigor of their play and the power of their bites to accommodate their partners and keep them engaged in the game. By temporarily relinquishing their superiority in these ways, dominant canids create a safe play environment for others.

15

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

16

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

When role reversing, a normally dominant dog may, for instance, roll on its back during play as a gesture of submission.

Should the writer make this addition here?

- A) Yes, because it describes an example of canid play behavior introduced earlier in the paragraph.
- B) Yes, because it reinforces the earlier assertion that play allows canids to bond with one another.
- C) No, because it contradicts evidence about canid gestures discussed in the following paragraph.
- D) No, because it blurs the focus of the paragraph by providing an example that is not related to the paragraph's main point.

17

- A) NO CHANGE
- B) observed and seen how
- C) picked up on how
- D) noted that

[1] In addition to curbing their most aggressive tendencies, young canids can send specific signals to show their intention to play. [2] Evolutionary biologist Marc Bekoff has observed a particular **18** gesture, he calls it a bow, that canids engaged in play behavior use. [3] When a canid bows, it keeps its hind legs erect while it crouches on its front legs. [4] Bekoff indicates that these play gestures are especially likely to occur immediately before or after a canid bites its play partner and then shakes its own head rapidly from side to side, a type of bite that canids also employ during fights. [5] He has also found that bows are more likely to accompany head-shaking bites when performed by members of the most competitive canid species. [6] Bekoff concludes that the more likely it is for a canid's play behavior to be seen as aggressive, the more likely it **19** was that the behavior will be accompanied by a playful bow. [7] In one such species, the coyote, 92 percent of the head-shaking bites he documented were signaled with bows, **20** whereas only 74 percent of such bites were signaled in this way by dogs, a less competitive species. **21**

By tamping down their aggressive behavior and signaling that they wish to play rather than fight, young canids provide reassurance for pack mates within a **22** rival social dynamic. These gestures keep play productive by enabling the young animals to develop socially without undue risk.

18

- A) NO CHANGE
- B) gesture calling it
- C) gesture, it is called
- D) gesture, which he calls

19

- A) NO CHANGE
- B) is
- C) has been
- D) had been

20

- A) NO CHANGE
- B) as opposed to
- C) because
- D) in light of

21

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

- A) NO CHANGE
- B) after sentence 2.
- C) after sentence 4.
- D) after sentence 5.

22

- A) NO CHANGE
- B) competitive
- C) matched
- D) contending

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

The Powerlessness of Persuasion

When US presidential elections come around every four years, the customary two or three debates that occur each election year **23** have been the subject of much speculation. **24** Before, during, and after each debate, news outlets cover the event assiduously and place great importance **25** to whether the Republican or the Democratic (or, if applicable, the third-party) candidate wins. Surprisingly, **26** though: studies show that presidential debates actually have little—even negligible—bearing on voters’ decisions at the polls.

23

- A) NO CHANGE
- B) are
- C) is
- D) has been

24

- A) NO CHANGE
- B) Before: during,
- C) Before; during;
- D) Before during

25

- A) NO CHANGE
- B) regarding if
- C) on whether
- D) of whether

26

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

Research by political scientists Robert Erikson and Christopher Wlezien **27** examines every publicly available poll about presidential candidates between the years 1952 and 2008. As shown in the table, which utilizes data from Erikson and Wlezien, between 1988 and 2008, the most substantial change in public support for a candidate occurred in 2000, when support for the incumbent party candidate decreased by 3.52 percentage points. In the twenty-year span analyzed, the debates had the least impact in 1992. The first debate during that election year gave the candidate from the incumbent party a **28** teeny increase in public support of

27

Which choice most effectively introduces the main claim of the paragraph?

- A) NO CHANGE
- B) shows that with few exceptions, debates have not proved to swing public support for a candidate one way or the other.
- C) suggests that debate performance can play a crucial role in the outcome of presidential elections.
- D) supports the idea that debates can tie the scales in close presidential races.

28

- A) NO CHANGE
- B) petite growth
- C) minuscule increase
- D) diminutive hike

0.17 percentage points. Furthermore, after all three debates that election year, **29** public support for the incumbent party candidate never rose above 43 percent. Other election years in the 1988 to 2008 time frame yielded similar results: in 1988 the incumbent party candidate witnessed a slight increase in public support, and in **30** 1996, 2004, and 2008, a slight decrease.

Public Support for Incumbent
Party Candidate, 1998–2008

Election year	Debate period	Percent of public support		Change in public support after debate period (percentage points)
		pre-debate	post-debate	
1988	First	52.90	53.15	+0.25
	Second	53.72	55.32	+1.60
	Overall			+2.42
1992	First	41.57	41.74	+0.17
	Second	42.76	40.73	−2.03
	Third	41.73	42.13	+0.40
	Overall			+0.56
1996	First	60.27	58.80	−1.47
	Second	58.64	58.83	+0.19
	Overall			−1.44
2000	First	51.07	50.13	−0.94
	Second	49.66	48.47	−1.19
	Third	48.92	47.55	−1.37
	Overall			−3.52
2004	First	52.80	50.54	−2.26
	Second	50.05	50.97	+0.92
	Third	50.59	50.85	+0.26
	Overall			−1.95
2008	First	48.11	46.76	−1.35
	Second	46.66	45.73	−0.93
	Third	45.86	46.18	+0.32
	Overall			−1.93

Adapted from Tom Holbrook, "Debate Expectations." ©2012 by Politics by the Numbers.

29

The writer wants to provide relevant information from the table about the 1992 debate period that supports the point being made in this paragraph. Which choice best accomplishes this goal?

