Practice Test 3

Reading Test

65 MINUTES, 52 QUESTIONS

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

Questions 1–10 are based on the following passage.

The passage that follows is adapted from an 1859 novel that follows the lives of both English and French characters during the French Revolution.

"You were very sound, Sydney, in the matter of those crown witnesses today. Every question told."

"I always am sound; am I not?"

Line
"I don't gainsay it. What has roughened your
5 temper? Put some punch to it and smooth it again."

With a deprecatory grunt, Carton complied.

"The old Sydney Carton of old Shrewsbury School," said Stryver, nodding his head over him as he reviewed him in the present and the past, "the old seesaw
10 Sydney. Up one minute and down the next; now in spirits and now in despondency!"

"Ah!" returned the other, sighing: "Yes! The same Sydney, with the same luck. Even then, I did exercises for other boys, and seldom did my own."

15 "And why not?"

"God knows. It was my way, I suppose."

"Carton," said his friend, squaring himself at him with a bullying air, as if the fire-grate had been the furnace in which sustained endeavour was forged, and
20 the one delicate thing to be done for the old Sydney Carton of old Shrewsbury School was to shoulder him into it, "your way is, and always was, a lame way. You summon no energy and purpose. Look at me."

"Oh, botheration!" returned Sydney, with a lighter
25 and more good-humoured laugh, "don't *you* be moral!"

"How have I done what I have done?" said Stryver; "how do I do what I do?"

"Partly through paying me to help you, I suppose. But it's not worth your while to apostrophise me, or
30 the air, about it; what you want to do, you do. You were always in the front rank, and I was always behind."

"I had to get into the front rank; I was not born there, was I?"

"I was not present at the ceremony; but my opinion
35 is you were," said Carton. At this, he laughed again, and they both laughed.

"Before Shrewsbury, and at Shrewsbury, and ever since Shrewsbury," pursued Carton, "you have fallen into your rank, and I have fallen into mine. You were
40 always somewhere, and I was always nowhere."

"And whose fault was that?"

"Upon my soul, I am not sure that it was not yours. You were always driving and shouldering and passing, to that restless degree that I had no chance for my life
45 but in rust and repose. It's a gloomy thing, however, to talk about one's own past, with the day breaking. Turn me in some other direction before I go."

"Well then! Pledge me to the pretty witness," said Stryver, holding up his glass. "Are you turned in a
50 pleasant direction?"

"Pretty witness," he muttered, looking down into his glass. "I have had enough of witnesses today and tonight; who's your pretty witness?"

"The picturesque doctor's daughter, Miss Manette."

55 "*She* pretty?"

"Is she not?"

"No."

CONTINUE

"Why, man alive, she was the admiration of the whole Court!"

60   "Rot the admiration of the whole Court! Who made the Old Bailey a judge of beauty? She was a golden-haired doll!"

"Do you know, Sydney," said Mr. Stryver, looking at him with sharp eyes, and slowly drawing a hand across
65   his florid face: "do you know, I rather thought, at the time, that you sympathized with the golden-haired doll, and were quick to see what happened to the golden-haired doll?"

"Quick to see what happened! If a girl, doll or no
70   doll, swoons within a yard or two of a man's nose, he can see it without a perspective-glass. I pledge you, but I deny the beauty. And now I'll have no more drink; I'll get to bed."

When his host followed him out on the staircase
75   with a candle, to light him down the stairs, the day was coldly looking in through its grimy windows. When he got out of the house, the air was cold and sad, the dull sky overcast, the river dark and dim, the whole scene like a lifeless desert. And wreaths of dust were spinning
80   round and round before the morning blast, as if the desert-sand had risen far away, and the first spray of it in its advance had begun to overwhelm the city.

Climbing to a high chamber in a well of houses, he threw himself down in his clothes on a neglected bed,
85   and its pillow was wet with wasted tears. Sadly, sadly, the sun rose; it rose upon no sadder sight than the man of good abilities and good emotions, incapable of their directed exercise, incapable of his own help and his own happiness, sensible of the blight on him, and
90   resigning himself to let it eat him away.

1

The primary purpose of the passage as a whole is to

A)   describe the history between Carton and Stryver.

B)   characterize life at the Shrewsbury School.

C)   reveal Carton's character.

D)   show that Stryver has been exploiting Carton.

2

Based on the information in the passage, Carton is best characterized as

A)   unsound.

B)   mercurial.

C)   unlucky.

D)   imperceptive.

3

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

A)   Lines 10–11 ("Up . . . despondency")

B)   Lines 13–14 ("Even . . . own")

C)   Lines 35–36 ("At this . . . laughed")

D)   Lines 45–46 ("It's a . . . breaking")

4

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

A)   soul.

B)   liquor.

C)   essence.

D)   jubilation.

5

Based on lines 17–22 ("squaring … it"), it can be reasonably inferred that

A)   Stryver is frustrated with Carton's behavior.

B)   Stryver is planning to push Carton into the fireplace.

C)   Stryver believes Carton to be comparatively older.

D)   Stryver wishes to bully Carton as he did at Shrewsbury.

CONTINUE

6

The use of italics in line 55 primarily serves to emphasize Carton's

A) incredulity.

B) confusion.

C) annoyance.

D) affection.

7

The passage suggests which of the following about Stryver?

A) He is in love with Miss Manette.

B) He believes that Carton lacks the intelligence required to be successful.

C) He does not believe that Carton finds Miss Manette unattractive.

D) He was born into a wealthy family.

8

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

A) Lines 32–33 ("I had . . . I")

B) Line 41 ("And whose . . . that")

C) Lines 58–59 ("Why . . . Court")

D) Lines 63–68 ("Do you . . . doll")

9

In context, "desert" in line 79 refers to

A) Stryver's cold demeanor.

B) London's landscape.

C) Carton's windows.

D) sunlit dunes.

10

The "tears" referred to in line 85 are "wasted" because

A) Miss Manette will never love Carton.

B) Carton is unlikely to change his ways.

C) Carton's home is one of squalor.

D) Stryver will continue to exploit Carton's labor.

CONTINUE

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

This passage is adapted from Priit Vesilind, *The Singing Revolution.* ©2008 by Sky Films Incorporated.

By the end of 1939 Soviet troops had forced their way into garrisons in the Baltic states of Estonia, Latvia, and Lithuania. In 1940 the Soviets forcibly
Line annexed the three Baltic states into the USSR. But in
5   1941 Hitler double-crossed Stalin: he launched an attack on the Soviet Union. The Baltic nations were caught in the middle of the treachery. In 1945, when the war ended, Estonia remained occupied by the Soviets.

10   After nearly 50 years of Soviet occupation, when agitations for independence came in the late 1980s, the protestors pointed back to the Molotov-Ribbentrop Pact, a secret non-aggression treaty between the Soviet Union and Nazi Germany. If the Kremlin were
15   to acknowledge the existence of this protocol, they reasoned, it would be admitting that the Baltic States had no legal "marriage" with Moscow, but that these nations were forcibly abducted with the collusion of the world's most heinous fascist regime. So the
20   occupied nations had every right to ask for their freedom, and with no need for a legal "divorce."

The Baltic states had been morally supported with the firm stand taken in 1940 by the United States not to recognize the legality of the forceful annexation
25   of Estonia, Latvia, and Lithuania. But politics were effective only if the Estonians had some other leverage. A nation of barely one million, burdened with half a million foreign settlers and 100,000 Soviet troops, could not threaten the Soviet Union militarily or
30   economically, so it had to do it with the force of its culture. Estonia had always been a nation of singers. Its wealth of folk songs gave rhythm to village life and work, and its earnest anthems often invoked the longing for self-determination. Estonians had lived for
35   centuries in servitude, and the themes of their music were often grim: sorrow, slavery, soil, blood, birch forests, and sacrifice. But there was always hope in their hearts.

Early in their national awakening, about 140 years
40   ago, Estonians established a history of mass song festivals, held when money and politics allowed—celebrations that would kindle and fortify the courage to express their love of language and nation, and their reluctance to be absorbed by anyone. The festivals were

45   a nationwide phenomenon, as were similar festivals held in Latvia and Lithuania.

In Tallinn the massive modern song stage held some 30,000 singers and the outdoor amphitheater could accommodate as many as 300,000. Often, 30
50   percent of all Estonians would be there—at a single concert. During the Soviet years the festivals were forced to pay tribute to Communist icons and the solidarity of the Soviet peoples. Choirs from other parts of the vast empire would come and all would
55   whip up a rousing tribute to Stalin or Lenin. To these mandatory performances Estonians would introduce patriotic songs disguised as love songs or folk music. An unofficial national anthem, by the popular choir director Gustav Ernesaks, established itself in 1947,
60   and survived the entire Soviet occupation despite a serious attempt by officials to eliminate it in 1969.

By the late 1980s the nation was simmering. A movement of young historians was already defying Soviet authority in speeches that laid history bare under
65   the cover of Gorbachev's policy of glasnost, or "free speech." And the burden of protest songs had passed to rock-and-rollers, young men whose energized patriotic tunes blared from every radio.

Momentum built to a crescendo in the summer
70   of 1988 when a rock concert in Tallinn's Old Town spilled into the Song Festival grounds and massive crowds gathered for six straight nights to lift arms, sway in unison, and sing patriotic songs. Emboldened, Estonians brought out forbidden blue-and-black-and-
75   white national flags, some from attics and basements where they had been hidden since 1940. Shockingly, no one stopped them. For the finale of these "Night Song Festivals" more than 200,000 Estonians gathered.

This was the heart of "The Singing Revolution,"
80   a spontaneous, non-violent, but powerful political movement that united Estonians with poetry and music. After that there was no backing up. Sedition hung in the wind, waiting to be denied.
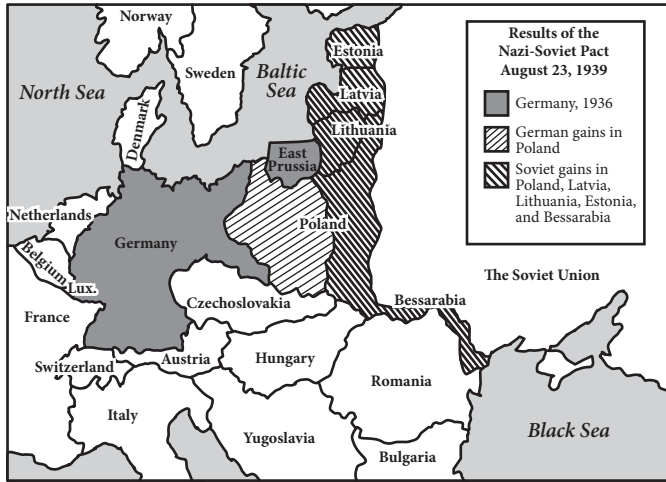
CONTINUE

Diagram of Europe following the Nazi-Soviet Pact of 1939, also known as the Molotov-Ribbentrop Pact. Image adapted from CQ Researcher.

11

The point of view from which the passage is written is best described as

A) condemnatory of the Soviet Union's treacherous actions.

B) sympathetic to the Baltic states' struggle for freedom.

C) dismissive of the idea of non-violent revolution.

