CollegeBoard SAT®

DECEMBER 4, 2021
US
version 1.0

The SAT®

Test Book

IMPORTANT REMINDERS

1

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

2

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

Test begins on the next page.

Reading Test

65 MINUTES, 52 QUESTIONS

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

DIRECTIONS

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

Questions 1-10 are based on the following passage.

This passage is adapted from Naomi Jackson, *The Star Side of Bird Hill*. ©2014 by A. Naomi Jackson. Ten-year-old Phaedra is visiting her grandmother, Hyacinth, in Bird Hill, Barbados. Simone Saveur and Christopher are local children.

On her first and last visit of Hyacinth's house, Simone Saveur sat down and started looking around, taking mental notes, collecting grist for the gossip mill. Because while Hyacinth could safely say that she had been into almost every house on Bird Hill, whether to deliver a baby or visit an old person who was feeling poorly, or just to sit for a while talking about who had died and left and been born, only a handful of hill women could say that they had seen Hyacinth's house beyond the gallery where she sat with guests. All of them had at one point or another been invited to admire Hyacinth's rose garden, which in her vanity she sometimes showed off, going on about how they bloomed, the insects that troubled them, her pruning techniques. It could be said that Hyacinth's rose garden, which she tended to like another set of grandchildren, was an elaborate fortress whose beauty so thoroughly enchanted its visitors that they never questioned why they'd never been invited inside.

When Phaedra saw Simone looking around, she suddenly felt protective of Hyacinth and her house and everything in it: a pitcher and glasses with orange slices etched into them that had been around since before Phaedra was born, the open jalousies and the white curtains that lapped against the girls' faces, the lovingly carved archway that separated the front room from the dining room, just barely fitting a dining table and a hutch, the pictures of Phaedra and her sister Dionne and their mother, Avril, lining the walls. Where their apartment building in Brooklyn was marked with just a number, 261, Phaedra loved her grandmother's house because of the question "Why worry?" written in blue script above the front steps. Everything in Hyacinth's house had been touched by those she loved, and so it was Phaedra's and Dionne's in a way that their apartment in Brooklyn never would be.

Once, when there was a lull in conversation, Simone Saveur's roving eyes settled on Phaedra. Simone tried to explain the concept of cooking a dirt pot, but Phaedra was not at all interested in cooking, not even for play. She knew she wouldn't be playing any such game, or spending time with girls who thought this was a good time. Phaedra's mouth corners turned down and soon everyone was saying their good-byes. Phaedra's mother said that her daughter's gloomy face could rain out a good time. In this case, Phaedra thought the force of her foul mood came in handy; it encouraged a quick end to what had been an uncomfortable, bordering on unpleasant, afternoon.

That summer, Christopher and Phaedra were inseparable. Phaedra could barely trouble herself to remember the other girls' names, having put them in the category of "just girls," which was the same as

CONTINUE

dumping them into the rubbish bin of her mind. With Chris, there was ease to their play, a rough-and-tumbleness that she welcomed. Chris made Phaedra most happy by not asking her too many questions.

Phaedra liked to look at Christopher, who had the same sloe-eyed gaze as his mother's, an ever-ready smile, and pink lips that made him seem more tender than other boys his age. Now she watched as he stuffed the stocky fingers of his eternally ashy hands into his pockets and surveyed the land below the hill, mimicking the firm stance he'd seen his father take in the pulpit.

From where they stood, Phaedra and Chris could see the fishermen's boats at Martin's Bay, the buoys bobbing up and down in the blue-green water. Further east, a riot of rock formations, vestiges of an island long since gone, jutted out at Bathsheba. It was Phaedra's first summer in Barbados, and she wanted more than anything to feel the sand between her toes and to look at her feet through the clear-clear water. With its natural beauty, Barbados was far superior to Brooklyn. She stood next to Chris. It was hard to explain, but she had a feeling, standing there, that she'd never felt before in Brooklyn, not that she owned these things, but that she was somehow part of them. When Phaedra went on a class trip to the Empire State Building and looked down at the city from 102 stories above the sidewalk, she didn't have that feeling. The city was beautiful in its own way, but it wasn't hers. She didn't try to explain how she felt to Chris. What she most liked about their friendship was how much space there was for silence, the kind of quiet she'd never found with girls her age.

1

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

A) depicting a lasting memory from an island visit to illustrating daily life in a large city.

B) recounting an unwanted social interaction to describing a meaningful friendship.

C) retelling a conversation among members of an extended family to characterizing the elements of an ideal home.

D) explaining an event from a sheltered childhood to portraying a moment of independence.

2

It can reasonably be inferred from the passage that a primary motivation for Simone's visit to the house is to

A) fulfill a social obligation to pay a visit to Hyacinth.

B) obtain a stem of one of the highly prized roses in the garden.

C) caution Phaedra about the other girls in the neighborhood.

D) gain a social advantage by spending time in the house.

3

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

A) Lines 1-4 ("On her . . . mill")

B) Lines 11-15 ("All . . . techniques")

C) Lines 39-41 ("Once . . . Phaedra")

D) Lines 41-43 ("Simone . . . play")

4

In the context of the passage, Phaedra's reaction to the question written on the Bird Hill house (line 34) mainly serves to

A) illustrate her admiration of touches that reflect personalization.

B) intensify a conflict that puts her at odds with Simone.

C) explain her decision to adopt Christopher's aloofness.

D) contradict the neighbors' unkind assumptions about her.

CONTINUE

5

Based on the passage, which benefit does Phaedra get from staying in Hyacinth's house?

A) Freedom to share her opinions without reservation
B) An unaccustomed experience of living amid luxury
C) Reminders of her strong connections to her family
D) A chance to witness her grandmother's generosity

6

In describing the "force of her foul mood" (line 50), the narrator most likely means that Phaedra is able to

A) postpone a tough confrontation.
B) influence the outcome of a situation.
C) convince others to alter their preferences.
D) exaggerate the severity of a problem.

7

The passage most strongly suggests that Phaedra's attitude toward girls who want to befriend her is best described as

A) resentful, because she feels obligated to spend time with them.
B) dismissive, because she has no desire to get to know them individually.
C) uncertain, because she recognizes that she has little in common with them.
D) awkward, because she finds them uninteresting but wants to spare their feelings.

8

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

A) Lines 46-47 ("Phaedra's . . . good-byes")
B) Lines 47-52 ("Phaedra's . . . afternoon")
C) Lines 54-58 ("Phaedra . . . mind")
D) Lines 58-61 ("With . . . questions")

9

The main purpose of the fifth paragraph (lines 62-69) is to

A) describe a character's qualities that endear him to another character.
B) illustrate a character's striking resemblance to a family member.
C) explain the reason for a character's admiration for his father.
D) highlight a turning point in the relationship between two characters.

10

As used in line 67, "surveyed" most nearly means

A) researched.
B) questioned.
C) estimated.
D) considered.

CONTINUE

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

This passage is adapted from Julie Sedivy and Greg Carlson, *Sold on Language: How Advertisers Talk to You and What This Says about You*. ©2011 by John Wiley & Sons Ltd.

Metaphors can play a role in triggering not just a specific set of *thoughts*, but also a specific set of *feelings*. This aspect of metaphor is like turning on the colored stage lights. Using metaphor can have the effect of switching from a flat white light aimed at the stage to one that bathes the scene in melancholy blue. It makes you care.

Political scientist Todd Hartman demonstrated how metaphors matter by applying them to the rather arcane policy issue of network neutrality. The issue affects how information is priced and transmitted over the Internet, and became important in response to lobbying efforts by broadband service providers to be allowed to charge a premium for transmitting certain data at high speeds. Those opposed to the lobbying efforts argued that tiered pricing would violate the "neutrality" principle of the Internet—in other words, the principle that the Internet was originally created with the intent of treating all data equally. To see whether metaphors could move people more than straightforward, unembellished language, Hartman had some volunteers in his study read this accurate, but somewhat dry statement:

Congressman Alan Davidson, who specializes in technology issues, supports Network Neutrality legislation. He recently told reporters: 'Telecoms want to charge fees on the Internet to connect content providers to their customers. Network Neutrality would prevent this from happening. It would ensure that we don't have a system where some companies have access to fast services, while the rest are left with slower connections.'

Others got a version that was built around the metaphor of the Internet as the information superhighway:

Congressman Alan Davidson, who specializes in technology issues, supports Network Neutrality legislation. He recently told reporters: 'Telecoms want to set up toll booths on the Internet to stand between content providers and their customers. Network Neutrality would prevent this from happening. It would ensure that we don't have a system where some companies have access to an express lane, while the rest are stuck waiting in line at the toll booth.'

The first message communicates pretty much the same policy content as the second metaphor-filled message. But it treats the issue as an *abstract* policy matter. Most people likely feel they don't have enough of a framework within which to evaluate the consequences of the proposed fee structure. The emotional impact of the language is pretty bland: sometimes fees for service are good, or at least necessary; sometimes they're bad. The message itself gives no particular reason to think one way or the other about them. But the second message brings the whole thing into the domain of personal experiences that everyone can relate to. Voters' experiences with toll booths aren't abstract—they're very concrete, and *very* annoying. And by alluding to the idea of the Internet as an information superhighway, with its images of speed, modernity, and dynamic movement, the message draws into the foreground people's feelings about the transformational potential of unfettered access to the Internet. Who could possibly be in favor of informational gridlock?

Not surprisingly, the persuasive effects of the two messages were dramatically different. People who read the dry version that was stripped of metaphor were no more supportive of network neutrality afterwards than another group who'd read neither of the messages—both of these groups were about 44% in favor of network neutrality. So, the persuasive work of the plain language was approximately zilch. But among the group who'd read the message laced with metaphor, the level of support for network neutrality soared to 61%.

CONTINUE

Figure 1

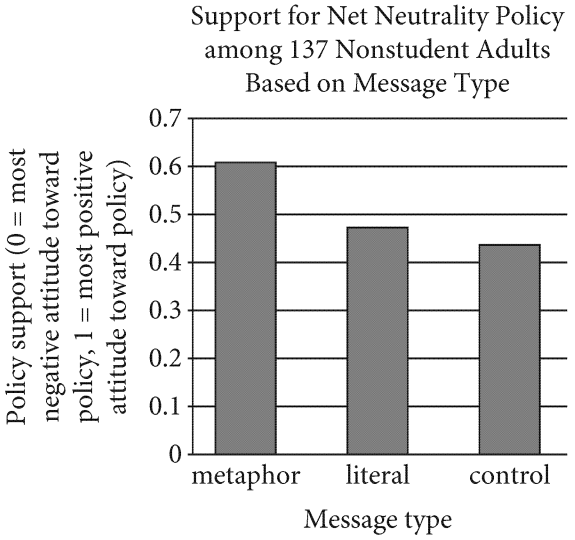
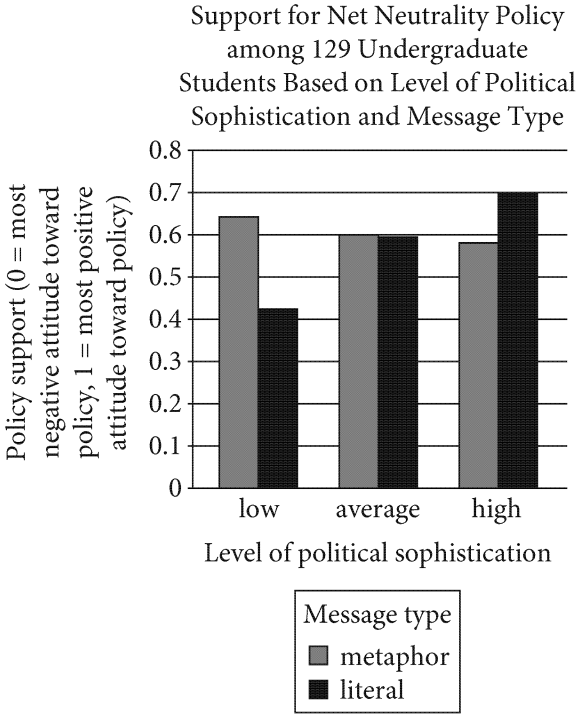


Figure 2



Figures adapted from Todd K. Hartman, "Toll Booths on the Information Superhighway? Policy Metaphors in the Case of Net Neutrality." ©2012 by Taylor & Francis Group, LLC.