- A) NO CHANGE
- B) the shifts in public support for the incumbent party candidate had varied, falling by 2.03 percentage points after the second debate and rising by 0.40 percentage points after the third.
- C) the incumbent party candidate saw an increase in public support of only 0.56 percentage points—just about half of a percentage point.
- D) public support for the incumbent party candidate remained lower than it was in any other debate period between 1988 and 2008.

30

Which choice uses information from the table to provide an example similar to the example already in the sentence?

- A) NO CHANGE
- B) 2004 and 2008 the total change in support for the incumbent party candidate was almost identical.
- C) 2004 and 2008 the second debate resulted in a rise and a fall, respectively, in support for the incumbent party candidate.
- D) the second debate in 1988, the amount of that increase was larger than in the first.

To explain the relatively insignificant effects of presidential debates on voters, political scientist John Sides observes, “The debates occur late in the campaign, long after the vast majority of voters have arrived at a decision.” Others note that the debates tend to attract

31 politically engaged viewers who are particularly interested in politics and thus may be more likely to have already formed their opinions of the candidates before the debate. The structured format of the debates often **32** limit candidates to providing brief statements and even briefer rebuttals, largely equalizing debate performance. Viewers are likely to consider the winner of the debate to be the candidate they favored before the debate began.

Meager shifts in support during the debate period **33** are discussed at great length by the press. In a close race, even a small change in support could influence the outcome of the election. Moreover, presidential debates are important for helping the public understand the issues. According to the Pew Research Center, 70 percent of the voters who reported watching the 2012 debate coverage said the debates were informative to them. The public may not be persuaded by debates, but at least they are better informed.

31

- A) NO CHANGE
- B) and draw in viewers
- C) viewers watching them
- D) viewers

32

- A) NO CHANGE
- B) limits
- C) have limited
- D) is limiting

33

Which choice provides the most effective introduction to the paragraph?

- A) NO CHANGE
- B) should not, however, be completely discounted.
- C) can also be attributed to political advertisements.
- D) can often be misleading.

Questions 34-44 are based on the following passage.

27 Rue de Fleurus

[1] In the early twentieth century, perceptions about art were changing rapidly. [2] Modern artists were experimenting with color, materials, and **34** perspective, creating innovative and abstract works that challenged the concept that art must depict the world realistically. [3] At the eye of the modern-art storm **35** was writer Gertrude Stein, her brother Leo, and their Paris apartment at 27 Rue de Fleurus. [4] It all began when the Steins purchased two paintings by Henri Matisse, including *Woman with a Hat*. [5] While many viewers were disturbed by *Woman's* bold brushstrokes and unconventional coloration (the woman is depicted in bright blues, greens, and reds), the Steins saw this style as a powerful expression of emotion. [6] People flocked to see the Steins' paintings because of the scandal they were creating. [7] "Matisse brought people, everybody brought somebody," Gertrude recalled. **36**

34

- A) NO CHANGE
- B) perspective; creating
- C) perspective, they created
- D) perspective, it created

35

- A) NO CHANGE
- B) is
- C) are
- D) were

36

The writer wants to include the following sentence in the paragraph.

Viewers were often shocked by the audacity of these new works and doubted their validity as true art.

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

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

In 1906, **37** although they displayed Matisse's paintings, the Steins began hosting weekly gatherings to show their growing collection of avant-garde artwork.

38 In the Steins' private museum, paintings crowded every available inch of wall space. Artists, writers,

37

Which choice provides the most logical transition from the previous paragraph?

- A) NO CHANGE
- B) while Gertrude was writing one of her books,
- C) to accommodate the surge of visitors,
- D) between the two of them,

38

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

- A) Kept, because it explains the mention of tourists and passersby in the next sentence.
- B) Kept, because it contributes to the paragraph's goal of depicting the atmosphere at 27 Rue de Fleurus.
- C) Deleted, because it makes no mention of the Matisse paintings discussed in the previous paragraph.
- D) Deleted, because it features a description that is incomplete.

collectors, and critics, as well as tourists and

39 passersby, mingled. They did so amid an assortment of furniture dotted with books and portfolios. At the Steins', one could be introduced to artists such as the young Pablo Picasso, whose paintings had been acquired by the Steins. Art critic Lewis Hind described the atmosphere as one of "excitement and stimulation"; crowded with people and controversial paintings,
40 socializing, networking, and debating had a forum at 27 Rue de Fleurus.

39

Which choice best combines the sentences at the underlined portion?

- A) passersby, mingled
- B) passersby, mingled and were
- C) passersby, mingled, and did so
- D) mingling passersby were

40

- A) NO CHANGE
- B) a forum for socializing, networking, and debating was found at 27 Rue de Fleurus.
- C) the forum at 27 Rue de Fleurus was for socializing, networking, and debating.
- D) 27 Rue de Fleurus was a forum for socializing, networking, and debating.

Though many were inspired, plenty of visitors were puzzled—even disgusted—by the art on display.

41 Many of the paintings were purchased from the gallery of Ambroise Vollard, with whom the Steins were friendly. Leo, for instance, would spend hours explaining to an audience that a work that seemed ugly or

42 jarring was actually masterfully expressing the essence of a form or an idea. The Steins not only helped promote modern art but also **43** they helped define the conversations about it.

By 1913, though, the dynamic at 27 Rue de Fleurus had begun to change: as Picasso, Matisse, and other new artists gained wider acceptance, the shock value of their work wore off. Though Gertrude would continue to host popular weekly gatherings—Leo moved to Italy in 1914, taking a portion of the collection with him—the provocation and **44** hysteria of those Saturday evenings, as well as much of the artwork, had gone. In Gertrude’s 1933 memoir, she reflected about the painters, “Once everybody knows they are good the adventure is over.”