D) conflicted about the underlying cause of the revolution.

12

In lines 34–38, the author draws a distinction between

A) the tone of Estonian songs and the people's true feelings.

B) the themes of Estonian folk songs and anthems.

C) the military strength of Estonia and that of the Soviet Union.

D) song festivals in Estonia and those in Latvia and Lithuania.

13

In the context of the passage, the phrase "their reluctance to be absorbed" suggests that Estonians

A) refused to speak Russian with the many foreign settlers in Estonia.

B) wanted to have an independent nation.

C) worked to ensure their culture stayed distinct from those of the other Baltic states.

D) were unwilling to devote the amount of concentration to song festivals that the Soviets demanded.

14

Which choice best supports the claim that the Soviet Union perceived Estonia's culture as a threat?

A) Lines 31–34 ("Estonia . . . self-determination")

B) Lines 39–44 ("Early . . . anyone")

C) Lines 51–53 ("During . . . peoples")

D) Lines 58–61 ("An unofficial . . . 1969")

CONTINUE

15

As used in line 66, "burden" most nearly means

A) weight.

B) travail.

C) responsibility.

D) need.

16

The primary rhetorical effect of the last sentence of the passage is to

A) convey the sense of dread that hung over Estonia at the height of the Singing Revolution.

B) indicate the depth of disagreement between violent and non-violent revolutionaries.

C) show how crucial music and poetry were to Estonia's fight for independence.

D) communicate the sense of optimistic tension that Estonians felt after the Night Song Festivals.

17

The author implies which of the following about Estonian song festivals?

A) They afforded Estonians a medium through which national and cultural pride could be expressed.

B) They were started during the Soviet occupation to preserve Estonian culture and language.

C) They were unique in size and format to the country where they were founded.

D) They provided an opportunity to sing songs that were more uplifting than those sung while working.

18

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

A) Lines 19–21 ("So . . . 'divorce'")

B) Lines 44–46 ("The festivals . . . Lithuania")

C) Line 62 ("By the . . . simmering")

D) Lines 79–82 ("This . . . music")

19

Which of the following claims is supported by the diagram?

A) In the 1939 pact, Germany gained the entirety of Poland.

B) The Soviet Union doubled in size after the pact.

C) Lithuania and Estonia are contiguous countries.

D) The Soviet Union's gains stretched from the Baltic Sea to the Black Sea.

20

Which statement from the passage is most directly reflected by the information presented on the diagram?

A) Lines 1–3 ("By the . . . Lithuania")

B) Lines 3–4 ("In 1940 . . . USSR")

C) Lines 10–14 ("After . . . Germany")

D) Lines 22–25 ("The Baltic . . . Lithuania")

21

What purpose does the diagram serve in relation to the passage as a whole?

A) It clarifies Estonia's relationship to the Soviet Union.

B) It illustrates the results of a non-aggression treaty that shaped the region.

C) It shows the impact of the Singing Revolution on surrounding countries.

D) It emphasizes the importance of Estonia's role in the region.

CONTINUE ▶

Questions 22–31 are based on the following passage.

This passage is an excerpt adapted from a speech given in 1917 by American Senator Robert LaFollette. In the speech, LaFollette explains the special importance of free speech during times of war and the relation between free speech and democratic governance.

Since the declaration of war the triumphant war press has pursued those Senators and Representatives who voted against war with malicious falsehood and
Line recklessly libelous attacks, going to the extreme limit of
5 charging them with treason against their country.

I have in my possession numerous affidavits establishing the fact that people are being unlawfully arrested, thrown into jail, held incommunicado for days, only to be eventually discharged without ever
10 having been taken into court, because they have committed no crime. Private residences are being invaded, loyal citizens of undoubted integrity and probity arrested, cross-examined, and the most sacred constitutional rights guaranteed to every American
15 citizen are being violated.

It appears to be the purpose of those conducting this campaign to throw the country into a state of terror, to coerce public opinion, to stifle criticism, and suppress discussion of the great issues involved in this
20 war.

I think all men recognize that in time of war the citizen must surrender some rights for the common good which he is entitled to enjoy in time of peace. But sir, the right to control their own Government
25 according to constitutional forms is not one of the rights that the citizens of this country are called upon to surrender in time of war.

Rather in time of war the citizen must be more alert to the preservation of his right to control his
30 Government. He must be most watchful of the encroachment of the military upon the civil power. He must beware of those precedents in support of arbitrary action by administrative officials, which excused on the plea of necessity in war time, become
35 the fixed rule when the necessity has passed and normal conditions have been restored.

More than all, the citizen and his representative in Congress in time of war must maintain his right of free speech. More than in times of peace it is necessary that
40 the channels for free public discussion of governmental policies shall be open and unclogged. I believe, Mr. President, that I am now touching upon the most

important question in this country today—and that is the right of the citizens of this country and their
45 representatives in Congress to discuss in an orderly way frankly and publicly and without fear, from the platform and through the press, every important phase of this war; its causes, the manner in which it should be conducted, and the terms upon which peace should
50 be made. I am contending, Mr. President, for the great fundamental right of the sovereign people of this country to make their voice heard and have that voice heeded upon the great questions arising out of this war, including not only how the war shall be prosecuted but
55 the conditions upon which it may be terminated with a due regard for the rights and the honor of this Nation and the interests of humanity.

I am contending for this right because the exercise of it is necessary to the welfare, to the existence, of this
60 Government to the successful conduct of this war, and to a peace which shall be enduring and for the best interest of this country.

Suppose success attends the attempt to stifle all discussion of the issues of this war, all discussion
65 of the terms upon which it should be concluded, all discussion of the objects and purposes to be accomplished by it, and concede the demand of the war-mad press and war extremists that they monopolize the right of public utterance upon these
70 questions unchallenged, what think you would be the consequences to this country not only during the war but after the war?

It is no answer to say that when the war is over the citizen may once more resume his rights and feel some
75 security in his liberty and his person. As I have already tried to point out, now is precisely the time when the country needs the counsel of all its citizens. In time of war even more than in time of peace, whether citizens happen to agree with the ruling administration or
80 not, these precious fundamental personal rights—free speech, free press, and right of assemblage so explicitly and emphatically guaranteed by the Constitution should be maintained inviolable.

CONTINUE

22

The position that LaFollette takes is best described as that of

A) a law-maker suggesting a new piece of legislation.

B) an impartial observer arbitrating a legal issue.

C) a dissenter arguing for a cause.

D) a pacifist arguing against international conflicts.

23

In the passage, LaFollette draws a distinction between

A) rights that are appropriately and inappropriately sacrificed during war.

B) moments when free speech is and is not necessary.

C) just wars and wars fought for economic interest.

D) the interests of the Nation and the interests of humanity.

24

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

A) Lines 6–11 ("I have . . . crime")

B) Lines 21–27 ("I think . . . war")

C) Lines 30–31 ("He must . . . power")

D) Lines 50–57 ("I am . . . humanity")

25

Based on the information in the passage, those criticized by the press are

A) members of Congress standing in opposition to the war.

B) citizens who have committed treason against their country.

C) government officials seeking to stifle free speech.

D) Senators and Representatives who have committed libel.

26

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

A) declare defeat.

B) throw away.

C) set aside.

D) submit to.

27

Lines 32–36 suggest that

A) some rights are necessarily given up during war time.

B) restrictions on civil powers are always arbitrary.

C) the Government must be watchful of the military.

D) temporary restrictions may become permanent.

28

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

A) periods.

B) conversations.

C) definitions.

D) conditions.

29

The principal rhetorical effect of the phrase in lines 48–50 ("its causes . . . made") is to

A) argue against granting free speech during war by emphasizing the difficulties faced by the military and the President.

B) suggest the numerous points at which citizens should exercise their free speech during times of war.

C) discuss three reasons members of the press are currently unable to speak frankly without fear.

D) show that LaFollette believes that the citizens understand the dynamics of war far better than the President.

CONTINUE ▶

30

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

A) Lines 11–15 ("Private . . . violated")

B) Lines 16–20 ("It appears . . . war")

C) Lines 30–36 ("He must . . . restored")

D) Lines 37–41 ("More . . . unclogged")

31

The author's attitude toward "the attempt to stifle" (line 63) can be described as

A) sympathetic.

B) apathetic.

C) frustrated.

D) morose.

CONTINUE

Questions 32–41 are based on the following passage and supplementary material.

This passage is adapted from Joe Turner, "Fill Up Your Gas Tank with Bamboo?" ©2015 by *Science.*

2014 was a banner year for making automotive fuel from nonfood crops, with a series of major new production plants opening in the United States.

Line
5   However, producing this so-called cellulosic ethanol remains considerably more expensive than gasoline. So researchers are always on the lookout for new ways to trim costs. Now they have a new lead, a microbe that can use abundant nitrogen gas as the fertilizer it needs to produce ethanol from plants.

10 The discovery is "a major commercial accomplishment for biofuel production," says Steven Ricke, a microbiologist and editor of a textbook on biofuel production at the University of Arkansas, Fayetteville, who was not involved in the study.

15 Scientists have long eyed biofuels as a cleaner and more sustainable alternative to traditional fossil fuels. Instead of pumping oil from the ground, researchers harvest plants like cassava and sugarcane, grind them up, add enzymes to break down the plant matter, and
20 sprinkle in yeast. The microbe ferments sugars in the plants to produce ethanol, a form of alcohol, which is now commonly mixed with gasoline and used in cars and buses around the world.

But biofuels are controversial. The majority are
25 derived from food crops, like corn. Critics say the increased demand for these crops could increase food prices. And although direct emissions of carbon dioxide from burning biofuels are less than those from traditional fuels, some scientists now argue
30 that once indirect emissions from land use changes and producing the crop are considered, the overall emissions from some biofuels can actually be higher.

So in recent years, researchers have turned to nonfood crops—like trees and bamboo—for biofuel
35 production. These crops need less fertilizer than traditional biofuel crops, and they often have less detrimental impact on the land. In an ideal world, biofuels would be produced only from plant materials that cannot be eaten, such as trees and parts of plants
40 that are left in fields after harvest, like straw.

But there are problems. The enzymes needed to break down plants' primary structural components—cellulose and hemicellulose—into simple sugars are expensive. To ferment the simple sugars, the microbes

45 also need nitrogen to grow and divide. So researchers add fertilizer to their fermentation vats to boost the ethanol yields. It is estimated that an ethanol production plant may be spending more than $1 million on this a year.

50 Instead of using yeast to ferment their plants into fuel, microbiologists at Indiana University, Bloomington, turned to *Zymomonas mobilis*, a bacterium also capable of doing the job. So the researchers looked at the amount of ethanol that the
55 microbe could produce with and without additional nitrogen fertilizer being supplied and found that it did better without it. The study, published in the *Proceedings of the National Academy of Sciences,* even showed that the bacterium produces ethanol
60 more quickly and uses more of the plant material when it uses nitrogen gas than when it is fed nitrogen in fertilizer. If the same holds true in a production plant, this could reduce biofuel production costs, the authors say. The process is also more environmentally friendly,
65 they add, because there are greenhouse gas emissions associated with producing nitrogen fertilizer.