11

Lines 3-7 ("This . . . care") serve mainly to

A) elaborate on a claim.
B) challenge a perspective.
C) define a term.
D) introduce a theory.

12

According to the passage, the issue of network neutrality came to the attention of the public as a result of

A) legislators petitioning for access to faster Internet speeds for their constituents.
B) everyday users desiring to benefit from competition among Internet companies.
C) Internet service providers wanting to charge higher and more variable fees.
D) political analysts debating the issue in the media.

13

The passage indicates that the first version of Davidson's message

A) presented his position on the issue of net neutrality dispassionately.
B) provided a detailed explanation of an unpopular policy.
C) addressed people's concerns about the negative effects of a major policy change.
D) acknowledged the difficulty of balancing Internet access with company profits.

CONTINUE

14

Which choice best supports the idea that the authors believe that when presented with the second version of Davidson's message, most people would support network neutrality?

A) Lines 34-36 ("Others . . . superhighway")
B) Lines 42-45 ("*It would . . . booth*")
C) Lines 60-65 ("And by . . . Internet")
D) Lines 65-66 ("Who could . . . gridlock")

15

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

A) helps.
B) reveals.
C) realizes.
D) handles.

16

Based on the passage, which aspect of the study contributed most directly to its success?

A) The statements read by the study participants were written by a congressman who was a technology specialist.
B) The metaphor used in the second message focused on an experience that was familiar to the study participants.
C) The issue addressed in the messages had financial implications for Internet users.
D) The participants in the study were asked about their support for the issue after they read their assigned messages.

17

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

A) Lines 11-15 ("The issue . . . speeds")
B) Lines 25-27 ("*Congressman . . . legislation*")
C) Lines 51-54 ("The emotional . . . bad")
D) Lines 56-58 ("But the . . . relate to")

18

As used in line 74, "work" most nearly means

A) activity.
B) duty.
C) influence.
D) product.

19

Which statement from the passage most directly addresses the control message type depicted in figure 1?

A) Lines 67-68 ("Not . . . different")
B) Lines 68-73 ("People . . . neutrality")
C) Lines 73-75 ("So, the . . . zilch")
D) Lines 75-77 ("But among . . . 61%")

CONTINUE

20

According to the data in figure 2, which combination of message type and political sophistication reflects the lowest support for network neutrality?

A) Metaphor; low

B) Literal; low

C) Literal; average

D) Metaphor; high

21

Based on the passage, with which statement about data presented in figure 2 would the authors most likely agree?

A) Students with a high level of political sophistication tend to have a more negative attitude toward network neutrality when it's explained to them in a metaphorical message because this type of message fails to acknowledge their analytical strengths.

B) Students with a high level of political sophistication tend to have a more positive attitude toward network neutrality when it's explained to them in a literal message because the conciseness of this type of message helps keep their attention.

C) Students with a low level of political sophistication tend to have a more positive attitude toward network neutrality when it's explained to them in a literal message because this type of message more clearly explains the facts surrounding the issue.

D) Students with a low level of political sophistication tend to have a more negative attitude toward network neutrality when it's explained to them in a literal message because this type of message is the least likely to help listeners form an opinion.

CONTINUE

Questions 22-31 are based on the following passage.

This passage is from Ewen Callaway, "Gene Drives Thwarted by Emergence of Resistant Organisms." ©2017 by Macmillan Publishers Limited, part of Springer Nature.

In the small city of Terni in central Italy, researchers are putting the final touches on what could be the world's most sophisticated mosquito cages. The enclosures, each occupying 150 cubic metres, simulate the muggy habitats in which Africa's *Anopheles gambiae* mosquitoes thrive. By studying the insects under more-natural conditions, scientists hope to better understand how to eradicate them—and malaria—using an emerging genetic-engineering technology called gene drives.

The technique can quickly disseminate genetic modifications in wild populations through an organism's offspring, prompting some activists to call for it to be shelved. Yet gene drives might not be as effective as activists think. Recent research has identified a major hurdle to using them to eliminate diseases and vanquish invasive pests: evolution.

Organisms altered by gene drives, including mosquitoes, have shown promise in proof-of-concept laboratory experiments. But wild populations will almost certainly develop resistance to the modifications. Researchers have begun identifying how this occurs so that they can address the problem.

Gene drives thwart the rules of inheritance in sexually reproducing organisms. Normally, offspring have a 50:50 chance of inheriting a gene from their parents. Gene drives alter those odds, preferentially passing on one version to an organism's offspring until, in theory, an entire population bears that gene.

Such 'selfish' genetic elements occur naturally in mice, beetles and many other organisms, and researchers have had modest success with hijacking them to battle pests. But interest in gene drives has surged with the advent of CRISPR–Cas9 gene editing, which can be used to copy a mutation from one chromosome into another.

In late 2015, researchers reported a CRISPR gene drive that caused an infertility mutation in female mosquitoes to be passed on to all their offspring. Lab experiments showed that the mutation increased in frequency as expected over several generations, but resistance to the gene drive also emerged, preventing some mosquitoes from inheriting the modified genome.

This is hardly surprising, says Philipp Messer, a population geneticist at Cornell University in Ithaca, New York. Just as antibiotics enable the rise of drug-resistant bacteria, population-suppressing gene drives create the ideal conditions for resistant organisms to flourish.

One source of this resistance is the CRISPR system itself, which uses an enzyme to cut a specific DNA sequence and insert whatever genetic code a researcher wants. Occasionally, however, cells sew the incision back together after adding or deleting random DNA letters. This can result in a sequence that the CRISPR gene-drive system no longer recognizes, halting the spread of the modified code.

The researchers building the mosquito cage in Italy, part of a multimillion-dollar project called Target Malaria, found this form of resistance in some mosquitoes. And Messer's team reported in December that these mutants are likely to flourish.

Natural genetic variation is another route to resistance. CRISPR-based gene drives work by recognizing short genetic sequences, and individuals with differences at these sites would be immune to the drive. A recent study analysed the genomes of 765 wild *Anopheles* mosquitoes from across Africa. The team found extreme genetic diversity, which would limit the list of potential gene-drive targets, the researchers say.

"These things are not going to get too far in terms of eradicating a population," says Michael Wade, an evolutionary geneticist at Indiana University Bloomington. Gene drives could result in the genetic isolation—in which populations do not mate with each other—of groups that manage to avoid inheriting the modified genetic code, he and his colleagues found. And gene variants that decrease a population's propensity to mingle with other populations—such as those that limit flight capacity in insects—would suddenly prove beneficial and could spread.

Resistance to gene drives is unavoidable, so researchers are hoping that they can blunt the effects long enough to spread a desired mutation throughout a population. Some have floated the idea of creating gene drives that target multiple genes, or several sites within the same gene, diminishing the speed with which resistance would develop. By surveying a species' natural genetic diversity, researchers could target genes common to all individuals.

CONTINUE

22

Which of the following statements about the research in Terni, Italy, on *Anopheles gambiae* mosquitoes can most reasonably be inferred from the passage?

A) The study was noteworthy for being the first to employ mosquito cages for research purposes.

B) The study was unable to reproduce the typical environment that mosquitoes in the wild are accustomed to.

C) The researchers planned to take what they learned about mosquito behavior and apply it to other animals.

D) The researchers' objective in studying the mosquitoes was to find a way to get rid of them completely.

23

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

A) Lines 1-4 ("In the . . . cages")

B) Lines 4-6 ("The enclosures . . . thrive")

C) Lines 6-10 ("By studying . . . drives")

D) Lines 11-14 ("The technique . . . shelved")

24

Which of the following best characterizes one of the author's beliefs about gene drives?

A) Without enough genetic variation in a population, gene drives won't be able to introduce the intended genomic changes.

B) Gene drives can be harmful to the various groups of plants and animals in which they occur naturally.

C) With some fine-tuning, gene drives will soon be able to prevent organisms from developing resistance.

D) Gene drives may not have as big an impact on the genetic makeup of a population as some opponents of the technique predict.

25

The main purpose of the fourth paragraph (lines 25-30) is to

A) criticize the use of the gene-drive technique by explaining its effects on a species.

B) provide context for how the gene-drive technique works in certain organisms.

C) offer a solution to the problem of organisms in the wild developing genetic resistance.

D) convey a sense of excitement that researchers feel about the possibilities of thwarting genetic resistance.

26

As used in line 35, "surged" most nearly means

A) flowed.

B) increased.

C) rushed.

D) spilled.

27

The author mentions the 2015 mosquito research in the sixth paragraph (lines 38-45) mainly to support the argument that

A) CRISPR gene drives have solved the problems that earlier experiments with gene drives faced.

B) CRISPR gene drives shouldn't be used on mosquitoes because they cause infertility.

C) gene drives have encountered some problems despite promising early results.

D) gene drives have become less popular among researchers because of the problem of genetic resistance.

CONTINUE

28

The passage indicates that one of the reasons the *Anopheles* mosquitoes develop resistance to CRISPR-based gene drives is because of

A) the great difference in genetic makeup within a population.

B) a few difficulties in identifying the right enzymes to insert.

C) similarities between the species' lab and wild environments.

D) how ineffective the CRISPR gene is in males of the species.

29

Based on the passage, it can most reasonably be inferred that using some genetic-engineering technologies to attempt to get rid of mosquitoes could

A) make certain traits more likely to spread among surviving mosquitoes.

B) prove to be more effective in the wild than in laboratory experiments.

C) provide an inexpensive solution to an increasingly expensive problem.

D) be applied successfully to organisms that do not reproduce sexually.

30

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

A) Lines 55-57 ("Occasionally . . . letters")

B) Lines 60-63 ("The researchers . . . mosquitoes")

C) Lines 69-70 ("A recent . . . Africa")

D) Lines 81-85 ("And gene . . . spread")

31

As used in line 89, "floated" most nearly means

A) drifted.

B) proposed.

C) rested.

D) suspended.

CONTINUE

Questions 32-41 are based on the following passages.

Passage 1 is adapted from a speech delivered in 1914 by H. H. Asquith. Passage 2 is adapted from "Memorandum in Support of Ireland's Claim for Recognition as a Sovereign Independent State." Originally published in 1919. Asquith, the British prime minister, spoke in Dublin, Ireland, shortly after the start of the First World War. At the time, Ireland had been subject to government by English leaders for centuries.

