1

2017 PSAT
SATURDAY

# Reading Test

## 60 MINUTES, 47 QUESTIONS

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

**DIRECTIONS**

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

**Questions 1-9 are based on the following passage.**

This passage is adapted from Colum McCann, *Let the Great World Spin*. ©2009 by Colum McCann.

It is not fashionable anymore, I suppose, to have a regard for one's mother in the way my brother and I had then, in the mid-1950s, when the noise outside the window was mostly wind and sea chime. One looks for the chink in the armor, the leg of the piano stool shorter than the other, the sadness that would detach us from her, but the truth is we enjoyed each other, all three of us, and never so evidently as those Sundays when the rain fell gray over Dublin Bay and the squalls blew fresh against the windowpane.

Our house in Sandymount looked out to the bay. We had a short driveway full of weeds, a square of lawn, a black ironwork fence. If we crossed the road we could stand on the curved seawall and look a good distance across the bay. A bunch of palm trees grew at the end of the road. They stood, smaller and more stunted than palms elsewhere, but exotic nonetheless, as if invited to come watch the Dublin rain. Corrigan sat on the wall, banging his heels and looking over the flat strand to the water. I should have known even then that the sea was written in him, that there would be some sort of leaving. The tide crept in and the water swelled at his feet. In the evenings he walked up the road past the Martello Tower to the abandoned public baths, where he balanced on top of the seawall, arms held wide.

On weekend mornings we strolled with our mother, ankle-deep in the low tide, and looked back to see the row of houses, the coastline, and the little scarves of smoke coming up from the chimneys. Two enormous red and white power station towers broke the horizon to the east, but the rest was a gentle curve, with gulls on the air, the mail boats out of Dun Laoghaire, the scud of clouds on the horizon. When the tide was out, the stretch of sand was corrugated and sometimes it was possible to walk a quarter-mile among isolated waterpools and bits of old refuse, log shaver shells, bedstead pipes.

Dublin Bay was a slow heaving thing, like the city it horseshoed, but it could turn without warning. Every now and then the water smashed up against the wall in a storm. The sea, having arrived, stayed. Salt crusted the windows of our house. The knocker on the door was rusted red.

When the weather blew foul, we sat on the stairs, Corrigan and I. Our father, a physicist, had left us years before. A check, postmarked in London, arrived through the letter box once a week. Never a note, just a check, drawn on a bank in Oxford. It spun in the air as it fell. We ran to bring it to our mother. She slipped the envelope under a flower pot on the kitchen windowsill and the next day it was gone. Nothing more was ever said.

The only sign of our father was a wardrobe full of his old suits and trousers in our mother's bedroom. Corrigan drew the door open. In the darkness we sat with our backs against the rough wooden planks and slipped our feet in our father's shoes, let his sleeves touch our ears, felt the cold of his cuff buttons. Our mother found us one afternoon, dressed in his gray

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CONTINUE

1

suits, the sleeves rolled up and the trousers held in place with elastic bands. We were marching around in his oversize brogues when she came and froze in the doorway, the room so quiet we could hear the radiator tick.

"Well," she said as she knelt to the ground in front of us. Her face spread out in a grin that seemed to pain her. "Come here," she kissed us both on the cheek, tapped our bottoms, "Now run along." We slipped out of our father's old clothes, left them puddled on the floor.

Later that night we heard the clang of the coat hangers as she hung and rehung the suits.

Over the years there were the usual tantrums and bloody noses and broken rocking-horse heads, and our mother had to deal with the whispers of the neighbors, sometimes even the attentions of local widowers, but for the most part things stretched out comfortably in front of us: calm, open, a sweep of sandy gray.

**1**

The main theme of the passage is

A) the benefits of a modest upbringing in the country.

B) the inevitable antagonism between a mother and her sons.

C) the natural competition between two brothers.

D) family members remaining close despite adversity.

**2**

The narrator is best described as

A) an adult explaining the causes of his current problems.

B) an adult reminiscing about his childhood experiences.

C) a teenager imagining a life different from his own.

D) a child describing his daily life.

**3**

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

A) Lines 1-4 ("It . . . chime")

B) Lines 12-13 ("We . . . fence")

C) Lines 16-19 ("They . . . rain")

D) Lines 31-34 ("Two . . . on the horizon")

**4**

As used in line 2, "regard" most nearly means

A) gaze.

B) fondness.

C) understanding.

D) relationship.

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CONTINUE

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5

The narrator characterizes his brother, Corrigan, primarily as

A) careless.
B) nervous.
C) devious.
D) restless.

6

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

A) Lines 7-10 ("but the . . . windowpane")
B) Lines 19-22 ("Corrigan . . . leaving")
C) Line 23 ("The tide . . . feet")
D) Lines 45-46 ("When . . . I")

7

The third paragraph (lines 27-38) illustrates which contrast?

A) The natural landscape and human-made objects
B) The comforts of home and the thrill of travel
C) Quiet and commotion
D) Past and present

8

As used in line 40, "turn" most nearly means

A) rotate.
B) bend.
C) reverse.
D) transform.

9

Lines 43-44 ("Salt . . . red") serve mainly to

A) emphasize the poverty of the narrator's family.
B) explain why the narrator dislikes bad weather.
C) illustrate the lasting effects of sea storms.
D) indicate that the house is not well maintained.

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CONTINUE

1

**Questions 10-18 are based on the following passage.**

This passage is adapted from Harold Ickes, "I Am an American Day" speech. Delivered May 18, 1941. Ickes was secretary of the interior under President Franklin Roosevelt.

I want to ask a few simple questions. And then I shall answer them.

What has happened to our vaunted idealism? Why have some of us been behaving like scared chickens? Where is the million-throated, democratic voice of America?

For years it has been dinned into us that we are a weak nation; that we are an inefficient people; that we are simple-minded. For years we have been told that we are beaten, decayed, and that no part of the world belongs to us any longer.

Some amongst us have fallen for this carefully pickled tripe. Some amongst us have fallen for this calculated poison. Some amongst us have begun to preach that the "wave of the future" has passed over us and left us a wet, dead fish.

They shout—from public platforms in printed pages, through the microphones—that it is futile to oppose the "wave of the future." They cry that we Americans, we free Americans nourished on Magna Carta and the Declaration of Independence, hold moth-eaten ideas. They exclaim that there is no room for free men in the world any more and that only the slaves will inherit the earth. America—the America of Washington and Jefferson and Lincoln and Walt Whitman—they say, is waiting for the undertaker and all the hopes and aspirations that have gone into the making of America are dead too.

However, my fellow citizens, this is not the real point of the story. The real point—the shameful point—is that many of us are listening to them and some of us almost believe them.

I say that it is time for the great American people to raise its voice and cry out in mighty triumph what it is to be an American. And why it is that only Americans, with the aid of our brave allies—yes, let's call them "allies"—the British, can and will build the only future worth having. I mean a future, not of concentration camps, not of physical torture and mental straitjackets, not of sawdust bread or of sawdust Caesars—I mean a future when free men will live free lives in dignity and in security.

This tide of the future, the democratic future, is ours. It is ours if we show ourselves worthy of our culture and of our heritage.

But make no mistake about it; the tide of the democratic future is not like the ocean tide—regular, relentless, and inevitable. Nothing in human affairs is mechanical or inevitable. Nor are Americans mechanical. They are very human indeed.

What constitutes an American? Not color nor race nor religion. Not the pedigree of his family nor the place of his birth. Not the coincidence of his citizenship. Not his social status nor his bank account. Not his trade nor his profession. An American is one who loves justice and believes in the dignity of man. An American is one who will fight for his freedom and that of his neighbor. An American is one who will sacrifice property, ease, and security in order that he and his children may retain the rights of free men. An American is one in whose heart is engraved the immortal second sentence of the Declaration of Independence.

Americans have always known how to fight for their rights and their way of life. Americans are not afraid to fight. They fight joyously in a just cause.

We Americans know that freedom, like peace, is indivisible. We cannot retain our liberty if three-fourths of the world is enslaved. Brutality, injustice and slavery, if practiced as dictators would have them, universally and systematically, in the long run would destroy us as surely as a fire raging in our nearby neighbor's house would burn ours if we didn't help to put out his.

**10**

The main purpose of the speech is to

A) recall an idyllic time in America's history.

B) reveal the problematic nature of America's heritage.

C) inform Americans about an imminent event.

D) persuade Americans to live up to their purported ideals.

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CONTINUE

1

11

Over the course of the speech, Ickes's main focus shifts from

A) revealing an apparent mystery to exposing the underlying truth.

B) pretending to mock a custom to confessing his preference for it.

C) describing a critical situation to encouraging people to respond to it.

D) condemning a questionable initiative to offering an alternative to it.

12

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

A) resist.

B) grasp.