41

Which sentence provides the best introduction for the example in the following sentence?

- A) NO CHANGE
- B) The value of the Steins’ collection was confirmed decades later when some of the paintings sold for millions of dollars.
- C) Gertrude and Leo were not the only members of the Stein family who appreciated art; their older brother Michael was also a collector.
- D) The Steins sought to convince skeptics of the art’s merit, however, vigorously defending each piece.

42

- A) NO CHANGE
- B) jarring;
- C) jarring—
- D) jarring,

43

- A) NO CHANGE
- B) helping to define
- C) helped define
- D) defining

44

- A) NO CHANGE
- B) thrill
- C) mayhem
- D) pandemonium

STOP

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

No Test Material On This Page



Math Test – No Calculator

25 MINUTES, 20 QUESTIONS

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

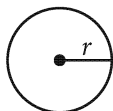
DIRECTIONS

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

NOTES

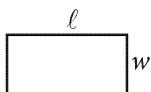
1. The use of a calculator **is not permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated,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

REFERENCE

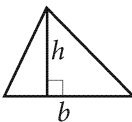


$$A = \pi r^2$$

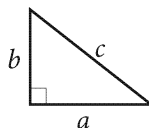
$$C = 2\pi r$$



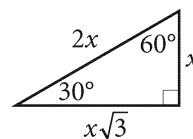
$$A = \ell w$$



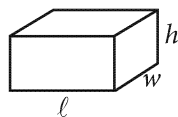
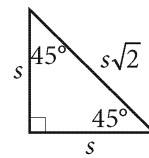
$$A = \frac{1}{2}bh$$



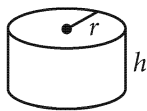
$$c^2 = a^2 + b^2$$



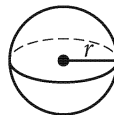
Special Right Triangles



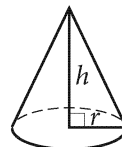
$$V = \ell wh$$



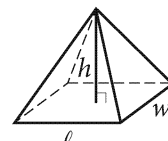
$$V = \pi r^2 h$$



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



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



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

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

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

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



1

First-time customers at a dog-boarding facility must pay a onetime \$15 evaluation fee, as well as \$30 for each day and \$20 for each night the dog spends at the facility. Which of the following expressions best models the total cost, in dollars, for a first-time customer to board a dog at this facility for d days and n nights?

- A) $30d + 20n + 15$
- B) $(30 + 15)d + 20n$
- C) $(30 + 20)(d + n)$
- D) $(30 + 20)(d + n) - 15$

2

Which of the following is equivalent to the expression $3(x + 2)(x - 5) + 2(x + 1)(x + 3)$?

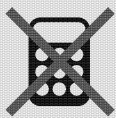
- A) $5x^2 - x - 24$
- B) $5x^2 - x - 39$
- C) $5x^2 - x - 51$
- D) $5x^4 - x^2 - 39$

3

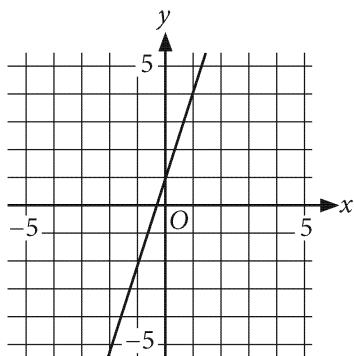
$$\sqrt{12x} = x + 3$$

What value of x satisfies the equation above?

- A) -3
- B) 0
- C) 3
- D) 12



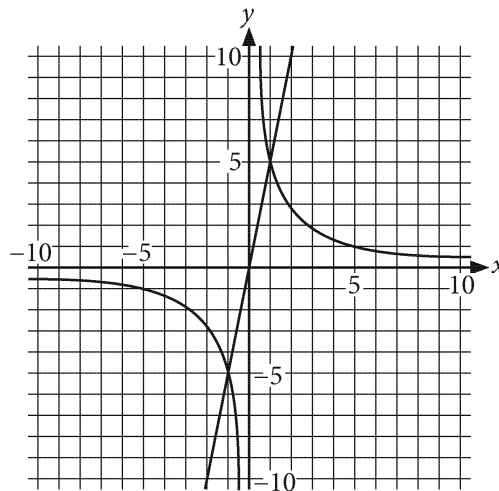
4



The graph of a line is shown in the xy -plane above. Which of the following is an equation of the line?

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

5



The graphs of two equations in a system of equations are shown in the xy -plane above. Which of the following statements is true?

- A) The point $(0, 0)$ represents the solution to the system.
- B) The points $(-1, -5)$ and $(1, 5)$ represent the solutions to the system.
- C) The point $(5, 5)$ represents the solution to the system.
- D) The points $(5, 0)$ and $(0, 5)$ represent the solutions to the system.



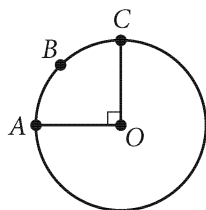
6

$$W(d) = 2.5d + 21$$

The function W defined above models the typing speed, in words per minute, of a student taking a typing class, where d is the number of days the student has been in class and $0 \leq d \leq 15$. According to the model, what is the typing speed, in words per minute, of a student who has been in class for 7 days?

- A) 9.5
- B) 28.0
- C) 30.5
- D) 38.5

7



The circle above has center O and $OC = \frac{1}{2}$. What is the length of arc \widehat{ABC} ?

