PRACTICE TEST

3

Test Reminders

1. A #2 pencil is required.

2. Follow the time restrictions for each section.

3. You are allowed to write on the test.

4. Circle your answers to ensure accuracy when filling in the answer sheet, provided on page 317.

5. Calculate your estimated score by using the conversion chart on page 319.

Reading Test

65 MINUTES, 52 QUESTIONS

Directions: Each passage or pair of passages below is followed by several questions. Read each passage or pair, and then 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 Raymond Carver, "Nobody Said Anything." ©1970 by Raymond Carver.

We were wet and shivering. We looked at the fish, kept touching him. His sides were scarred, whitish welts as big as quarters and kind of puffy.
Line There were nicks out of his head around his eyes
(5) and on his snout where I guess he had banged into the rocks and been in fights. But I thought he was something.

"I guess I'd better go pretty soon," I said. I looked at the clouds over the hills where the sun
(10) was going down. "I better get home."

"I guess so. Me too. I'm freezing," the kid said, "Hey, I want to carry him," the kid said.

"Let's get a stick. We'll put it through his mouth and both carry him," I said.
(15) The kid found a stick. We put it through the gills and pushed until the fish was in the middle of the stick. Then we each took an end and started back, watching the fish as he swung on the stick.

"What are we going to do with him?" the kid
(20) said.

"I don't know," I said. "I guess I caught him," I said.

"We both did. Besides, I saw him first."

"That's true," I said. "Well, you want to flip
(25) for him or what?" I felt with my free hand, but I didn't have any money. And what would I have done if I had lost?

Anyway, the kid said, "No, let's not flip."

I said, "All right, it's okay with me." I looked
(30) at that boy, his hair standing up, his lips gray. I could have taken him if it came to that. But I didn't want to fight.

We got to where we had left our things and picked up our stuff with one hand, neither of us
(35) letting go of his end of the stick. Then we walked up to where his bicycle was. I got a good hold on the stick in case the kid tried something.

Then I had an idea. "We could half him," I said.

(40) "What do you mean?" the boy said, his teeth chattering again. I could feel him tighten his hold on the stick.

"Half him. I got a knife. We cut him in two and each take half. I don't know, but I guess we could
(45) do that."

He pulled at a piece of his hair and looked at the fish. "You going to use that knife?"

"You got one?" I said.

The boy shook his head.
(50) "Okay," I said.

I pulled the stick out and laid the fish in the grass beside the kid's bicycle. I took out the knife. "Right here?" I said. The kid nodded. I started cutting down into him. I came to his guts and turned
(55) him over and stripped everything out. I kept cutting until there was only a flap of skin on his belly holding him together. I took the halves and tore him in two.

I handed the kid the tail part.
(60) "No," he said, shaking his head. "I want that half,"

I said, "They're both the same! Now watch it, I'm going to get mad in a minute."

"I don't care," the boy said, "If they're both the
(65) same, I'll take that one. They're both the same, right?"

"They're both the same," I said. "But I think I'm keeping this half here. I did the cutting."

"I want it," the kid said. "I saw him first."
(70) "Whose knife did we use?" I said.

"I don't want the tail," the kid said.

I looked around. There were no cars on the road and nobody else fishing. There was an airplane droning, and the sun was going down. I was cold
(75) all the way through. The kid was shivering hard, waiting.

"I got an idea," I said. I opened my creel[1] and showed him a trout. "See? It's a green one. It's the only green one I ever saw. So whoever takes the
(80) head, the other guy gets the green trout and the tail part. Is that fair?"

"I guess so," he said. "Okay, I guess so. You take that half. I got more meat on mine."

"I don't care," I said. "Which way do you
(85) live?"

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[1] Basket for storing fish

"Down on Arthur Avenue. Why?"

"Where's that? Is that down by the ball park?" I said.

"Yeah, but why?" he said. That kid looked
(90) scared.

"I live close to there," I said. "So I guess I could ride on the handlebars."

But the kid only said, "I'm freezing."

1

Which of the following provides the most reasonable summary of the passage?

A) Two boys seek compromises to resolve a conflict over a desired object.

B) Two boys engage in a debate over the legitimacy of ownership rights.

C) Two boys tease each other about sharing a single fish between them.

D) Two boys threaten each other with violent action, then find a peaceful resolution.

2

As used in line 7, "something" most nearly means

A) special.

B) pathetic.

C) grotesque.

D) innocent.

3

In lines 26-27 ("And ... lost") the narrator suggests that winning the fish

A) is meaningless to him.

B) will enable him to feed his family.

C) is very important to him.

D) will impress his friends.

4

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

A) Lines 8-10 ("I guess ... home")

B) Lines 62-63 ("Now ... minute")

C) Lines 67-68 ("But ... cutting")

D) Lines 91-92 ("So ... handlebars")

5

As used in line 31, "taken" most nearly means

A) grabbed.

B) outrun.

C) claimed.

D) beaten.

6

The main purpose of lines 72-76 ("I looked ... waiting") is to convey a sense of

A) suspense.

B) confusion.

C) melodrama.

D) grief.

7

The kid's attitude towards the narrator can best be described as

A) friendly.

B) neutral.

C) annoyed.

D) uneasy.

8

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

A) Line 47 ("You ... knife")
B) Lines 64-66 ("I don't ... right")
C) Lines 89-90 ("That ... scared")
D) Line 93 ("But ... freezing")

9

In the passage, the narrator offers all of the following compromises EXCEPT

A) cutting the fish in two.
B) offering to trade another fish.
C) riding home on the handlebars.
D) carrying the fish together between them.

10

Based on the events of the passage, the narrator would most likely have responded in what way if the boy had refused to accept the compromise?

A) Fighting the boy until he agreed
B) Stealing both fish from the boy
C) Proposing another compromise
D) Leaving both fish for the boy

Questions 11-20 are based on the following passage.

This passage is adapted from Scripps Institute of Oceanography News, "Cannibalism in the North Atlantic: Scripps Researcher Finds Crustacean Species Keeps Population in Check by Eating Its Young." ©2001 by Scripps Institute of Oceanography, UCSD.

Using a combination of field samples from the Norwegian Sea and a new method for analyzing sea life populations, researchers have shown that
Line tiny marine crustaceans called copepods use
(5) cannibalism as a mechanism to limit their population. Traditional notions have assumed that fluctuations in marine populations can be explained mainly by physical processes. That is, if you understand ocean circulation and other
(10) physical functions affecting marine life, then you can understand how and why populations fluctuate. Other theories of marine populations are based on birth rates, including the processes of feeding and growth that lead to the production of new
(15) offspring. Researchers from San Diego and Germany have provided evidence that there is much more to the story. Instead of birth rates, they flipped conventional notions and analyzed the death rates of copepods.
(20) Researchers found that egg mortality in the copepod species *Calanus finmarchicus* is directly related to the abundance of females in the population. "We found that a tenfold increase in adult egg-producing female copepods will not
(25) result in a similar increase in the number of surviving eggs," said Ohman, a professor in the Integrative Oceanography Division at Scripps. "Rather, half as many eggs will survive. We believe the reason is cannibalism and we think it's
(30) a self-regulating mechanism that no one has found before in the open sea."
Copepods, tiny marine crustaceans (about four *Calanus finmarchicus* fit end to end on a dime), are the most numerous multicellular animals in the
(35) oceans, and possibly the most numerous on Earth. They figure prominently in marine food webs as grazers of phytoplankton and serve as prey for a variety of fishes, marine mammals and marine birds. They also play a key role in the ocean's
(40) "biological pump," a process that transfers carbon from the atmosphere to the deep ocean. They are important vehicles for repositioning carbon in the ecosystem because they eat the phytoplankton, which are tiny aquatic plants that absorb carbon
(45) dioxide from the atmosphere. Larger copepods excrete the accumulated carbon as fecal pellets that settle down to the ocean floor; smaller species release most of their carbon back into the atmosphere by respiration. The larger the copepod,
(50) the more carbon sedimentation that results. Measuring changes in copepod size as well as understanding the process of self-regulating population control—the cannibalism suggested by Professor Ohman—could be useful to studies in
(55) climate change.
Battling rough seas and waves that sometimes surpassed 50 feet, Ohman's researchers performed experiments and collected zooplankton samples for 80 days. The sample data were then analyzed using
(60) a new numerical method devised for copepod populations. "In the past, zooplankton loss rates were treated as constant and linear," said Ohman. "People didn't know enough about them so the simplest assumption was made, which was to pick a
(65) value that sounded reasonable out of the hat and keep it constant. We found a population-limiting mechanism that you couldn't predict using that approach." Ohman believes the new study will point future research toward the importance of death rates
(70) in addition to birth rates. The implication of this study is if you want to predict how marine ecosystems might respond to climate change, or how the ocean food web is going to influence the ocean's capacity to take up carbon dioxide, you
(75) have to understand the biological dynamics as well as physical processes.
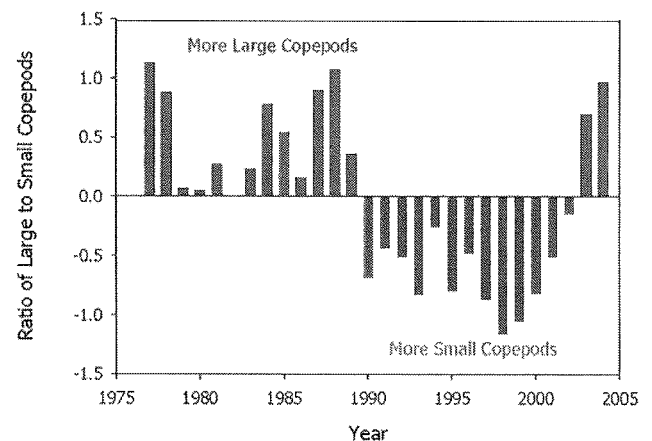
11

The "new method for analyzing sea life populations" (lines 2-3) refers to

A) looking at the physical processes of the ocean.
B) studying birth rates of ocean organisms.
C) understanding ocean circulation.
D) analyzing death rates of ocean creatures.