C) possess.

D) sponsor.

13

Based on the speech, it is most logical to conclude that Ickes strongly objects to

A) arbitrary decisions by political leaders.

B) violations of basic human rights.

C) idealistic approaches to foreign affairs.

D) inaccurate reporting of political events.

14

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

A) Lines 7-11 ("For . . . longer")

B) Lines 17-19 ("They shout . . . future")

C) Lines 42-43 ("I mean . . . security")

D) Lines 65-66 ("Americans . . . life")

15

As used in line 52, "constitutes" most nearly means

A) motivates.

B) comprises.

C) appoints.

D) declares.

16

Based on the speech, with which description of Americans would Ickes most likely agree?

A) Americans are unwilling to trade freedom for wealth and security.

B) Americans idolize past leaders regardless of those leaders' weaknesses.

C) Americans fight to protect their families' physical well-being.

D) Americans value position and pedigree above all else.

17

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

A) Lines 52-54 ("What . . . birth")

B) Lines 54-56 ("Not the . . . profession")

C) Lines 60-62 ("An American . . . free men")

D) Lines 68-70 ("We Americans . . . enslaved")

18

One major claim that Ickes makes in the speech is that Americans are threatened by

A) the deteriorating values of their leaders.

B) an excess of national pride.

C) oppression and injustice abroad.

D) citizens' increasing selfishness.

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**Questions 19-27 are based on the following passages.**

Passage 1 is adapted from Brian Switek, "Triassic Crocodile Cousin Walked Like a Dinosaur." ©2011 by American Association for the Advancement of Science. Passage 2 is adapted from a book by the same author, *My Beloved Brontosaurus*. ©2013 by Brian Switek.

**Passage 1**

At a glance, it would be tempting to call *Poposaurus gracilis* a dinosaur. This 225-million-year-old reptile stood on two legs, had small forelimbs, and sported a long, tapering tail that allowed it to balance while walking and running about the Late Triassic landscape. But *Poposaurus* wasn't a dinosaur at all. It was much more closely related to the forerunners of crocodiles, and, according to a new study, its curious mode of walking challenges a leading hypothesis about why dinosaurs were so successful.

First described over a century ago, *Poposaurus* is a "rauisuchian," part of an extinct lineage of reptiles whose diverse array of members included the precursors of crocodiles and their closest relatives. Rauisuchians differed from crocodiles as we know them today in holding their limbs upright beneath their bodies rather than out to the side. This arrangement made them more efficient at walking and running on land, and, until recently, all rauisuchians were thought to have walked on all fours.

Then, in 2006, paleontologists Sterling Nesbitt and Mark Norell of the American Museum of Natural History in New York City described a bipedal rauisuchian they called *Effigia okeeffeae*. The discovery showed that at least some of the rauisuchians adapted a very dinosaurlike posture. Now, a new skeleton of *Poposaurus* described by Nesbitt, Yale University paleontologist Jacques Gauthier, and co-authors in the current edition of the *Bulletin of the Peabody Museum of Natural History* confirms that it, too, walked like a dinosaur. Instead of being an evolutionary fluke, the new find suggests that *Effigia* was part of a specialized subgroup of bipedal crocodile cousins that diversified at the same time as the early dinosaurs.

According to the new research, the anatomy of the creature's pelvis and hind limbs shows that *Poposaurus* walked upright, planting its feet close to the midline of its body. In fact, the hip anatomy would have made it impossible for *Poposaurus* to sprawl its limbs out to the side, like living crocodiles, although the exact way the rauisuchian's feet touched the ground is unclear. *Poposaurus* may have stood on tiptoe, walked with the whole foot touching the ground, or it might have alternated between both foot postures depending on how fast it was moving.

**Passage 2**

The true identity of *Effigia* was given away by the archosaur's ankle. Dinosaur ankles are dominated by a large, triangle-shaped bone—the astragalus—and have a very small accessory ankle bone called the calcaneum. Their ankles look like a simple hinge. But crocodile-like archosaurs have a large ankle bone that locks together into a complex unit where the connection between the ankle and foot has an S-shaped divide. This is the kind of ankle *Effigia* had.

The articulation with the hip was also key. In dinosaurs, the head of the femur juts inward to a hole in the pelvis. But the femur in *Effigia* articulated with the pelvis in a different way, in a fashion similar to croc-line archosaurs rather than to dinosaurs. The evidence was clear. Though *Effigia* was undoubtedly a crocodile cousin, the animal walked with an upright, bipedal posture like the early dinosaurs it lived alongside. Standing on two legs, this toothless archosaur had a long neck, tiny arms, and a body counterbalanced by a long tail. The deadly and über-efficient skeletal design of dinosaurs was not unique, after all.

*Effigia* wasn't an evolutionary fluke. The creature was quite similar to another animal from roughly the same time period, named *Shuvosaurus*. And while both *Effigia* and *Shuvosaurus* were toothless bipeds, a lovely skeleton of their close relative *Poposaurus* shows that there were sharp-toothed varieties, too. And all three were offshoots of a line of frightening creatures called rauisuchians.

So the upright posture of dinosaurs wasn't a unique invention that made them an unstoppable force. "This has always been a funny argument to me," said paleontologist Sterling Nesbitt. Not only is it "nearly impossible" to recognize evolutionary competition among prehistoric lineages, "*Effigia* and *Poposaurus* show that dinosaurs were not the only game in town, at least when talking about stance." Posture alone wasn't the deciding factor. Why

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CONTINUE

dinosaurs ultimately succeeded, and why *Effigia* and kin didn't leave descendants, might have come down to the fact that dinosaurs "had a unique combination of characters" that somehow gave them an evolutionary advantage.

**19**

The main purpose of Passage 1 is to

A) defend a controversial theory.
B) argue for the validity of a previously dismissed hypothesis.
C) explain the effects of a course of action.
D) present a groundbreaking discovery and its implications.

**20**

Passage 1 states that before the discovery of *Effigia*, paleontologists believed that rauisuchians

A) had no relationship to today's crocodiles.
B) always used four legs to walk.
C) were not efficient runners on land.
D) held their arms and legs out to the side.

**21**

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

A) Lines 7-11 ("It . . . successful")
B) Lines 12-16 ("First . . . relatives")
C) Lines 16-18 ("Rauisuchians . . . side")
D) Lines 19-22 ("This . . . fours")

**22**

As used in line 69, "counterbalanced" most nearly means

A) annulled.
B) canceled.
C) neutralized.
D) offset.

**23**

As used in line 78, "offshoots" most nearly means

A) roots.
B) prototypes.
C) branches.
D) sources.

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CONTINUE

24

Passage 2 states that *Effigia* was unlike *Poposaurus* in that *Effigia*

A) walked upright.
B) had no teeth.
C) was part of the rauisuchian line.
D) had hinge-like ankles.

25

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

A) Lines 64-67 ("Though . . . alongside")
B) Lines 74-77 ("And while . . . too")
C) Lines 78-79 ("And all . . . rauisuchians")
D) Lines 85-87 ("*Effigia* . . . stance")

26

Which claim is made in both passages?

A) Paleontologists have studied *Poposaurus* for more than one hundred years.
B) Rauisuchians lived in the Late Triassic period, 225 million years ago.
C) Dinosaur ankles feature a large bone called the astragalus.
D) Some rauisuchians walked like dinosaurs.

27

Compared to Passage 1, Passage 2 offers much more information about dinosaur

A) anatomy.
B) posture.
C) evolution.
D) movement.

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CONTINUE

1

**Questions 28-37 are based on the following passage and supplementary material.**

This passage is adapted from Alisa Opar, "Why We Procrastinate." ©2014 by Nautilus.

Psychologists are beginning to understand that we see our future selves as strangers. Though we will inevitably share their fates, the people we will become in a decade, quarter century, or more, are unknown to us. This impedes our ability to make good choices on their—which of course is our own—behalf. That bright, shiny New Year's resolution? If you feel perfectly justified in breaking it, it may be because it feels like it was a promise someone else made.

"It's kind of a weird notion," says Hal Hershfield, an assistant professor at New York University's Stern School of Business. "On a psychological and emotional level we really consider that future self as if it's another person."

Using fMRI,[1] Hershfield and colleagues studied brain activity changes when people imagine their future and consider their present. They homed in on two areas of the brain called the medial prefrontal cortex and the rostral anterior cingulate cortex, which are more active when a subject thinks about himself than when he thinks of someone else. They found these same areas were more strongly activated when subjects thought of themselves today, than of themselves in the future. Their future self "felt" like somebody else. In fact, their neural activity when they described themselves in a decade was similar to that when they described celebrities such as Matt Damon or Natalie Portman. And subjects whose brain activity changed the most when they spoke about their future selves were the least likely to favor large long-term financial gains over small immediate ones.