- A) $\frac{\pi}{2}$
- B) $\frac{\pi}{4}$
- C) $\frac{\pi}{8}$
- D) $\frac{\pi}{12}$

8

If $a > 0$, which of the following is equivalent to $\frac{2a^2}{3a^3}$?

- A) $\frac{2}{3}a^{-1}$
- B) $-a^{-1}$
- C) $\frac{2}{3}a$
- D) $\frac{2}{3}a^{\frac{2}{3}}$



9

$$\begin{aligned}2x + 5y &= 1 \\ 3x + 7.5y &= d\end{aligned}$$

In the system of equations above, d is a constant. If the system has infinitely many solutions (x, y) , what is the value of d ?

- A) 1.5
- B) 2.5
- C) 3.5
- D) 4.5

10

$$h(t) = -16t^2 + 104t + 3$$

At a baseball home run hitting contest, the trajectory of one home run was examined. The baseball's height h , in feet above the ground, t seconds after being hit is modeled by the quadratic function above. Which of the following is the best interpretation of the number 3 in this context?

- A) The number of seconds it took the baseball to reach its maximum height
- B) The number of seconds it took the baseball to hit the ground
- C) The number of feet above the ground the baseball was 16 seconds after it was hit
- D) The number of feet above the ground the baseball was when it was hit

11

If $27^x = 3$ and $4^{x+y} = 16$, what is the value of y ?

- A) -1
- B) $\frac{1}{3}$
- C) $\frac{5}{3}$
- D) $\frac{7}{3}$

12

The graph of $y = f(x)$ is a line in the xy -plane that has a slope $\frac{3}{4}$. If $f(12) = 18$, which of the following functions could represent $f(x)$?

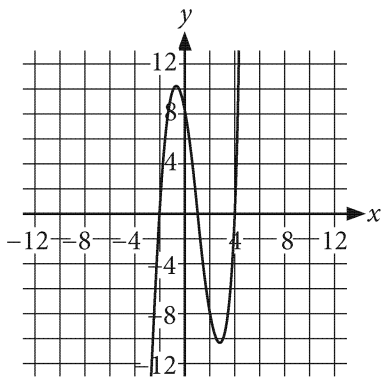
- A) $f(x) = \frac{3}{2}x$
- B) $f(x) = \frac{3}{2}x - 18$
- C) $f(x) = \frac{3}{4}x + 9$
- D) $f(x) = \frac{3}{4}x - \frac{3}{2}$



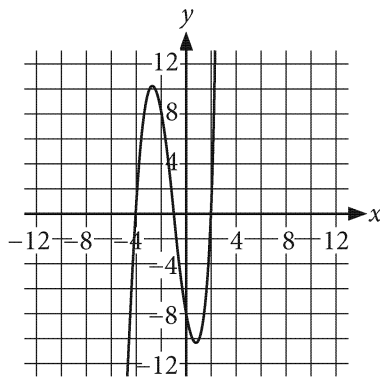
13

Which of the following could be the graph of $y = (x + 1)(x - 2)(x + 4)$?

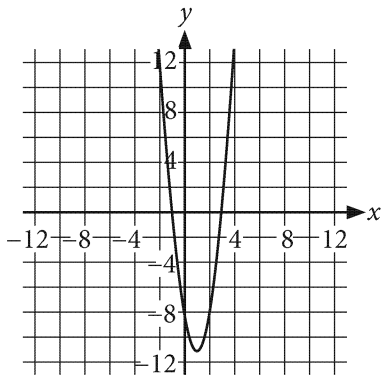
A)



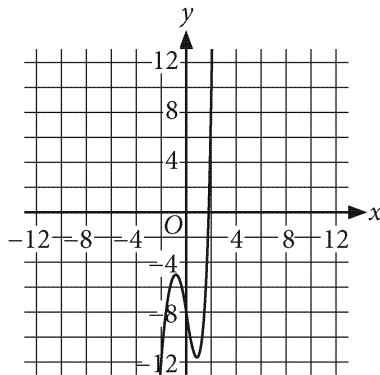
B)



C)



D)





14

$$x^2 - x - 2 = 0$$

Which of the following are the solutions to the equation above?

- A) $x = \frac{1}{4} \pm \sqrt{\frac{1}{2}}$
- B) $x = \frac{1}{4} \pm \sqrt{\frac{9}{4}}$
- C) $x = \frac{1}{2} \pm \sqrt{\frac{1}{4}}$
- D) $x = \frac{1}{2} \pm \sqrt{\frac{9}{4}}$

15


$$y = x^2 - 2x + 6$$
$$y = 2x + 2$$

In the xy -plane, the graphs of the two equations above intersect at (a, b) . What is the value of b ?

- A) 0
- B) 2
- C) 4
- D) 6

DIRECTIONS

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

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

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

Write
answer in
boxes.

— Fraction
line

[illegible]

Grid in
result.

Answer: 2.5

Decimal
point



























[illegible]

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

Answer: 201 – either position is correct

	2	0	1
			
			
			
			
			
			
			

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.



16

If $f(x) = x + 2$ and $g(x) = 2x$, what is the value of $3f(2) - g(2)$?

17

$$5(x + 1) = 6 + 2x$$

What value of x satisfies the equation above?

18

Each angle of $\triangle ABC$ is congruent to one of the angles of $\triangle QRS$. If $AB = 6$, $BC = 9$, $AC = 12$, and $RS = 36$, what is one possible value for the perimeter of $\triangle QRS$?