Passage 1

I should like . . . to ask your attention and that of my fellow-countrymen to the end which, in this War, we ought to keep in view. Forty-four years ago . . . [British Prime Minister] Gladstone used these words. He said: "The greatest triumph of our time will be the enthronement of the idea of public right as the governing idea of European politics." . . . The idea of public right—what does it mean when translated into concrete terms? It means, first and foremost, the clearing of the ground by the definite repudiation of militarism as the governing factor in the relation of States and of the future moulding of the European world. It means, next, that room must be found and kept for the independent existence and the free development of smaller nationalities, each with a corporate consciousness of its own. Belgium, Holland, Switzerland, the Scandinavian countries, Greece, and the Balkan States—they must be recognised as having exactly as good a title as their more powerful neighbours—more powerful in strength and in wealth—to a place in the sun. And it means finally, or it ought to mean, perhaps by a slow and gradual process, the substitution for force, for the clash of competing ambitions, for groupings and alliances and a precarious equipoise, of a real European partnership based on the recognition of equal rights, and established and enforced by a common will. A year ago that would have sounded like a Utopian idea. It is probably one that may not, or will not, be realised either to-day or to-morrow, but if and when this War is decided in favour of the Allies it will at once come within the range, and before long within the grasp, of European statesmanship.

. . . Ireland is a loyal country, and she would, I know, respond with alacrity to any summons which called upon her to take her share in the assertion and the defence of our common interests. But the issues raised by this War are of such a kind that, unless I mistake her people and misrepresent her history, they touch a vibrating chord both in her imagination and in her conscience. How can you Irishmen be deaf to the cry of the smaller nationalities to help them in their struggle for freedom . . . ?

Passage 2

English rule has never been for the benefit of Ireland and has never been intended for the benefit of Ireland; . . . it has isolated Ireland from Europe, prevented her development, and done everything in its power to deprive her of a national civilization. So far as Ireland at present is lacking in internal peace, is behind other countries in education and material progress, is unable to contribute notably to the common civilization of mankind, these defects are the visible consequences of English intrusion and domination.

The Irish people have never believed in the sincerity of the public declarations of English statesmen in regard to their "war aims," except in so far as those declarations avowed England's part in the war to have been undertaken for England's particular and Imperial interests. They have never believed that England went to war for the sake of France or Belgium or Serbia, or for the protection or liberation of small nationalities, or to make right prevail against armed might. If English statesmen wish to be regarded as sincere, they can prove it to the world by abandoning, not in words but in act, the claim to subordinate Ireland's liberty to England's security.

Ireland's complete liberation must follow upon the application of [US] President Wilson's principles. It has not resulted from the verbal acceptance of those principles; and their rejection is implied in the refusal to recognise for Ireland the right of self-determination. Among the principles declared by the President . . . we cite the following:

. . . "Peace should rest upon the rights of peoples, not on the rights of governments—the rights of peoples, great and small, weak or powerful; their equal right to freedom and security and self-government, and to participation, upon fair terms, in the economic opportunities of the world." . . .

It is evident that, while Ireland is denied the right to choose freely and establish that form of government which the Irish people desire, no

CONTINUE

international order can be founded on the basis of national right and international justice; the claim of the stronger to dominate the weaker will once more be successfully asserted; and there will be no true peace.

32

As used in line 9, "concrete" most nearly means

A) hard.
B) accurate.
C) specific.
D) compact.

33

Which statement best conveys Asquith's belief about the "Utopian idea" (line 29)?

A) It is already occurring.
B) It is a possibility.
C) It is unlikely to be realized.
D) It is unachievable.

34

The main purpose of the second paragraph of Passage 1 (lines 35-44) is to

A) appeal to the Irish people's sense of allegiance and justice.
B) emphasize the importance of national identity.
C) proclaim England's admiration for the Irish people's national pride.
D) encourage peace among European nations.

35

Passage 1 most strongly suggests that Asquith believes that Irish people will wish to take part in the war effort because they

A) want to promote unity among all small nations.
B) wish Ireland to be viewed as a powerful country.
C) seek to preserve the country's military reputation.
D) can empathize with citizens of smaller states.

36

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

A) Lines 16-21 ("Belgium . . . sun")
B) Lines 21-28 ("And it . . . will")
C) Lines 35-38 ("Ireland . . . interests")
D) Lines 38-44 ("But the . . . freedom")

37

As used in line 70, "complete" most nearly means

A) absolute.
B) intact.
C) concluded.
D) pure.

38

The last paragraph of Passage 2 mainly serves to

A) encourage other nations to protest England's domination of Ireland.
B) emphasize the interconnectedness of Ireland's domestic concerns and broader global movements.
C) highlight the need for unity in Ireland before national attention shifts to issues abroad.
D) argue that the fight for world peace is more important than Ireland's fight for freedom.

CONTINUE

39

Passage 1 and Passage 2 both use which kind of evidence in their analysis?

A) Anecdotes of individuals affected by war
B) Direct reference to a respected political figure
C) Examination of England's military history
D) References to England's past treatment of Ireland

40

Which choice provides the best evidence that Asquith would agree with some of Wilson's principles discussed in lines 77-83 of Passage 2?

A) Lines 1-3 ("I should . . . view")
B) Lines 9-13 ("It means, first . . . world")
C) Lines 13-16 ("It means, next . . . own")
D) Lines 29-34 ("It is . . . statesmanship")

41

The author of Passage 2 would most likely characterize Asquith's argument about the rights of states in Passage 1 as

A) insincere, because England has a long history of restraining the rights of other nations.
B) questionable, because England has failed to include Ireland in past efforts to support such rights.
C) idealistic, because England has not fully considered the cost of securing rights for these states.
D) hypocritical, because England has not extended such rights to the nation of Ireland.

CONTINUE

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

This passage is adapted from Laura Geggel, "Enormous Gorge Shaped by River's Tectonic Transformation." ©2014 by Purch.

The Tsangpo Gorge in Tibet, one of the deepest canyons in the world, formed when tectonic forces pushed up the earth and steepened the path of a river that then caused massive erosion, a new study finds.

The discovery rewrites the geological history of the region, which some researchers thought was caused by massive river erosion that triggered tectonic uplift in the Eastern Himalaya.

"Our observation in the end is relatively simple," said Dirk Scherler, a geologist at the GFZ German Research Centre for Geosciences in Potsdam. He and his colleagues said they think an unknown event caused an increase in tectonic uplift rates about 3 million years ago. As the uplift became more pronounced, about 2.5 million years ago, it dammed the Yarlung Tsangpo River that runs through the region, preventing it from flowing down the mountains.

"So the river either turns into a lake and gives up, or if it's carrying enough sediment, it can fill in that [area] and keep spilling over the edge," said Kelin Whipple, a professor of geomorphology at Arizona State University, who was not involved in the study.

Once the river dropped enough sediment and made it over the natural dam, it quickly flowed down the mountain. At that point, the mountain was steeper because of the increased tectonic uplift, causing the river to run faster and leading to vast erosion in the gorge, the researchers said.

Yet, the research team needed evidence of the ancient sediment to support their idea. The year before, civil engineers from the China Earthquake Administration had gathered core samples after drilling at five locations along the Yarlung Tsangpo River. One researcher visited the California Institute of Technology in Pasadena, and shared the core samples with Scherler, who was completing his postdoctoral research in geology.

Scherler and his colleagues examined the drill-core samples—some retrieved from up to 0.6 miles (1 kilometer) deep—to see whether the area in question had a sediment deposit. "And sure enough, there was," said Whipple, who wrote an opinion piece about the study for the journal Science. "And they show it very nicely in their study."

The core samples contained sand, rounded gravel and larger rocks cemented together, a mix indicative of sediment from a flowing river, the researchers said. About 2,600 feet (800 meters) below the surface, the samples contained bedrock, showing that the sediment had filled an ancient canyon.

The researchers studied the sediments at the bottom of the core samples—the earliest sediment layers—and measured two isotopes: beryllium-10 and aluminum-26. These isotopes are made when sediment is exposed to cosmic rays, high-energy radiation from space. The isotopes decay at different rates once the sediment is buried, and the river began dropping sediment about 2.5 million years ago, the researchers said.

Until now, many researchers viewed part of the Tsangpo Gorge, called the Namche Barwa massif, as a poster child of how rivers may influence tectonics.

Perhaps the Yarlung Tsangpo River collided with the Brahmaputra River (the two rivers are now connected), the model suggested. The collision may have diverted the Yarlung Tsangpo River, and caused it to cut down the mountain, quickly eroding it.

As the rock eroded, it would have become lighter, making it easier for the tectonic forces below to push the rock up in a so-called "tectonic aneurysm," which would have made the mountains steeper, Whipple said.

"In response to that very rapid erosion, you're thinning and weakening the crust as it's getting hotter in response to the erosion, bringing hot rocks closer to the surface," Whipple said. "And that induces a response where the rocks actually start flowing toward that spot, causing uplift."

CONTINUE

Figure 1

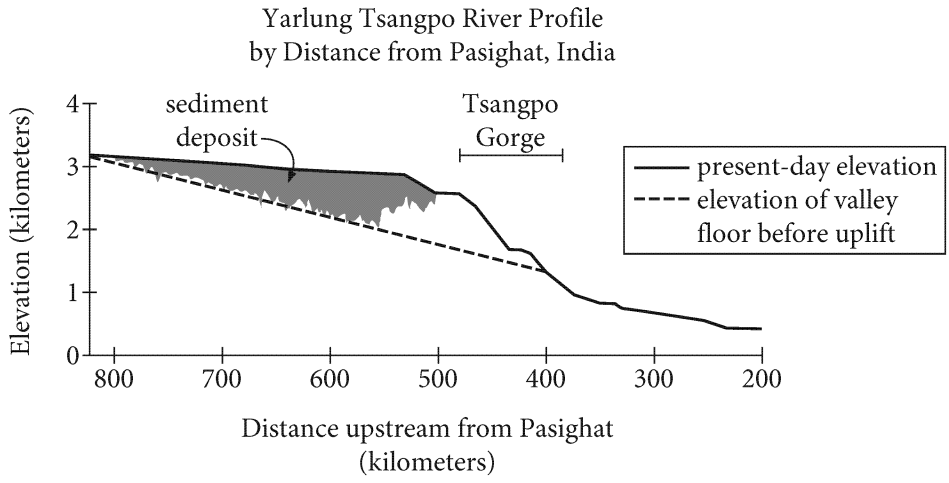
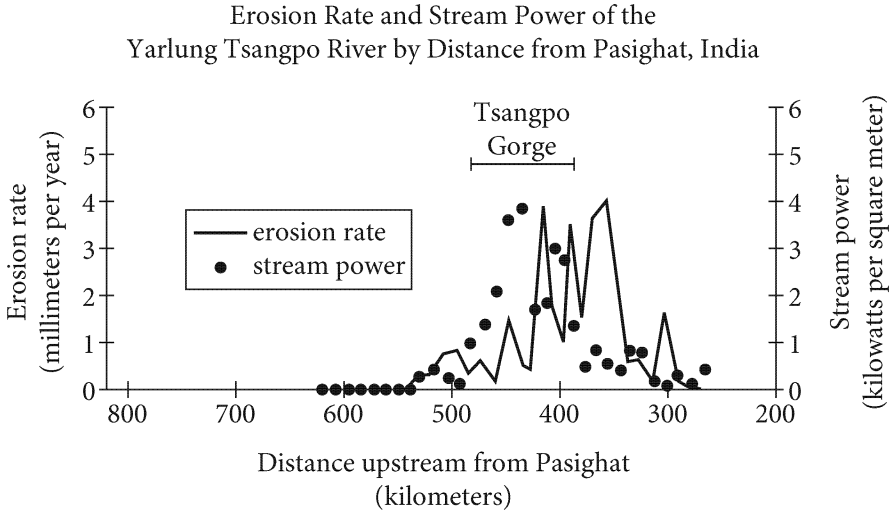


Figure 2



Figures adapted from Ping Wang et al., "Tectonic Control of Yarlung Tsangpo Gorge Revealed by a Buried Canyon in Southern Tibet." ©2014 by American Association for the Advancement of Science.