Emily Pronin, a psychologist at Princeton, has come to similar conclusions in her research. In a 2008 study, Pronin and her team told college students that they were taking part in an experiment on disgust that required drinking a concoction made of ketchup and soy sauce. The more they, their future selves, or other students consumed, they were told, the greater the benefit to science. Students who were told they'd have to down the distasteful quaff that day committed to consuming two tablespoons. But those that were committing their future selves (the following semester) or other students to participate agreed to guzzle an average of half a cup. We think of our future selves, says Pronin, like we think of others: in the third person.

The disconnect between our present and time-shifted selves has real implications for how we make decisions. We might choose to procrastinate, and let some other version of our self deal with problems or chores. Or we can focus on that version of our self that derives pleasure, and ignore the one that pays the price.

But if procrastination or irresponsibility can derive from a poor connection to your future self, strengthening this connection may prove to be an effective remedy. This is exactly the tactic that some researchers are taking.

Inspired by the use of images to spur charitable donations, Hershfield and colleagues took subjects into a virtual reality room and asked them to look into a mirror. The subjects saw either their current self, or a digitally aged image of themselves. When they exited the room, they were asked how they'd spend $1,000. Those exposed to the aged photo said they'd put twice as much into a retirement account as those who saw themselves unaged.

[1] Functional magnetic resonance imaging, a technique that measures neural activity by measuring changes in blood flow in the brain

**Figure 1**

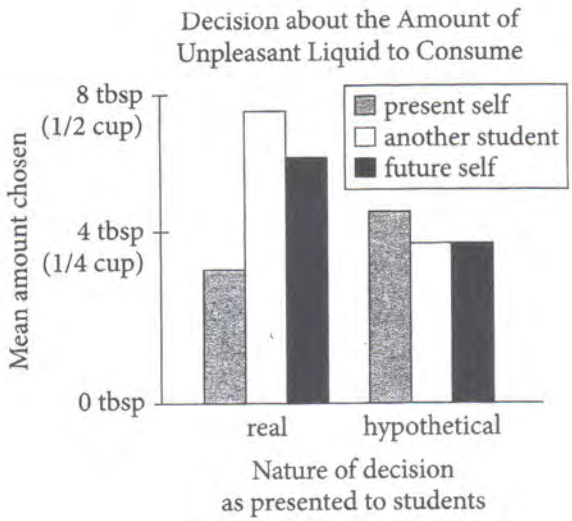


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**Figure 2**


Figures adapted from Emily Pronin et al., "Doing unto Future Selves as You Would Do unto Others: Psychological Distance and Decision Making." ©2008 by Society for Personality and Social Psychology, Inc.

Figure 2 refers to students' decisions in three scenarios. In the first scenario, students decided whether to receive a $50 reward that day or a $65 reward after a delay of two and a half months. In the second, they decided whether another student should receive a $50 reward that day or a $65 reward after a delay of two and a half months. In the third, they decided whether their future selves should receive a $50 reward after a delay of two and a half months or a $65 reward after a delay of an additional two and a half months.

28

In the first paragraph, the author refers to a New Year's resolution primarily to

A) point out the futility of making promises about future behavior.

B) cast a potentially complex psychological idea in everyday terms.

C) introduce a personal anecdote to illustrate a scientific concept.

D) suggest that specific occasions can trigger forward-looking thoughts.

29

As used in line 8, "breaking" most nearly means

A) revealing.

B) deciphering.

C) fracturing.

D) violating.

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30

Based on the passage, people with relatively low activity in the medial prefrontal cortex and rostral anterior cingulate cortex when thinking about their future selves would be more likely than other people to

A) make decisions that promise quick payoffs rather than greater payoffs at later times.

B) conceive of their future selves in a significantly different way than they conceive of celebrities.

C) take actions that are beneficial to their future selves even if those actions are unpleasant in the near term.

D) commit their future selves to greater responsibilities than those to which they commit other people.

31

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

A) Lines 18-22 ("They homed . . . else")

B) Lines 23-25 ("They found . . . the future")

C) Lines 26-29 ("In fact . . . Portman")

D) Lines 29-33 ("And subjects . . . ones")

32

Which choice best supports the idea that students in Pronin's experiment thought of their future selves the same way they thought of other people?

A) Lines 39-41 ("The more . . . science")

B) Lines 41-43 ("Students . . . tablespoons")

C) Lines 44-46 ("But those . . . cup")

D) Lines 49-51 ("The disconnect . . . decisions")

33

According to the passage, one reason that people delay performing unpleasant chores is that they

A) believe there is a possibility that someone else will do the chores in the meantime.

B) think of themselves in the present as distinct from the selves who will eventually do the chores.

C) have placed a higher priority on enjoyable activities than on chores.

D) rely on other people for motivation to complete chores in a timely manner.

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CONTINUE

34

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

A) infer.

B) obtain.

C) distill.

D) originate.

35

It can most reasonably be inferred from the passage that seeing an aged image of yourself is likely to

A) strengthen the feeling of connection between your current self and your future self.

B) encourage you to behave charitably toward other people in the near future.

C) suppress activity in regions of your brain associated with self-conception.

D) trigger the same amount of brain activity as does seeing an image of a celebrity.

36

Data presented in figure 1 indicate that on average, students who believed that they faced a real decision about drinking an unpleasant liquid behaved in which way?

A) They committed their future selves to drink less of the liquid than they committed other students to drink.

B) They committed to drink more of the liquid in the present than they committed anyone to drink hypothetically.

C) They committed their future selves to drink less of the liquid than they committed their present selves to drink.

D) They committed other students to drink less of the liquid in the present than they committed other students to drink hypothetically.

37

Based on information in the passage, Hershfield would most likely expect which statement about the students whose responses are depicted in figure 2 to be true?

A) They showed the least amount of brain activity in the scenario in which they were most likely to accept the immediate reward.

B) They showed an increase in brain activity as the length of the proposed delay of the reward increased.

C) They showed similar patterns of brain activity in the two scenarios in which they were most likely to delay the reward.

D) They showed an increase in brain activity as the amount of the proposed reward increased.

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CONTINUE

1

**Questions 38-47 are based on the following passage and supplementary material.**

This passage is adapted from Walter Piper, Jay Mager, and Charles Walcott, "Marking Loons, Making Progress." ©2011 by Sigma Xi, The Scientific Research Society.

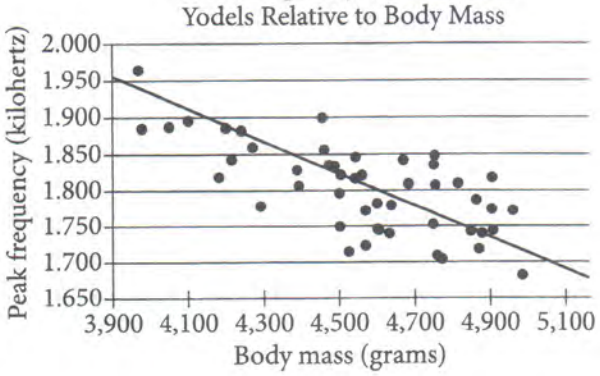
In common loons [a type of aquatic bird], the individually distinctive male-only territorial calls known as yodels almost always occur when a male is in a tense interaction with an intruder that has landed on its territory or when an intruder is flying overhead. So yodels appear to be "aimed" at specific territorial opponents. If so, we should expect that a yodeler wishes to communicate something about himself or his motivation to defend his territory—perhaps in an effort to save himself the trouble and energetic cost of a lengthy confrontation or battle. One crucial bit of information that a male might want to communicate is his body size or condition. We might hypothesize that a large or fit male, who would be a formidable opponent, would want to communicate that, if possible, through his yodel.

In fact yodels do betray information about the fighting ability of the yodeler. The information is encoded in the dominant [peak] frequency of the yodel—the frequency of the yodel that is of greatest amplitude, or loudest. However, dominant frequency is closely correlated not with body size but with body mass. Thus, it seems that heavy males are potentially signaling their body condition through their lower frequency yodel. We also found a correlation between change in body mass and dominant frequency from one year to the next. That is, males whose yodels rise in pitch from one year to the next have lost body mass over that period and those whose yodels become deeper have gained mass. A loon listening to a male's yodel, therefore, could instantly get information about its condition, and, if it recognized the same male yodel from the year before, could learn whether the male was gaining or losing condition.

There is one puzzling aspect to the finding of "honest signaling" of body size, as animal behaviorists call it. Why would a small male ever yodel, if in so doing he was revealing his small size to all listeners? This practice would seem masochistic—equivalent to asking another male to try to evict you from your territory. Yet small males yodel about as often as do large males. There must be some compensating benefit to yodeling that offsets the disadvantage of telling competitors that you are small.