19

$$y = x - 3$$

$$y = -2x + 9$$

If (a, b) are the coordinates of the point of intersection of the two lines in the xy -plane represented by the equations above, what is the value of a ?

20

$$i^3 + i^4 + i^5 + i^6$$

The complex number expression above can be rewritten in the form $a + bi$, where a and b are real numbers. What is the value of $|a| + |b|$?

(Note: $i = \sqrt{-1}$)

STOP

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

No Test Material On This Page



Math Test – Calculator

55 MINUTES, 38 QUESTIONS

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

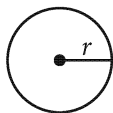
DIRECTIONS

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 16 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

NOTES

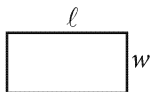
1. The use of a calculator **is not permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated,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

REFERENCE

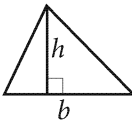


$$A = \pi r^2$$

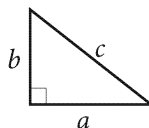
$$C = 2\pi r$$



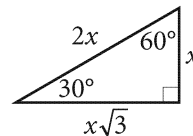
$$A = \ell w$$



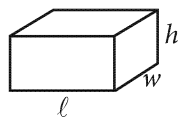
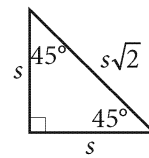
$$A = \frac{1}{2}bh$$



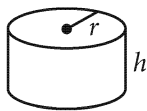
$$c^2 = a^2 + b^2$$



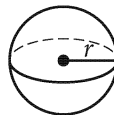
Special Right Triangles



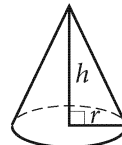
$$V = \ell wh$$



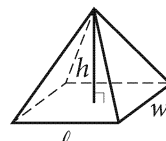
$$V = \pi r^2 h$$



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



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



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

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

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

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



1

A service delivers packages each day at an average rate of 10 packages per hour. Which of the following best approximates the number of packages, n , the service delivers in t hours?

- A) $n = t + 10$
- B) $n = t - 10$
- C) $n = 10t$
- D) $n = \frac{t}{10}$

2

At a certain point in time, 1 US dollar was equivalent to 0.90 euro. Based on this relationship, what was the value of 20 US dollars in euros at that time?

- A) 22.00
- B) 20.00
- C) 18.00
- D) 0.90

3

Which of the following is equivalent to the expression $-4x^2 - 12x$?

- A) $4(-x^2 + 3x)$
- B) $-4x(x + 3)$
- C) $-2x(2x - 6)$
- D) $-x(4x - 12)$

4

Which of the following equations, when graphed in the xy -plane, would result in a line with slope of 4 that passes through the point $(0, -3)$?

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



5

$$2(1 - x) = x + 10$$

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

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

6

An athletic trainer wants to determine whether a new exercise regimen improves the performance of members of high school athletic teams. To test whether the regimen improves performance, the trainer arranges for all the members of the boys' track team at a local high school to use it for one season. The trainer will then compare this season's performances to performances in previous years. Which of the following would NOT improve the quality of this study?

- A) Randomly assigning half of the track team to use the new regimen while the other half uses the current regimen
- B) Including members of all the boys' athletic teams at the high school in the study
- C) Including students who are not on athletic teams at the high school in the study
- D) Including members of the girls' track team at the high school in the study

7

	Female	Male	Total
Democrat	80	180	260
Republican	23	256	279
Independent	0	2	2
Total	103	438	541

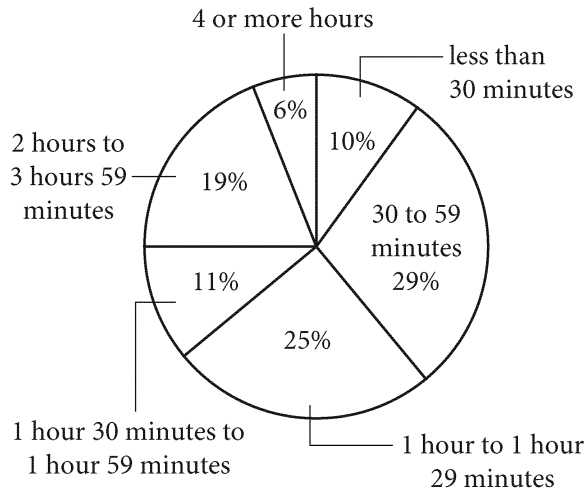
The table above shows a summary of the members of the 113th Congress of the United States in November 2014, categorized by gender and political affiliation. If one of the Democrats in the 113th Congress is selected at random, which of the following is closest to the percent likelihood that that member of Congress is female?

- A) 31%
- B) 44%
- C) 78%
- D) 80%



8

According to a study done by the Bureau of Labor Statistics, on a typical day between the years 2003 and 2006, about 16% of Americans aged 15 and older exercised. The pie chart below shows the distribution of the length of time those people spent exercising each day.



Based on the data shown, which of the following could be the median length of time spent exercising each day for those people who exercised?

- A) 0 minutes
- B) 45 minutes
- C) 1 hour 5 minutes
- D) 2 hours 10 minutes

9

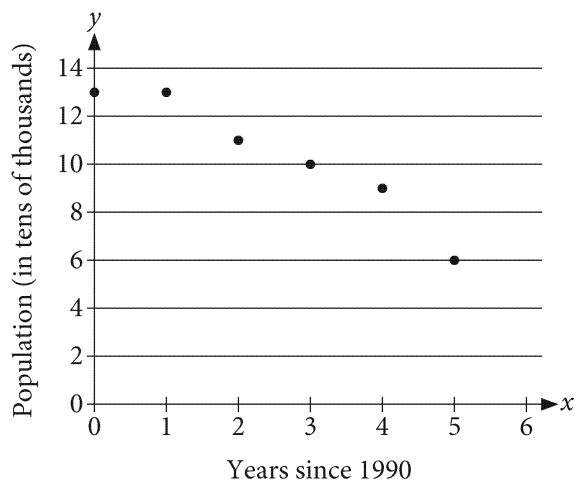
The perimeter P of a square with side length s is given by the formula $P = 4s$. The side length of Square A is 2 times the side length of Square B. How many times larger is the perimeter of Square A than the perimeter of Square B?