CONTINUE

42

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

A) a recounting of several hypotheses related to river gorge formation to a more detailed explanation of the prevalent hypothesis.

B) a description of a study focusing on a particular river gorge to an analysis of that study's applicability to other river gorges.

C) an argument defending controversial new research about river gorges to a counterargument supporting more established research.

D) an explanation of a recent finding that challenges a long-standing hypothesis about a river gorge to a description of that older hypothesis.

43

What is the main effect of the author's use of "massive" in lines 4 and 7 and "vast" in line 29?

A) To characterize the erosion as having occurred on an unusually large scale

B) To portray the river as having a high rate of flow unlikely to occur elsewhere

C) To credit the researchers with an especially important discovery

D) To emphasize the high level of force required to trigger erosion

44

As used in line 5, "rewrites" most nearly means

A) revises the published wording about.

B) shifts the authorship of.

C) changes the general understanding of.

D) replaces the data available for analysis on.

45

Based on the passage, what question central to Scherler's team's hypothesis remains unanswered?

A) When did the natural dam begin to block the flow of the Yarlung Tsangpo River?

B) How deep would the Tsangpo Gorge be now if the increase in tectonic uplift had not occurred?

C) What types of sediment deposits indicate that a river once flowed in an area?

D) What circumstances led to the tectonic uplift that dammed the Yarlung Tsangpo River?

46

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

A) Lines 11-14 ("He and . . . years ago")

B) Lines 14-18 ("As the . . . mountains")

C) Lines 46-49 ("The core . . . said")

D) Lines 49-51 ("About . . . canyon")

CONTINUE

47

Which choice provides the best evidence for the idea that Scherler's team constructed their hypothesis before being able to make direct observations related to it?

A) Lines 26-29 ("At that . . . said")
B) Lines 30-31 ("Yet, the . . . idea")
C) Lines 35-38 ("One researcher . . . geology")
D) Lines 39-42 ("Scherler . . . deposit")

48

It can reasonably be inferred from the passage that many geologists reacted to Scherler's team's study by

A) attempting to replicate its results.
B) accepting its conclusion.
C) questioning its methods.
D) publishing rebuttals to it.

49

As explained by Whipple, the previous hypothesis on the formation of the Tsangpo Gorge attributed the tectonic uplift to

A) the steepness of the Namche Barwa massif.
B) crust fissures.
C) river erosion.
D) the gorge wall's sedimentary makeup.

CONTINUE

50

The data in figure 1, gathered by Scherler's team, indicate that the team estimated the Yarlung Tsangpo River's valley floor before uplift to be a

A) steep drop followed by a gradual slope.

B) series of erratic elevation changes.

C) flat plane between gentle inclines.

D) steadily decreasing slope.

51

Based on figure 1, the "natural dam" (line 25) that Scherler's team believes existed on the Yarlung Tsangpo River was most likely located approximately how many kilometers from Pasighat?

A) 400

B) 500

C) 700

D) 800

52

According to the data in figure 2, the Yarlung Tsangpo River's stream power is strongest at about

A) 100 kilometers upstream from the upper rim of the Tsangpo Gorge.

B) the upper rim of the Tsangpo Gorge.

C) the midpoint of the Tsangpo Gorge.

D) the bottom of the Tsangpo Gorge.

STOP

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

Writing and Language Test

35 MINUTES, 44 QUESTIONS

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

DIRECTIONS

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

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

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

Questions 1-11 are based on the following passage.

Hip-Hop Breaks Out

In 1973 Clive 1 Campbell an aspiring disc jockey, who performed under the name DJ Kool Herc, made his debut when he provided music for a party in his apartment building in the West Bronx, a section of New York City. Although the funk and soul songs Herc selected for partygoers to dance to may seem very different from later hip-hop music, many music

1

A) NO CHANGE
B) Campbell, an aspiring disc jockey who performed under the name DJ Kool Herc,
C) Campbell, an aspiring disc jockey, who performed under the name DJ Kool Herc
D) Campbell, an aspiring disc jockey who performed under the name DJ Kool Herc

CONTINUE

historians regard this party as an important event in the development of the genre. The interplay between 2 DJs; rappers, and dancers at gatherings like this one 3 have transformed the soundtrack of neighborhood parties in the 1970s into the internationally popular rap music of subsequent decades.

2

A) NO CHANGE
B) DJs rappers,
C) DJs, rappers,
D) DJs, rappers;

3

A) NO CHANGE
B) will transform
C) transformed
D) transform

CONTINUE

People attended these parties not only to hear their favorite songs **4** but also to watch the "b-boys" and "b-girls," dancers whose moves featured flips and dramatic poses. B-boys and b-girls saved their most impressive, acrobatic moves for the breaks in the **5** songs. In these sections, the vocals and most of the instruments fell away, leaving only the driving beat. **6** In this case, the dance style was called "breaking." Herc and other DJs quickly learned to select songs based on their appealing breaks.

4

A) NO CHANGE
B) also
C) and also
D) as well as

5

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

A) songs; these breaks consisted of sections in which
B) songs until
C) songs, sections in which
D) songs, and these are sections in which

6

A) NO CHANGE
B) For this reason,
C) In other words,
D) In fact,

CONTINUE

7 Because of his skill at promoting his parties, Herc hit upon an innovative way of emphasizing the breaks in the songs he played, which he dubbed the merry-go-round technique. 8 Herc would spin two copies of the same record on different turntables, cuing up one record to play at the beginning of a break just as the other record was coming to the end. By repeating this technique over and over, 9 a song's break could extend from a short interlude lasting only a few seconds into a percussion breakdown that could go on for minutes. Other DJs

7

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

A) NO CHANGE
B) Other DJs would eventually become more famous, but
C) To provide more opportunities for the b-boys and b-girls to dance,
D) Before rap music became popular worldwide,

8

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

A) Kept, because it explains the merry-go-round technique introduced in the previous sentence.
B) Kept, because it explains Herc's process of song selection mentioned in the previous paragraph.
C) Deleted, because it diverts attention from the discussion of Herc as a musical innovator.
D) Deleted, because it merely repeats information about Herc's performance style that is adequately explained elsewhere in the paragraph.

9

A) NO CHANGE
B) extending a song's break could be done
C) it could extend a song's break
D) he could extend a song's break

CONTINUE

refined this technique by smoothly mixing beats from different songs together and **10** by assuming similarly inventive names when they performed.

Rapping, which began as simple banter with the audience, evolved alongside DJing and breaking to add another layer of sophistication to the hip-hop scene. At first, rappers would use a microphone to call out short rhymes and catchphrases to encourage the dancers and set the mood—Herc did this himself at early performances before ceding the microphone to other rappers. As time went on, some rappers began to memorize long, cohesive flows of rhyming lyrics that could be recited along with the DJ's beats.

By the end of the 1970s, hip-hop was expanding **11** beyond its source in the neighborhoods where it had originated and beginning to be played on the radio. The sounds that Herc had used to inspire b-boys and b-girls at house parties in the Bronx were on their way to becoming a global musical phenomenon.

10

The writer wants to provide a second example that supports the point being made in the sentence. Which choice best accomplishes this goal?

A) NO CHANGE
B) by scratching records to create a unique form of percussion.
C) were sometimes able to reach a broader audience.
D) could be fiercely competitive in their drive to be the best.

11

A) NO CHANGE
B) to grow beyond the boundaries of
C) and growing outside
D) beyond

CONTINUE

Questions 12-22 are based on the following passage and supplementary material.

A Better View for Early Tetrapods

— 1 —

Around 385 million years ago, the first vertebrates moved out of the water and onto land. While it has long been thought that limbs and lungs were the crucial adaptations to appear prior to terrestrial living, neuroscientist Malcolm MacIver presents a compelling new hypothesis. MacIver argues that, preceding vertebrate terrestriality, improvements in vertebrate vision provided these water-dwelling animals with vital information about **12** its surroundings and aided them in becoming fully terrestrial. MacIver's "buena vista" (good view) hypothesis offers **13** novel insights into the visual and behavioral ecology of these ancient vertebrates and enhances our understanding of the water-to-land transition.

12

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

13

A) NO CHANGE
B) exotic
C) avant-garde
D) unwonted

CONTINUE

— 2 —

MacIver supports his hypothesis with a convincing array of computational and paleontological evidence. Working with paleontologist Lars Schmitz, MacIver analyzed skulls of fifty-nine early **14** tetrapods; the earliest known limbed but still aquatic vertebrates from the transitional period. The scientists discovered that among certain tetrapods eye socket (and thus pupil) size tripled and eye location changed from the sides to the top of the head.

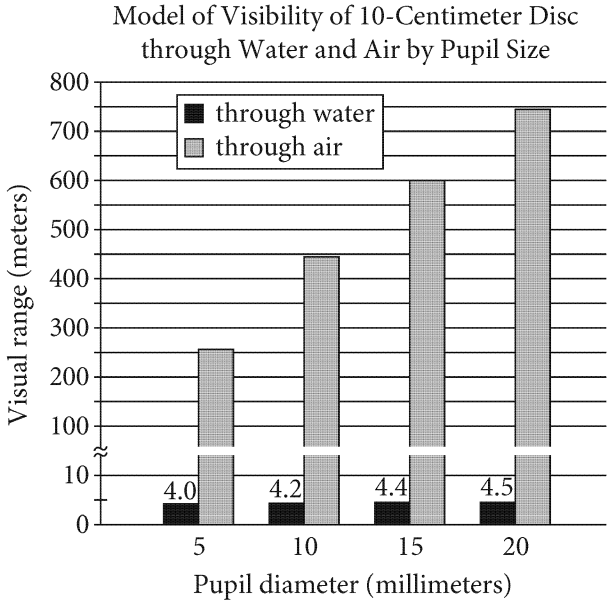
14

A) NO CHANGE
B) tetrapods, the
C) tetrapods, they are the
D) tetrapods. The

CONTINUE

— 3 —

Using computational modeling, MacIver and Schmitz simulated the visibility of a 10-centimeter black disc **15** with two types of tetrapods. When the view of the disc through water was simulated, a tripling of pupil size from 5 to 15 millimeters yielded an increase in visual range of **16** less than 0.5 meter. This demonstrated that larger eyes would have **17** skimped on benefits to animals viewing their surroundings through water, as they would have still been limited to seeing and **18** able to react to only close-range objects, such as predators or prey. **19** Likewise, the same tripling of pupil size increased the visual range to a remarkable 600 meters when the scientists simulated the view of the disc through air.