However, questions remain about how well this process will work in a large biofuel plant. Whereas using *Z. mobilis* might make it cheaper for producers
70 to use inexpensive, nonfood crops, there could also be added costs and problems.

The overall environmental benefits may also be slim. Even if nitrogen fertilizers are not used in the fermentation process, they might still be needed to
75 grow the crops. And the new advance doesn't address other environmental impacts from biofuels, such as the greenhouse gas emissions from growing, harvesting, and transporting the plants. According to Fengqi You, a chemical engineer at Northwestern University in
80 Evanston, Illinois, further studies would be needed to consider all the environmental and economic costs and benefits of doing this on an industrial scale so that it can be compared with existing systems.
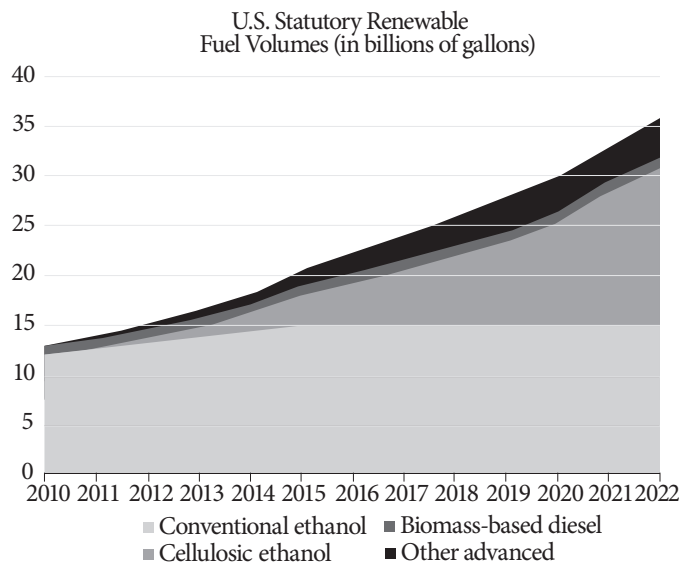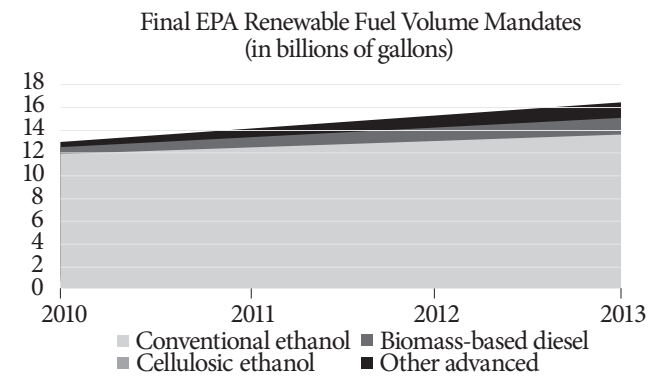
CONTINUE

U.S. Statutory Renewable
Fuel Volumes (in billions of gallons)

Figure 1

Final EPA Renewable Fuel Volume Mandates
(in billions of gallons)

Figure 2

Figures adapted from data by Center for Climate and Energy Solutions.

32

The passage is written from the perspective of an

A) advocate arguing for more project funding.

B) educator explaining textbook chemistry concepts.

C) expert lauding the successes of an industry.

D) objective observer evaluating new research.

33

The last sentence of the first paragraph primarily serves to

A) assess recent commercial accomplishments.

B) explain why one fuel is more expensive than another.

C) propose a potential solution to a known problem.

D) restate the results of a banner year.

34

According to the passage, nonfood crops produce fewer indirect land use emissions by

A) occupying land that would otherwise produce corn.

B) curtailing sudden increases in food prices.

C) limiting the fertilizer required to produce biofuels.

D) stopping the proliferation of fossil fuel use.

35

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

A) Lines 35–37 ("These . . . land")

B) Lines 37–40 ("In an . . . straw")

C) Lines 41–44 ("The enzymes . . . expensive")

D) Lines 47–49 ("It is . . . year")

CONTINUE

36

As used in line 37, "ideal world" most nearly means

A) best-case scenario.

B) dream sequence.

C) perfect model.

D) utopian society.

37

It can most reasonably be inferred from the results of the Indiana University study involving *Zymomonas mobilis* that

A) all bacteria can ferment corn and trees into fuel.

B) total greenhouse gas emissions will remain unchanged.

C) researchers would prefer biofuels to be used as a food source.

D) using nitrogen gas may reduce biofuel production costs.

38

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

A) Lines 59–63 ("the bacterium . . . costs")

B) Lines 64–66 ("The process . . . fertilizer")

C) Lines 68–71 ("Whereas . . . problems")

D) Lines 73–75 ("Even . . . crops")

39

As used in line 73, "slim" most nearly means

A) brittle.

B) negligible.

C) skinny.

D) useless.

40

According to figure 1, in what year is the required statutory volume of conventional ethanol closest to that of another fuel type?

A) 2010

B) 2012

C) 2018

D) 2022

41

According to figure 2, which of the following fuels is least likely to meet the volume requirements shown in figure 1?

A) Biomass-based diesel

B) Cellulosic ethanol

C) Conventional ethanol

D) Other advanced renewable fuels

CONTINUE

Questions 42–52 are based on the following passages.

Passage 1 is adapted from Theodore S. Melis, Ed., "Effects of Three High-Flow Experiments on the Colorado River Ecosystem Downstream from Glen Canyon Dam, Arizona," published in 2011 by the U.S. Geological Survey. Passage 2 is adapted from Paul E. Grams, "A Sand Budget for Marble Canyon, Arizona—Implications for Long-Term Monitoring of Sand Storage Change," published in 2013 by the U.S. Geological Survey.

Passage 1

At the time Glen Canyon Dam was constructed (1956–63), little consideration was given to how dam operations might affect downstream resources
Line in Grand Canyon National Park. In fact, the dam
5 was completed before enactment of the National Environmental Policy Act of 1969 and the Endangered Species Act of 1973. By the late 1950s, public values began to shift, and throughout the 1960s and 1970s recognition of the environmental consequences of
10 Glen Canyon Dam and its operation grew. National Park Service and U.S. Geological Survey scientists and river recreationists observed the physical transformation of the river in Grand Canyon, including the loss of large beaches used for camping,
15 narrowing of rapids so as to reduce navigability, and changes in the distribution and composition of riparian vegetation. The humpback chub and Colorado pikeminnow, species found only in the Colorado River Basin, were listed as endangered in 1967 by
20 the U.S. Fish and Wildlife Service, which concluded in 1978 that the dam and its operation jeopardized the continued existence of humpback chub in Grand Canyon.

Annual spring snowmelt floods were the defining
25 attribute of the pre-dam flow regime. Before the Colorado River was regulated by dams, streamflow gradually increased from mid-December to March, precipitously increased in April and May, and reached its peak in early June.
30 Pre-dam floods disturbed the aquatic ecosystem, and native fish species developed strategies to survive periods when the velocity in the main part of the channel was high and large amounts of suspended sediment were being transported. For example, several
35 of the native fish species share unusual body shapes, including a large adult body size, small depressed skulls, large humps on their backs, and small eyes, which presumably developed as adaptations to life in a

turbid and seasonably variable riverine environment.
40 Sandbars, riverbanks, and their accompanying aquatic habitats were reshaped during floods. Additionally, the increased elevation of the river surface during floods provided water to native riparian vegetation otherwise principally dependent on precipitation.

Passage 2

45 Decline in the size and abundance of sandbars since the pre-Glen Canyon Dam era has been documented by analysis of old aerial and ground-level photographs and by topographic surveys that began in the mid-1970s. Scientists have estimated that sandbar
50 area in the upstream 100 miles of Glen, Marble, and Grand Canyons was 25 percent less in 2000 than in average pre-dam years. This decline occurred because releases of water from Lake Powell are virtually free of sediment. The tributaries that enter the Colorado River
55 downstream from the dam supply only a fraction of the pre-dam sand supply, and the capacity of the post-dam river to transport that sand greatly exceeds this limited supply. Normal dam operations, therefore, tend to erode, rather than build, sandbars.
60 By experimentation, scientists have learned that controlled floods, if released from the reservoir immediately following large inputs of sand from tributaries, can build sandbars. These sandbars are built during controlled floods when sand is carried
65 from the riverbed and temporarily suspended at high concentration in the flow. The suspended sand is transported into eddies where it is then deposited in areas of low stream-flow velocity. Sandbars enlarged by this process provide larger camping beaches for
70 river-rafting trips and create backwater habitats used by native fish. Newly deposited sandbars also provide areas for riparian vegetation to grow and are a source of windblown sand. Windblown sand carried upslope from sandbars helps to cover and potentially preserve
75 some of the culturally significant archeological sites in Grand Canyon.

Scientists have also learned that controlled floods may erode sandbars if the concentration of suspended sand during a controlled flood is too low.
80 The concentration of sand during a flood is directly proportional to the amount of the riverbed covered by sand and the size of that sand. Higher concentrations of suspended sand occur when the sand is relatively

CONTINUE ➡

fine and large amounts of the riverbed are covered by
85 sand. These findings are incorporated in the current reservoir-release management strategy for Glen Canyon Dam, which involves releasing controlled floods—administratively referred to as High Flow Experiments (HFEs)—whenever the Paria River
90 has recently delivered large amounts of sand to the Colorado River. The magnitude and duration of the controlled floods is adjusted to transport just the amount of sand that has recently been delivered from the Paria River.

42

The author of Passage 1 most likely believes that the Glen Canyon Dam

A) is a useful tool for managing scarce water resources.

B) was built with a lack of foresight.

C) has decimated native fish populations.

D) has had a calming effect on the aquatic ecosystem.

43

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

A) Lines 1–4 ("At the . . . Park")

B) Lines 17–23 ("The humpback . . . Canyon")

C) Lines 24–25 ("Annual . . . regime")

D) Lines 30–34 ("Pre-dam . . . transported")

44

The author of Passage 1 mentions scientists and river recreationists primarily to

A) provide support for the idea that the post-dam river looks drastically different.

B) draw a contrast between scientific observations and casual observations of river conditions.

C) emphasize the spirit of collaboration between the science community and the public in conservation efforts.

D) prove that the Glen Canyon Dam has had a ruinous effect on the river.

45

Passage 1 suggests that the humpback chub

A) is now extinct in the Grand Canyon.

B) has a small, depressed skull.

C) can survive in changing environments.

D) thrives in high velocity river channels.

46

As used in line 25, "regime" most nearly means

A) government.

B) tenure.

C) system.

D) management.

47

As used in line 65, "suspended" most nearly means

A) stopped.

B) mixed.

C) withheld.

D) hanging.

48

It is reasonable to conclude that controlled floods

A) successfully simulate pre-dam snowmelt floods.

B) contain large amounts of suspended sediment.

C) may be detrimental to the health of the Colorado River.

D) should be carried out during the months when snowmelt floods typically occur.