Indeed, there is more information contained in the yodel than just identity and condition. The mere fact that a male is yodeling reveals that he is territorial, of course, but we wanted to determine whether the number of repeat syllables in a male's yodels communicated something about his aggressiveness. Repeat syllables vary greatly in number from yodel to yodel within and between males, so it seemed plausible that this flexible aspect of the call was being used for this purpose. Indeed, we have learned that males produce more repeat syllables in their yodels when in close encounters with intruders than when intruders were flying over or far away on the water. We followed up this promising piece of field data with an experiment that simulated the intrusion of a male floater into the territory defended by a breeding pair. As expected, territorial males responded more quickly and with more tremolos and yodels of their own to foreign yodels manipulated to have four or seven repeat syllables than to those altered to have only one repeat syllable. Thus, the number of repeat syllables in the yodel is taken by other loons as a signal of high aggressive motivation on the part of the yodeler. So a small male must yodel in order to signal his territorial status and aggressiveness, even though his yodel betrays his small size in the process.

Peak Frequency of Male Loon Yodels Relative to Body Mass

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CONTINUE

38

The primary purpose of the passage is to

A) discuss the effects that loons' yodels have on other male loons.

B) challenge the conventional scientific interpretation of loon yodels.

C) show that loon yodels convey information about the yodelers.

D) explain how loons recognize individuals by their yodels.

39

The authors most directly speculate that one reason that male loons yodel is to

A) communicate details about their physical attributes to potential mates.

B) identify whether neighboring loons are familiar or intruders.

C) assess the condition and aggressiveness of other males in the vicinity.

D) deter other loons from engaging them in physical conflicts over territory.

40

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

A) Lines 1-6 ("In common . . . overhead")

B) Lines 6-7 ("So yodels . . . opponents")

C) Lines 7-11 ("If so . . . battle")

D) Lines 12-13 ("One . . . condition")

41

The primary function of the question in lines 38-40 is to

A) raise doubts about the reliability of some data.

B) acknowledge a significant exception to a pattern.

C) concede that a finding conflicts with earlier findings.

D) suggest that a discovery requires further explanation.

42

According to the authors, a potential drawback of yodeling for some loons is that it

A) could invite challenges from competitors.

B) makes the yodeler appear aggressive.

C) reveals which territories have the best resources.

D) may cause other loons to treat the yodeler as an intruder.

43

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

A) Lines 31-35 ("A loon . . . condition")

B) Lines 40-42 ("This . . . territory")

C) Lines 60-63 ("We followed . . . pair")

D) Lines 68-70 ("Thus . . . yodeler")

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CONTINUE

1

44

According to the passage, what is one reason that the researchers suspected that the repetition of syllables in yodels is significant?

A) Males repeat syllables in their yodels only during confrontations with other males.

B) Yodels with repeated syllables appear to be regarded by other males as territorial claims.

C) The quantity of repeated syllables is inconsistent within a male's yodels and across males' yodels.

D) There is wide variation in the volume of the repeated syllables within a male's yodels.

45

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

A) adjusted.

B) deceived.

C) exploited.

D) negotiated.

46

According to the graph, if a male loon's body mass changes from 4,100 grams to 4,900 grams, the frequency of its yodel will most likely

A) increase by approximately 1.5 kilohertz.

B) increase by approximately 0.15 kilohertz.

C) decrease by approximately 0.15 kilohertz.

D) decrease by approximately 1.5 kilohertz.

47

The data represented on the graph best support the statement in which lines of the passage?

A) Lines 14-16 ("We might . . . yodel")

B) Lines 21-23 ("However . . . mass")

C) Lines 25-27 ("We also . . . next")

D) Lines 28-31 ("That . . . mass")

# STOP

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

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2

2017 PSAT
SATURDAY

# Writing and Language Test

## 35 MINUTES, 44 QUESTIONS

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

**DIRECTIONS**

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

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

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

**Questions 1-11 are based on the following passage and supplementary material.**

### Medical Writing: The Art of Communicating Science

Individuals who enjoy writing and have an interest in health science should consider a career in medical writing. Medical writers analyze scientific information, such as the results of research studies, to develop written materials for a wide range of readers. The job of a medical writer 1 is projected to be increasingly in demand: a medical writer must explain highly technical scientific data and processes to general audiences. Because medical writing is a specialized field, it requires a

1

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

A) NO CHANGE
B) is often overlooked in the medical field:
C) is akin to the task of a translator:
D) can be difficult to sustain:

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CONTINUE

high level of education. Writers need to be familiar with medical terminology and statistical analysis, which is why advanced degrees in a field related to medicine are advantageous. Medical writers must also possess strong writing skills in order to articulate complex scientific ideas clearly and concisely.

Since medical writers are employed in a variety of areas, from pharmaceuticals to advertising, the writer's role depends chiefly on the needs of a particular organization. **2** For example, Patrick Cullinan, a medical writer at a **3** mega pharmaceutical company, writes reports to accompany new drug applications being submitted to health authorities for approval. Cullinan interprets quantitative data from research **4** studies. He does this so that he can summarize the function, effectiveness, and, if necessary, risks of a particular drug. In addition **5** for composing study reports, Cullinan prepares journal articles and conference presentations. For Maggie Merchant, a medical writer at a biotechnology company, responsibilities include writing consumer manuals that **6** explains the technology behind new products and how they should be used.

**2**

A) NO CHANGE
B) Furthermore,
C) At the same time,
D) Despite this fact,

**3**

Which choice best preserves the overall tone of the passage?

A) NO CHANGE
B) major
C) big-time
D) heavy-duty

**4**

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

A) studies in order to summarize
B) studies for the summary of
C) studies; by doing this, he is able to summarize
D) studies, and the purpose of this is to summarize

**5**

A) NO CHANGE
B) to compose
C) of composing
D) to composing

**6**

A) NO CHANGE
B) has explained
C) will have explained
D) explain

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CONTINUE

2

A field resistant to fluctuations in the job market, 7 the job prospects in medical writing are excellent. According to the US Bureau of Labor Statistics, jobs in technical writing (of which medical writing is a subfield) will increase by 15 percent from 2012 to 2022, faster than the average for all occupations. Medical writers are also paid well. As shown in the table, according to a 2011 survey, 8 writers in communications and advertising made almost double the salary of writers at medical education companies. Moreover, salaries are rising: The mean salary of writers at pharmaceutical companies increased 15 percent from 2006 to 2010. Medical writers for clinical research organizations and the government are also in high demand, with mean salaries increasing by 9 17 percent and 24 percent, respectively, from 2006 to 2010.

7

A) NO CHANGE
B) medical writing holds excellent job prospects.
C) medical writers have access to excellent job prospects.
D) there are excellent job prospects in medical writing.

8

Which choice offers an accurate interpretation of the survey results in the table?

A) NO CHANGE
B) the mean salary for medical writers at biotechnology companies was $116,800.
C) writers working at medical education companies earned a mean salary of $93,400.
D) writers at pharmaceutical companies earned more, on average, than medical writers working for all other types of primary employers.

9

Which choice offers an accurate interpretation of the survey results in the table?

A) NO CHANGE
B) 9 percent and 10 percent,
C) 10 percent and 12 percent,
D) 17 percent and 15 percent,

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CONTINUE

2

Survey of Salaries for Full-Time Medical Writers

| Primary employer | Mean salary (in USD), 2010 | Percent change in mean salary from 2006 to 2010 |
|---|---|---|
| Biotechnology company | $116,800 | +10 |
| Pharmaceutical company | $112,800 | +15 |
| Communications and advertising | $93,400 | +12 |
| Medical device company | $92,700 | +9 |
| Other | $95,700 | +25 |
| Clinical research organization | $89,600 | +17 |
| Government | $88,300 | +24 |
| Medical education company | $79,500 | +3 |

Adapted from Susan Bairnsfather, "Results of the 2011 AMWA Salary Survey." ©2012 by American Medical Writers Association.

Not only is medical writing a lucrative field, **10** and it also holds intangible value. Providing a bridge between specialists and general **11** audiences medical writers play an important social role. By making the complex language of science accessible, they have a direct impact on the public's ability to understand cutting-edge research.

**10**

A) NO CHANGE
B) as it also holds
C) thus it holds also
D) but it also holds

**11**

A) NO CHANGE
B) audiences;
C) audiences,
D) audiences:

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CONTINUE

**Questions 12-22 are based on the following passage.**

**Planting the Seeds: Gardening in Schools**

The back-to-the-land movement of the 1960s and 1970s, with **12** it's emphasis on growing one's own food, spurred a renewed interest in gardening in the United States. Inspired by this movement, some teachers and educational administrators established gardening programs in **13** schools, they believed that the hands-on activities of gardening would benefit students in many ways. Although students seemed to enjoy the programs, little quantitative research was conducted to measure their effectiveness. As a result, advocates lacked the evidence they needed to persuade others of the value of school gardening. However, recent studies have confirmed what these advocates **14** long observe: gardening in schools has positive effects on students' knowledge and behavior.