Adapted from Jennifer Ouellette, "Why Did Life Move to Land? For the View." ©2017 by Quanta Magazine.

15

Which choice provides the most accurate description of the data represented in the graph?

A) NO CHANGE
B) in 100-meter increments.
C) at a fixed visual range.
D) through water and through air.

16

Which choice accurately represents the information in the graph?

A) NO CHANGE
B) between 4 and 5 meters.
C) between 200 and 300 meters.
D) more than 400 meters.

17

A) NO CHANGE
B) dished out the measliest of
C) short-changed on
D) offered paltry

18

A) NO CHANGE
B) have been reacting
C) reacting
D) react

19

A) NO CHANGE
B) As a result,
C) In contrast,
D) Furthermore,

CONTINUE

— 4 —

Such improvements in aerial visual acuity would have had profound behavioral implications for early tetrapods, initiating their eventual transition to land. Assuming a crocodilian hunting posture—with body submerged, eyes above water—the animals could use their long-range aerial vision to more strategically evade predators and pursue prey. Of course, the emergence of limbs and lungs **20** had ultimately enabled these early vertebrates to walk and breathe as fully terrestrial **21** animals: however, as evidenced by MacIver's research, it was the better view of unexploited food sources above the water's surface that compelled certain tetrapods to leave the water in the first place.

Question 22 asks about the previous passage as a whole.

20

A) NO CHANGE
B) will ultimately enable
C) is ultimately enabling
D) would ultimately enable

21

A) NO CHANGE
B) animals, however:
C) animals; however,
D) animals, however;

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

22

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

> Surprisingly, the changes occurred prior to the emergence of lungs and weight-bearing limbs, suggesting that these larger-eyed aquatic vertebrates were likely using their eyes above water.

The best placement for the sentence is at the end of

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

CONTINUE

Questions 23-33 are based on the following passage.

A Sea of Possibilities

Greg Marshall has a three-stage response to new 23 gadgets, first, "That's really cool," then, "I need one of those," and finally, "What is it?" 24 However, when he first saw a 3-D printer more than fifteen years ago, the Canadian naval architect was mesmerized and decided to

23

A) NO CHANGE
B) gadgets, first:
C) gadgets; first,
D) gadgets: first,

24

A) NO CHANGE
B) Nonetheless,
C) Moreover,
D) DELETE the underlined portion, adjusting the capitalization as needed.

CONTINUE

purchase one, though he wasn't exactly sure what it could be used for. 25 Marshall initially printed scale models of yacht designs for his clients, but 26 now he has found a grander purpose, intrigued by advances in 3-D printing, for this technology—printing entire yachts.

25

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

> Marshall operates out of Victoria, British Columbia.

Should the writer make this addition here?

A) Yes, because it presents a detail about Marshall's life as a naval architect that is essential to the passage.

B) Yes, because it provides a logical transition to the next sentence.

C) No, because it interrupts the narrative of Marshall's first experience with 3-D printing technology.

D) No, because it contradicts information stated later in the passage.

26

A) NO CHANGE

B) now, intrigued by advances in 3-D printing, he has found a grander purpose for this technology—printing entire yachts.

C) now he has found a grander purpose for this technology intrigued by advances in 3-D printing—printing entire yachts.

D) now he has found a grander purpose for this technology—printing entire yachts intrigued by advances in 3-D printing.

CONTINUE

At the 2017 Superyacht Design Symposium in Kitzbühel, Austria, Marshall made a case for printing ships using titanium, a 27 high-strength, low-density metal that resists corrosion. Materials and manufacturing methods often constrain the choices that naval architects make when designing the hulls, superstructures, and interiors of vessels. However, Marshall claimed that because 3-D printers operate at the level of microns (a human hair is 75 microns thick), naval architects will soon have the freedom to "do all sorts of things that are just not practical to do on a yacht if it's manually built," such as creating pipes within pipes, integrated wiring, and complicated manifolds. 28 "The ability to conduct a business around [3-D printing] is much more predictable," said Marshall. Far from being a novelty, this technology has the potential to have an impact on the entire industry, overturning traditional shipbuilding methods.

Marshall isn't the only naval architect charting a new course for the field. Oskar Levander, naval architect and vice president of innovation at Rolls-Royce (the engineering firm, not the automaker), wants to incorporate autonomous vehicle technology into cargo ships so they can cruise 29 from port to port without a crew. "These ships will represent some of the most fundamental changes seen by the shipping industry in a long time," Levander wrote for the magazine *IEEE Spectrum*.

27

A) NO CHANGE
B) high-strength, less dense
C) strong, lower-density
D) higher-strength, low-density

28

Which quotation from Marshall most logically builds on the claim made in the previous sentence?

A) NO CHANGE
B) "Whatever we can imagine in our heads," said Marshall, "we can actually translate to the shipyard."
C) "As we're seeing, these [printers] are getting larger and larger," said Marshall, noting that they're "still not in the resolution we need, but getting close."
D) "I'm always amazed at how many parts get flown from all over the world to create one of these superyachts," said Marshall.

29

A) NO CHANGE
B) to one port after another without a crew to operate the cargo ship.
C) and transport cargo between ports without a crew of sailors on board.
D) to distant ports using autonomous vehicle technology.

CONTINUE

[1] Like self-driving cars, 30 it will operate using sophisticated navigation and communication systems. [2] While much of the necessary technology exists now, Levander predicts that these ships will start small. [3] The first vessel will likely be a small ship, such as a ferry or tugboat, operating in a specific area. [4] By 2025, 31 pretty much all of the biggest ships will use the technology, with remotely controlled or completely autonomous ships 32 becoming a regular sight on the open ocean. 33

New technology will continue to revolutionize old industries. As it does, other naval architects will no doubt follow the example of Marshall and Levander, embracing the sea of possibilities these advances offer.

30

A) NO CHANGE
B) self-sailing ships
C) ships
D) some

31

A) NO CHANGE
B) some really big boats will have installed
C) weighty wanderers of the waves will have hoisted aboard
D) larger vessels will have incorporated

32

A) NO CHANGE
B) become
C) becomes
D) have become

33

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

> He expects that this ship will retain a crew, but only for nonnavigational responsibilities.

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.

CONTINUE

Questions 34-44 are based on the following passage.

Going with the Grain

Growth in grain production was one of the United States' great successes in the nineteenth century. In fact, from 1839 to 1909, US grain output increased almost eightfold. Economists usually attribute this growth to technological advances such as mechanical farm equipment and barbed wire because new tools enabled farmers to use resources more efficiently. William Parker and Judith Klein, for example, argue that mechanical planters and harvesters reduced the amount of human labor required to produce each bushel of grain. Richard Hornbeck emphasizes the role of barbed wire in reducing the cost of protecting crops from free-range 34 cattle. Allowing farmers to focus their resources on crop production. Arguments such as these, while persuasive, treat crops as 35 essentially static entities that change very little and overlook a key factor in the growth of grain production: 36 westward expansion on the North American continent.

34

A) NO CHANGE
B) cattle, barbed wire thus allowed
C) cattle, this allowed
D) cattle, thereby allowing

35

A) NO CHANGE
B) unchanging entities or substances, in essence,
C) essentially static entities
D) entities, in essence,

36

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

A) NO CHANGE
B) the growth of the labor force on western farms.
C) farmers' experiments with crop varieties.
D) major changes in federal land policy.

CONTINUE

Farmers did not simply grow "wheat," "oats," or "corn": they grew particular varieties of crops, and 37 they experimented with various poisons to keep weeds and insects at bay. Economists Alan Olmstead and Paul Rhode give as an example farmers' experiments with winter wheats—wheats planted in autumn and harvested in spring—as 38 it expanded westward. Winter wheat varieties that thrived in the eastern United States struggled in midwestern states such as Kansas and Nebraska, where the winters were harsher. Midwestern farmers thus tried new 39 types. The new types were imported from other countries, or they were created through crossbreeding existing wheats. A solution presented itself when German Mennonites introduced Turkey Red wheat, a hardy variety from southern Russia, to the United States in the 1870s. Farmers adopted this variety, which would eventually account for 99 percent of all hard winter 40 wheat planted: in the United States in the early twentieth century.

37

Which choice most effectively establishes one of the main ideas of the paragraph?

A) NO CHANGE
B) experiments in the twentieth century would result in even more crop varieties.
C) they built homes for their families, experimenting with various designs in adapting to the harsh climate.
D) experimentation was necessary to find ones that would thrive in a given environment.

38

A) NO CHANGE
B) economists
C) the country
D) both

39

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

A) types—which they achieved by importation of new types or creation of them
B) types, either imported from other countries or created
C) types, and such new types were imported from other countries or created
D) types by either importing these new types or creating them

40

A) NO CHANGE
B) wheat; planted
C) wheat planted
D) wheat planted,

CONTINUE

[1] Even when farmers found a variety suited to the climate, they still had to make sure that it was resistant to pests and disease. [2] Farmers initially planted rust-resistant Red Fife, but a rust emerged later that could destroy this wheat, so they were forced to experiment again. [3] This cycle repeated itself several times, making biological innovation a never-ending endeavor. 41

41

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

> Wheat rust, a fungal disease that can destroy a whole crop in weeks, presented a particular challenge.

The best placement for the sentence is

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

CONTINUE

Recognizing that farmers constantly experimented to find the best crop varieties 42 places mechanical innovation in an appropriate historical context. Mechanization certainly boosted production, but only if crops 43 were able to survive threats to their existence. 44 The increasing use of chemical pesticides after the Second World War would further enhance the remarkable productivity of US farms.

42

A) NO CHANGE
B) place
C) have placed
D) are placing

43

A) NO CHANGE
B) are
C) will be
D) would have been

44

Which choice provides the most effective conclusion to the paragraph and the passage?

A) NO CHANGE
B) Regular access to electricity on US farms would further revolutionize farm machinery in the twentieth century.
C) Nonetheless, barbed wire has continued to be an effective means of restraining cattle on properties in the western United States.
D) Harvesters and barbed wire would have been useless if a crop couldn't survive the winter or the next wave of rust.

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.

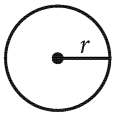
DIRECTIONS

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.

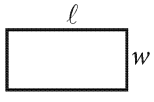
NOTES

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.