- A) 2
- B) 4
- C) 8
- D) 16



10

The population y , in tens of thousands, of a certain city x years since 1990 is shown in the scatterplot below.



If the data are modeled using a line of best fit, which of the following could be an equation of that line?

- A) $y = 13.8 + 1.4x$
- B) $y = 13.8 - 1.4x$
- C) $y = 12 + 1.4x$
- D) $y = 12 - 1.4x$

11

$$6x + y = 3$$

$$y = 5x + 1$$

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

- A) -2
- B) $\frac{2}{11}$
- C) $\frac{4}{11}$
- D) 4



Questions 12 and 13 refer to the following information.

For one week, the manager of a restaurant gathered customer feedback by randomly selecting 50 customers and asking them to complete a survey question. A total of 700 customers ate at the restaurant during the week in which the survey was completed. The survey question and the survey results are shown below.

To what extent do you agree or disagree with the following statement: “I would recommend this restaurant to others.” (Select only one of the five choices.)

Survey Question Results

Response	Number of customers
Strongly agree	6
Agree	24
Neither agree nor disagree	13
Disagree	5
Strongly disagree	2
Total	50

12

The manager assigns the values shown below to each response choice to calculate a mean rating for the survey question.

Response	Rating
Strongly agree	2
Agree	1
Neither agree nor disagree	0
Disagree	-1
Strongly disagree	-2

What is the mean rating for all 50 responses?

- A) 0.27
- B) 0.54
- C) 0.80
- D) 0.90

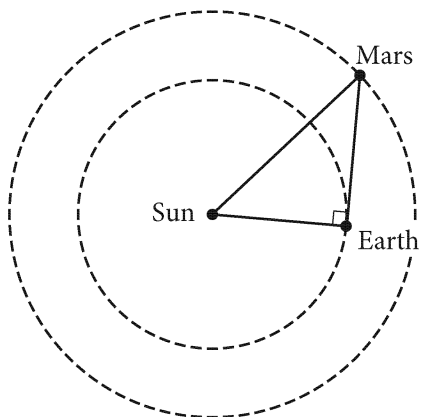
13

Which of the following is an appropriate conclusion about the customers surveyed?

- A) The majority of the customers would recommend the restaurant to others.
- B) The majority of the customers would not recommend the restaurant to others.
- C) The majority of the customers would neither recommend nor not recommend the restaurant to others.
- D) The number of the customers who would recommend the restaurant to others is the same as the number of the customers who would not recommend the restaurant to others.



14



Note: Figure not drawn to scale.

The figure above represents the relative positions of the Sun, Earth, and Mars at a particular time when the distance from the Sun to Mars is approximately 220,000,000 kilometers and the distance from the Sun to Earth is approximately 149,000,000 kilometers. What is the approximate distance, in kilometers, from Earth to Mars at that time?

- A) 27,000,000
- B) 71,000,000
- C) 162,000,000
- D) 266,000,000

15

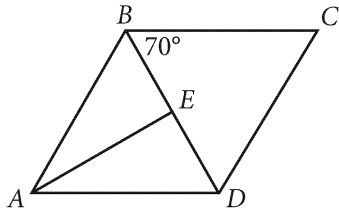
Name	Time
Aaron	7 min 21 sec
Jamal	5 min 5 sec
Maya	5 min 21 sec
Aliyah	5 min 17 sec
Nacek	5 min 10 sec

Five students ran a mile, and their times are shown in the table above. If Aaron's time is removed from the data set, which of the following measures will change the least?

- A) Mean
- B) Median
- C) Maximum
- D) Range



16



Note: Figure not drawn to scale.

In the rhombus shown above, E is the midpoint of \overline{BD} . What is the measure of $\angle EAD$?

- A) 20°
- B) 35°
- C) 40°
- D) 70°

17

Ms. Miller is one of the music teachers at Union High School, which has 1,125 students. She selected 40 of her music students at random and asked each whether they play an instrument. Of the 40 students surveyed, 31 play an instrument. Based on the design of the study, which of the following is the largest group of students to whom the results of Ms. Miller's survey can be generalized?

- A) All of Ms. Miller's music students at Union High School
- B) All of the music students at Union High School
- C) All of the students at Union High School
- D) All of the music students in the state



Questions 18-20 refer to the following information.

A fitness club is hosting an indoor triathlon. Each triathlon participant spends 10 minutes swimming in the pool, 30 minutes biking on a stationary bike, and 20 minutes running on a treadmill. Scores are given based on total combined distance in miles, D , of the three activities, which can be found using the equation below.

$$\frac{1}{6}s + \frac{1}{2}b + \frac{1}{3}r = D$$

In the equation, s is the participant's average swimming speed, in miles per hour (mph); b is the participant's average biking speed, in mph; and r is the participant's average running speed, in mph.

18

In the swim portion of the triathlon, Deonte's average swimming speed was 1.2 miles per hour. His goal is to have a total combined distance of at least 10 miles. He knows he will have an average biking speed that is between 2 and 3 times faster than his average running speed. Which system of inequalities represents the ways in which Deonte can meet his goal?