49

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

A) Lines 58–59 ("Normal . . . sandbars")

B) Lines 66–68 ("The suspended . . . velocity")

C) Lines 71–73 ("Newly . . . sand")

D) Lines 77–79 ("Scientists . . . low")

50

The author of Passage 1 would most likely respond to the High Flow Experiments described in Passage 2 by

A) appreciating the efforts of scientists to maintain the sand supply below the dam.

B) warning of the calamity of interfering with the river ecosystem.

C) questioning the ability of controlled floods to build up sandbars.

D) worrying that reshaped habitats will harm native fish.

51

Which of the following best describes the structure of the two passages?

A) Passage 1 introduces a problem, and Passage 2 proposes a solution to the problem.

B) Passage 1 offers a historical discussion, and Passage 2 describes the implications of a scientific practice.

C) Passage 1 discusses general principles, and Passage 2 examines practical applications.

D) Passage 1 describes an experiment, and Passage 2 offers suggestions for future action.

52

Which of the following statements is true of Passage 1, but not of Passage 2?

A) The passage gives details of scientific studies conducted on the river.

B) The passage offers documented evidence of topographic change in the river.

C) The passage indicates the importance of floods to the river ecosystem.

D) The passage gives specific examples of species affected by the dam.

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

Writing and Language Test

35 MINUTES, 44 QUESTIONS

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

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

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

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

Questions 1–11 are based on the following passage.

And Justice for All

Her father got her the job. Amanda was between semesters at college, and her **1** work at the mall wouldn't do much for her when she got out of school. It was time to do something more serious, something that meant more to her. Many of her friends were getting internships in the city, working for this or that publishing house or TV studio. Amanda, however, wanted something different. She would start applying to law schools **2** soon and she wanted to know what the law looked like in action.

1
A) NO CHANGE
B) work, at the mall, wouldn't do much for her
C) work at the mall wouldn't do much for her,
D) work, at the mall, wouldn't do much for her,

2
A) NO CHANGE
B) soon and,
C) soon, and
D) soon,

CONTINUE

Fortunately, her dad knew someone from high school, a friend [3] named Ellen, who had then gone on to study at Duke University. It was a thankless job, and although the Department building itself covered almost one hundred acres (in New York City, there was an entire island devoted to it), no one paid the Department of Corrections much mind. Most people never come near a jail cell, so [4] it's easy for them to dismiss inmates as totally removed from society.

[1] At the Department, however, Amanda learned about prisoners' rights. [2] Or, by the same token, when was the use of force appropriate from the officers? [3] There is a clear provision in the Constitution that prohibits "cruel and unusual punishment." [4] The meaning of these four words [5] were nowhere more ambiguous than in prisons. [5] Everyone within these walls had been convicted of a crime and was now paying [6] they're debt to society, but how could a government ensure that the place would deliver the "reform" in a reformatory or the "penitence" in a penitentiary?

3

Which of the following true statements contains information most in keeping with the main idea of this passage?

A) NO CHANGE

B) who had gone on to law school and now worked at the County Department of Corrections.

C) with whom he had not spoken in twenty-five years, though with whom he still felt very close.

D) DELETE the underlined portion.

4

Which of the following best concludes this paragraph by reinforcing ideas presented in this sentence and the preceding one?

A) NO CHANGE

B) people often know literally nothing about prison life, though they are endlessly fascinated.

C) movie studios are famous for their sordid but often wrong depictions of prison life.

D) incarceration rates in the United States are some of the highest in the world.

5

A) NO CHANGE

B) have been

C) are

D) is

6

A) NO CHANGE

B) their

C) there

D) his or her

CONTINUE

[6] Should inmates with, for example, mental illnesses be treated differently from others? **7**

While Amanda did not gain any answers from her summer at the Department of Corrections, she **8** gathered together a whole new set of questions. She had uncovered questions and conundrums about the prison system itself, but she had begun to see prisoners' rights as central to the question of free rights as well. She began to wonder exactly what it was that a government owed its people and how much freedom was too much. Her internship that summer made her realize that politics and the law **9** was a living thing. As she applied to law schools the following fall, Amanda wrote passionately about what she had uncovered. "Although law has long

7

In the sequence of the paragraph, the best placement for sentence 2 would be

A) where it is now.

B) before sentence 1.

C) after sentence 3.

D) after sentence 6.

8

A) NO CHANGE

B) gathered up

C) collected up

D) gathered

9

A) NO CHANGE

B) were living things.

C) was a thing that was alive.

D) were things that were living.

CONTINUE

been considered a profession of privilege and prestige," she concluded her essay, "I have seen firsthand how it affects the lives of all of us. We may believe that we never come into contact with the **10** law; however, it is written into everything around us, including how we see ourselves." **11**

10

A) NO CHANGE

B) law, however

C) law, however;

D) law, however,

11

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

> Amanda was accepted into three law schools and chose the one with the strongest coursework on the prison system.

Should the writer make this addition here?

A) Yes, because it explains how students can use their interests to choose the right school.

B) Yes, because it reveals the conclusion to a dilemma mentioned earlier in the paragraph.

C) No, because it distracts from the passage's focus on how an experience can affect one's view of the world.

D) No, because it does not indicate whether Amanda actually graduated from law school and became a lawyer.

CONTINUE

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

Alexander's Empire of Culture

Alexander the Great is a name known to all, but not all know the extent of Alexander's accomplishments. Now that the study of the "classics" (mainly Roman and Greek civilizations) has **12** disappeared both from high-school and college curricula, Alexander the Great's legend is not on the tongue of every schoolboy, though his accomplishments have not **13** diminished for all that.

Alexander was born in Pella, Macedonia, in 356 BCE. His father, King Philip II, a strong military king **14** in his own write, believed that his son was born part man and part god. Alexander came to cultivate the image himself, bolstered by his keen intellect and learning, quickened in part by his tutor, the great Greek philosopher Aristotle. Pella was at that time a backwater of Greek culture, and **15** his arrival announced a new era of what historians would later call "enlightened monarchy," **16** even though that term is used much more to describe monarchies in the eighteenth century.

12

A) NO CHANGE

B) disappeared from both

C) disappeared both

D) from both disappeared

13

A) NO CHANGE

B) ameliorated

C) gone down

D) subsided

14

A) NO CHANGE

B) in his own right,

C) in his own rite,

D) by his own rite,

15

A) NO CHANGE

B) Aristotle's

C) their

D) the

16

Which of the following true statements would best conclude the paragraph by emphasizing the change that Alexander's rule brought to Macedonia?

A) NO CHANGE

B) although those who suffered defeat at Alexander's hands might not have seen it that way.

C) suggesting a style for the reigns of both Julius Caesar and Napoleon Bonaparte.

D) underlining further that Philip's former militaristic state was entering a new age.

CONTINUE

Still, the age was not entirely new. Alexander spent nearly all his time abroad, first uniting the Greek kingdom that threatened to fall apart at Philip's death, then moving on to broader military conquests. **17** Alexander had conquered an incredible amount of land by the time of his death in 323 BCE, **18** as his empire stretched from Greece to modern-day India, some two million square miles. When his armies conquered Persia (now Iran and Iraq) once and for all, he took on the title by which he is still known today: King of Babylon, King of Asia, King of the Four Quarters of the World.

17

The author wants to insert an introductory phrase or clause at the beginning of this sentence that will emphasize the continuity Alexander's reign had with the previous one. Which of the following choices would most effectively give this emphasis?

A) In what must have been truly exhausting,

B) With great ambition,

C) As his father had before him,

D) Just as historians have noted,

18

Which of the following choices gives information consistent with the map shown below?

A) NO CHANGE

B) while he traveled on foot throughout most of modern-day Europe,

C) because he circled the entire Mediterranean Sea and much of the Indian Ocean,

D) as he conquered all of Italy hundreds of years before Caesar had done so,
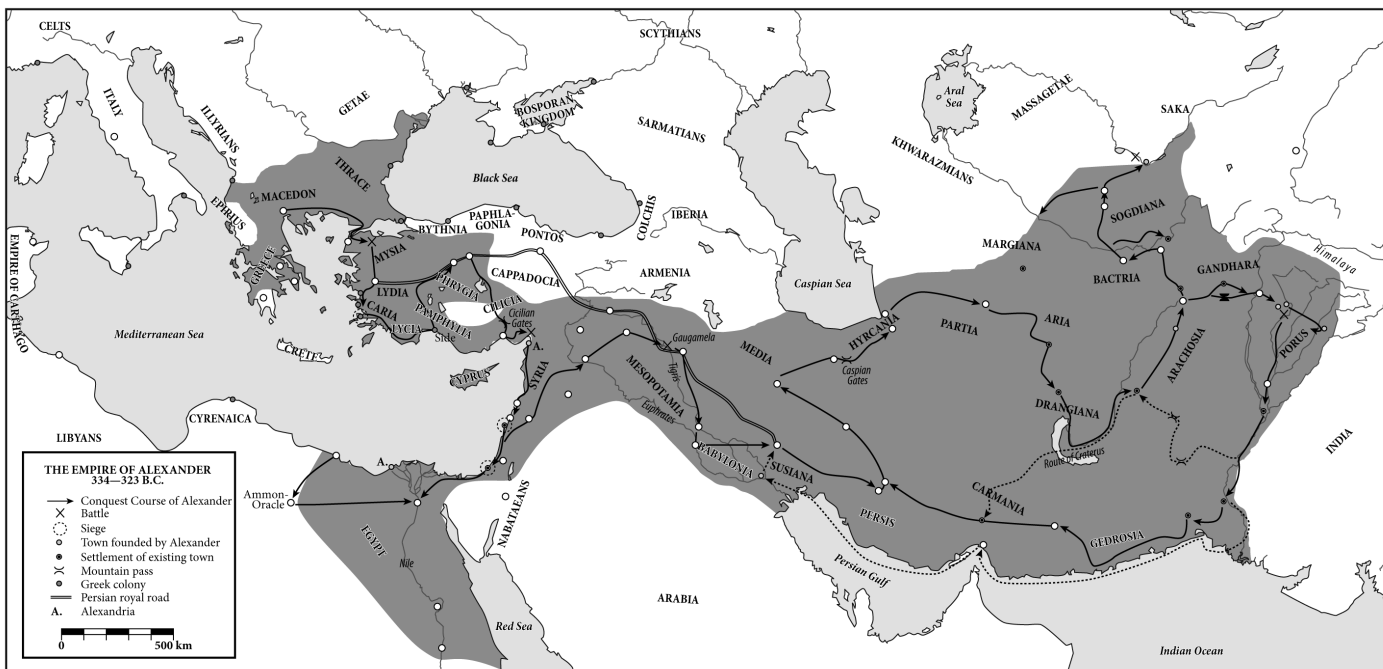
Extent of the empire of Alexander the Great

Alexander's historical importance is not merely one of military might, however. **19** He moved to these different parts of the world, he brought Greek culture with him. His reign marks an unprecedented **20** instance of contact, between the ancient East and West. Over twenty cities throughout the empire bear his name. Alexandria, Egypt, perhaps the most famous of these cities, continues to **21** thrive. It is the second-largest city in the modern nation of Egypt.