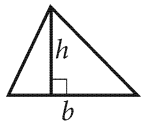
REFERENCE



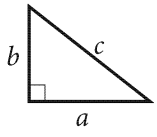
$A = \pi r^2$
$C = 2\pi r$



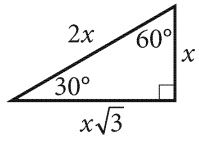
$A = \ell w$

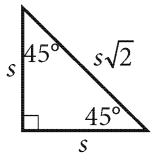


$A = \frac{1}{2}bh$

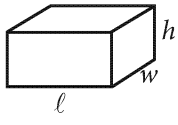


$c^2 = a^2 + b^2$

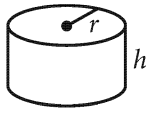




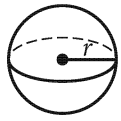
Special Right Triangles



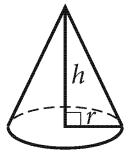
$V = \ell wh$



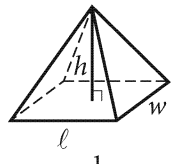
$V = \pi r^2 h$



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



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

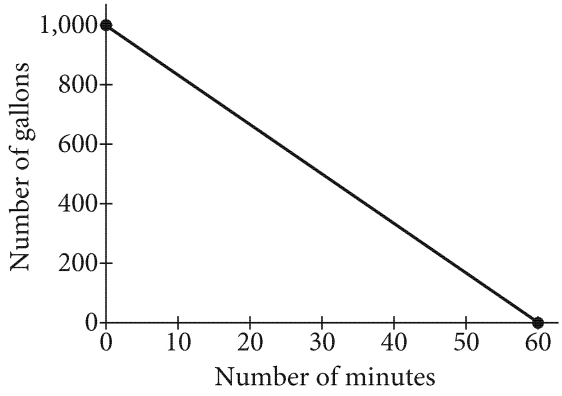


$V = \frac{1}{3}\ell wh$

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.

CONTINUE

1



The line shown represents the number of gallons of water in a tank as a function of the number of minutes a pump has been running to empty the water from the tank. How many gallons of water were in the tank when the pump started running?

A) 0

B) $\frac{50}{3}$

C) 60

D) 1,000

2

In January 2010, there were 127.8 million jobs in the United States. The number of US jobs increased approximately 0.2 million per month for the next 60 months. Which equation represents this situation, where j is the number of US jobs, in millions, and t is the time, in months, since January 2010?

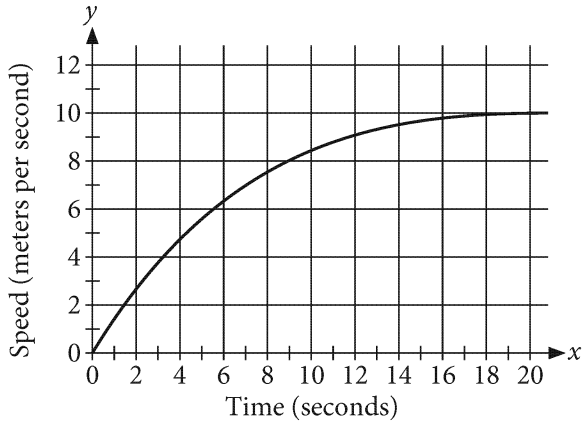
A) $j = 127.8t + 0.2$

B) $j = 0.2t + 127.8$

C) $j = 12t + 127.8$

D) $j = 127.8t + 12$

3



The graph shows the speed of an object over a period of time. Which is closest to the time, in seconds, it took for the object's speed to change from 4 meters per second to 8 meters per second?

A) 1

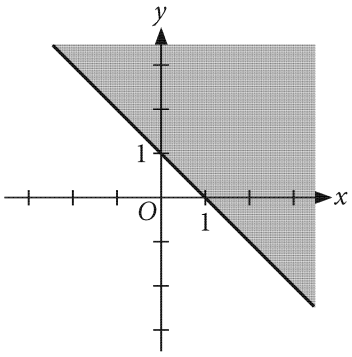
B) 4

C) 6

D) 15

CONTINUE

4



The shaded region shown represents all of the solutions for which of the following inequalities?

A) $x + y \geq 1$

B) $x + y \leq 1$

C) $x - y \geq 1$

D) $x - y \leq 1$

5

Which of the following linear equations has infinitely many solutions?

A) $2(4x + 3) = 6$

B) $2(4x + 3) = 8x$

C) $2(4x + 3) = 8x - 6$

D) $2(4x + 3) = 8x + 6$

6

$$\sqrt{x^3}$$

The given expression is equivalent to $x^{\frac{c}{6}}$, where c is a constant. What is the value of c ?

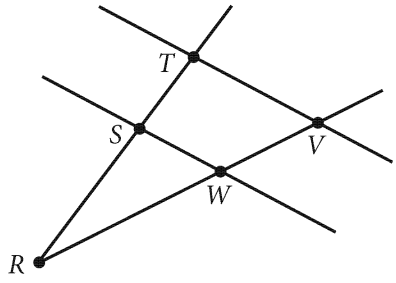
A) 9

B) 7

C) 5

D) 4

7



In the figure, four lines intersect as shown. Which of the following additional pieces of information is sufficient to prove that angle SWR is congruent to angle TVR ?

A) Angle VTR is congruent to angle TSW.

B) Angle VTR is congruent to angle WSR.

C) Angle TRV is congruent to angle SRW.

D) Angle TSW is congruent to angle WSR.

CONTINUE

8

Which of the following is an equation of a line in the xy-plane that has a slope of 3 and a y-intercept of -2 ?

A) $3x - y = -2$

B) $3x - y = 2$

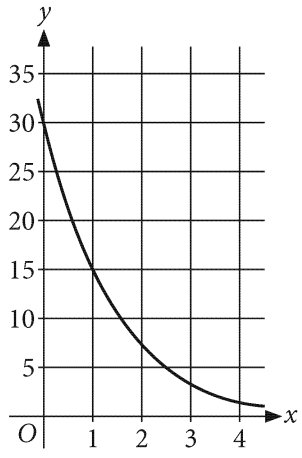
C) $x + 3y = -2$

D) $x + 3y = 2$

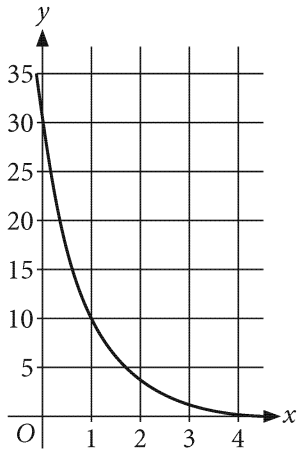
9

What is the graph of the equation $y = 30\left(\frac{1}{3}\right)^x$?

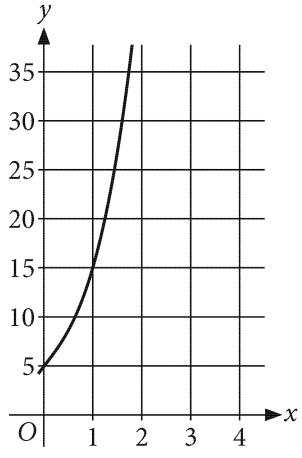
A)



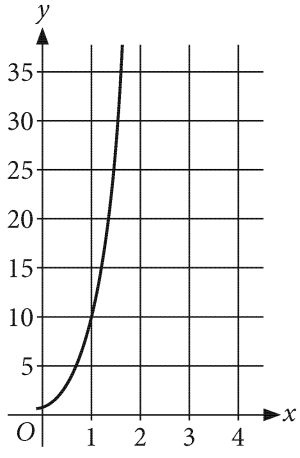
B)



C)



D)



CONTINUE

10

The graph of a certain parabola in the xy-plane intersects the y-axis once and the x-axis twice. Which of the following forms of the parabola's equation gives the y-value of the y-intercept as a constant?

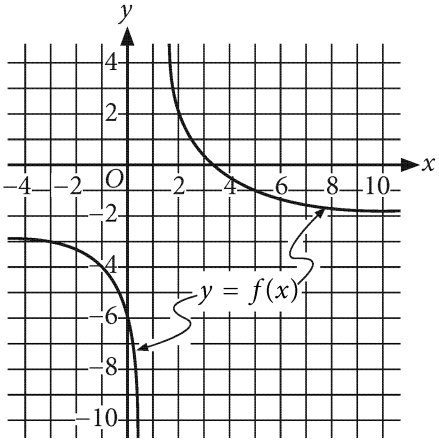
A) $y = (2x - 3)(5x + 7)$

B) $y = 10\left(x - \frac{3}{2}\right)\left(x + \frac{7}{5}\right)$

C) $y = 10x^2 - x - 21$

D) $y = 10\left(x - \frac{1}{20}\right)^2 - \frac{841}{40}$

11



The graph of $y = f(x)$ is shown. What is the value of $f(0)$?

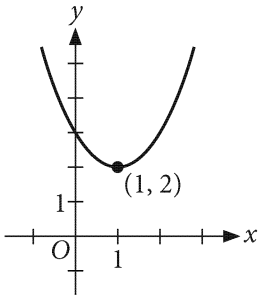
A) -6

B) 0

C) 3

D) $f(0)$ is undefined.

12



The graph of a quadratic equation is shown. The system consisting of this equation and the equation $y = k$, where k is a constant, has two real solutions. Which of the following could be the value of k ?

A) 0

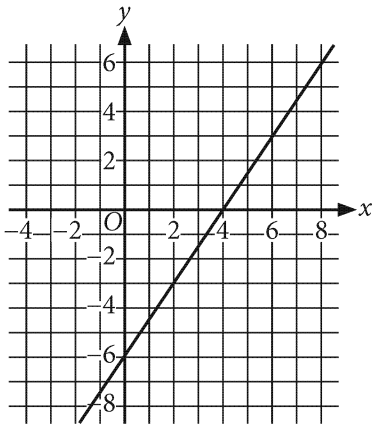
B) 1

C) 2

D) 3

CONTINUE

13



What is an equation of the graph shown?

A) $-6x + 4y = 3$

B) $-2x + 3y = -18$

C) $3x - 2y = 12$

D) $4x - 6y = 9$

14

If $x = \frac{\pi}{3}$ radians, what is the value of $\cos x$?

A) $\frac{\sqrt{3}}{2}$

B) $\frac{\sqrt{2}}{2}$

C) $\frac{1}{2}$

D) $\frac{1}{3}$

15

$$|\,2x + 7\,| = 51$$

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

A) −22

B) −7

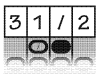
C) 7

D) 22

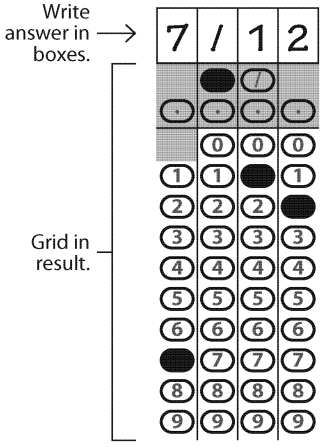
CONTINUE

DIRECTIONS

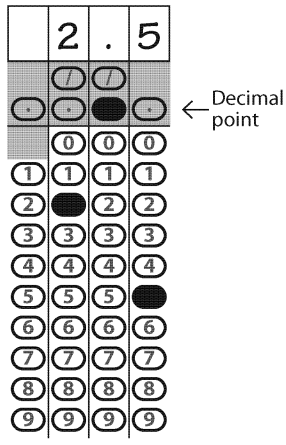
For questions 16-20, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

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

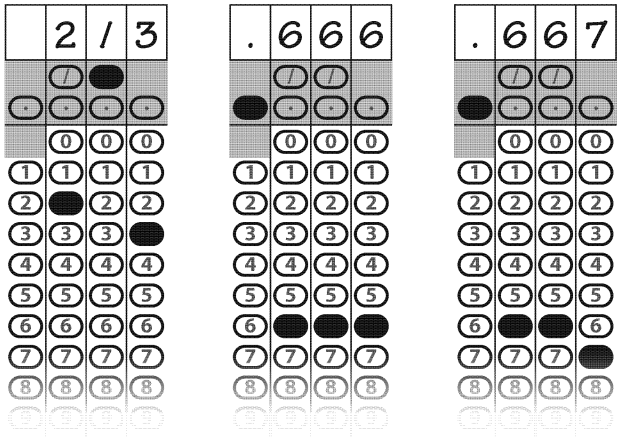
Answer: $\frac{7}{12}$



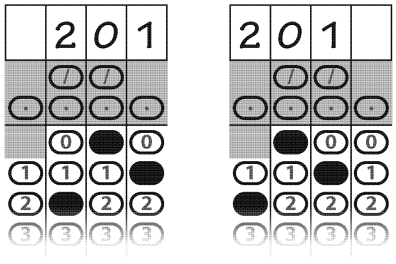
Answer: 2.5



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



Answer: 201 – either position is correct



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

CONTINUE

16

What is the solution to the equation $6(x + 3) - 5 = 37$?