12

The assumption that if you understand the physical processes of the ocean, then you can understand population fluctuations of marine life suggests that

A) changes in habitat determine changes in the organisms that live within that habitat.
B) human interferences like fishing have the largest impact on the populations of marine life.
C) understanding birth rates is the key to understanding death rates of copepods.
D) populations have self-regulating mechanisms, such as cannibalism and lower reproduction rates, which determine population rates.

13

Which situation would provide the best support for the answer to the previous question?

A) An increase in pollution that results in a change in coloration of the moths that live in the area
B) A dramatic drop in dolphin populations triggered by a change that loosens fishing regulations
C) A large avalanche that changes the ecology of a mountainside and forces the species there to adapt
D) An insect species that stops producing eggs whenever the population of the hive reaches a certain number

14

The quotations in lines 23-26 ("We ... eggs") and 28-31 ("Rather ... sea") indicate that researchers originally believed that a ten-fold increase in the number of egg-producing females would

A) mean a severe decrease in the number of eggs produced.
B) result in a proportional increase in the number of eggs that survive to hatch.
C) make the population too large for the organisms to survive.
D) decrease the number of females hatched in the next generation due to an over-abundance of females in the population.

15

As used in line 36, "figure" most nearly means

A) depend.
B) are included.
C) calculate.
D) are considered.

16

Which choice best represents the researchers' attitude toward the collection of data, as depicted in lines 56-59 ?

A) They were resolute in the face of a challenge.
B) They were eager to experience nature.
C) They relied heavily on electronic equipment.
D) They were unwilling to endure hardship.

17

The author's analysis of the "study" (line 68) in the last paragraph supports the proposition that

A) physical factors play the primary role in determining the survival of ocean life.
B) knowing how organisms interact with each other is integral to forecasting changes in ocean life.
C) plankton is one of the most important forms of ocean life.
D) "physical processes" do not affect the integrity of ocean habitats enough to impact marine populations.

18

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

A) Lines 63-66 ("People ... constant")
B) Lines 66-68 ("We found ... approach")
C) Lines 68-70 ("Ohman ... birth rates")
D) Lines 71-76 ("if you ... processes")

19

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

A) authority.
B) volume.
C) position.
D) ability.

20

Which claim about the relationship between copepods and carbon repositioning is best supported by information from both the passage and the graph?

A) More carbon sedimentation from copepods occurred in 1978 than in 1987.
B) No carbon sedimentation from copepods occurred between 1990 and 2002.
C) The amount of copepod-produced carbon in the atmosphere increased from 1990 to 2002.
D) A reduction in copepod-produced carbon occurred in 2003 as the result of cannibalism among the smaller copepods.

Questions 21-31 are based on the following passage.

This passage is adapted from Christoph Niemann, "How the NSA Almost Killed the Internet." ©2014 by Christoph Niemann.

While tech companies such as Yahoo, Google, and Facebook didn't know the name Prism before June, 2013, they came to understand that it refers
Line to a secret government program several years old,
(5) in which their own companies were turning over specified data to the government, often without formal warrants, for national security purposes. Generally, companies would divert requested data to special equipment owned by the government.
(10) In some cases, without realizing fully what they were doing, they even hosted the equipment on company property.

The program's legal justification derives from a series of laws, renewals, and extensions.
(15) The Foreign Intelligence Security Act of 1978, widely referred to as FISA, created a secret court that blesses information requests. The FISA Amendments Act of 2008 carved out a new section of the law, which gave legal cover to the
(20) warrantless surveillance programs operated in total secrecy under President Bush. Other covert surveillance practices are justified under a Reagan-era Executive Order which authorized the National Security Agency (NSA) to collect pretty much any
(25) data from outside the U.S. that concerns foreign persons.

Unlike the tech companies, telephone companies seem perfectly comfortable turning over information about their customer bases to the
(30) NSA. Verizon has never denied passing along its key billing information, including the number and duration of every call made by each of its millions of customers. In a way, this isn't surprising. Telephone companies don't sell themselves on
(35) trust, and customers have few expectations of their relationship with those quasi-monopolistic behemoths. Instead of catering to consumers, telephone companies seem to prioritize winning favor with the government that regulates them.
(40) Technology companies are another matter. It's almost a cliché when tech CEOs claim that without the trust of their users, they would have no business. They depend on customers' willingness to share information. In exchange, those customers
(45) receive more and better services, and expect that the companies will keep their personal data private and secure. Users had no reason to think their information would be handed over to the government without a warrant.

(50) At least one company challenged those requests as unconstitutional. Yahoo waged a secret battle in the FISA court to resist turning over user data. But it was for naught. An August 22, 2008, court order determined that the government's interest in
(55) national security, along with safeguards in the program, outweighed privacy concerns in a manner consistent with the law. Yahoo's unsuccessful challenge set a marker for those who might resist in the future: The FISA request program was legal,
(60) and any company that failed to cooperate would risk the financial penalties specified in the law.

There appear to be smaller ways to resist, though. "The government can request the information, but they can't compel how the information
(65) is given," says Twitter's general counsel, Vijaya Gadde. "You can make it easy or you can make it hard." Pocketbook issues present a subtler means of resistance. FISA requires the government to reimburse companies for the cost of retrieving
(70) information. Google says it doesn't bother to charge the government. But one company says it uses that clause, hoping to limit the extent of the requests. "At first, we thought we shouldn't charge for it," says an executive of that company. "Then we
(75) realized, it's good—it forces the NSA to stop and think."

In the end, though, there is a greater financial motive to cooperate. "Large companies do a lot of business with the government," one top technology
(80) executive points out. "It's hard to look at the government officers and say, 'We're fighting you on this policy—oh, and can I have that $400 million contract?'"

The clash illustrates a seemingly irresolvable
(85) conflict. While Silicon Valley must be transparent in many regards, spy agencies operate under a cloak of obfuscation. National security may be a legitimate justification for this secrecy, but one of the disturbing consequences of secret programs is
(90) the destructive shroud of doubt they cast over everything they touch. Months after Edward Snowden's historic leak, basic facts about Prism remain elusive. How much information is actually collected by the program? Exactly what kind of
(95) cooperation did our favorite tech companies offer to the NSA?

21

The passage most strongly suggests which of the following about tech companies' assisting the government in gathering data through the Prism program?

A) Most tech companies are willing to help the government and, by law, must do so anyway.

B) The tech companies initially had little awareness of the program and have found little success in resisting it.

C) Many tech companies have found creative ways to avoid complying with the Prism program.

D) The tech companies are more interested in making money than in protecting their customers' privacy.

22

What is the author's most likely purpose for the statement on lines 10-12 ("In some cases ... property") ?

A) To admit that the tech companies have knowingly been in league with the government

B) To accuse the government of having covertly installed surveillance equipment

C) To suggest that the tech companies have been unwittingly complicit in assisting the government

D) To indicate the subtle ways in which the government has been infiltrating tech companies

23

As used in line 17, "blesses" most nearly means

A) makes sacred.

B) approves.

C) forgives.

D) processes.

24

Based on the author's tone and word choice in lines 17-21 ("The FISA ... President Bush"), which of the following best indicates the author's point of view on the FISA Amendment Act of 2008?

A) He thinks the legal framework provides legitimacy to the surveillance programs.

B) He believes the FISA Amendment Act was a necessary step in the development of the Prism program.

C) He feels President Bush's surveillance policies were illegal.

D) He believes the Amendments Act goes too far in justifying covert surveillance programs.

25

Which excerpt from lines 21-26 ("Other covert ... persons") gives further evidence for the author's point of view regarding the FISA Amendment Act of 2008 and other legal justifications for surveillance?

A) Lines 21-23 ("Other covert ... Executive Order")

B) Lines 22-24 ("a Reagan-era ... National Security Agency")

C) Lines 24-25 ("to collect ... data")

D) Lines 24-26 ("any data ... persons")

26

In drawing a distinction between telephone companies and tech companies, the author provides the most support for which of the following claims?

A) Lines 34-35 ("Telephone companies ... trust")

B) Lines 35-37 ("customers ... relationship with [telephone companies]")

C) Lines 38-39 ("telephone companies ... government")

D) Lines 41-43 ("tech CEOs claim ... [tech companies] would have no business")

CONTINUE

27

Through use of the word "behemoths" (line 37), the author suggests that

A) telephone companies have little desire to appease the government.
B) telephone companies don't trust the government.
C) telephone companies need to expand their business into other, more collaborative areas.
D) telephone companies are larger than they probably should be.

28

Which best describes the relationship between the fifth, sixth, and seventh paragraphs (lines 50-83) ?

A) The fifth and sixth present methods that tech companies have used to resist the government, while the seventh paragraph implies that resistance is futile.
B) They convey with increasing intensity the relative unimportance of financial concerns when tech companies attempt to resist the government.
C) The author gradually builds an argument for tech companies' actively resisting the government.
D) The fifth paragraph clarifies the legality of the government's authority, while the sixth and seventh refute this claim.

29

As used in line 85, "transparent" most nearly means

A) invisible.
B) submissive.
C) resolute.
D) open.

30

In lines 87-91 ("National security ... touch") the author suggests that

A) government surveillance programs will soon infiltrate every aspect of our lives.
B) the government has no credible reason to place surveillance demands on tech companies.
C) Prism's surveillance activities could have a damaging impact on the internet, especially since we know so little of their full extent.
D) because Prism is so complex, even the government is unaware of how extensive the surveillance program is.

31

Which of the following techniques by the author gives the best additional evidence for the answer to the previous question?

A) The quotes from an authority in the next-to-last paragraph (lines 77-83)
B) The use of "Silicon Valley" as a synecdoche (line 85)
C) The metaphorical usage of the word "shroud" (line 90)
D) The rhetorical questions at the end of the passage (lines 93-96)

Questions 32-41 are based on the following passage.

This passage is adapted from Wikipedia, "Mark Antony" and www.geni.com, "Marcus Antonius."