A) $\frac{1}{2}b + \frac{1}{3}r \geq 8.8$
 $2b < r < 3b$

B) $\frac{1}{2}b + \frac{1}{3}r \geq 8.8$
 $2r < b < 3r$

C) $\frac{1}{2}b + \frac{1}{3}r \geq 9.8$
 $2b < r < 3b$

D) $\frac{1}{2}b + \frac{1}{3}r \geq 9.8$
 $2r < b < 3r$

19

Kate's average running speed during the triathlon was 7.5 mph, and her average biking speed was 16 mph. Her total combined distance was 10.75 miles. At what average speed, in mph, did she swim?

- A) 0.25
- B) 1.50
- C) 1.79
- D) 5.07

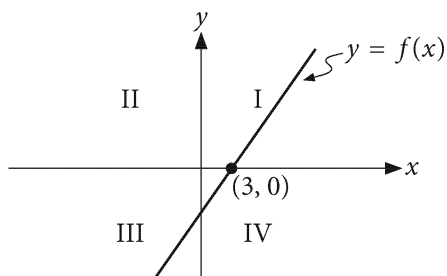
20

In the triathlon, Jamie ran exactly 6 times the distance he swam. Which equation relates his average swimming speed to his average running speed?

- A) $r = 3s$
- B) $r = 6s$
- C) $r = \frac{s}{12}$
- D) $r = \frac{s}{6}$



21



The graph in the xy -plane above shows the linear function f . If $g(x) = -2x + 4$, in which quadrant does the graph of $y = f(x)$ intersect the graph of $y = g(x)$?

- A) I
- B) II
- C) III
- D) IV

22

For the years 1990 through 2006, the average number of beverage bottles per person, w , not recycled in a year can be represented by the equation $w = 15.61(1.17)^t$, where t is the number of years after 1990. Which of the following is the best interpretation of the number 15.61 in the context of the problem?

- A) The maximum number of beverage bottles per person not recycled each year
- B) The increase in the number of beverage bottles per person not recycled each year
- C) The average number of beverage bottles per person not recycled in 1990
- D) The percent increase in the number of beverage bottles per person not recycled each year

23

A school district currently has 2,000 students and expects growth for the next 5 years. The school board is comparing two different growth projections. One model predicts that each year there will be 30 more students than the previous year. The other model predicts that each year there will be 1% more students than the previous year. To the nearest whole number, what is the difference in the projection of the total number of students these models predict after 5 years?

- A) 10
- B) 20
- C) 29
- D) 48

24

$$\frac{3}{2x-1} = \frac{x}{5}$$

In the equation above, $2x - 1$ could equal which of the following?

- A) -6
- B) -5
- C) 4
- D) 8

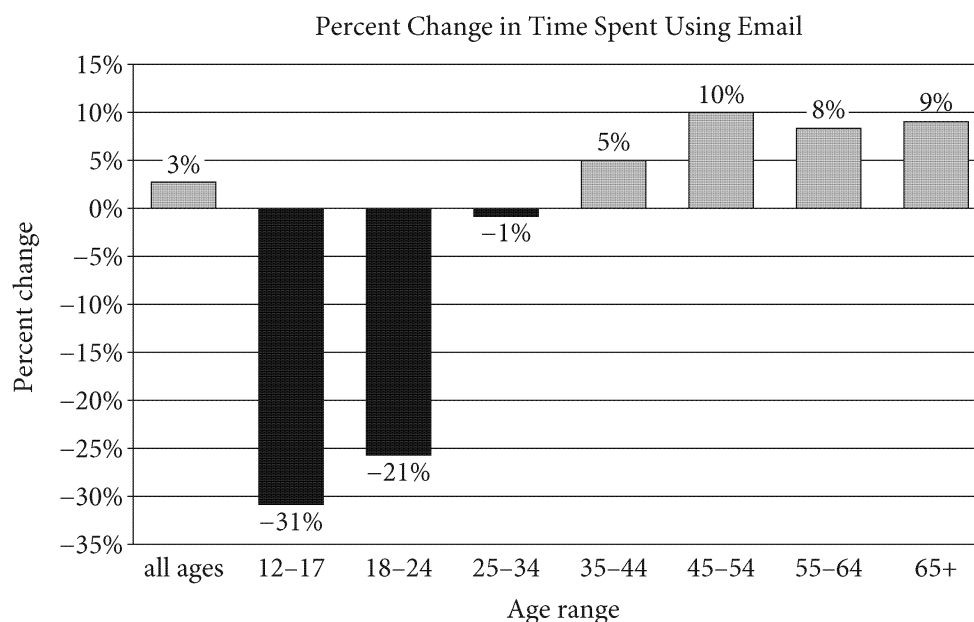


25

The function f is defined by $f(x) = -ax^2 + bx + 5$, where a and b are positive constants. Which of the following points CANNOT be on the graph of $y = f(x)$ in the xy -plane?

- A) $(-2, 2)$
- B) $(-1, 4)$
- C) $(0, 4)$
- D) $(1, 6)$

26



The bar graph above shows the percent change in the average number of hours people in different age groups spent using email from October 2010 to October 2011. Which of the following conclusions is most appropriate based on the bar graph?

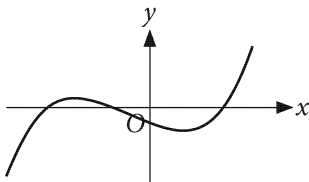
- A) The majority of people who use email are between 45 and 64 years old.
- B) Younger people spent less time using email in October 2011 than in October 2010.
- C) The 12- to 17-year-old group spent the least amount of time using email over this period of time.
- D) About 32% of the population spent more time using email in October 2011 than in October 2010.