17

$$9x + 9y = 18$$
$$6x + 4y = 12$$

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

18

$$2x^2 - 6x + 3 = 0$$

The solutions to the equation above can be expressed in the form $\frac{6 \pm \sqrt{n}}{4}$, where n is a positive integer.

What is the value of n ?

19

$$(1 - x)(1 + x + x^2 + x^3 + x^4 + x^5 + x^6)$$

The given expression is equivalent to $1 - x^n$, where n is a constant. What is the value of n ?

20

A rectangular prism has edge lengths of 6 inches, 10 inches, and 8 inches. What is the surface area, in square inches, of the prism?

STOP

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

Math Test – Calculator

55 MINUTES, 38 QUESTIONS

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

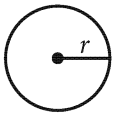
DIRECTIONS

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

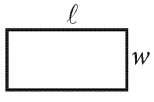
NOTES

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

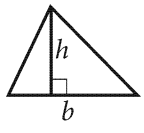
REFERENCE



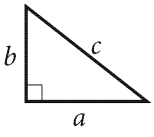
$A = \pi r^2$
$C = 2\pi r$



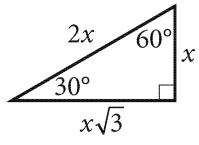
$A = \ell w$

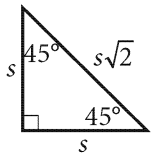


$A = \frac{1}{2}bh$

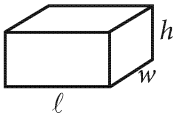


$c^2 = a^2 + b^2$

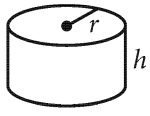




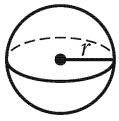
Special Right Triangles



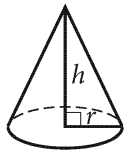
$V = \ell wh$



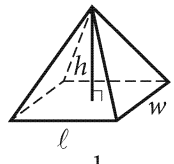
$V = \pi r^2 h$



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



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



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

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

CONTINUE

1

The US Bureau of Engraving and Printing produces 36 million notes (paper currency) every 24 hours. At what rate are the notes produced, in millions of notes per hour?

A) 1.0
B) 1.5
C) 2.0
D) 2.5

2

The function g is defined by $g(x) = x^3 - 10x$. What is the value of $g(5)$?

A) 25
B) 75
C) 125
D) 175

3

The initial mass of sodium-24 in a sample is 10 grams. The mass of sodium-24 in the sample decreases by half every 15 hours. Which of the following equations represents the mass y, in grams, of sodium-24 in the sample after x hours?

A) $y = \left(\frac{1}{2}\right)^{\frac{x}{15}}$

B) $y = (10)^{\frac{x}{15}}$

C) $y = 10\left(\frac{1}{2}\right)^{\frac{x}{15}}$

D) $y = 15\left(\frac{1}{2}\right)^{\frac{x}{15}}$

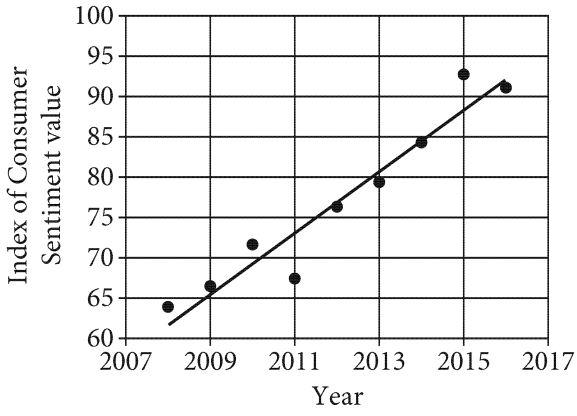
4

The Appalachian Trail is approximately 2,200 miles long and connects Springer Mountain in Georgia and Mount Katahdin in Maine. A hiker starts walking the trail at Springer Mountain and continues in the same direction at a constant speed of 10 miles per day. The equation $10x = 2{,}200$ represents this situation. What does the solution to the equation represent in this context?

A) The number of days the hiker takes to walk the entire trail
B) The number of days the hiker takes to walk 10 miles
C) The distance, in miles, the hiker walks in 1 day
D) The distance, in miles, the hiker walks in 10 days

CONTINUE

5



The points on the scatterplot show the Index of Consumer Sentiment values for US consumers each year from 2008 to 2016. A line of best fit for the data is also shown. For 2015, which of the following is closest to the difference between the actual Index of Consumer Sentiment value and the value predicted by the line of best fit?

A) 4.6

B) 2.1

C) 1.0

D) 0.2

6

A student added potassium iodide solution to lead nitrate solution and recorded the mass of lead iodide produced. The student performed the experiment for each of five concentrations of potassium iodide. The results are shown in the table.

Potassium iodide concentration (moles per liter)	Lead iodide mass (grams)
0.20	0.52
0.40	1.00
0.60	1.48
0.80	1.96
1.00	2.44

Which of the following types of functions best models the lead iodide mass, in grams, as a function of the potassium iodide concentration, in moles per liter, for this experiment?

A) Increasing linear

B) Decreasing linear

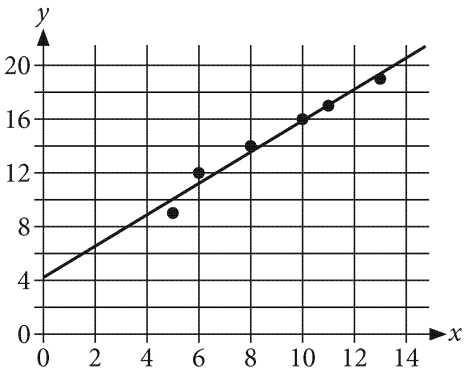
C) Increasing exponential

D) Decreasing exponential

CONTINUE

7

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



Which is an equation of the line of best fit?

A) $y = 1.16 - 4.22x$

B) $y = 1.16 + 4.22x$

C) $y = 4.22 - 1.16x$

D) $y = 4.22 + 1.16x$

8

For a linear function f, the graph of $y = f(x)$ in the xy-plane passes through the points $(4, 22)$ and $(7, 37)$. Which equation defines f?

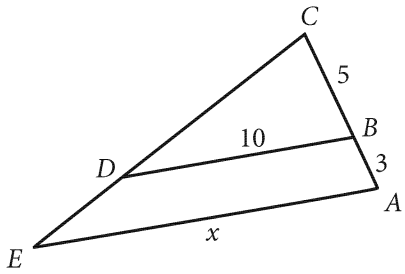
A) $f(x) = 5x + 2$

B) $f(x) = 5x + 22$

C) $f(x) = -5x + 42$

D) $f(x) = -5x - 2$

9



In the figure shown, $\overline{BD}$ is parallel to $\overline{AE}$. What is the length of $\overline{AE}$?

A) 6

B) 13

C) 16

D) 27

CONTINUE

10

A psychologist studied how employees at a large company prefer to work. The psychologist surveyed 3 groups of employees. The results are summarized in the table.

	Work preference			
Group	Individually	On a team	No preference	Total
A	7	4	14	25
B	8	11	6	25
C	7	5	18	30
Total	22	20	38	80

If a surveyed employee who prefers to work on a team is chosen at random, what is the probability of selecting an employee from group A or group B?

A) 0.20

B) 0.25

C) 0.30

D) 0.75

11

If $\frac{m}{n} = \frac{8m}{xn}$, what is the value of x ?

A) 1

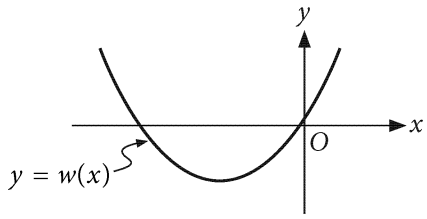
B) 2

C) 4

D) 8

12

The graph of $y = w(x)$ is shown in the xy-plane.



If a, b, and c are positive constants, which of the following could define the function w ?

A) $w(x) = -a(x + b)^2 - c$

B) $w(x) = -a(x - b)^2 - c$

C) $w(x) = a(x + b)^2 - c$

D) $w(x) = a(x - b)^2 - c$

13

For positive values of x and n, x is n% of 20. Which expression represents n in terms of x ?

A) $100\left(\frac{80}{x}\right)$

B) $100\left(\frac{x}{80}\right)$

C) $100\left(\frac{20}{x}\right)$

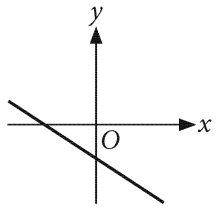
D) $100\left(\frac{x}{20}\right)$

CONTINUE

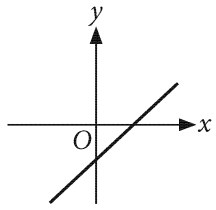
14

In the equation $cx + dy = 20$, c and d are negative constants. Which of the following could be the graph of the equation in the xy-plane?

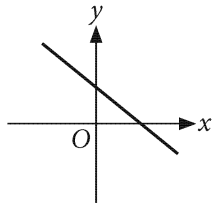
A)



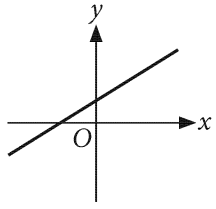
B)



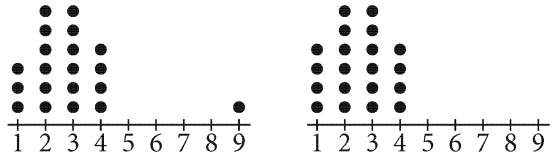
C)



D)



15



Which statement best compares the means of the two data sets shown?

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

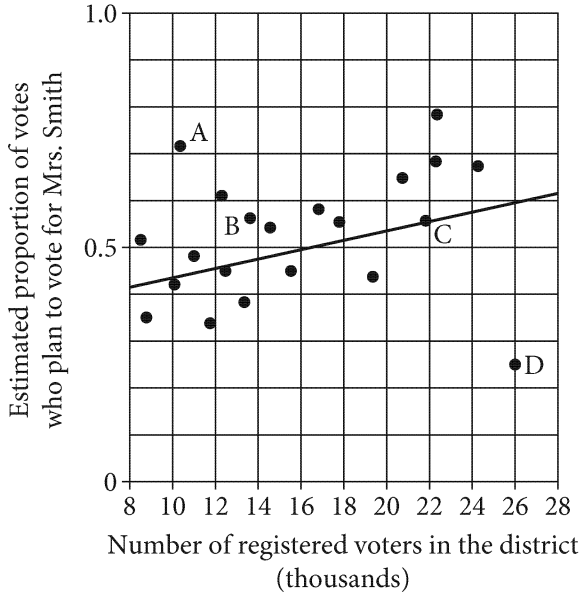
B) The mean of data set A is equal to the mean of data set B.