A group of Senators resolved to kill Caesar to prevent him from seizing the throne. Originally, the conspirators had planned to eliminate not only
Line Caesar but also many of his supporters, including
(5) Antony, but Brutus rejected the proposal, limiting the conspiracy to Casear alone. Antony, having learned of the plot the night before, went to stop Caesar from attending the Senate meeting where the assassination would take place. However, a
(10) group of senators intercepted Caesar and directed him toward the meeting before Antony could reach him. Within moments, the entire group, including Brutus, was striking out at the dictator. Caesar attempted to get away, but, blinded by blood, he
(15) tripped and fell; the men continued stabbing him as he lay defenseless on the lower steps of the portico.

In the aftermath of Caesar's death (44 B.C.), his assassins claimed they had been striking a
(20) blow for freedom in the name of the Old Republic; instead of dancing in streets, however, the initial reaction to the news of Caesar's murder was intense uncertainty, particularly among the ruling elite, as everyone waited to see who would make
(25) the next move. The conspirators themselves went into hiding. M. Aemilius Lepidus (one of Caesar's lieutenants, who had a legion of recruits ready to take to Gaul) imposed order, but Mark Antony (who had long been Caesar's right-hand man and
(30) was consul along with Caesar in 44) soon took charge of matters, leaving Lepidus to depart for Gaul. Antony was in nominal control of state affairs, but virtually everyone was on eggshells. Antony wielded a good deal of power as consul
(35) and as Caesar's second in command, but enjoyed little personal authority and dared not assert himself too strongly, lest he meet a fate similar to that of Caesar.

The Senate, on the other hand, was concerned
(40) about popular reaction to Caesar's death, particularly on the part of Caesar's veterans. Most importantly, the official constitutional machinery, although it had continued to operate during the turbulent years 49 to 44 B.C., had been
(45) a virtual dead letter under Caesar's rule: his death created a vacuum in which no one quite knew how to behave. An uneasy truce was arrived at. An official amnesty was granted to the conspirators,
but Antony's speech at Caesar's funeral—along
(50) with the generous gifts to the *plebes* included in the terms of Caesar's will—so stirred the urban mob that a riot ensued and the conspirators fled Rome in fear for their safety. (Caesar's funeral is the occasion for the famous speech in Shakespeare's
(55) play: "I have come to bury Caesar, not to praise him...") Antony then quickly retrieved Caesar's private papers from his widow and employed them to govern in Caesar's name, claiming to find there Caesar's plans for Rome's future.
(60) When Caesar's will was read, however, Antony received a nasty shock. In it Caesar named as his chief heir a virtual unknown by the name of C. Octavius, adopting him (posthumously) as his son.

Octavius was Caesar's grand-nephew on his
(65) sister's side, a rather sickly 18-year-old with only limited political and military experience. Upon his adoption, Octavius became C. Julius Caesar Octavianus (or, in English, simply Octavian). Antony might well have expected little trouble in
(70) dealing with a youth of so little experience, few political connections, and virtually no personal authority. Unfortunately, Antony failed to recognize that in Octavian he was dealing with a natural born politician. Octavian never was an imposing figure
(75) physically, and he owed his military victories largely to the skill of his able lieutenants. In the political realm, however, he was without peer, rising from a virtual unknown in 44 B.C. to become the first of the Julio-Claudian emperors.

Which of the following provides the most reasonable summary of the passage?

A) Caesar's assassination goes wrong; Antony takes advantage of the situation and later forms an alliance with Octavian.

B) A conspiracy eliminates Caesar, creating a vacuum of power; Antony attempts to assume control but meets an unexpected obstacle in Octavian.

C) Realizing his rule will soon end, Caesar sets up a plan in which Octavian will be able to seize control from pretenders to the throne such as Antony.

D) Members of the Senate devise a scheme to get rid of Caesar and set up Antony in his place; however, Octavian uncovers their plot and spoils their ambitions.

33

If they were asked to explain their actions, what image of themselves would the assassins portray to the citizens of the Republic?

A) Anarchists
B) Official representatives of the New Republic
C) Crusaders for liberty
D) Legitimate leaders in exile

34

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

A) Lines 1-2 ("A group ... throne")
B) Lines 19-20 ("claimed ... Republic")
C) Lines 21-23 ("the initial ... uncertainty")
D) Lines 25-26 ("The conspirators ... hiding")

35

The author uses the phrase "everyone was on eggshells" (line 33) in order to

A) suggest that the Senate was on the verge of outright panic.
B) emphasize the atmosphere of cautious uncertainty.
C) imply a sense of mass confusion among the populace.
D) to depict the deep depression that Mark Antony was prone to.

36

In the first two paragraphs (lines 1-38), Mark Antony is primarily portrayed as

A) observant and nervous.
B) opportunistic and deceitful.
C) loyal and cautious.
D) manipulative and power-hungry.

37

As used in line 57, "employed" most nearly means

A) hired.
B) dedicated.
C) occupied.
D) used.

38

As used in line 62, "virtual" most nearly means

A) imaginary.
B) technical.
C) relative.
D) skilled.

39

Which of the following best characterizes the relationship between Antony and Octavian?

A) Antony took Octavian as his apprentice and taught him how to be an effective ruler.
B) Antony and Octavian served as partners in their rule of the Republic.
C) Octavian ruled as emperor, and Antony, as his lieutenant, helped him win military victories.
D) Octavian was an unexpected hindrance to Antony's ambitions.

40

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

A) Lines 56-61 ("Antony ... shock")
B) Lines 69-72 ("Antony ... authority")
C) Lines 72-74 ("Unfortunately ... politician")
D) Lines 74-76 ("Octavian ... lieutenants")

41

In stating that "Antony failed to recognize that in Octavian he was dealing with a natural born politician," (lines 72-74) the author is suggesting that

A) Antony had underestimated Octavian's political acumen.
B) news of Octavian's political skills was purposefully kept hidden from Antony by Caesar.
C) Octavian was clever at hiding his experience.
D) Octavian had been trained by politicians his whole life.

CONTINUE

Questions 42-52 are based on the following passages.

Passage 1 is adapted from John F. Kennedy's 1962 speech, "We Choose to Go to the Moon." Passage 2 is adapted from President Obama's 2010 "Speech at Kennedy."

Passage 1

Those who came before us made certain that this country rode the first waves of the industrial revolutions, the first waves of modern invention,
Line and the first wave of nuclear power, and this
(5) generation does not intend to founder in the backwash of the coming age of space. We mean to be a part of it—we mean to lead it. For the eyes of the world now look into space, to the moon and to the planets beyond, and we have vowed that we
(10) shall not see it governed by a hostile flag of conquest, but by a banner of freedom and peace. We have vowed that we shall not see space filled with weapons of mass destruction, but with instruments of knowledge and understanding.
(15) We set sail on this new sea because there is new knowledge to be gained, and new rights to be won, and they must be won and used for the progress of all people. For space science, like all technology, has no conscience of its own. Whether
(20) it will become a force for good or ill depends on man, and only if the United States occupies a position of pre-eminence can we help decide whether this new ocean will be a sea of peace or a new terrifying theater of war.
(25) There is no strife, no prejudice, no national conflict in outer space as yet. Its hazards are hostile to us all. Its conquest deserves the best of all mankind, and its opportunity for peaceful cooperation may never come again. But why, some
(30) say, the moon? Why choose this as our goal? And they may well ask why climb the highest mountain?
We choose to go to the moon in this decade and do the other things, not because they are easy,
(35) but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win, and
(40) the others, too.
Many years ago the great British explorer George Mallory, who was to die on Mount Everest, was asked why he wanted to climb it. He said, "Because it is there."

(45) Well, space is there, and we're going to climb it, and the moon and the planets are there, and new hopes for knowledge and peace are there. And, therefore, as we set sail we ask God's blessing on the most hazardous and dangerous and greatest
(50) adventure on which man has ever embarked.

Passage 2

The story of NASA started a little more than half a century ago in a desolate region of what is now called Kazakhstan. Because it was from there that the Soviet Union launched Sputnik, the first
(55) artificial satellite. Americans were dumbfounded. The Soviets had taken the lead in a race for which we were not yet fully prepared.
But we caught up very quick. In 1961, President Kennedy boldly declared that the United
(60) States would send a man to the Moon and return him safely to the Earth within the decade. And as a nation, we set about meeting that goal, reaping rewards that have in the decades since touched our lives. Many gave their careers to the effort. And
(65) some have given far more.
Leading the world to space helped America achieve new heights of prosperity here on Earth, while demonstrating the power of a free and open society to harness the ingenuity of its people. As
(70) President, I believe that space exploration is not an afterthought in America's quest for a brighter future—it is an essential part of that quest.
Now, I understand that some believe that we should attempt a return to the surface of the Moon
(75) first, as previously planned. But I just have to say pretty bluntly here: We've been there before. There's a lot more of space to explore, and a lot more to learn when we do. So I believe it's more important to ramp up our capabilities to reach a
(80) series of increasingly demanding targets, while advancing our technological capabilities with each step forward.
Fifty years after the creation of NASA, our goal is no longer just a destination to reach. Our
(85) goal is the capacity for people to work and learn and operate and live safely beyond the Earth for extended periods of time, ultimately in ways that are more sustainable and even indefinite.

42

As it is used in line 2 of Passage 1, "waves" most nearly means

A) ends.
B) tides.
C) surges.
D) patterns.

43

It can be reasonably inferred from Passage 1 that the speaker believes which of the following choices?

A) Space is a territory which should be conquered.
B) Space will be a dead end.
C) Space will be the next potential battleground.
D) Space will become what humankind makes it.

44

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

A) Lines 15-16 ("We ... gained")
B) Lines 19-21 ("Whether ... man")
C) Lines 21-24 ("only if ... war")
D) Lines 26-27 ("Its hazards ... all")

45

How would the speaker in Passage 1 most likely respond to the claim made in lines 73-78 ("Now ... do") of Passage 2?