12

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

13

A) NO CHANGE
B) schools they believed
C) schools; and believed
D) schools, believing

14

A) NO CHANGE
B) had long observed:
C) are long observing:
D) having long observed:

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CONTINUE

School gardening programs have been shown to **15** boost students' academic outcomes, especially in science. Researchers in Texas, for example, found that elementary school student gardeners scored 5.6 points higher on a science achievement test than **16** those of students not gardening at school. In addition, researchers at the Department of Horticulture at Louisiana State University found that students' science achievement scores increased **17** notably and considerably after a semester of weekly gardening activities.

15

A) NO CHANGE
B) inflate
C) extend
D) lift up

16

A) NO CHANGE
B) the scores of students who did not garden
C) did students who did not garden
D) nongardening students' scores

17

A) NO CHANGE
B) considerably
C) in a way that was extremely considerable
D) considerably in an important way

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CONTINUE

18 The approach to school gardens has changed somewhat since the 1960s and 1970s. A study conducted by Michelle Ratcliffe, Farm to School manager at Ecotrust in Portland, Oregon, along with a team of researchers in Massachusetts, found that a semester-long school gardening program 19 grew a number of different plants: those who participated in the program showed a desire to eat not only more vegetables but also a wider variety of them. In an experiment in Idaho, sixth graders who participated in a twelve-week school gardening program ate considerably more fruits and vegetables after the program than 20 before. Furthermore, the student gardeners increased their vitamin A, vitamin C, and fiber intake.

18

Which choice provides the most effective introduction to the paragraph?

A) NO CHANGE
B) When studying the effects of school gardens, researchers should cover a broad span of time.
C) The benefits of school gardens to students' academic performance are not limited to science.
D) School gardening has also been shown to improve students' nutritional habits.

19

Which choice most effectively sets up the results that follow in the sentence?

A) NO CHANGE
B) provided students with a variety of skills:
C) improved many students' test scores:
D) changed students' attitudes toward vegetables:

20

The writer is considering revising the underlined portion to the following.

before—even more than students at the same school who had had twelve weeks of classroom-based nutrition lessons.

Should the writer make this revision here?

A) Yes, because it addresses a potential counterargument about the relative benefits of classroom instruction in improving nutrition.
B) Yes, because it provides an important qualification to the generally positive results of the Idaho experiment.
C) No, because it introduces irrelevant material about an activity unrelated to gardening.
D) No, because it unnecessarily repeats the detail that the experiment lasted for twelve weeks.

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CONTINUE

[1] In spite of these results, not everyone is convinced that school gardening programs can be implemented nationwide. [2] However, gardening can be practiced almost anywhere, even indoors. [3] Critics point out that some areas of the United States are unsuitable for year-round outdoor gardening, and urban schools may lack the necessary outdoor green space. [4] Lettuce and other vegetables can be grown in pots in a classroom, and schools can create partnerships with local organizations located off school grounds, such as city parks departments. [5] Given their many benefits to students, **21** this program should be expanded to serve students everywhere in the country. **22**

**21**

A) NO CHANGE
B) a gardening program
C) gardening programs
D) it

**22**

To make this paragraph most logical, sentence 2 should be placed

A) where it is now.
B) before sentence 1.
C) after sentence 3.
D) after sentence 4.

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CONTINUE

**Questions 23-33 are based on the following passage.**

**Skyspace at Crystal Bridges**

23 The town of Bentonville, Arkansas, is in one of the fastest-growing regions of the southern United States, and it is the site of an ambitious new art museum, the Crystal Bridges Museum of American Art. The inside of the structure is almost bare, with white limestone benches along the walls. The closest thing to framed artwork in this stand-alone installation is the piece of sky 24 exposed by the oculus. This is a circular hole in the ceiling. The oculus brings the sky into the 25 structure so on a sunny day, a circle of light travels slowly across the interior; on a rainy day, viewers inside the installation may get wet; if a bird flies overhead, it becomes part of

23

The writer wants to help the reader visualize the structure introduced in the paragraph by describing its appearance and setting. Which choice most effectively achieves this goal?

A) NO CHANGE
B) On grounds that are easily accessible by bicycle or on foot, visitors to the Crystal Bridges Museum of American Art can experience an art museum and a nature hike not merely on the same day but actually at the same time.
C) The stones found in Arkansas fields and creeks range in color from brown to gray, and their durability and weathered appearance make them especially popular as building materials for external walls.
D) At the end of a nature trail on the grounds of the Crystal Bridges Museum of American Art in northwest Arkansas, visitors encounter a squat, round structure built using the area's naturally occurring rocks.

24

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

A) exposed by the oculus, a circular hole
B) exposed by a hole that is circular and known as an oculus
C) that the oculus, a circular hole, exposes
D) that is exposed in a circular shape by a hole called an oculus

25

A) NO CHANGE
B) structure
C) structure, because
D) structure:

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CONTINUE

the artwork. At sunrise and sunset, a colored light display projected onto the ceiling **26** shift from purple to blue to green to beige. The different colors surrounding the oculus make the changing shades of sunlight appear even more dramatic.

[1] The art installation, *The Way of Color* by James Turrell, is part of the Crystal Bridges **27** leadership's effort to tie the institution's art to its immediate environment. [2] In *The Way of Color*, a shaft of light created by the oculus behaves like a paintbrush, sweeping brightness across the floor as the earth turns. [3] To establish the natural setting as part of the art on display, elements of nature are used like art materials throughout the museum and its grounds. [4] Even the museum itself is a work of art, framing the area's natural features. [5] It consists of two glass structures that seem to float on either side of a pond. [6] Standing in one of the structures, **28** viewing the pond, the other gallery, and the surrounding mountainous woodlands in one sight line, fulfilling architect Moshe Safdie's aim to design "a museum in which art and nature are experienced simultaneously and harmoniously." **29**

**26**

A) NO CHANGE
B) shifted
C) shifts
D) was shifting

**27**

A) NO CHANGE
B) leaderships' effort to tie the institutions'
C) leadership's effort to tie the institutions
D) leadership's effort to tie the institutions'

**28**

A) NO CHANGE
B) visitors can view the pond,
C) the pond can be viewed,
D) while viewing the pond,

**29**

To make this paragraph most logical, sentence 3 should be placed

A) where it is now.
B) after sentence 1.
C) after sentence 4.
D) after sentence 5.

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CONTINUE

2

Though Crystal Bridges and its installations are at the forefront of this trend among present-day art institutions, incorporating natural features in works of art is not a new idea. **30** In spite of this, the Pantheon, a 2,000-year-old building in Rome, Italy, seems to be a monument to its own oculus. Aside from the entrance, the building's 29-foot-wide oculus is its only light source. This causes the circle of light that travels around the interior to appear especially bright, a method of **31** influencing both the brightness and the appearance of natural light that Turrell reinterpreted with **32** their use of colored projections.

Nature's capacity to inspire and enchant is timeless, and features like light, water, and spacious scenery have almost universal appeal. Removing art from **33** locations that are difficult to reach and tying it to the natural world that surrounds us all welcomes everyone into the audience.

**30**

A) NO CHANGE
B) Incidentally,
C) In fact,
D) In contrast,

**31**

A) NO CHANGE
B) altering the visible characteristics and
C) modifying and changing
D) manipulating

**32**

A) NO CHANGE
B) its
C) his
D) our

**33**

Which choice provides the most effective contrast to the approach to art described in the rest of the sentence?

A) NO CHANGE
B) a formal, constricted setting
C) a community-oriented institution
D) museums outside of major cities

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CONTINUE

**Questions 34-44 are based on the following passage.**

### The Hydrilla Invasion

Hydrilla (*Hydrilla verticillata*) is an invasive freshwater plant species native to Asia and Africa 34 . Hydrilla's ability to generate new plants from stem fragments and from underground root tubers 35 allow it to spread rapidly and thus quickly decrease biodiversity in an ecosystem.

In 1999, hydrilla was found in Texas's Lake Austin, where the impact of its invasion extended beyond the ecological. Because the plant does not stop growing when it nears the surface of a body of water, it tends to form thick mats of foliage. These mats impede water flow, which can contribute to flooding and harm irrigation and city water supplies. 36 Hydrilla is still a relatively unknown problem in many communities, so efforts are needed to educate the public about its dangers. By early 2013, hydrilla had covered just over a quarter of the lake's area, posing a real threat to the health and value of the lake.

**34**

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

> that has been taking over US waterways since its accidental introduction into a Florida river system in the 1960s

Should the writer make this addition here?