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

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

CONTINUE

Questions 16 and 17 refer to the following information.



In a recent state election, Mrs. Smith was a candidate for governor. A sample of 21 voting districts was selected at random from all voting districts in the state. From each district in the sample, 200 registered voters were selected at random and asked whether they planned to vote for Mrs. Smith. Each point in the scatterplot above represents the number of registered voters in one of the 21 districts and the estimated proportion of voters in that district who plan to vote for Mrs. Smith. Four districts (A, B, C, and D) are labeled in the scatterplot. A line of best fit for the data is also shown.

16

Based on the line of best fit, which of the following is closest to the predicted proportion of registered voters who plan to vote for Mrs. Smith in a district with 20,000 registered voters?

A) 0.45
B) 0.55
C) 0.60
D) 0.65

17

Based on the sample, which of the labeled districts in the scatterplot has the greatest number of registered voters who plan to vote for Mrs. Smith?

A) A
B) B
C) C
D) D

CONTINUE

Questions 18 and 19 refer to the following information.

$$f(x) = 116.18 - 2.31x$$

The average low temperature, in degrees Fahrenheit (°F), for locations in the United States in January can be modeled by the given function f, where x is the latitude, in degrees north of the equator (°N), between the longitude lines of 90°W and 100°W.

18

Lisbon, North Dakota, has a latitude of approximately 46.4°N and a longitude of approximately 97.7°W. Which of the following is closest to the average low temperature, in °F, in January, predicted for Lisbon by the model?

A) −9.0
B) −4.5
C) 4.5
D) 9.0

19

$$g(x) = 69.79 - 0.80x$$

For locations in Europe and North Africa, the average low temperature in January, in °F, can be modeled by the given function g, where x is the latitude, in °N, between the longitude lines of 0°E and 10°E. For which of the following values of x are the predictions made by the model for the United States and the model for Europe and North Africa closest in value?

A) 14.9
B) 30.7
C) 45.2
D) 59.8

CONTINUE

20

$$4y - 8x = 36$$
$$y - 2x = 18$$

How many solutions does the given system of equations have?

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

21

Data set X: 1, 2, 3, 10, 17, 18, 19
Data set Y: 7, 8, 9, 10, 11, 12, 13

The means of data sets X and Y above are both 10. Which of the following is true about the comparison of the standard deviations of the two data sets?

A) The standard deviation of data set X is less than the standard deviation of data set Y.
B) The standard deviation of data set X is greater than the standard deviation of data set Y.
C) The standard deviations of the two data sets are equal.
D) There is not enough information to compare the standard deviations of the two data sets.

22

The diameter of circle A is 6 times the diameter of circle B. The circumference of circle A is how many times the circumference of circle B ?

A) 3
B) 6
C) 12
D) 36

CONTINUE

23

The amount of heat $Q(t)$, in calories, required to raise the temperature of 20 grams of snow by t degrees Celsius (°C) is defined by a linear function Q. If $Q(0) = 0$ and $Q(3) = 30$, how many calories of heat are required to raise the temperature of the snow from −10°C to −4°C ?

A) 4

B) 6

C) 40

D) 60

24

A quantity n is decreased by 20% of its value. The result is 160. What is the value of n ?

A) 32

B) 128

C) 192

D) 200

25

$$7a + 3b = 34$$
$$9a + 9b = 18$$

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

A) 120

B) 4

C) −8

D) −16

CONTINUE

26

$$(2x + 4)(3x + 6) = a(x^2 + bx + c)$$

The given equation is true for all values of x, where a, b, and c are constants. What is the value of b ?

A) 2

B) 4

C) 6

D) 24

27

$$x^2 + y^2 - 4x + 2y - 11 = 0$$

In the xy-plane, the graph of the given equation is a circle. What are the coordinates (x, y) of the center of the circle?

A) $(-4, -11)$

B) $(-4, 2)$

C) $(2, -1)$

D) $(2, 1)$

28

$$(2x - 3)^2 = 4x - 6$$

The solutions of the equation above are m and n. If $m > n$, what is the value of $m - n$?

A) 0

B) 1

C) 2

D) 3

CONTINUE

29

A researcher determined that the ratio of males to females in a healthy herd of deer should be 3 to 7. If a population has 70 deer, how many female deer should be in the herd in order for the herd to be considered healthy?

A) 21

B) 30

C) 40

D) 49

30

In 2007, wind erosion was responsible for 0.77 billion tons of soil loss on cropland in the US. Sheet water erosion and rill water erosion were also responsible for soil loss on cropland. These three types of erosion were responsible for a total of 1.73 billion tons of soil loss. Which inequality represents the soil loss x, in billions of tons, on cropland from sheet water erosion in 2007?

A) $0 < x < 0.96$

B) $0.77 < x < 1.73$

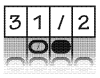
C) $0.96 < x < 1.73$

D) $1.73 < x < 2.50$

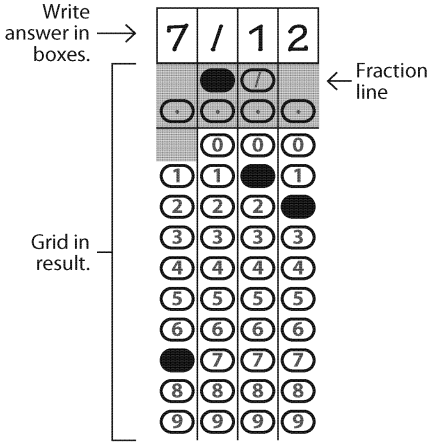
CONTINUE

DIRECTIONS

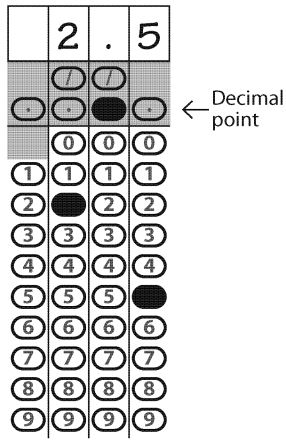
For questions 31-38, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

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

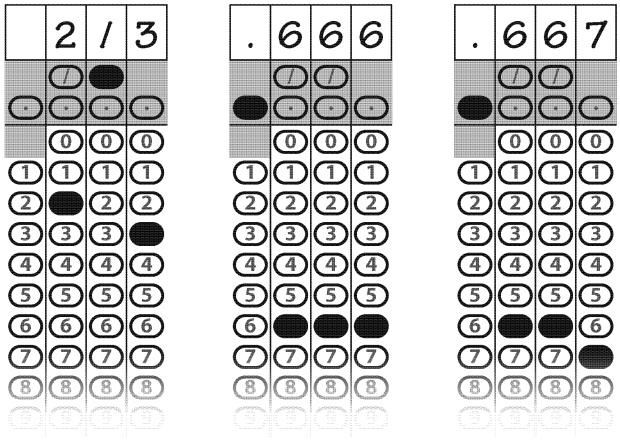
Answer: $\frac{7}{12}$



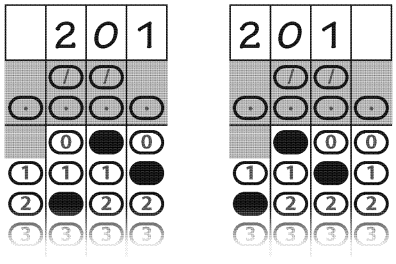
Answer: 2.5



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



Answer: 201 – either position is correct

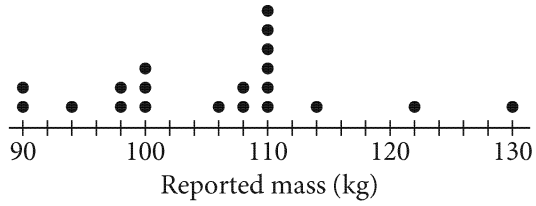


NOTE:
You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.

CONTINUE

31

The dot plot shows the reported mass, in kilograms (kg), of 20 ostriches.



How many of the ostriches have a reported mass of 110 kg?

32

If $(x - 2)^2 = 16$, what is one possible value of $x + 2$?

33

A car dealership has only sedans, SUVs, and minivans for sale. On Monday, 20% of the vehicles for sale were sedans and 50% were SUVs. If there were 16 sedans for sale at the dealership on Monday, how many minivans were for sale?

34

In the xy-plane, the graph of the equation $y = \dfrac{2x + 9}{x + 5}$ intersects the y-axis at $(0, c)$. What is the value of c ?

CONTINUE

35

Score range	Number of players
21–25	7
26–30	103
31–35	142
36–40	117
41–45	38
46–50	19
51–55	11

The table above shows the score range and the number of players in each score range for 437 players of a computer game. If the scores in the computer game are only integer values, what is one possible median score for the 437 players?

36

If $4(p - 3) = 18 - 2(p - 3)$, what is the value of $p - 3$?

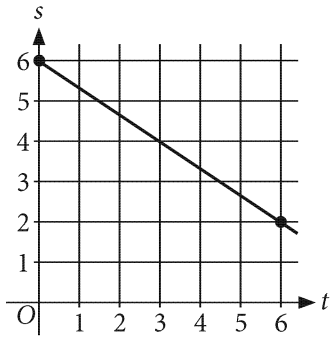
CONTINUE

37

Type of university or college	Enrollment			
	Less than 5000	5000 to 10,000	Greater than 10,000	Total
Public	9	9	4	22
Private nonprofit	31	2	0	33
Private for-profit	7	0	1	8
Total	47	11	5	63

The table summarizes the number of universities and colleges in the state of Iowa by type and enrollment. If a university or college with enrollment greater than 10,000 is selected at random, what is the probability it is a public university or college? (Express your answer as a decimal or fraction, not as a percent.)

38



The graph shows the relationship between the length t, in feet, of a patterned fabric and the length s, in feet, of a solid fabric that Josh can buy from a craft store for a total of \$18.00. The relationship can be modeled by the equation $at + bs = 18$, where a and b are constants. What is the value of $\frac{a}{b}$?

STOP

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

December 4, 2021 US

ANSWER KEY

Reading Test Answers

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

READING TEST RAW SCORE (NUMBER OF CORRECT ANSWERS)

Writing and Language Test Answers

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

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

Math Test – No Calculator Answers

1 D	11 A
2 B	12 D
3 C	13 C
4 A	14 C
5 D	15 B
6 A	16 4
7 B	17 2
8 B	18 12
9 B	19 7
10 C	20 376

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

Math Test – Calculator Answers

1 B	11 D	21 B	31 6
2 B	12 C	22 B	32 0, 8
3 C	13 D	23 D	33 24
4 A	14 A	24 D	34 9/5, 1.8
5 A	15 A	25 C	35 31, 32, 33, 34, 35
6 A	16 B	26 B	36 3
7 D	17 C	27 C	37 4/5, .8
8 A	18 D	28 B	38 2/3, 1.66, 1.67
9 C	19 B	29 D	
10 D	20 A	30 A	

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