A) By agreeing that there is nothing to be gained from a trip to the moon.
B) By arguing that establishing a base on the moon is crucial for further development of space exploration.
C) By agreeing that it would be better to pursue more demanding goals in space.
D) By arguing that we must travel to the moon to ensure that space exploration proceeds peacefully.

46

Which of the speaker's points from Passage 1 provides the best evidence for the answer to the previous question?

A) The intent to be world leaders (lines 1-7)
B) The desire for peaceful exploration of space (lines 7-14)
C) The prospect for cooperation in space (lines 25-29)
D) The benefits of accepting difficult challenges (lines 33-40)

47

In Passage 2, the purpose of line 61-65 ("And ... more") is to suggest that people have

A) spent billions of dollars traveling to space.
B) forgotten the importance of space exploration.
C) died while attempting to explore space.
D) gotten to space easily over the years.

48

In Passage 1, the speaker's attitude toward the moon race can best be described as

A) hopelessly optimistic.
B) guarded.
C) firm and urgent.
D) lackadaisical.

49

As it is used in Line 69 of Passage 2, the word "harness" most nearly means

A) to strap in.
B) to utilize.
C) to strengthen.
D) to embolden.

CONTINUE

50

In the final paragraph of Passage 2 (lines 83-88), the speaker suggests that future space travel should focus primarily on

A) building up a vast array of defensive structures to protect the Earth from space debris.
B) locating new planets with probes and studying the data from the safety of Earth.
C) mapping out complex galactic charts to plan future missions.
D) exploring planets to potentially colonize.

51

The speakers of the passages would most likely agree on which of the following statements?

A) Space needs to be armed and defended before someone else conquers it.
B) Space exploration should be focused on the moon first, and farther reaches of space after.
C) Reaching the moon is the most important task to achieve in regard to space exploration.
D) Space exploration is a key component to an American identity.

52

Both passages discuss all of the following EXCEPT

A) space exploration.
B) the Soviets.
C) national identity in relation to space exploration.
D) going to the moon.

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.

2

Directions: Each passage below is accompanied by several questions which may ask you to consider revisions to improve expression of ideas or correct grammatical errors. Some questions may ask you to make editing decisions which involve a graphic (a table or chart). For each question, choose the answer that most effectively improves the passage. Select "NO CHANGE" to leave the highlighted portion as it is.

Questions 1-11 are based on the following passage.

Although vaccines are among the safest, most effective ways to protect children from major communicable diseases, some parents still doubt these claims. **1** In addition, some choose immunization schedules that defy science, or refuse to vaccinate altogether. If these parents were distributed randomly their decisions would be less likely to harm others. But parents who use personal belief exemptions to avoid school vaccination requirements often live in the same communities. According to a recent study, the children in these communities face the highest risk of dying from whooping cough and other vaccine-preventable diseases.

The study **2** came out as California is grappling with a measles outbreak linked to people who visited Disneyland in mid-December, 2014. So far, California has reported 41 cases. Dr. Tracy Lieu, director of Kaiser Permanente's Division of Research, who led the study, has identified the clustering of parents who refuse vaccinations for their children as a primary cause.

[1] When Lieu and her colleagues analyzed vaccination against specific diseases, **3** he or she found that under-vaccination rates were 1.69 times higher for children living in Marin and Sonoma counties compared with other areas: [2] "These kinds of clusters can be associated with later epidemics." [3] Another contagious disease that spreads due to a lack of vaccination is whooping cough. [4] The Disneyland measles outbreak is a **4** subtle reminder that pathogens can gain a foothold where vulnerable people congregate. [5] That's why states require children to be fully vaccinated before entering kindergarten. **5**

1

A) NO CHANGE
B) As a result,
C) Nonetheless,
D) Further,

2

A) NO CHANGE
B) will come out
C) has come out
D) is going to come out

3

A) NO CHANGE
B) it
C) they
D) she

4

Which is the most consistent with the purpose and tone of the passage?

A) NO CHANGE
B) stark
C) subdued
D) graphic

5

For the sake of focus, which sentence should be deleted from the third paragraph?

A) Sentence 1
B) Sentence 2
C) Sentence 3
D) Sentence 5

"Not surprisingly, areas that are under-immunized directly correlate with those areas at greatest risk of infections when they occur," says Dr. Paul Offit, who directs the Vaccine Education Center at Children's Hospital of Philadelphia. When enough people stop [6] vaccinating, he says measles and whooping cough, among the most contagious diseases, rapidly [7] make use of holes in community, or herd, immunity. To illustrate, last year a record number of parents nationwide claimed personal belief exemptions, and health officials reported [8] more measles cases in 2014 than in any year of the previous two decades.

6

A) NO CHANGE
B) vaccinating—he says—measles
C) vaccinating he says measles
D) vaccinating, he says, measles

7

Which choice is most consistent with the purpose and tone of the passage?

A) NO CHANGE
B) exploit
C) harness
D) tap into

8

Which choice is most consistent with the information presented in the chart?

A) NO CHANGE
B) twice as many measles cases in 2014 as in the previous three years
C) that 2014 showed the only increase in the number of measles cases since 1994
D) more measles cases in 2014 than in any year since the elimination of measles was declared
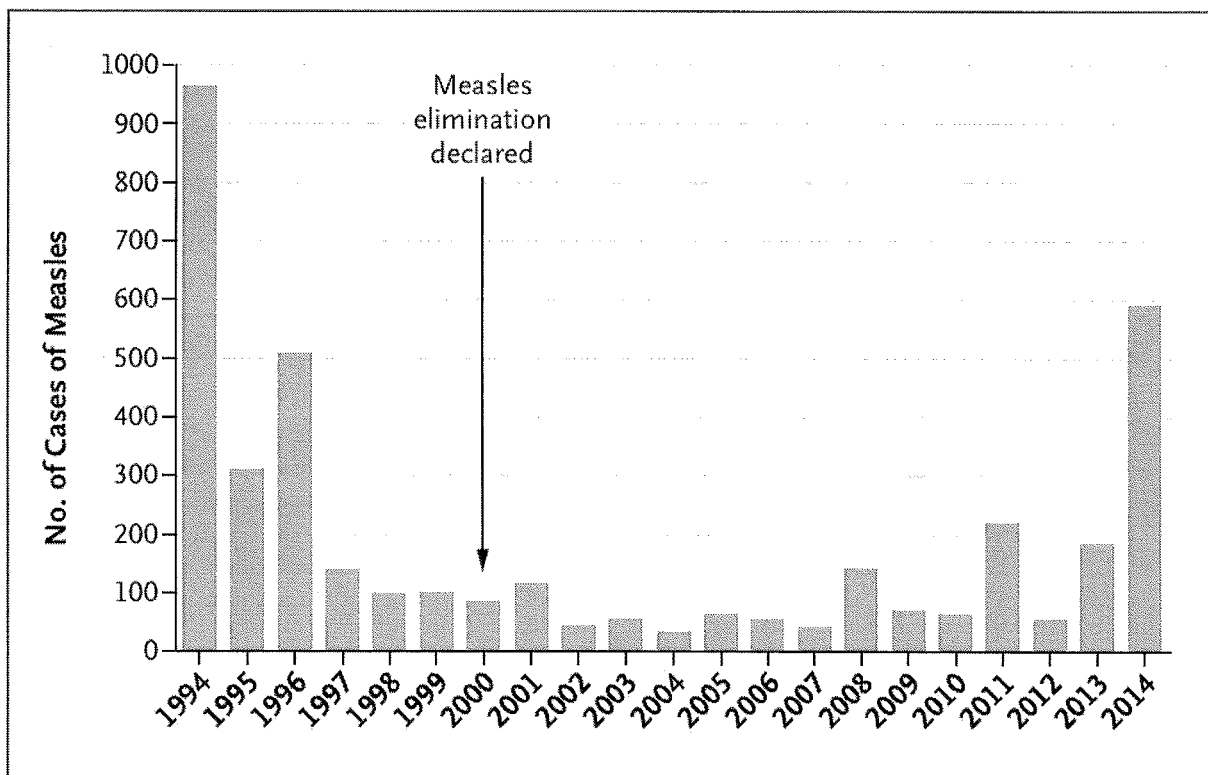
Some parents think measles [9] aren't a big risk, Offit says. But as a veteran of the 1991 Philadelphia measles epidemic that infected 1,400 and killed nine children who weren't immunized, Offit cautions that playing the odds is a dangerous game. But creating rules that make that game safer is challenging in a society that cherishes individual rights. "We're open-minded in the U.S.," Offit [10] says, "even to the point where we let parents hurt their children." But increasingly, pediatricians refuse to help parents do that. [11]

9

A) NO CHANGE
B) don't
C) isn't
D) wasn't

10

A) NO CHANGE
B) says—"even
C) says: "even
D) says; "even

11

Considering the author's tone and intention, which of the following sentences provides the best conclusion for the last paragraph?

A) The alternative is to sit back and let parents make a bad decision that could endanger children's lives.
B) Because the instances of vaccination-related illnesses are insignificant, immunization regulation is not important.
C) Fortunately, measles and other childhood diseases are not as a big a risk as they used to be.
D) Still, parents should have the right to decide whether their children should be vaccinated.

Questions 12-22 are based on the following passage.

Dr. Melon wakes at 3 a.m. to the sound of his cell phone. His wife **12** rolls over and asks— "Who is calling you so early?" "The hospital. They have a patient who was in an accident last night, and he needs immediate surgery," he replies. "Why can't they call someone else? You've already performed 15 surgeries this week and we were supposed to go shopping for a new dresser tomorrow." It would be safe to say that Dr. Melon's wife never really understood what he does.

Brain surgeons typically perform 40 to 50 brain surgeries and 160 to 180 spine surgeries a year. It is not **13** odd for them to perform 15 brain surgeries in a week. **14** Meanwhile, they find themselves working 60-plus hours in a single 7-day span. Doesn't leave a lot of time to catch up on all your Thursday shows. Luckily, they can catch up with **15** they're family and friends using Twitter or Facebook in between surgeries.