Perhaps history is the wrong place to understand the accomplishments of Alexander the Great. Epic poetry seems more suitable. After all, Alexander's great teacher Aristotle showed him Homer's *Iliad* and *Odyssey*, and it seems that Alexander himself understood his life as a shuttling back and forth between man and god, the individual and the world, and the natural **22** and the unnatural.

19

A) NO CHANGE

B) As he

C) Although he

D) Moreover, he

20

A) NO CHANGE

B) instance, of contact, between the ancient East

C) instance of contact between the ancient East

D) instance of contact between the ancient East,

21

Which of the following is the most effective way to combine these two sentences?

A) thrive; it is

B) thrive, is

C) thrive. It's

D) thrive and is

22

A) NO CHANGE

B) versus

C) from

D) but

CONTINUE

Questions 23–33 are based on the following passage.

Brother, Can You Spare a Dime?

Although printed cheaply and for quick consumption, 23 today's experience of culture is largely shaped by dime novels. For much of the nineteenth century, Americans consumed fiction, poetry, and non-fiction by way of literary periodicals. Some of our best-known authors from this period, 24 though there were also some notable exceptions, published something close to their complete works between the pages of countless periodicals.

23

A) NO CHANGE

B) we experience culture the way we do because of dime novels.

C) dime novels have shaped the way we experience culture today.

D) the shape of dime novels influences of cultural experiences.

24

Which of the following true phrases gives the most specific information in the context?

A) NO CHANGE

B) some of the best-known authors of all time,

C) and some who were not so well-known,

D) especially Edgar Allan Poe and Nathaniel Hawthorne,

Things started to change around the Civil War. Harriet Beecher Stowe's great 25 novel, *Uncle Tom's Cabin* had been an enormously popular serial novel in the abolitionist periodical *The National Era*. By the time the novel's forty-week run had concluded, however, publishers were clamoring for an actual 26 book. That book went on to become the first American bestseller. And it showed that Americans were willing to pay for books, which had, to that point, been too expensive to print and subsequently to buy. 27

25

A) NO CHANGE
B) novel, *Uncle Tom's Cabin,*
C) novel *Uncle Tom's Cabin,*
D) novel *Uncle Tom's Cabin*

26

A) NO CHANGE
B) book, rather than a series from a magazine.
C) book written by Stowe.
D) book that could be sold to Americans.

27

At this point, the writer is considering adding the following true statement:

The average annual income for men in New England from 1820–1850 was a mere $323.25.

Should the writer make this addition here?

A) Yes, because it makes clear how expensive books must have been in the period.
B) Yes, because it shows that even those in New England could not afford books printed there.
C) No, because it strays from the paragraph's focus on the changes in book publishing.
D) No, because it suggests that people in New England were not wealthy enough to read.

In 1860, Irwin and Erastus Beadle published the first in a long series of what **28** would become known as Beadle's Dime Novels. The first was called *Malaeska, The Indian Wife of the White Hunter*. By the turn of the nineteenth century, dime novels were everywhere.

The **29** affects are difficult to chart, but we can actually see the influence of these dime novels everywhere. Much of the mythology of the Old West, for example, was concretized in these dime novels, and William Bonney and James Butler Hickok became the folk heroes Billy the Kid and Wild Bill Hickok as the dime novels charted their (largely imagined) adventures. **30**

28

A) NO CHANGE

B) becomes

C) is

D) would have become

29

A) NO CHANGE

B) effects

C) effect's

D) affect's

30

The author is considering deleting the names "Billy the Kid and Wild Bill Hickok" from the preceding sentence. Should the names be kept or deleted?

A) Kept, because they are specific names in a sentence that speaks in generalities.

B) Kept, because they demonstrate the transformation described in the sentence.

C) Deleted, because they are nicknames of people whose true names are already listed in the sentence.

D) Deleted, because they encourage the frontier behavior that made the Wild West such a violent place.

CONTINUE

The new media of the twentieth-century—film, radio, and comic books—may have replaced the dime novel, but they did so with much they had **31** been taught from the dime novel's popularity. All three media, for instance, borrowed characters that had become popular in dime novels—characters such as Frank Reade and Nick Carter, Master Detective. Then, in comic books and radio, a new generation of superheroes—The Shadow, Superman, and Popeye—was created in the mold of the old swashbuckling romanciers of the dime-novel era.

So today, as we enjoy superhero action films or boy-wizard series of novels, we should be aware that there is nothing new under the Sun. Indeed, **32** for our hopelessly mass-media universe, this now forgotten form laid the foundation, pushing the same books onto countless readers. Such a feat may be commonplace as films gross many billions of dollars at the box office, but in the nineteenth century, the dime novel brought a new **33** integration and a belief that the small world was getting larger bit by bit.

31
A) NO CHANGE
B) got
C) learned
D) brought

32
If the punctuation is adjusted accordingly, the best placement for the underlined portion would be
A) where it is now.
B) after the word *form*.
C) after the word *foundation*.
D) at the end of the sentence.

33
A) NO CHANGE
B) framework
C) plan
D) composition

CONTINUE ➡

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

The Tiger Moth's Phantom Target

— 1 —

Bats have always seemed mysterious predators. While many other animal predators use methods **34** similar to human hunters, bats have evolved a series of unique methods of capturing prey. **35** The main curiosity among the bat's weaponry is its use of echolocation, or sonar.

— 2 —

Because bats hunt in the dark, they are not often able to see their prey. Instead, they use a process wherein they emit sounds and listen for the echoes. If **36** they are, say, standing atop a mountain and shout, you can figure out the distance across the canyon using the speed of sound waves and a series of precise calculations. Using its innate senses, a bat does these same **37** calculations instinctively. With extreme precision, a bat can identify its prey's location and size in the dark and capture its prey. While a bat does have relatively acute vision, **38** though not nearly as acute as some species of shrimp, its echolocation is what makes it such an effective predator.

34

A) NO CHANGE
B) similar to that of human hunters,
C) similar to those of human hunters,
D) like human hunters,

35

A) NO CHANGE
B) The echolocation, sonar, of the bat's weaponry is its main curiosity.
C) The bat has a curious weaponry, main among which is its echolocation and sonar.
D) The bat's weaponry is mainly curious in its use of echolocation of sonar.

36

A) NO CHANGE
B) they're,
C) one is,
D) you are,

37

A) NO CHANGE
B) calculations by instinct.
C) calculations with its instincts.
D) calculations.

38

The writer intends to insert a phrase or clause that emphasizes a common misunderstanding about bats' vision. Which of the following would best suit that intention?

A) NO CHANGE
B) undermining the cliché "blind as a bat,"
C) despite the pitch darkness in which it hunts,
D) in addition to its incredible hearing,

CONTINUE

— 3 —

However, scientists have recently discovered a species that can disrupt the bat's usually failsafe echolocation. The tiger moth, a victim of bat predation for over 50 million years, has figured out a way to "jam" **39** its system of echolocation. Most tiger moths can emit clicks that warn bats away from the **40** moths; suggesting that the moths might be inedible toxic compounds.

— 4 —

In the long history of bat research, scientists have never seen the like of these tiger moths. Although human methods of warfare have used sonic deception for as long as such warfare has existed, the tiger moth and **41** their sonar jamming provide one of the first instances of aural camouflage in the animal kingdom that scientists have discovered. It seems that no matter how ancient the conflict, bats and tiger moths continue to attack, **42** counterattack, and adapt in a war as old as time.

39

A) NO CHANGE

B) the bats'

C) the bat's

D) the bats

40

A) NO CHANGE

B) moths, suggesting

C) moths suggesting

D) moths. Suggesting

41

A) NO CHANGE

B) it's

C) its

D) its'

42

A) NO CHANGE

B) counterattack, and, adapt

C) counterattack and adapt

D) counterattack and adapt,

CONTINUE

— 5 —

One species, the tiger moth *Bertholdia trigona*, has done even better. This species emits a high-frequency clicking noise that throws off the bat's sonar altogether. While no one is certain exactly how these clicks camouflage the *B. trigona*, the clicks have been remarkably successful in defending the moths from bat attacks. Some suggest that the clicks force bats to misinterpret their sensory data, taking the moth clicks for their own echoes. As a result, bats **43** miss their prey at the moment of attempted capture, and the tiger moths flit away unharmed. **44**
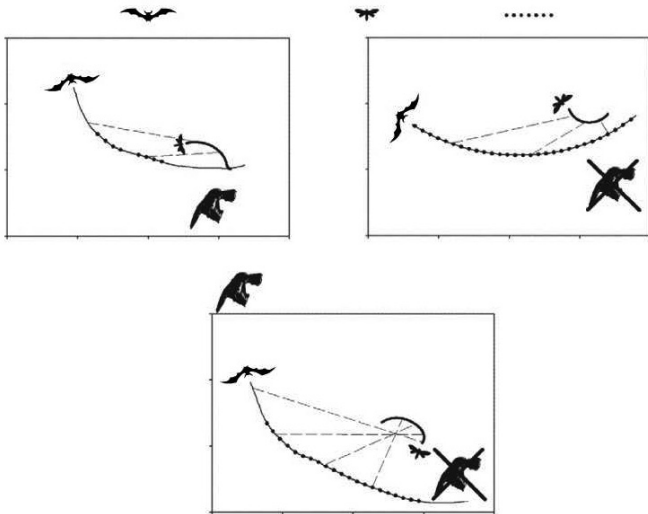
This image is adapted from the *Journal of Experimental Biology* © 2011.

43

Which of the following provides accurate information based on the diagrams?

A) NO CHANGE

B) attack other animals they find easier to detect,

C) fly after one another, bonking their heads together,

D) hear no sounds at all,

44

In the context of the passage as a whole, the best placement for paragraph 5 would be

A) where it is now.

B) after paragraph 1.

C) after paragraph 2.

D) after paragraph 3.

S T O P
If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.

Math Test – No Calculator

25 MINUTES, 20 QUESTIONS

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

DIRECTIONS

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

NOTES

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

$V = \ell wh$

$V = \pi r^2 h$

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

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

$V = \frac{1}{3}\ell wh$
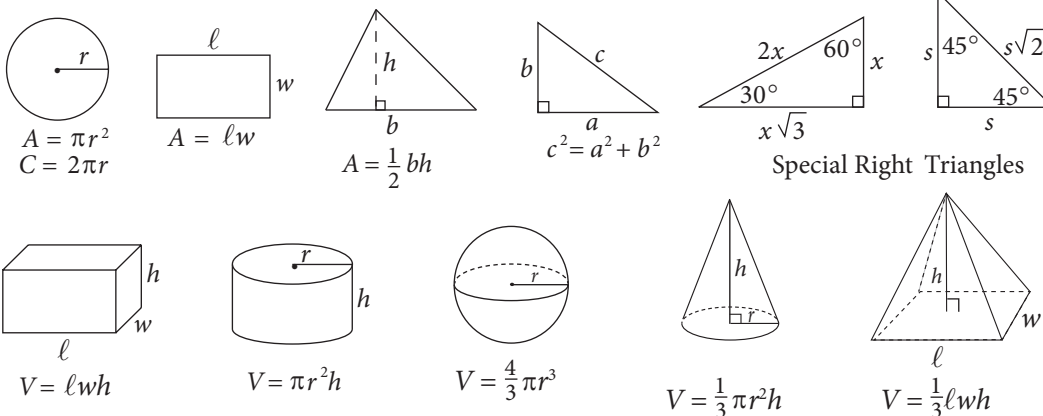
The number of degrees of arc in a circle is 360.
The number of radians of arc in a circle is 2π.
The sum of the measures in degrees of the angles of a triangle is 180.