A) Yes, because it cites specific data that support the paragraph's main point.

B) Yes, because it provides context for a concept that is fundamental to the passage.

C) No, because it does not logically relate to the first part of the sentence.

D) No, because it contradicts another point made in the paragraph.

**35**

A) NO CHANGE

B) have allowed

C) are allowing

D) allows

**36**

At this point, the writer wants to support the main point of the paragraph with a relevant detail. Which choice best accomplishes this goal?

A) NO CHANGE

B) Hydrilla can also interfere with recreational activities on lakes, damaging boat propellers and thwarting swimmers, as well as creating a physical barrier to fishing lines.

C) Hydrilla, like other submersed plants, can increase water clarity, leading some people to question whether it should be removed from lakes at all.

D) Hydrilla needs to be removed entirely only in some areas, while other areas can withstand the presence of some hydrilla as long as it is properly managed.

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CONTINUE

2

37 The city of Austin's Watershed Protection Department needed to take action, but removing hydrilla is not an easy task. Mechanical removal is expensive and must be performed 38 on a regular basis in a costly fashion, and while various herbicides can be used, 39 targeting hydrilla specifically can be tricky. Drawdown—the practice of lowering the water level in winter to expose underwater plants to the cold air (thus killing them)—proved effective to a 40 degree, hydrilla could still survive in very deep areas of the lake, so another solution was needed.

37

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

A) NO CHANGE
B) Even though scientists question how hydrilla displaces native plant populations,
C) Subsequently, hydrilla reproduces quickly and in a few different ways, so
D) Hydrilla can reproduce via seeds, but as this is not its primary reproduction method,

38

A) NO CHANGE
B) regularly with a significant cost,
C) regularly, which is costly,
D) regularly,

39

A) NO CHANGE
B) and targeting
C) however, targeting
D) as targeting

40

A) NO CHANGE
B) degree; while
C) degree, but
D) degree, otherwise,

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CONTINUE

Scientists at the Watershed Protection Department determined that the best strategy was to add a second invasive species, grass 41 carp; to combat the first. Grass carp is an herbivorous fish that eats hydrilla, but the fear was that one problem species would merely be 42 rotated by another. Management experts needed to 43 ensure that the grass carp population would not grow. The solution, they found, was to introduce sterile fish. This allowed management officials and preservationists to gradually release large numbers of grass carp—about 40,000—into Lake Austin without worrying about their population growth.

The strategy paid off in the summer of 2013 when the final addition of 11,000 grass carp caused the population to reach a critical mass. By September of that year, a management survey found no hydrilla in Lake Austin at all. The real test of success will come at the end of the grass carp's life span; 44 .

41

A) NO CHANGE
B) carp—
C) carp
D) carp,

42

A) NO CHANGE
B) preempted
C) supplanted
D) modified

43

A) NO CHANGE
B) ensure; that
C) ensure that—
D) ensure, that

44

At this point, the writer wants to create a logical conclusion to the paragraph. Which choice most effectively accomplishes this goal?

A) officials must test the fish to make sure they are sterile, as carp that can reproduce are not allowed in the lake
B) officials have vowed to watch the lake carefully to see if hydrilla resurges as its predator population dwindles
C) computer models are used to determine how many fish are needed in a given area, depending on the amount of hydrilla
D) it is possible that a combination of fish and other removal techniques may be the best solution

# STOP

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

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2017 PSAT
SATURDAY

# Math Test – No Calculator

## 25 MINUTES, 17 QUESTIONS

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

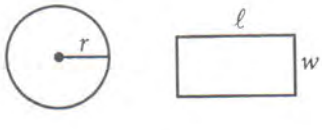
**DIRECTIONS**

**For questions 1-13**, solve each problem, choose the best answer from the choices provided, and fill in the corresponding circle on your answer sheet. **For questions 14-17**, solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 14 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**

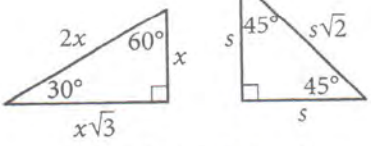



$A = \pi r^2$
$C = 2\pi r$

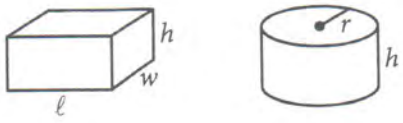
$A = \ell w$

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

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




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 $2\pi$.
The sum of the measures in degrees of the angles of a triangle is 180.

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CONTINUE

1

Tom scored 85, 78, and 98 on his first three exams in history class. Solving which inequality gives the score, $G$, on Tom's fourth exam that will result in a mean score on all four exams of at least 90 ?

A) $90 - (85 + 78 + 98) \leq 4G$

B) $4G + 85 + 78 + 98 \geq 360$

C) $\frac{(G + 85 + 78 + 98)}{4} \geq 90$

D) $\frac{(85 + 78 + 98)}{4} \geq 90 - 4G$

2

Hiro and Sofia purchased shirts and pants from a store. The price of each shirt purchased was the same and the price of each pair of pants purchased was the same. Hiro purchased 4 shirts and 2 pairs of pants for \$86, and Sofia purchased 3 shirts and 5 pairs of pants for \$166. Which of the following systems of linear equations represents the situation, if $x$ represents the price, in dollars, of each shirt and $y$ represents the price, in dollars, of each pair of pants?

A) $4x + 2y = 86$
$3x + 5y = 166$

B) $4x + 3y = 86$
$2x + 5y = 166$

C) $4x + 2y = 166$
$3x + 5y = 86$

D) $4x + 3y = 166$
$2x + 5y = 86$

3

If $f$ is the function defined by $f(x) = \frac{2x - 1}{3}$, what is the value of $f(5)$ ?

A) $\frac{4}{3}$

B) $\frac{7}{3}$

C) 3

D) 9

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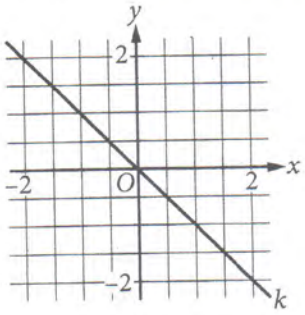
CONTINUE

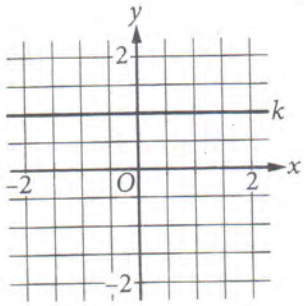
4

In the $xy$-plane, line $\ell$ is the graph of equation $y = x + 1$. If line $k$ is parallel to line $\ell$, which of the following graphs could show line $k$ in the $xy$-plane?

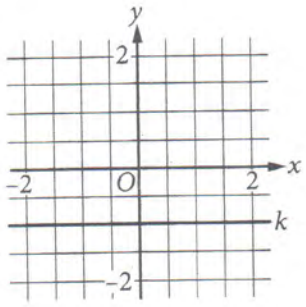
A)



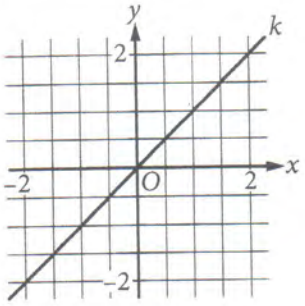

B)




C)




D)




5

Which of the following is a solution to the inequality $5x - 25 > 18$ ?

A) $-5$

B) $0$

C) $5$

D) $10$

6

$$y = 2^{x+3}$$

If the equation above is graphed in the $xy$-plane, which of the following points $(x, y)$ is the $y$-intercept of the graph?

A) $(-3, 0)$

B) $(0, 8)$

C) $(0, -3)$

D) $(8, 0)$

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CONTINUE

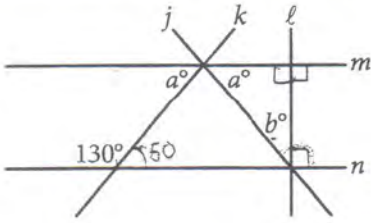
7

$$f(\theta) = -0.28(\theta - 27)^2 + 880$$

An engineer wanted to identify the best angle for a cooling fan in an engine in order to get the greatest airflow. The engineer discovered that the function above models the airflow $f(\theta)$, in cubic feet per minute, as a function of the angle of the fan $\theta$, in degrees. According to the model, what angle, in degrees, gives the greatest airflow?

A) $-0.28$
B) $0.28$
C) $27$
D) $880$

8




Note: Figure not drawn to scale.

In the figure above, lines $m$ and $n$ are parallel. What is the value of $b$ ?

A) 40
B) 50
C) 65
D) 80

9

$$y = x + 1$$
$$y = x^2 + x$$

If $(x, y)$ is a solution to the system of equations above, which of the following could be the value of $x$ ?