Many surgeons working in hospitals go from operating room to operating room during their day. But not all neurosurgeons work at hospitals. **16** However, many have their own private practices that specialize in specific problems such as tumors, cerebrovascular disorders, pediatric disorders, and epilepsy. Others work for universities or teach at medical schools.

Dr. Melon enters the hospital and speaks to the patient's physician about the trauma. Surgeries following a head trauma are rare. Brains are not like broken legs or skin. They are actually like **17** Jell-O, but they can't exactly be sewn back together. Patients need surgeries after head traumas to alleviate brain swelling, remove bloodclots, **18** repaired blood vessels, or control pressure inside of the skull.

12
A) NO CHANGE
B) rolls over and asks, "Who is calling
C) rolled over and asked: "Who called
D) rolled over, asking "Who is calling

13
A) NO CHANGE
B) unusual
C) peculiar
D) unconventional

14
A) NO CHANGE
B) Often
C) On the other hand
D) Incidentally

15
A) NO CHANGE
B) its
C) there
D) their

16
A) NO CHANGE
B) Nevertheless,
C) While
D) In fact,

17
A) NO CHANGE
B) Jell-O, yet they
C) Jell-O, or they
D) Jell-O, so they

18
A) NO CHANGE
B) repairing
C) to repair
D) repair

[1] Dr. Melon washes up for the surgery.
[2] To cut open his patient's head, Dr. Melon uses a drill to create a burr hole. [3] Through the burr hole, Dr. Melon inserts an intraventricular catheter, which penetrates the leathery membrane that surrounds the brain to drain excess fluid and relieve pressure. [4] After several hours in the operating room, the surgery is successfully completed and Dr. Melon washes up. **19**

Dr. Melon checks his watch; there will be some time to grab a quick breakfast with his wife before furniture shopping. Before he makes it out of the parking lot, he gets another emergency call. A senator has been admitted into the hospital for a condition called an arteriovenous malformation, which is a congenital condition that **20** is causing an abnormal tangle of blood vessels in the brain. Left untreated, **21** the patients brain could bleed, which can lead to brain damage or death. Dr. Melon texts his wife and gets ready to scrub up again. The afternoon flies by and Dr. Melon **22** is at the hospital.

19

Which of the following would be the best arrangement for the sentences in the paragraph?

A) (as it is now)
B) 1, 3, 2, 4
C) 4, 1, 2, 3
D) 1, 3, 4, 2

20

A) NO CHANGE
B) will cause
C) caused
D) causes

21

A) NO CHANGE
B) the patient's
C) their
D) his or her

22

Which choice is most consistent with the purpose and tone of the passage?

A) NO CHANGE
B) hasn't left
C) still hasn't managed to leave
D) leaves

Questions 23-33 are based on the following passage.

During the Civil War, American women turned their attention to the world outside the home. Thousands of women in the North and South joined volunteer brigades and [23] signing up to work as nurses. It was the first time in American history that women played a significant role in a war effort.

With the outbreak of war in 1861, women and men alike eagerly [24] volunteer to fight for the cause. In the Northern states, women organized ladies' aid societies to supply the Union troops with everything they needed, from food, to clothing, to cash raised through creative fundraising.

But many women wanted to take a more active role in the war effort. Inspired by the work of Florence Nightingale in the Crimean War, they [25] detected a way to work on the front lines, caring for sick and injured soldiers and keeping the rest of the Union troops healthy and safe: in June 1861, the federal government agreed to create "a preventive hygienic and sanitary service for the benefit of the army" called the United States Sanitary Commission. The Sanitary Commission's primary objective was to combat preventable diseases and infections by improving conditions in army camps.

Nearly 20,000 women worked for the Union war effort, some 3,000 of them as nurses. Army nurses traveled from hospital to hospital, providing "humane and efficient care for wounded, sick and dying soldiers." [26] They also acted as mothers and [27] housekeeper for the soldiers under their care.

23

A) NO CHANGE
B) were signed
C) signed
D) had signed

24

A) NO CHANGE
B) volunteered
C) have volunteered
D) volunteers

25

Which is the most consistent with the purpose and tone of the passage?

A) NO CHANGE
B) sensed
C) found
D) uncovered

26

Which of the following additions here would be the most suitable for developing the information in this paragraph?

A) An extended excerpt from the letter of a wounded soldier describing the care he received in an Army hospital
B) A biographical note about a particular nurse and the studies she undertook in order to become a caregiver
C) A description of the environment within an Army hospital barrack
D) Further details regarding the specific duties nurses undertook in order to care for the soldiers

27

A) NO CHANGE
B) housekeeping
C) housekeepers
D) as housekeeper

White women in the South threw themselves into the war effort with the same zeal as their Northern counterparts. The Confederacy had less money and fewer resources than did the Union, however, so they did much of their work on their own or through local auxiliaries and relief societies. They cooked, sewed, and provided uniforms, blankets, sandbags and other supplies for entire regiments. They [28] drafted letters to soldiers and worked as untrained nurses in makeshift hospitals or in their homes.

[1] Slave women [29] were—of course, not free to contribute to the Union cause. [2] In addition to their own plantation and household labor, many slave women had to do the work of their husbands and partners too: The Confederate Army frequently impressed male slaves, and slaveowners fleeing from Union troops often took their valuable male slaves with them. [3] While the Civil War did promise freedom, it also added to these women's burdens. [4] Working-class white women had a similar experience: [30] Unless their husbands, fathers and brothers fought in the Army, they were left to provide for their families on their own. [31]

During the Civil War, women especially faced a host of new duties and [32] responsibilities, these wartime contributions helped expand many women's ideas about what women were capable of. [33]

28

Which is the most consistent with the purpose and tone of the passage?

A) NO CHANGE
B) wrote
C) scribbled
D) published

29

A) NO CHANGE
B) were, of course,
C) were—of course—
D) were, of course

30

A) NO CHANGE
B) Until
C) Although
D) While

31

Which of the following would be the best arrangement for the sentences in the paragraph?

A) (as it is now)
B) 1, 3, 2, 4
C) 2, 1, 3, 4
D) 3, 1, 2, 4

32

A) NO CHANGE
B) responsibilities… these
C) responsibilities. These
D) responsibilities and joining

33

Which of the following, if added to the end of the passage, would provide the best conclusion?

A) An account of how women's roles continued to evolve and expand after the war
B) A brief explanation of men's reactions to women's participation in the war effort
C) A reference to the altered perspective of a particular Southern woman
D) An anecdote illustrating a new capability that women had developed during the war

Questions 34-44 are based on the following passage.

We expect words like "culture" and "technology" to appear in history textbooks or sociology articles, **34** or those words also appear regularly in animal-behavior journals—and, increasingly, in ways that would be familiar to humans who read fashion magazines and follow fads.

The "culture" concept got jump-started in primatology in the 1940s, with reports of an all-time primate genius, a Japanese macaque monkey named Imo. Her troop lived near a beach frequented by tourists who fed them, and she **35** has invented a technique for washing and salting potatoes by dipping them into seawater. **36** Then not resting on her laurels, Imo had another breakthrough. Tourists would toss the monkeys grains of wheat that would get mixed with sand. Imo figured out that if she threw a handful of the mixture into the water, the sand would sink and the wheat would float—and she could then collect the wheat.

Where does "culture" fit into Imo's biography? Her techniques spread to friends and **37** relatives; continuing in the group for years. By the classic definition of social anthropology, this constituted cultural transmission.

[1] Meanwhile, other primates **38** were seen on the technology scene. [2] Jane Goodall observed in 1960 that Tanzanian chimps make tools—sticks modified for fishing tasty termites out of mounds. [3] Termites, indeed, are a delicacy for many animals. [4] Subsequent research showed tool-use among chimps across Africa: rock hammers and anvils for cracking nuts, **39** they used clumped-up leaves for sopping up water from tree hollows, sticks sharpened for hunting. **40**

34

A) NO CHANGE
B) and
C) but
D) so

35

A) NO CHANGE
B) invented
C) was inventing
D) invents

36

A) NO CHANGE
B) Then not, resting on her laurels
C) Then, not resting on her laurels,
D) Then—not resting on her laurels,

37

A) NO CHANGE
B) relatives,
C) relatives:
D) relatives—

38

Considering the author's tone and intention, which choice would be most suitable here?

A) NO CHANGE
B) appeared on
C) pointed out
D) showed up on

39

A) NO CHANGE
B) clumped-up leaves
C) using clumped-up leaves
D) clumping up leaves

40

Which sentence, if removed from this paragraph, would help to improve the paragraph's unity?

A) Sentence 1
B) Sentence 2
C) Sentence 3
D) Sentence 4

CONTINUE

Different populations make different tools. New techniques spread across social networks. Youngsters pick up techniques by watching their mothers (with daughters learning faster than sons, as the latter mess around and don't pay attention). Techniques spread from one group to another when someone emigrates. **41**

So what's new in chimp-culture studies? The transmission of arbitrary behaviors that seem to have no real purpose. Reporting recently in the journal *Animal Cognition*, Edwin van Leeuwen of the Max Planck Institute for Psycholinguistics in the Netherlands and colleagues saw something irresistibly nutty in a 12-chimp group in Zambia. Back in 2007, a female named Julie got it into her head to start walking around with a long, straw-like blade of grass in her ear.

The behavior had no discernible function, and no other chimp had ever been **42** observed to do the "grass-in-ear-behavior" (what the authors call GIEB). **43** Other chimps soon went about **44** there business with grass stuck in their ears. Julie remained the queen of GIEB-ing. During the five-year study period, the other group members GIEB-ed from one to 36 times, whereas Julie clocked in with an untouchable 168 times. Eventually, two-thirds of Julie's group GIEB-ed. The behavior continued even after her death in 2012—the gold standard of cultural transmission.

41

What information, if inserted in a paragraph here, would help provide a more comprehensive view of the topic being discussed?