CONTINUE

1

Which of the following equations has a vertex of (3, –3) ?

A) $y = 5(x - 3)^2 - 3$

B) $y = 5(x + 3)^2 - 3$

C) $y = 5(x - 3)^2 + 3$

D) $y = 5(x + 3)^2 + 3$

2

A beverage store charges a base price of x dollars for one keg of root beer. A sales tax of a certain percentage is applied to the base price, and an untaxed deposit for the keg is added. If the total amount, in dollars, paid at the time of purchase for one keg is given by the expression $1.07x + 17$, then what is the sales tax, expressed as a percentage of the base price?

A)   0.07%

B)   1.07%

C)   7%

D) 17%

3

Syed took out a cash advance of d dollars from a financing company. The company deducts a fee of $\frac{1}{3}$ of the original advanced amount along with a wire transfer fee of $30.00. Which of the following represents the final advanced amount that Syed receives after all applied fees, in dollars?

A) $\frac{1}{3}d - 30$

B) $\frac{1}{3}(d - 30)$

C) $\frac{2}{3}(d - 30)$

D) $\frac{2}{3}d - 30$

4

What is the equation of a line that contains the point (1, 6) and has a y-intercept of 4 ?

A) $y = \frac{1}{2}x + 4$

B) $y = x + 4$

C) $y = 2x + 4$

D) $y = 4x + 2$

CONTINUE

5

The number of bonus points, $B(p)$, that a credit card holder receives is given by the function $B(p) = 4p + 7$, where p represents the number of purchases made. If the number of purchases is increased by 3, by how much does the number of bonus points increase?

A)   3

B)   4

C) 12

D) 19

6

Jeff tests how the total volume occupied by a fluid contained in a graduated cylinder changes when round marbles of various sizes are added. He found that the total volume occupied by the fluid, V, in cubic centimeters, can be found using the equation below, where x equals the number of identical marbles Jeff added, one at a time, to the cylinder, and r is the radius of one of the marbles.

$$V = 24\pi + x\left(\frac{4}{3}\pi r^3\right)$$

If the volume of the graduated cylinder is 96π cubic centimeters, then, what is the maximum number of marbles with a radius of 3 centimeters that Jeff can add without the volume of the fluid exceeding that of the graduated cylinder?

A) 1

B) 2

C) 3

D) 4

7

If b is two more than one-third of c, which of the following expresses the value of c in terms of b ?

A) $c = \dfrac{b - 2}{3}$

B) $c = \dfrac{b + 2}{3}$

C) $c = 3(b - 2)$

D) $c = 3(b - 6)$

8

The rotation rate of a mixing blade, in rotations per second, slows as a liquid is being added to the mixer. The blade rotates at 1,000 rotations per second when the mixer is empty. The rate at which the blade slows is four rotations per second less than three times the square of the height of the liquid. If h is the height of liquid in the mixer, which of the following represents $R(h)$, the rate of rotation?

A) $4 - 9h^2$

B) $1,000 - (4 - 3h)$

C) $1,000 - (9h - 4)$

D) $1,000 - (3h^2 - 4)$

9

A dental hygiene company is creating a new 24-ounce tube of toothpaste by combining its most popular toothpastes, Cavity Crusher and Bad Breath Obliterator. Cavity Crusher contains 0.25% of sodium fluoride as its active ingredient, and Bad Breath Obliterator contains 0.30% of triclosan as its active ingredient for a total of 0.069 ounces of active ingredients in both toothpastes. Solving which of the following systems of equations yields the number of ounces of Cavity Crusher, c, and the number of ounces of Bad Breath Obliterator, b, that are in the new toothpaste?

A) $c + b = 0.069$
       $0.25c + 0.3b = 24$

B) $c + b = 24$
   $0.0025c + 0.003b = 0.069$

C) $c + b = 24$
    $0.025c + 0.03b = 0.069$

D) $c + b = 24$
    $0.25c + 0.3b = 0.069$

10

$$\frac{2d^2 - d - 10}{d^2 + 7d + 10} = \frac{d^2 - 4d + 3}{d^2 + 2d - 15}$$

In the equation above, what is the value of d ?

A) −4

B) 2

C) 4

D) 6

11
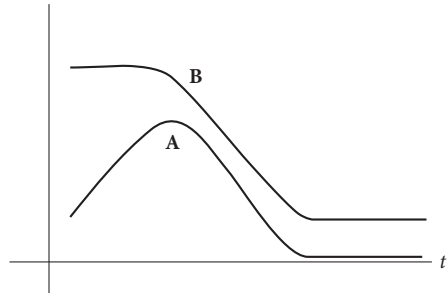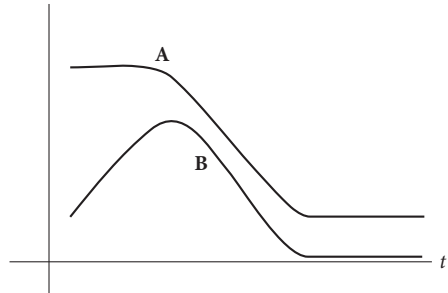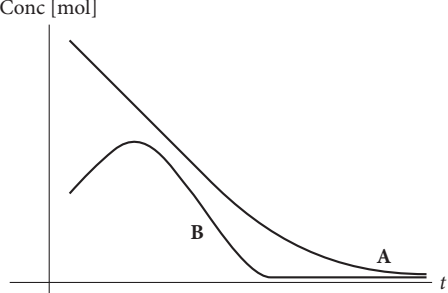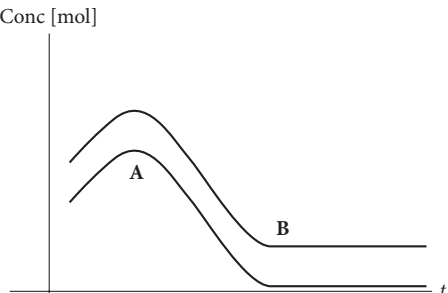
Which of the following is a possible equation for a circle that is tangent to both the x-axis and the line $x = 4$?

A) $(x + 2)^2 + (y + 2)^2 = 4$

B) $(x + 2)^2 + (y - 2)^2 = 4$

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

D) $(x - 6)^2 + (y - 2)^2 = 4$

12
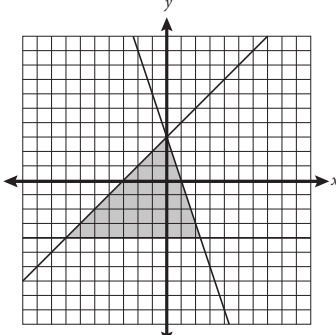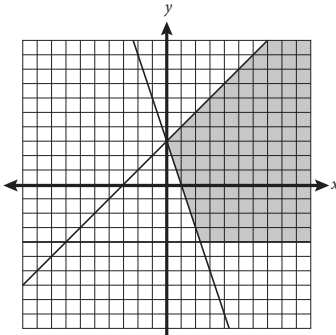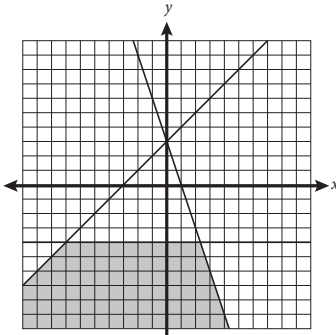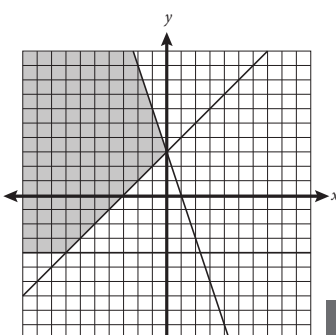
Reactant A is placed in a beaker, to which Reactant B will be added. Reactants A and B will not react unless B gets to a certain concentration. Once the reaction starts, both concentrations decrease until B has been consumed. Which of the following graphs, showing concentration in moles as a function of time in seconds, represents the reaction?

A)

B)

C)

D)

13

$$-2y \le 8$$

$$y - 3 \le x$$

$$-\frac{1}{3}y + 1 \ge x$$

Which of the following graphs shows the solution to the system of inequalities above?

A)

B)

C)

D)

CONTINUE

14
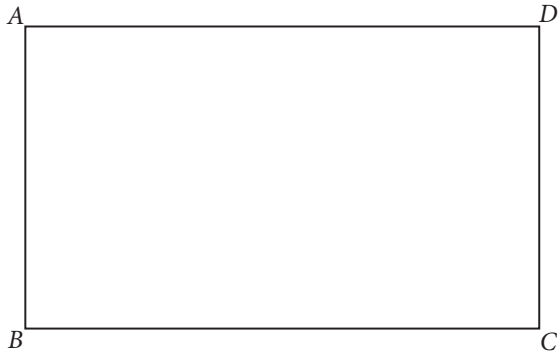
If rectangle *ABCD* has an area of 48 and the tangent

of ∠*BCA* (not shown) is $\dfrac{3}{4}$, then which of the

following is the length of $\overline{BD}$ (not shown)?

A)   5

B)   10

C)   13

D)   It cannot be determined from the given information.

15

Which of the following is equivalent to

$$\frac{2m + 6}{4} \times \frac{6m - 36}{3m + 9} \text{ ?}$$

A) $\dfrac{12m^2 - 216}{12m + 36}$

B) $\dfrac{8m - 30}{3m + 13}$

C) $\dfrac{m - 6}{4}$

D) $m - 6$

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 circles accurately. You will receive credit only if the circles are filled in correctly.

2. Mark no more than one circle in any column.

3. No question has a negative answer.

4. Some problems may have more than one correct answer. In such cases, grid only one answer.

5. **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If $\boxed{3\,|\,1\,|\,/\,|\,2}$ is entered into the grid, it will be interpreted as $\frac{31}{2}$, not as $3\frac{1}{2}$.)

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: $\frac{7}{12}$

Write answer in boxes. → Fraction line

Grid in result.

Answer: 2.5

← Decimal point

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

A rectangular box has sides 3, 4, and x and a volume of 18. What is the value of x ?

17

Jeanne babysits Chuy one day each week. Jeanne charges a \$20 fee for the day, plus \$5.50 for every 30 minutes of babysitting. How much has Jeanne earned after three hours of babysitting? (Disregard the \$ sign when gridding your answer.)

18

The parabola $y = -x^2 + 5x + 6$ is intersected by the line $y = -\dfrac{1}{2}x + 12$. What is the y-coordinate of the intersection closest to the x-axis?

CONTINUE

19

$$13r + 8v = 47$$
$$22v = 63 - 17r$$

Based on the system of equations above, what is the sum of r and v ?

20

A gardener has a cultivated plot that measures 4 feet by 6 feet. Next year, she wants to double the area of her plot by increasing the length and width by x feet. What is the value of x ?