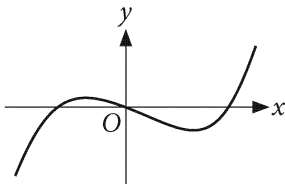
27

In the function $p(x) = (x - r)(x - s)(x - t)$, r and s are positive constants and t is a negative constant. Which of the following could represent the graph of $y = p(x)$?

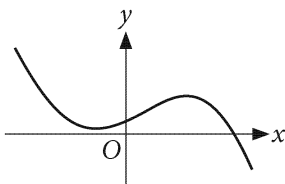
A)



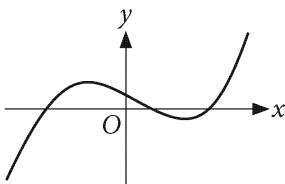
B)



C)



D)



28

The height h , in feet, of a toy rocket above the ground t seconds after it is launched can be modeled by the function $h(t) = -16t^2 + 224t$. Which of the following methods can be used to find m , the maximum height, in feet, of the rocket above the ground?

- A) Compute $h(0) = -16(0)^2 + 224(0)$ to find $h(0) = m$.
- B) Rewrite h as $h(t) = -t(16t + 224)$. The number 224 represents m .
- C) Rewrite h as $h(t) = -16t(t - 14)$. The number 14 represents m .
- D) Rewrite h as $h(t) = -16(t - 7)^2 + 784$. The number 784 represents m .



29

$$a(3x - 4) = 9x - 8$$

In the equation above, a is a constant. If no value of x satisfies the equation, what is the value of a ?

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

30

The population of Town A grew by approximately 27% between 1996 and 2000 and then decreased by approximately 25% between 2000 and 2004. If the population was 26,400 in 2000, what was the approximate change in the number of people living in Town A between 1996 and 2004?

- A) Increase of 987 people
- B) Increase of 528 people
- C) Decrease of 528 people
- D) Decrease of 987 people



31

$$1.90c + 1.50n = T$$

The equation above gives the total cost T , in dollars, to purchase c pounds of cherries and n pounds of nectarines at a local grocery store. How much greater would be the total cost, in dollars, to purchase 4 pounds of cherries and 5 pounds of nectarines than to purchase 3 pounds of cherries and 4 pounds of nectarines? (Disregard the \$ sign when gridding your answer. For example, if your answer is \$4.97, grid 4.97)

32

A harvest festival charges a fixed cost per van for parking and an amount per person to enter the festival. One van with 3 people in it is charged \$22, and another with 5 people is charged \$32. How many people are in a van that is charged \$47 to enter the festival?

33

$$2x^2 - 22x + 56 = 0$$

If $x = k$ represents a solution to the quadratic equation above, what is one possible value of k ?

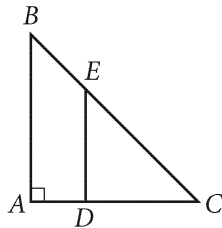
34

Building	Height (ft)
Burj Khalifa	2717
Shanghai Tower	2073
Makkah Royal Clock Tower	1971

The table above shows the heights of three of the world's tallest buildings. If a new building is built, what is one possible height, rounded to the nearest foot, that would make the average height of the four buildings greater than 2150 feet but less than 2151 feet?



35



Note: Figure not drawn to scale.

In the figure above, \overline{AB} is parallel to \overline{DE} , and \overline{DC} is twice the length of \overline{AD} . If the area of triangle ABC is 9 and the lengths of \overline{AB} and \overline{AD} are both integers, what is one possible length of \overline{DE} ?

36

A helicopter is flying at a speed of 180 miles per hour. What is its speed in meters per second? (Use 1 mile = 1600 meters.)

Questions 37 and 38 refer to the following information.

The table below compares features of the orbits of Earth and Pluto.

	Earth	Pluto
Semimajor axis (in 10^6 kilometers)	149.60	5,906.38
Perihelion (in 10^6 kilometers)	147.09	4,436.82
Aphelion (in 10^6 kilometers)	152.10	7,365.93

37

The ratio of Pluto's semimajor axis to Earth's semimajor axis is $p:1$, where p is a constant. What is the value of p , rounded to the nearest tenth?

38

To the nearest hundredth, what percent of Pluto's perihelion distance is Earth's perihelion distance? (Disregard the % sign when gridding 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.

October 7, 2017 International

ANSWER KEY

Reading Test Answers

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

READING TEST
RAW SCORE
(NUMBER OF
CORRECT ANSWERS)

Writing and Language Test Answers

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

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

Math Test – No Calculator Answers

1 A	11 C
2 A	12 C
3 C	13 B
4 D	14 D
5 B	15 D
6 D	16 8
7 B	17 $1\frac{1}{3}$, .333
8 A	18 81, 108, 162
9 A	19 4
10 D	20 0

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

Math Test – Calculator Answers

1 C	11 B	21 D	31 3.4
2 C	12 B	22 C	32 8
3 B	13 A	23 D	33 4, 7
4 C	14 C	24 A	34 1840, 1841, 1842
5 B	15 B	25 C	35 $2\frac{2}{3}$, $4\frac{4}{3}$, 2, 4
6 C	16 A	26 B	36 80
7 A	17 A	27 D	37 39.5
8 C	18 D	28 D	38 3.32
9 A	19 B	29 A	
10 B	20 A	30 D	

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