A) A discussion of another significant area of Jane Goodall's research
B) A synopsis of studies done on other "cultural" tendencies among primates since the 1960s
C) An analysis of emigrating behaviors among monkeys
D) A survey of different chimp populations in a section of Tanzanian forest

42

Considering the author's tone and intention, which choice would be most suitable here?

A) NO CHANGE
B) watched
C) spied upon
D) glanced at

43

Which sentence, if inserted here, would provide the best transition between sentences?

A) But the behavior caught on.
B) The authors chuckled at the term they had coined.
C) Humans have their own versions of the GIEB.
D) Other chimps decided not to adopt the behavior.

44

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

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.

STOP

Math Test

3

25 MINUTES, 20 QUESTIONS

For questions 1-20, 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.

$A = \pi r^2$

$C = 2\pi r$

$A = lw$
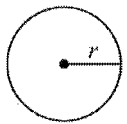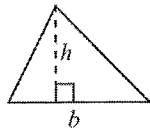
$A = \frac{1}{2}bh$
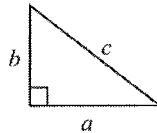
$c^2 = a^2 + b^2$
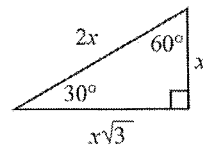
Special Right Triangles

$V = lwh$

$V = \pi r^2 h$

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

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

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

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

CONTINUE

1

Which of the following expressions is equivalent to 1 ?

A) $\dfrac{sin\frac{\pi}{6}}{cos\frac{\pi}{6}}$

B) $\dfrac{cos\frac{\pi}{6}}{sin\frac{\pi}{3}}$

C) $\dfrac{cos\frac{\pi}{6}}{cos\frac{\pi}{3}}$

D) $sin\frac{\pi}{6} + cos\frac{\pi}{6}$

2

What is the arc length of the arc whose measure is 60° in a circle of radius 2 ? The formula for arc length is $s = r\angle C$, where r is the radius of the circle and θ is the measure of the central angle.
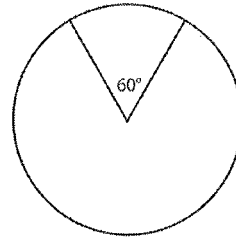
A) $\dfrac{\pi}{3}$

B) $\dfrac{2\pi}{3}$

C) $\dfrac{\pi}{2}$

D) $\dfrac{\pi}{6}$

CONTINUE

3

A computer factory uses a function g to relate the number of person-hours p to the number of computer boards c assembled. What must be true about the *domain* and *range*?

A) They are both integers.
B) Each value in the domain is inversely related to each corresponding value in the range.
C) Each value in the domain is greater than the corresponding value in the range.
D) They are both whole numbers.

4

Which of the following can the compound inequality given below be simplified into?

$(-2x - 3 \le 5 \text{ and } x + 2 \le 1)$

A) $-4 \le x \le -1$

B) $-3 < x \le -1$

C) $x \ge -4$

D) $x \le -3 \text{ or } x \ge -1$

5

$$3x^2 + 11x + 6$$

Which of the following is a factor of the above quadratic?

A) $x + 3$
B) $x + 2$
C) $x + 6$
D) $3x + 1$

6

If the graph of the function $y = -3x^2 + 6x - 5$ opens downward, in what direction does the graph of the function $x = -3y^2 + 6y - 5$ open?

A) Upward
B) Downward
C) To the left
D) To the right

CONTINUE

7

The graph of $ax + b$ is shown below.
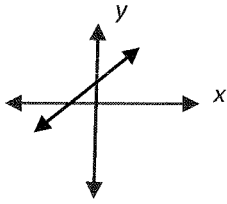
What is the graph of $y = -ax + b$?

A)
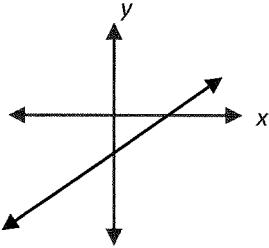
B)
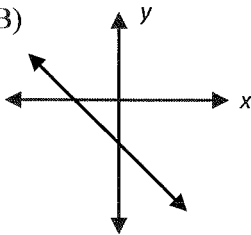
C)
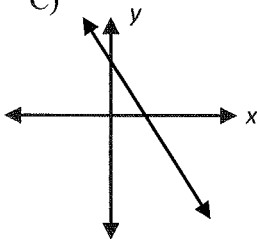
D)
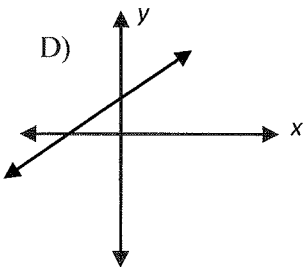
Graphs are not drawn to scale.

8

Which of the following equations has an extraneous root?

A) $x^2 - 6x = 0$

B) $5x^2 + 17x - 12 = 0$

C) $(x^2 - 5) + (y^2 + 2) = 6$

D) $\sqrt{x + 4} = x - 2$

9

Which of the following expressions is equivalent to $\sqrt[6]{x^3}\ \sqrt[3]{x}\ \sqrt{81x}$?

A) $9x\sqrt[3]{x}$

B) $\sqrt[6]{81x^3}$

C) $9\sqrt[3]{x^2}$

D) $9x\sqrt[3]{3x^2}$

10

Divide $2x^4 - 5x^3y + 6x^2y^2 - 4xy^3 + y^4$ by $x^2 - xy + y^2$. What is the quotient?

A) $2x^2 - 3xy + y^2$

B) $2x^2 - 7xy + 15y^2$

C) $2x^2 - 7xy - 3y^2$

D) $2x^2 - 3xy + 2y^2$

11

Let $8y = 4r + 1$ and $4x = 2r + 3$.
What is x in terms of y ?

A) $x = 2y - 5$

B) $x = y - \dfrac{5}{8}$

C) $x = y + \dfrac{5}{8}$

D) $x = \dfrac{1}{2}y + \dfrac{3}{4}$

12

Determined not to reveal too much of his financial situation, Jake stated that it can be modeled by the inequality $|\,2x - 300\,| > 500$. What was Jake implying about his financial situation?

A) He has less than $800.

B) He has more than $400.

C) It is somewhere between owing less than $100 and having less than $400.

D) He either owes more than $100 or has more than $400.

CONTINUE

13

An electric company offers its customers a residential plan containing 4-tier pricing which can be the most cost effective plan. The table below displays how much the cost is in each tier corresponding with the number of KWh used. KWh is a unit of energy, equal to the energy used in one hour by one KW of power.

Avg. Cost Per KWh	Number of KWh
$0.14	0 - 386
$0.19	387 - 501
$0.28	502 - 771
$0.32	772 -

What is the formula that the company uses for calculating how many KWh are consumed by a customer having the 4-tier pricing and using between 502 and 771 KWh inclusive?

A) $f(x) = 0.14(386) + 0.19(115) + 0.28(x - 501)$

B) $f(x) = 0.14(x - 501) + 0.19(115) + 0.28(386)$

C) $f(x) = 0.19(501) + 0.28(x - 502)$

D) $f(x) = 0.14(386) + 0.19(501) + 0.28(x - 502)$

14

The vertex form of a parabola's equation is $y = (x - h)^2 + k$, where point (h,k) is the vertex of the parabola. What is the vertex form of the parabola represented by the standard form equation $y = x^2 - 2x + 8$?

A) $y = (x - 4)^2$
B) $y = (x - 1)^2 + 8$
C) $y = (x + 1)^2 + 11$
D) $y = (x - 1)^2 + 7$

15
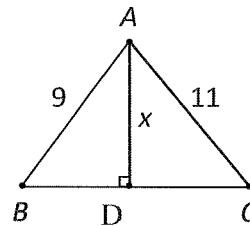
Figure is not drawn to scale.

If $AB = 9$, $AC = 11$, and $AD = x$, what is $Tan\ B$ in terms of x ?

A) $\dfrac{x}{9}$

B) $\dfrac{\sqrt{81 - x^2}}{9}$

C) $\dfrac{x}{\sqrt{81 - x^2}}$

D) $\dfrac{\sqrt{81 - 2x^2}}{x}$

CONTINUE

Each of the remaining questions requires you to solve the problem and enter your answer by marking the circles in the special grid, as shown in the examples below. You may use any available space for scratch work.

Answer: 201
Either position is correct

← Fraction line

← Decimal point

- Mark no more than one circle in any column.
- Because the answer sheet will be machine-scored, you will receive credit only if the circles are filled in correctly.
- 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.
- Some problems may have more than one correct answer. In such cases, grid only one answer.
- No question has a negative answer.
- Mixed numbers such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2.
(If ⊞ is gridded, it will be

interpreted as $\frac{31}{2}$ not $3\frac{1}{2}$.)

Decimal Answers: If you obtain a decimal answer with more digits than the grid can accomodate, it may be either rounded or truncated, but it must fill the entire grid. For example, if you obtain an answer such as 0.6666... you should record your result as .666 or .667. A less accurate value such as .66 or .67 will be scored as incorrect.

Acceptable ways to grid 2/3 are:

CONTINUE

16

$$\frac{4}{3}x^2 - 3x + 2 \qquad \frac{2}{3}x^2 + \frac{1}{2}x - \frac{1}{2}$$

The difference of the expressions above has the form $ax^2 + bx + c$. What is $|b|$?

18

Lauren's father is four times as old as Lauren. Five years ago, he was seven times as old. How old is Lauren's father now?

17

What is c so that the system of equations has infinitely many solutions?

$$2x - c - 15y = 2x - 23 + 10x$$

$$4x + 6y - 2 = 6$$

19

If $a(x + y) = 12$ and $2(x + y) = 24b$, then when solving for b in terms of a, what is the coefficient of a ?

20

Three points on a graph are $(-1,0)$, $(2,0)$, and $(3,2)$.

What is a in the equation of the quadratic function?

$$f(x) = a\,(x - b)\,(x - c)$$

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

55 MINUTES, 38 QUESTIONS

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

4

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.