STOP

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

Math Test – Calculator

55 MINUTES, 38 QUESTIONS

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

DIRECTIONS

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

NOTES

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

REFERENCE

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

$A = \ell w$

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

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

Special Right Triangles

$V = \ell w h$

$V = \pi r^2 h$

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

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

$V = \frac{1}{3}\ell w h$
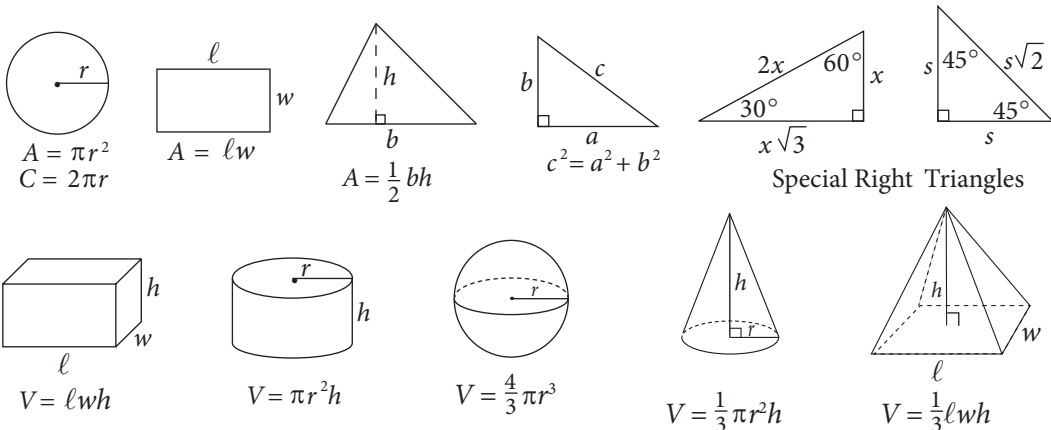
The number of degrees of arc in a circle is 360.
The number of radians of arc in a circle is 2π.
The sum of the measures in degrees of the angles of a triangle is 180.

CONTINUE

1

The population, *P*, of Town *Y* since 1995 can be estimated by the equation $P = 1.0635x + 3,250$, where *x* is the number of years since 1995 and $0 \leq x \leq 20$. In the context of this equation, what does the number 1.0635 most likely represent?

A) The estimated population of town *Y* in 1995

B) The estimated population of town *Y* in 2015

C) The factor by which the population of town *Y* increased yearly

D) The factor by which the population of town *Y* decreased yearly

2

If $x^2 + 12x = 64$ and $x > 0$, what is the value of *x* ?

A)   2

B)   4

C)   8

D)   16

3

Sai is ordering new shelving units for his store. Each unit is 7 feet in length and extends from floor to ceiling. The total length of the walls in Sai's store is 119 feet, which includes a length of 21 feet of windows along the walls. If the shelving units cannot be placed in front of the windows, which of the following inequalities includes all possible values of *r*, the number of shelving units that Sai could use?

A) $r \leq \dfrac{119 - 21}{7}$

B) $r \leq \dfrac{119 + 21}{7}$

C) $r \leq 119 - 21 + 7r$

D) $r \geq 119 + 21 - 7r$

CONTINUE

4

Truffula Tree Fruit Weight
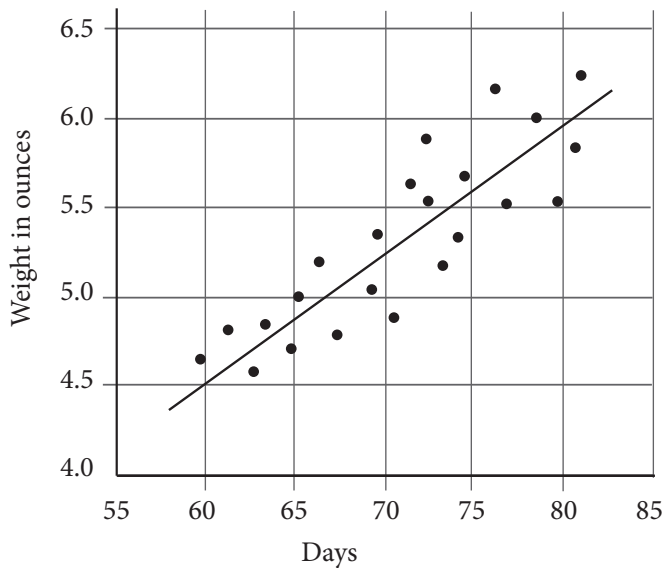
The scatterplot above shows the weight, in ounces, of the fruits on a certain truffula tree from days 55 to 85 after flowering. According to the line of best fit in the scatterplot above, which of the following is the closest approximation of the number of days after flowering of a truffula fruit that weighs 5.75 ounces?

A) 63

B) 65

C) 77

D) 81

5

Hannah placed an online order for shirts that cost $24.50 per shirt. A tax of 7% is added to the cost of the shirts, before a flat, untaxed shipping rate of $6 is charged. Which of the following represents Hannah's total cost for s shirts, in dollars?

A) $0.07(24.50s + 6)$

B) $1.07(24.50 + 6)s$

C) $1.07(24.50s) + 6$

D) $1.07(24.50 + s) + 6$

6

Once a certain plant begins to grow, its height increases at a linear rate. After six weeks, the plant is 54 centimeters tall. Which of the following functions best models the relationship between $h(w)$, the height, in centimeters, of the plant, and w, the number of weeks that the plant has been growing?

A) $h(w) = 6w$

B) $h(w) = 9w$

C) $h(w) = 54w$

D) $h(w) = 54 + w$

CONTINUE

7

Which of the following is equivalent to $(12x^2 + 4x + 5y)$ $+ (3x^2 - 2x + 3y)$?

A) $2x^2 - 2x + 8y$

B) $2x^2 + 15x + 8y$

C) $15x^2 - 2x + 8y$

D) $15x^2 + 2x + 8y$

8

An advertisement for Royal Rat Rations states: "7 out of 8 veterinarians recommend Royal Rat Rations for your fancy rat." No other information about the data is provided by the company.

Based on this data, which of the following inferences is most valid?

A) Royal Rat Rations provides the best nutrition for fancy rats.

B) If you do not feed your rat Royal Rat Rations, your rat will be unhealthy.

C) Only one veterinarian does not recommend Royal Rat Rations for your fancy rat.

D) Of the veterinarians surveyed by Royal Rat Rations, the majority recommend Royal Rat Rations for your fancy rat.

9

$$\frac{1}{2}t + 4 = \frac{3}{4}t - 5$$

In the equation above, what is the value of t ?

A)   4

B)   9

C) 18

D) 36

10

Dogs need 8.5 to 17 ounces of water each day for every 10 pounds of their weight. Everett has two dogs—Ringo is a 35-pound black lab mix, and Elvis is a 55-pound beagle. Which of the following ranges represents the approximate total number of ounces of water, w, that Elvis and Ringo need in a week?

A) $77 \le w \le 153$

B) $109 \le w \le 218$

C) $536 \le w \le 1,071$

D) $765 \le w \le 1,530$

CONTINUE

11

Priya is planning to send her favorite dry rub recipe to a friend who lives in France. Before sending the recipe, Priya wants to convert the American customary units in the instructions into metric units so that her friend will easily be able to understand the measurements. If the recipe calls for a ratio of four ounces of paprika to every seven ounces of chili powder, and if Priya's friend is planning to make a large batch of dry rub with 91 total ounces of chili powder, approximately how many total grams of paprika and chili powder will the recipe require? (1 ounce = 28.3 grams)

A) 4,047 grams

B) 4,521 grams

C) 4,925 grams

D) 5,149 grams

12

Luciano measured the amount of water that evaporated over a period of time from a container holding w ounces of water, where w is greater than 12. By the end of the first day, the cup had lost 2 ounces of water. By the end of the 7th day, the cup had lost an additional 8 ounces of water. By the end of the 11th day, the cup had lost half of the water that remained after the 7th day. Which of the following represents the remaining amount of water, in ounces, in Luciano's container at the end of the 11th day?

A) $\dfrac{w-2}{8}$

B) $\dfrac{w-2}{2} - 10$

C) $\dfrac{1}{2}w - 10$

D) $\dfrac{w-10}{2}$

CONTINUE

According to the data in the scatterplot, which of the following best represents the percent increase between the median of the results of the studies from 1995 and the median of the results of the studies from 1996 ?

A)   50%

B)   100%

C)   150%

D)   200%

Questions 13 and 14 refer to the following information.

In the 1990s, the park rangers at Yellowstone National Park implemented a program aimed at increasing the dwindling coyote population in Montana. Results of studies of the coyote population in the park are shown in the scatterplot below.

Coyote Population in Yellowstone Park

13

Based on the line of best fit in the scatterplot above, which of the following is the closest to the average annual increase in coyotes in Yellowstone Park between 1995 and 2000 ?

A) 22

B) 24

C) 26

D) 28

CONTINUE

15

Bailey's Boutique Clothing is having a 20% off sale during which shirts cost $30.00 and pants cost $60.00. On the day of the sale, Bailey's sells a total of 60 shirts and pants and earned a total of $2,250. On a regular day, Bailey's sells $\frac{2}{3}$ the number of shirts and pants sold during the sale and earns a total of $1,875. Solving which of the following systems of equations yields the number of shirts, s, and the number of pants, p, sold during a regular day?

A) $s + p = 40$
    $37.5s + 75p = 1,875$

B) $s + p = 40$
    $30s + 60p = 2,250$

C) $s + p = 60$
    $30s + 60p = 2,250$

D) $s + p = 2,250$
    $30s + 60p = 60$

16

Bryan, who works in a high-end jewelry store, earns a base pay of $10.00 per hour plus a certain percent commission on the sales that he helps to broker in the store. Bryan worked an average of 35 hours per week over the past two weeks and helped to broker sales of $5,000.00 worth of jewelry during that same two-week period. If Bryan's earnings for the two-week period were $850.00, what percent commission on sales does Bryan earn?

A) 1%

B) 2%

C) 3%

D) 4%

17

If $\dfrac{(C+x)}{x-3} = \dfrac{x+8}{3}$, which of the following could be an expression of C in terms of x ?

A) $3(1 + x)$

B) $x^2 + 2x - 24$

C) $\dfrac{1}{3}(x+6)(x-4)$

D) $\dfrac{1}{3}(x-3)(x+8)$

18

Lennon has 6 hours to spend in Ha Ha Tonka State Park. He plans to drive around the park at an average speed of 20 miles per hour, looking for a good trail to hike. Once he finds a trail he likes, he will spend the remainder of his time hiking it. He hopes to travel more than 60 miles total while in the park. If he hikes at an average speed of 1.5 miles per hour, which of the following systems of inequalities can be solved for the number of hours Lennon spends driving, d, and the number of hours he spends hiking, h, while he is at the park?