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

10

$$(x - 11y)(2x - 3y) - 12y(-2x + 3y)$$

Which of the following is equivalent to the expression above?

A) $x - 23y$
B) $2x^2 - xy - 3y^2$
C) $2x^2 + 24xy + 36y^2$
D) $2x^2 - 49xy + 69y^2$

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CONTINUE



**11**

An artist paints and sells square tiles. The selling price $P$, in dollars, of a painted tile is a linear function of the side length of the tile $s$, in inches, as shown in the table below.

| Side length, $s$ (inches) | Price, $P$ (dollars) |
|---|---|
| 3 | 8.00 |
| 6 | 18.00 |
| 9 | 28.00 |

Which of the following could define the relationship between $s$ and $P$?

A) $P = 3s + 10$

B) $P = \frac{10}{3}s + 8$

C) $P = \frac{10}{3}s - 2$

D) $P = \frac{3}{10}s - \frac{1}{10}$

**12**

$$v = -9.8t + 30$$

An object is launched upward. The equation above models the velocity $v$, in meters per second, of the object $t$ seconds after being launched. In the equation, what does the number 30 represent?

A) The initial height, in meters, of the object

B) The initial velocity, in meters per second, of the object

C) The change in the velocity, in meters per second, of the object $t$ seconds after being launched

D) The change in the velocity, in meters per second, of the object each second after being launched

**13**

Which of the following expressions is equivalent to $\sqrt[3]{b} \cdot b \cdot \sqrt[5]{b^2}$ for $b > 0$?

A) $b^{\frac{2}{15}}$

B) $b^{\frac{6}{15}}$

C) $b^{\frac{11}{15}}$

D) $b^{\frac{26}{15}}$

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CONTINUE

14

The quadratic equation $x^2 - a = 0$, where $a$ is a constant, has solutions $x = -8$ and $x = 8$. What is the value of $a$ ?

15

An agricultural scientist studying the growth of corn plants recorded the height of a corn plant at the beginning of a study and the height of the plant each day for the next 12 days. The scientist found that the height of the plant increased by an average of 1.20 centimeters per day for the 12 days. If the height of the plant on the last day of the study was 36.8 centimeters, what was the height, in centimeters, of the corn plant at the beginning of the study?

16

$$3x + 2y = 18$$
$$x = 4y - 1$$

What is the $y$-value of the ordered pair $(x, y)$ that satisfies the system of equations above?

17

If $a + b = 11$, what is the value of $a^2 + 2ab + b^2$ ?

# STOP

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

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PSAT 2017
SATURDAY

# Math Test – Calculator

## 45 MINUTES, 31 QUESTIONS

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

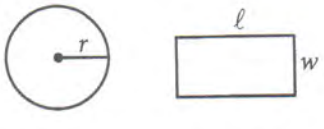
**DIRECTIONS**

**For questions 1-27**, solve each problem, choose the best answer from the choices provided, and fill in the corresponding circle on your answer sheet. **For questions 28-31**, solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 28 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

**NOTES**

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

**REFERENCE**

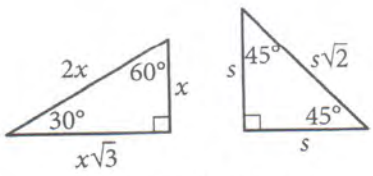



$A = \pi r^2$
$C = 2\pi r$

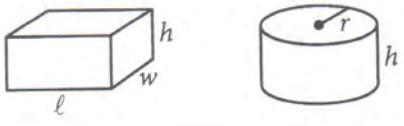
$A = \ell w$

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

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




Special Right Triangles




$V = \ell wh$

$V = \pi r^2 h$

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

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

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

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

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CONTINUE

**1**

If $5 + (3 - a) = 5$, what is the value of $a$ ?

A) $-5$

B) $-3$

C) $3$

D) $5$

**2**

$$(x + 1)(2x - 15)$$

Which of the following is equivalent to the expression above?

A) $2x^2 + 2x - 15$

B) $2x^2 - 13x - 15$

C) $3x^2 + 2x - 15$

D) $3x^2 - 13x - 15$

**3**

$$P = \frac{W}{t}$$

The power $P$ produced by a machine is represented by the equation above, where $W$ is the work performed during an amount of time $t$. Which of the following correctly expresses $W$ in terms of $P$ and $t$ ?

A) $W = Pt$

B) $W = \frac{P}{t}$

C) $W = \frac{t}{P}$

D) $W = P + t$

**4**

$$\sqrt{4x^3}$$

Which of the following is equivalent to the expression above for $x > 0$ ?

A) $2x^{\frac{2}{3}}$

B) $2x^{\frac{3}{2}}$

C) $4x^{\frac{2}{3}}$

D) $4x^{\frac{3}{2}}$

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CONTINUE



5

Call Ratings

| | 1 Star | 2 Stars | 3 Stars | 4 Stars | Total |
|---|---|---|---|---|---|
| Employee A | 16 | 49 | 72 | 8 | 145 |
| Employee B | 4 | 10 | 22 | 34 | 70 |
| Employee C | 8 | 56 | 45 | 16 | 125 |
| Employee D | 22 | 42 | 84 | 12 | 160 |
| Total | 50 | 157 | 223 | 70 | 500 |

A supervisor at a call center reviewed 500 calls taken by four employees and rated the employees' performance on each call on a scale from 1 star to 4 stars. The ratings for each employee are shown in the table above. According to the table, to the nearest whole percent, what percent of Employee A's calls received a rating of 1 star?

A) 3%
B) 11%
C) 16%
D) 32%

6

$$4x + 5y = 100$$
$$5x + 4y = 62$$

If the system of equations above has solution $(x, y)$, what is the value of $x + y$ ?

A) 0
B) 9
C) 18
D) 38

7

A computer that sends 340 kilobytes of data per second transfers a file with a size of 1.2 megabytes. Which of the following equations can be used to estimate how many kilobytes, $B$, remain to be sent $t$ seconds after the transfer begins? (1 megabyte is approximately equal to 1,000 kilobytes.)

A) $B = 1,200 - 340t$
B) $B = 340 - 1,200t$
C) $B = 1.2 - 0.34t$
D) $B = 0.34 - 1.2t$

8

A ticket broker sold 540 tickets for a concert. The number of tickets the ticket broker sold for this concert is 80% of the concert hall's seats. What is the total number of seats in the concert hall?

A) 432
B) 620
C) 675
D) 972

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CONTINUE

**Questions 9 and 10 refer to the following information.**

| Country | Population (millions) | Surface area (millions of square kilometers) |
|---|---|---|
| Brazil | 200 | 9 |
| Indonesia | 250 | 2 |
| Mexico | 120 | 2 |
| Russia | 140 | 17 |
| United States | 320 | 10 |

The table above shows the approximate populations and surface areas of five countries in 2013. (Surface area includes land and water.)

9

Which of the following best approximates the ratio of the surface area of the United States to the surface area of Mexico in 2013?

A) 1 to 5
B) 1 to 2
C) 2 to 1
D) 5 to 1

10

In 2003, 31% of the surface area of Brazil was used for growing crops, while 13% of the surface area of Russia was used for growing crops. Assuming the surface area of both countries stayed the same from 2003 to 2013, which of the following must be true?

I. In 2003, more surface area was used for growing crops in Brazil than in Russia.
II. The surface area of Russia that was used for growing crops in 2003 was more than the total surface area of the United States in 2013.
III. The surface area of Brazil that was used for growing crops in 2003 was less than the total surface area of Indonesia in 2013.

A) I only
B) II only
C) III only
D) I and II only

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CONTINUE



**11**

The International Space Station orbits Earth at an average speed of 4.76 miles per second. What is the space station's average speed in miles per hour?

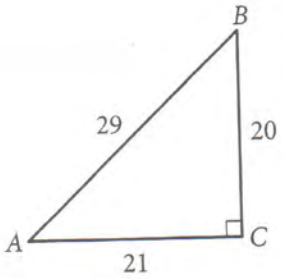
A) 285.6

B) 571.2

C) 856.8

D) 17,136.0

**12**




In the figure above, what is the value of $\tan(A)$ ?

A) $\frac{20}{29}$

B) $\frac{21}{29}$

C) $\frac{20}{21}$

D) $\frac{21}{20}$

**13**

If 1,200 customers register for new accounts at a social media website every day, what fraction of the first 60,000 new accounts are registered in the first 5 days?

A) $\frac{1}{5}$

B) $\frac{1}{10}$

C) $\frac{1}{12}$

D) $\frac{1}{50}$

**14**

| Station 1 | Station 2 | Station 3 | Station 4 | Station 5 |
|---|---|---|---|---|
| \$3.699 | \$3.609 | \$3.729 | \$3.679 | \$3.729 |

In the table above, Melissa recorded the price of one gallon of regular gas from five different local gas stations on the same day. What is the median of the gas prices Melissa recorded?