$A = \pi r^2$

$C = 2\pi r$

$A = lw$
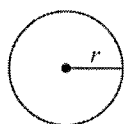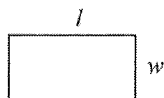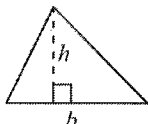
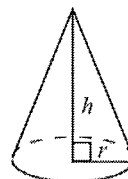$A = \frac{1}{2}bh$
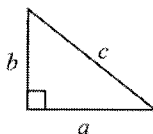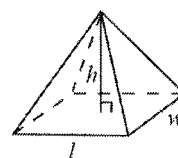
$c^2 = a^2 + b^2$
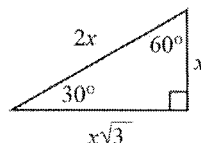
Special Right Triangles

$V = lwh$

$V = \pi r^2 h$

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

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

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

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

CONTINUE

1

Sam and Jorge began a business selling computers and put in $75,000 in capital. If Sam provided half as much capital as Jorge, how much capital did Sam put in, in thousands of dollars?

A) 15
B) 20
C) 25
D) 30

2

In a coordinate plane, if points $C(3, 7)$, $D(-1, 3)$, and $E(x, y)$ lie on line L, which of the following could be the coordinates of point E ?

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

CONTINUE

3

The cost of bowling for one day at Bowl X equals the cost of renting a pair of shoes, $3.50, plus the cost per game, $2.00, times the number of games, g. Which function represents the cost of bowling at Bowl X ?

A) $C(g) = 5.50$
B) $C(g) = 3.50 + 2.00g$
C) $C(g) = 3.50g + 2.00$
D) $C(g) = 5.50g$

4

Chocolate	Size of bar (grams)	Amount of sugar (grams)
Chocolate A	43	23
Chocolate B	40.8	19
Chocolate C	25	14.3
Chocolate D	41.1	24

From the chart above, which bar has the highest amount of sugar per size?

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

5

Thirty times which of the following equals $\frac{1}{30}$?

A) $\frac{1}{2 \times 3}$
B) $\frac{1}{2 \times 3 \times 5}$
C) $\frac{1}{2 \times 2 \times 3 \times 3 \times 5}$
D) $\frac{1}{2 \times 2 \times 3 \times 3 \times 5 \times 5}$

6

A chord inside of a circle is 1 inch from the center of the circle at its point closest to the center. If the circle has a 2-inch radius, what is the length of the chord?

A) 1
B) $\sqrt{3}$
C) $\sqrt{2}$
D) $2\sqrt{3}$

CONTINUE
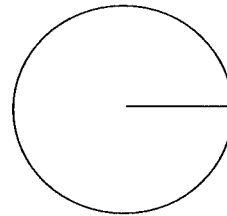
7

A 39″ TV costs $74 less than five times the cost of a Blu-Ray player. If the TV and the Blu-Ray player together cost $400, how much more does the TV cost than the Blu-Ray player? Neglect taxes.

A) $179
B) $242
C) $262
D) $400

8

If 125% of m is equal to 80% of n and $n \neq 0$, what is the value of $\frac{m}{n}$?

A) $\frac{16}{25}$

B) $\frac{4}{5}$

C) $\frac{5}{4}$

D) $\frac{25}{16}$

9

Betty Cookie prepared cookies by placing chocolate bar pieces in the dough. She asserted that each one of her cookies had 2 ounces of chocolate plus or minus less than 0.1 oz. A tester collected the following data on the amount of chocolate each cookie contained in 1 batch of 12 cookies.

Ounces of Chocolate	1.0	1.8	1.9	2.0	2.1	2.2
Frequency	1	4	1	1	3	2

To make her assertion true, the best description of the average would be the:

A) Mean
B) Median
C) Mode
D) Mean and Median

10

If $a^2 - 55 = b^2$ and $2a = 16$, which of the following could be a value for b ?

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

11
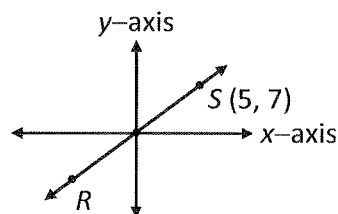
Note: Figure not drawn to scale

In the figure above, $\overleftrightarrow{RS}$ passes through the origin. If the x-coordinate of point R is -15, what is the y-coordinate of R ?
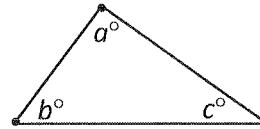
A) -25
B) -22
C) -21
D) -20

CONTINUE

12

At a taxi company, an employee gets paid $0.50/min. for driving people, has an average expense of $0.05/min. for gas and insurance, and figures a flat income tax rate of $200/wk. Which inequality below shows the number of hours that the employee needs to work per week, n, to get an income of at least $1,000/wk.?

A) $60n \geq 66.67$
B) $n \geq 1.5$
C) $n \geq 1200/27$
D) $n \geq 1200/33$

13

Note: Figure not drawn to scale

In the triangle above, $a + b = 70$ and $b + c = 150$. What is the value of b?

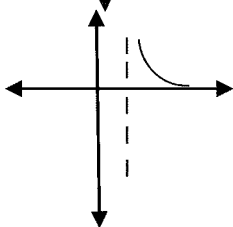A)   40
B)   50
C)   60
D)   70

14

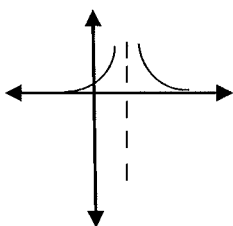Which of the following is a correct graph of the equation $|x - 1| = \frac{1}{y}$?

A)
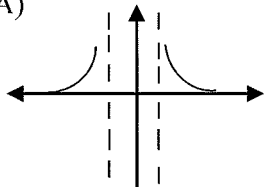
B)

C)

D)

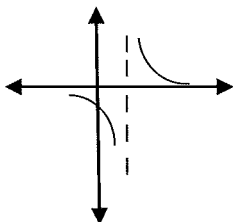**Note:** Figures not drawn to scale

15

	Brand X (mg)	Brand Y (mg)	Daily Tolerable Upper Intake Level (mg)
B$_3$	10	10	30
B$_6$	40	20	80
C	800	600	1800

Denise, a 40-year-old, wanted to intake the maximum daily tolerable amount of the water soluble vitamin B6 to get a lot of energy. She bought 2 brands of vitamins that contained vitamins B3, B6 and C, as well as other water soluble vitamins that had no intake limit. What is one feasible solution for the number of pills that Denise could take daily to get her maximum tolerable intake level of Vitamin B6 while not going over the tolerable upper intake level on vitamins B3 and C ?

A) 1 Brand X and 1 Brand Y
B) 2 Brand X and 1 Brand Y
C) 1 Brand X and 2 Brand Y
D) 2 Brand X and 0 Brand Y

16

When selecting a hat pattern to crochet, Diane will only use a pattern that requires at least 480 rows and no more than 520 rows. If r represents a number of rows that she will <u>not</u> crochet, an inequality that represents all possible values of r is:

A) $|r - 500| < 20$

B) $|r - 20| > 20$

C) $|r - 100| > 20$

D) $|r - 500| > 20$

Questions 17 and 18 refer to the following information.

According to scientists, a woman's average stride length (the heel of one foot when walking to the heel of the same foot) is 52" and a man's, 62".

17

How many times shorter is a woman's stride length than a man's?

A) 26/31
B) 24/31
C) 20/31
D) 15/31

18

Studies report that there are approximately 1,000 strides of an average male in a mile. Approximately how many strides would an average female take to reach 1 mile? Round to the nearest whole number.

A) 819
B) 1,048
C) 1,152
D) 1,192

CONTINUE

19

If x is increased by 25% and y is decreased by 10%, the resulting numbers will be equal. What is the ratio of $3x$ to y ?

A) $\dfrac{54}{25}$

B) $\dfrac{25}{6}$

C) $\dfrac{25}{54}$

D) $\dfrac{15}{2}$

20

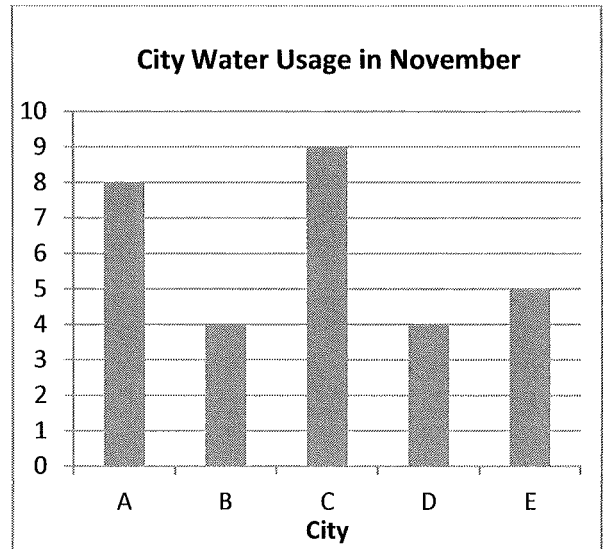Solve the set of quadratic equations below. What is one possible solution of $x + y$?

$y = 2(x + 3)^2 - 2$
$y - 12 = 4(x - 5)^2$

A) 12
B) 25
C) 48
D) 50

21

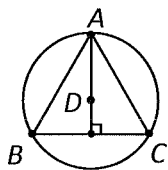The bar graph below shows how much water five different cities used in November.

If the amount of water all five cities used in November is 30,000 gallons, what is an appropriate label for the vertical axis of the graph?

A) Number of gallons (thousands)
B) Number of gallons (hundreds)
C) Month
D) Cost of water used

CONTINUE

22

In the figure above, equilateral triangle *ABC* is inscribed in circle *D*. If the altitude of triangle *ABC* is 15, what is the length of the circle's radius?

A) 12
B) 10
C) 8.7
D) 7.5

23

Tina paid $86 for a new outfit and didn't have to pay taxes. If the outfit was discounted at 20% off, and she had a store coupon for 30% off of her purchase price, what was the original price of her outfit?