A) $1.5h + 20d > 60$
      $h + d \le 6$

B) $1.5h + 20d > 60$
      $h + d \ge 6$

C) $1.5h + 20d < 60$
      $h + d \ge 360$

D) $20h + 1.5d > 6$
      $h + d \le 60$

CONTINUE

19

In a certain sporting goods manufacturing company, a quality control expert tests a randomly selected group of 1,000 tennis balls in order to determine how many contain defects. If this quality control expert discovered that 13 of the randomly selected tennis balls were defective, which of the following inferences would be most supported?

A) 98.7% of the company's tennis balls are defective.

B) 98.7% of the company's tennis balls are not defective.

C) 9.87% of the company's tennis balls are defective.

D) 9.87% of the company's tennis balls are not defective.

20

If $-\dfrac{20}{7} < -3z + 6 < -\dfrac{11}{5}$, what is the greatest possible integer value of $9z - 18$?

A) 6

B) 7

C) 8

D) 9

21

$$-24 - 8j = 12k$$
$$3 + \frac{5}{3}k = -\frac{7}{6}j$$

Which of the following ordered pairs (j, k) is the solution to the system of equations above?

A) $(6, -6)$

B) $(3, 0)$

C) $(0, 2)$

D) $(-4, 1)$

CONTINUE

22

United States Investment in
Alternative Energy Sources

	Actual 2007 Investment	Projected 2017 Investment
Biofuels	0.31	0.34
Wind	0.40	0.32
Solar	0.27	0.30
Fuel Cells	0.02	0.04
Total	1.00	1.00

The table above shows the relative investment in alternative energy sources in the United States by type. One column shows the relative investment in 2007 of $75 million total invested in alternative energy. The other column shows the projected relative investment in 2017 given current trends. The total projected investment in alternative energy in 2017 is $254 million. Suppose that a new source of alternative energy, Cold Fusion, is perfected. It is projected that by 2017 that $57 million will be invested in Cold Fusion in the United States, without any corresponding reduction in investment for any other form of alternative energy. What portion of the total investment of alternative energy in the United States will be spent on biofuels?

A) 0.18

B) 0.22

C) 0.28

D) 0.34

23

$$(x - 2)^2 + y^2 = 36$$
$$y = -x + 2$$

The equations above represent a circle and a line that intersects the circle across its diameter. What is the point of intersection of the two equations that lies in Quadrant II ?

A) $\left(-3\sqrt{2}, 3\sqrt{2}\right)$

B) $(-4, 2)$

C) $\left(2 + \sqrt{3}, 2\right)$

D) $\left(2 - 3\sqrt{2}, 3\sqrt{2}\right)$

CONTINUE

24
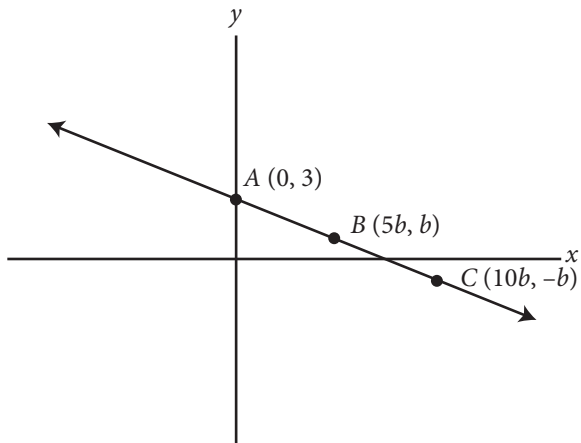
The graph of $f(x)$ is shown above in the xy-plane. The points $(0, 3)$, $(5b, b)$, and $(10b, -b)$ are on the line described by $f(x)$. If b is a positive constant, what are the coordinates of point C?

A) $(5, 1)$

B) $(10, -1)$

C) $(15, -0.5)$

D) $(20, -2)$

25

Melanie puts $1,100 in an investment account that she expects will make 5% interest for each three-month period. However, after a year she realizes she was wrong about the interest rate and she has $50 less than she expected. Assuming the interest rate the account earns is constant, which of the following equations expresses the total amount of money, x, she will have after t years using the actual rate?

A) $x = 1{,}100(1.04)^{4t}$

B) $x = 1{,}100(1.05)^{4t-50}$

C) $x = 1{,}100(1.04)^{t/3}$

D) $x = 1{,}100(1.035)^{4t}$

26
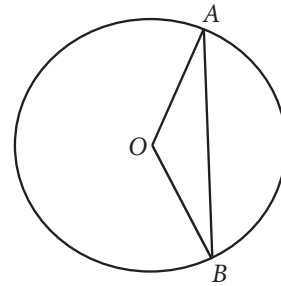
If the radius of the circle above is x, $\angle AOB = 120°$, and O is the center of the circle, what is the length of chord AB, in terms of x?

A) $\sqrt{2}x$

B) $\sqrt{3}x$

C) $\dfrac{x}{\sqrt{2}}$

D) $\dfrac{x}{\sqrt{3}}$

CONTINUE

27

Students in a physics class are studying how the angle at which a projectile is launched on level ground affects the projectile's hang time and horizontal range. Hang time can be calculated using the formula $t = \dfrac{2v \cdot \sin(\theta)}{g}$, where t is the hang time in seconds, v is the initial launch velocity, θ is the projectile angle with respect to level ground, and g is the acceleration due to gravity, defined as 9.8 m/s². Horizontal range can be calculated using the formula $R = \dfrac{v^2 \sin(2\theta)}{g}$, where R is the distance the projectile travels from the launch site, in feet. Which of the following gives the value of v, in terms of R, t, and θ?

A) $v = \dfrac{t\sin(\theta)}{2R\sin(\theta)}$

B) $v = \dfrac{2t\sin(\theta)}{R\sin(\theta)}$

C) $v = \dfrac{2R\sin(\theta)}{t\sin(2\theta)}$

D) $v = \dfrac{2R\sin(2\theta)}{t\sin(\theta)}$

28

If $(i^{413})(i^x) = 1$, then what is one possible value of x?

A) 0

B) 1

C) 2

D) 3

CONTINUE

29

The function g is defined by $g(x) = 2x^2 - dx - 6$, where d is a constant. If one of the zeros of g is 6, what is the value of the other zero of g ?

A)   2

B) $\dfrac{1}{2}$

C) $-\dfrac{1}{2}$

D) -2

30

The flu shot for a flu season is created from four strains of the flu virus, named Strain A, B, C, and D, respectively. Medical researchers use the following data to determine the effectiveness of the vaccine over the flu season. Table 1 shows the effectiveness of the vaccine against each of these strains individually. The graph below the table shows the prevalence of each of these strains during each month of the flu season, represented as a percentage of the overall cases of flu that month.

Table 1

Strain	Effectiveness
A	35%
B	13%
C	76%
D	68%
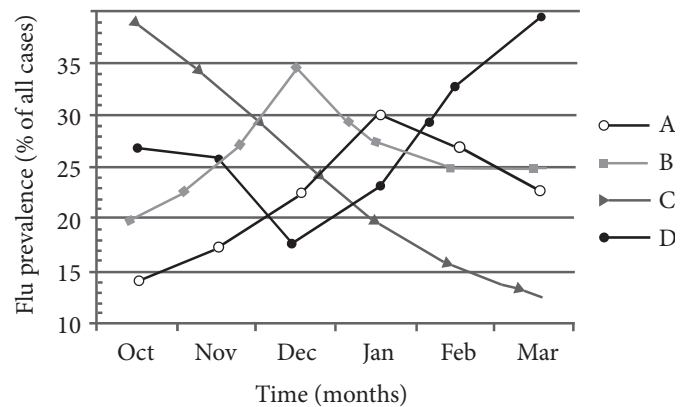
For the strain against which the flu shot was the most effective, approximately how effective was the shot overall during the month that strain was least prevalent?

A) 13%

B) 20%

C) 27%

D) 48%

DIRECTIONS

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

1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
2. Mark no more than one circle in any column.
3. No question has a negative answer.
4. Some problems may have more than one correct answer. In such cases, grid only one answer.
5. **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If $\boxed{3\ 1\ /\ 2}$ is entered into the grid, it will be interpreted as $\frac{31}{2}$, not as $3\frac{1}{2}$.)
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: $\frac{7}{12}$

Write answer in boxes. → Fraction line

Grid in result.

Answer: 2.5 → Decimal point

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

If $9 > 3v - 3$, what is the greatest possible integer value of v ?

32

In the expression $\dfrac{\dfrac{6}{5}}{\dfrac{12}{2y} - \dfrac{5}{y}} = 1$, what is the value of y ?

33

During a presidential election, a high school held its own mock election. Students had the option to vote for Candidate A, Candidate B, or several other candidates. They could also choose to spoil their ballot. The table below displays a summary of the election results.

	Candidate A	Candidate B	Other	Total
10th grade	0.32	0.58	0.10	1.00
11th grade	0.50	0.42	0.08	1.00
12th grade	0.63	0.32	0.05	1.00
Total	0.48	0.44	0.08	1.00

614 students voted for Candidate A. Approximately how many students attend the school?

34

If $\tan \theta = \dfrac{12}{5}$, then $\cos \theta =$

CONTINUE

35

Marcellus is traveling abroad in Ghana and using traveler's checks, which he has acquired from Easy Traveler's Savings Bank. Easy Traveler's Savings Bank charges a 7% fee on traveler's checks, which can then be used like cash at any location overseas at the same exchange rate, and any change will then be returned to Marcellus in local currency. For this trip, Marcellus bought a 651 Cedi traveler's check and paid a fee of 32.30 USD (United States dollars) for the check.

While in Ghana, Marcellus finds Leon's Pawnshop and Barter, which offers store credit for Marcellus's briefcase equal to its value in Cedis. If Marcellus's briefcase is worth 5,000 USD at the same exchange rate at which he bought his traveler's check, then how much store credit, to the closest Cedi, will Marcellus receive for the briefcase?

36

A square is inscribed in a circle. The area of the square is what percent of the area of the circle? (Disregard the percent symbol when gridding your answer.)

CONTINUE ➡

Questions 37 and 38 refer to the following information.

Professor Malingowski, a chemist and teacher at a community college, is organizing his graduated cylinders in the hopes of keeping his office tidy and setting a good example for his students. He has beakers with diameters, in inches, of $\frac{1}{2}$, $\frac{3}{4}$, $\frac{4}{5}$, 1, and $\frac{5}{4}$.

37

Professor Malingowski notices one additional cylinder lying on the ground, and can recall certain facts about it, but not its actual diameter. If he knows that the value of the additional graduated cylinder's diameter, x, will not create any modes and will make the mean of the set equal to $\frac{5}{6}$, what is the value of the additional cylinder's diameter?

38

With his original five cylinders, Professor Malingowski realizes that he is missing a cylinder necessary for his upcoming lab demonstration for Thursday's class. He remembers that the cylinder he needs, when added to the original five, will create a median diameter value of $\frac{9}{10}$ for the set of six total cylinders. He also knows that the measure of the sixth cylinder will exceed the value of the range of the current five cylinders by a width of anywhere from $\frac{1}{4}$ inches to $\frac{1}{2}$ inches, inclusive. Based on the above data, what is one possible value of y, the diameter of this missing sixth cylinder?

END OF TEST

DO NOT RETURN TO A PREVIOUS SECTION.