A) $138.67
B) $149.42
C) $153.57
D) $614.29

24

$f(x) = 2x + 5$ and $g(x) = x^2 - c$.
What is c if
$g(2f(x)) = 16x^2 + 80x + 97$?

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

25

The energy of a particular packet of energy E is equal to Planck's constant h times the frequency of the photon under study v . The formula is written as $E = hv$, where
$h = 6.6260755 \times 10^{-34}$ J * s.

Also, the frequency of the photon under study v is equal to the speed of light in a vacuum c divided by the wavelength λ. The formula is written as $v = c / \lambda$, where
$c = 3.0 \cdot 10^8$ m/s.

How many Joules of energy E are contained in one photon with a wavelength λ equal to 495 nm (1 nm = 10^{-9} m) ?

A) 4.02 x 10^{-19} J
B) 9.84 x 10^{-19} J
C) 1.61 x 10^{-20} J
D) 0.984 J

CONTINUE

26

Marty wants to retire when he is 65, and currently he is 35. How much money will he have to put in the bank at 8% interest compounded quarterly to get 300,000 in 30 years?

A) 27,867.67
B) 35,414.67
C) 38,420.20
D) 40,888.92

27

$$y = \frac{1}{2}(x - 3)^2 + 2$$
$$y = ax - \frac{3}{2}$$

Which one of the following values of a would yield two rational solutions for the system of equations above?

A) -2
B) -4
C) -6
D) -8

28

In a set of 24 cubes, each cube has pictures on two sides and letters on the remaining sides. How many sides of the entire set have letters?

A) 24
B) 48
C) 72
D) 96

29

A group of 96 college students take 23 cars on a field trip. If each car will be occupied by 4 or 5 students, what is the number of cars occupied by 5 students?

A) 7
B) 6
C) 5
D) 4

30

What is the maximum value of y if a point (x, y) is a possible solution of the system of inequalities?
$$y \le -4x + 16$$
$$y \le 3x + 9$$

A) 10
B) 13
C) 12
D) 19

CONTINUE

Each of the remaining questions requires you to solve the problem and enter your answer by marking the circles in the special grid, as shown in the examples below. You may use any available space for scratch work.

Answer: 201
Either position is correct

← Fraction line

← Decimal point

- Mark no more than one circle in any column.
- Because the answer sheet will be machine-scored, you will receive credit only if the circles are filled in correctly.
- 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.
- Some problems may have more than one correct answer. In such cases, grid only one answer.
- No question has a negative answer.
- Mixed numbers such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2.

(If `3 1 / 2` is gridded, it will be
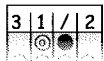
interpreted as $\frac{31}{2}$ not $3\frac{1}{2}$.)

Decimal Answers: If you obtain a decimal answer with more digits than the grid can accomodate, it may be either rounded or truncated, but it must fill the entire grid. For example, if you obtain an answer such as 0.6666... you should record your result as .666 or .667. A less accurate value such as .66 or .67 will be scored as incorrect.
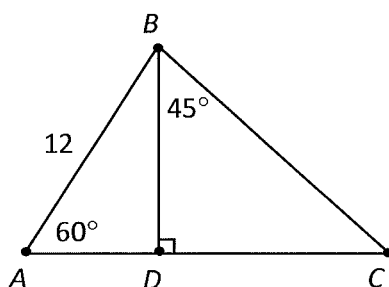
Acceptable ways to grid 2/3 are:

31

Three rubber stoppers of various sizes weigh a total of 10 oz. and are to be mailed by the First Class package service. The cost to mail is $2.32 for up to 3 oz. and $0.18/oz. after that, up to 13 oz. What is the cheapest cost in dollars and cents to mail the stoppers?

32

Note: Figure not drawn to scale

In the figure above, the length of *AB* is 12. What is the length of *BC* ?

33

A pig squeals at approximately 110 dB and the average conversation level is 60 dB. Intensity is a measure of loudness and is defined as $10^{\text{number of dB}/10}$. Approximately how many thousands of times more intense is the squeal of a pig than the loudness of normal conversation?

34

The weight of salt water is 8.6 lbs. / gallon, and 231 in.^{3} is equivalent to one gallon. Maya bought a new aquarium with dimensions 2 ft. x 1.5 ft. x 5 ft. and filled it 4/5 full of salt water for her new fish. She needs a stand to support the weight of the water, but first she needs to determine the water's weight. How much did the salt water in the tank weigh (in lbs.) to the nearest whole number?
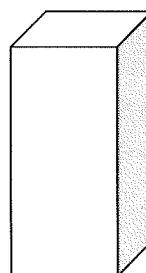
35

$$4cx + 2y = \frac{2}{3}y - 1$$

$$2x + \frac{4}{3}y = 2$$

If $x = -\frac{1}{2}$, then what is $|c|$?

Questions 36 and 37 refer to the following information.

The ratio of the screen dimensions of a standard-screen TV is 4:3, while that of a wide-screen TV is 16:9. The TV size is the length in inches of the diagonal.

36

What is the longest dimension of a 37" wide-screen TV in tenths of an inch?

37

If Mary wants to display the 16:9 ratio on a 32" standard-screen TV and maximize and center the viewing size, how much black space in square inches (to the nearest tenth) would be shown at the top? Note that a black screen will be shown where there is no picture.

38

What is the value of $x + 2$ if $\frac{5(x+2)}{3} = 10$?

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.

SAT Practice Essay

Directions: The essay portion of this test allows you to demonstrate how well you can read, comprehend, and analyze a passage. In your essay, you should show that you have read the passage carefully, present a coherent analysis, and use language accurately.

5

Important Reminders:

- You have 50 minutes to write your essay.
- A pencil is required for the essay. An essay written in ink will receive a score of zero.
- Do not write your essay in your test book. You will receive credit only for what you write on your answer sheet.

As you read the passage below, consider how Henry Petroski uses

- evidence, such as facts and examples, to support claims.
- reasoning to develop ideas and to connect claims and evidence.
- stylistic or persuasive elements, such as word choice or appeals to emotion, to add power to the ideas expressed.

Adapted from Henry Petroski, "Here's How to Fix America's Crumbling Bridges." © 2015 The Conversation US, Inc. Originally published November 19, 2014.

1 There are about 600,000 bridges in the United States, and about one in four is classified as functionally obsolete or structurally deficient. This doesn't mean they're in danger of imminent collapse; they may be simply too narrow or built for lighter traffic than today's standards.

2 There are plenty of repairs that need to be done. But drivers groan when individual bridges are finally slated for reconstruction since these repair projects— along with accompanying traffic snarls—can seem interminable.

3 The federal government pays much of the costs to repair and replace highway bridges, but it is up to the individual states to prioritize the work. Under current practice, the federal money comes principally from taxes on fuel. However, because motor vehicles have become more fuel efficient and people tend to drive less, the trust fund has been underfunded recently.

4 The traditional way a bridge has been built in America is for a state department of transportation to design the structure—either totally in-house or with the help of a consulting firm—and then issue a request for proposals from qualified construction companies. This process takes time and delays can occur for a variety of reasons. Complications or contradictions in the design may arise, which can halt construction and require a return to the drawing board. When changes are necessary, disagreements can arise over who—the state or the contractor—should be held financially responsible. Even when there are no technical or fiscal complications, environmentalists and other interest groups may call for a halt to work. Weather can also cause delays.

5 A well-crafted construction project will include monetary penalties on the contractor for not meeting deadlines. These can amount to tens of thousands of dollars for every day that the new bridge is not opened to traffic. On the other hand, if the bridge is finished ahead of schedule, the contractor will typically receive a bonus.

6 Increasingly in recent years, state departments of transportation have preferred to enter into so-called design-build contracts. In this case, a single company is engaged to do the design and carry out the construction of a bridge. This arrangement involves design and construction teams working together from the start. Any complications are likely to be resolved internally and quickly; thus,

the project can proceed with minimum delay. New York's nearly $4 billion Tappan Zee Bridge replacement project, currently the largest bridge project underway in the US, is a design-build project.

7   With government funding for infrastructure projects being so tight, an alternative has arisen in what are called public-private partnerships. In this arrangement, private investors assume the responsibility for financing and building a bridge or highway, and the investors are granted the right to collect tolls for what may be decades. The investors naturally believe they will realize a good return on their investment, even after they pay the public partner a sizable sum upfront. This payment can be in the billions of dollars—very tempting for a state or municipality struggling to balance its budget.

8   Pennsylvania recently entered into a public-private partnership to finance, design, build and maintain over the course of 25 years 558 of the state's bridges in need of repair or replacement. Although the state could do this kind of work itself, it would be limited in its annual expenses. The private consortium will produce generic designs and order common structural components in quantity, something the state could not do within its annual budget. What would have taken the Pennsylvania department of transportation 8 to 12 years to do under its normal procedures will be accomplished in just 3.

9   Pennsylvania's bridge replacement program was modeled after a Missouri initiative that repaired or replaced over 800 bridges in just three-and-a-half years, at a cost of $685 million. One of the features that made the project succeed was allowing the contractor to close a road and detour traffic rather than realign it where work was being done on a bridge. This not only saved the contractor the time and money it takes to divert traffic lanes but also provided a better environment for the construction workers, who could do their job more safely and quickly. Had the state transportation department been doing the work, voter and other political pressures would likely have argued against closing a road to work on a bridge.

10 Creative financing and contract arrangements like these are being implemented to repair and replace aging bridges more economically, quickly, and safely. We hope to see more such sensible infrastructure work in the future.

Write an essay in which you explain how Henry Petroski builds an argument to persuade his audience that design-build projects and public-private partnerships are efficient methods for repairing or replacing aging bridges. In your essay, analyze how Petroski uses one or more of the features listed in the box above (or features of your own choice) to strengthen the logic and persuasiveness of his argument. Be sure that your analysis focuses on the most relevant features of the passage.

Your essay should not explain whether you agree with Petroski's claims, but rather explain how Petroski builds an argument to persuade his audience.