A) \$3.679

B) \$3.689

C) \$3.699

D) \$3.729

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CONTINUE

**Questions 15 and 16 refer to the following information.**

| Texting behavior | Talks on cell phone daily | Does not talk on cell phone daily | Total |
|---|---|---|---|
| Light | 110 | 146 | 256 |
| Medium | 139 | 164 | 303 |
| Heavy | 166 | 74 | 240 |
| Total | 415 | 384 | 799 |

In a study of cell phone use, 799 randomly selected US teens were asked how often they talked on a cell phone and about their texting behavior. The data are summarized in the table above.

15

If one of the 799 teens surveyed is selected at random, what is the probability that the teen talks on a cell phone daily?

A) $\frac{1}{799}$

B) $\frac{415}{799}$

C) $\frac{384}{415}$

D) $\frac{384}{799}$

16

Based on the data from the study, an estimate of the percent of US teens who are heavy texters is 30% and the associated margin of error is 3%. Which of the following is a correct statement based on the given margin of error?

A) Approximately 3% of the teens in the study who are classified as heavy texters are not really heavy texters.

B) It is not possible that the percent of all US teens who are heavy texters is less than 27%.

C) The percent of all US teens who are heavy texters is 33%.

D) It is doubtful that the percent of all US teens who are heavy texters is 35%.

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CONTINUE



17

If $a = b + 2$, what is the value of $(3^a)(3^{-b})$ ?

A) 0

B) 1

C) 3

D) 9

18

A woodworker constructed a chest from two types of wood: cherry and maple. The cherry costs \$5.80 per board foot, while the maple costs \$4.20 per board foot. A total of 6 board feet of wood was used and cost a total of \$31.60. How many board feet of maple did the woodworker use to make the chest?

A) 2.0

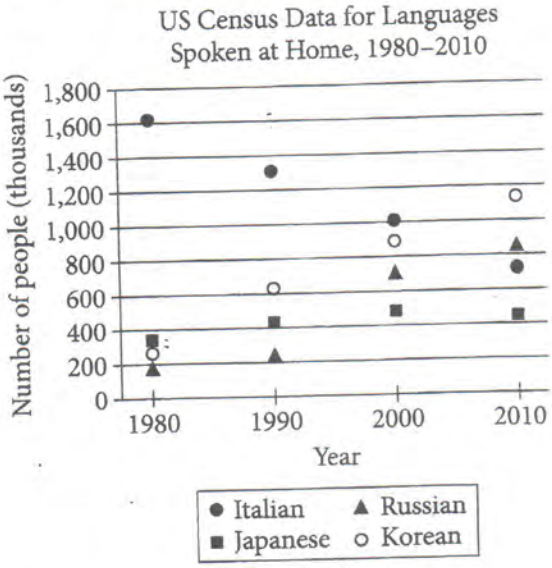
B) 3.0

C) 3.5

D) 4.0

19

The scatterplot below shows census data, for every 10 years from 1980 to 2010, of the number of people in the United States, in thousands, who spoke one of four different languages at home.




If a line of best fit is drawn for each of the four languages, which of the following orders the slopes of the four lines of best fit from greatest to least?

A) Italian, Japanese, Korean, Russian

B) Korean, Russian, Italian, Japanese

C) Korean, Russian, Japanese, Italian

D) Japanese, Korean, Russian, Italian

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CONTINUE

20

In January, Jim deposited $120.00 of his monthly paycheck into a savings account. The amount was 10% of his monthly paycheck. In February, Jim deposited 15% of his monthly paycheck into the savings account. If both monthly paychecks were for the same amount, how much more, in dollars, did Jim deposit into the savings account in February than in January?

A) $6.00

B) $18.00

C) $60.00

D) $180.00

21

| Food | Protein | Cost |
|---|---|---|
| 1 large egg | 6 grams | $0.36 |
| 1 cup of milk | 8 grams | $0.24 |

The table above shows the amount of protein in two foods and the cost of each food. Based on the table, what is the ratio of the cost per gram of protein in a large egg to the cost per gram of protein in a cup of milk?

A) 1 : 2

B) 2 : 3

C) 3 : 4

D) 2 : 1

22

An inspector begins a day of work with a large sample of shirts that need to be checked for defects. The inspector works at a constant rate throughout the morning. What type of model is best to model the number of shirts remaining to be checked for defects at any given time throughout the morning?

A) A linear model with a positive slope

B) A linear model with a negative slope

C) An exponential growth model

D) An exponential decay model

23

Megan's regular wage at her job is $p$ dollars per hour for the first 8 hours of work in a day plus 1.5 times her regular hourly wage for work in excess of 8 hours that day. On a given day, Megan worked for 10 hours, and her total earnings for that day were $137.50. What is Megan's regular hourly wage?

A) $11.75

B) $12.50

C) $13.25

D) $13.75

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CONTINUE

24

A team of workers has been moving cargo off of a ship. The equation below models the approximate number of tons of cargo, $y$, that remains to be moved $x$ hours after the team started working.

$$y = 120 - 25x$$

The graph of this equation in the $xy$-plane is a line. What is the best interpretation of the $x$-intercept in this context?

A) The team will have moved all the cargo in about 4.8 hours.

B) The team has been moving about 4.8 tons of cargo per hour.

C) The team has been moving about 25 tons of cargo per hour.

D) The team started with 120 tons of cargo to move.

25

The population of a town is currently 50,000, and the population is estimated to increase each year by 3% from the previous year. Which of the following equations can be used to estimate the number of years, $t$, it will take for the population of the town to reach 60,000 ?

A) $50{,}000 = 60{,}000(0.03)^t$

B) $50{,}000 = 60{,}000(3)^t$

C) $60{,}000 = 50{,}000(0.03)^t$

D) $60{,}000 = 50{,}000(1.03)^t$

26

Line $\ell$ in the $xy$-plane is perpendicular to the line with equation $x = 2$. What is the slope of line $\ell$ ?

A) 0

B) $-\frac{1}{2}$

C) $-2$

D) The slope of line $\ell$ is undefined.

27

The mean amount of time that the 20 employees of a construction company have worked for the company is 6.7 years. After one of the employees leaves the company, the mean amount of time that the remaining employees have worked for the company is reduced to 6.25 years. How many years did the employee who left the company work for the company?

A) 0.45

B) 2.30

C) 9.00

D) 15.25

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CONTINUE



28

| $x$ | $f(x)$ | $g(x)$ |
|---|---|---|
| 1 | 3 | 20 |
| 2 | 6 | 25 |
| 3 | 9 | 30 |
| 4 | 12 | 35 |
| 5 | 15 | 40 |

The functions $f$ and $g$ are defined by the table above.

If $f(a) = 6$, what is the value of $g\left(\frac{a}{2}\right)$?

29

A local transit company sells a monthly pass for \$95 that allows an unlimited number of trips of any length. Tickets for individual trips cost \$1.50, \$2.50, or \$3.50, depending on the length of the trip. What is the minimum number of trips per month for which a monthly pass could cost less than purchasing individual tickets for trips?

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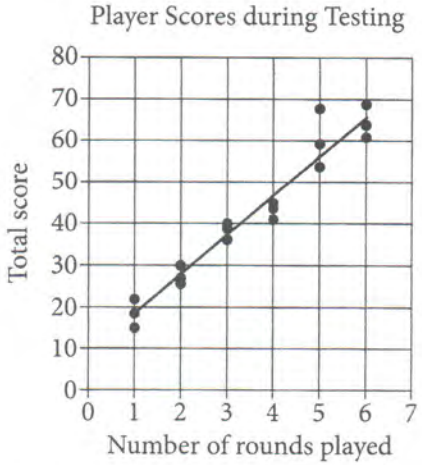
CONTINUE

**Questions 30 and 31 refer to the following information.**




A game designer is testing a new game. A random sample of 18 people played the game for a predetermined number of rounds, and each person's total score after completing his or her last round was recorded. The scatterplot above shows the total score and number of rounds played for each of the 18 people. A line of best fit for the data is also shown. The equation of the line of best fit is $y = 9.49x + 8.91$, where $y$ represents the predicted total score and $x$ represents the number of rounds played.

30

Three people played exactly the same number of rounds, and all their scores were lower than the total score predicted by the line of best fit. How many rounds did these three people play?

31

One of the people who played 5 rounds had a total score of 59.20. How much greater is this score than the total score predicted by the line of best fit?

# STOP

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

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# Answer Key

## Wednesday, Oct. 11, Test Form

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

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

| Math Test – No Calculator | |
|---|---|
| SECTION 3 | |
| 1 | D |
| 2 | B |
| 3 | C |
| 4 | B |
| 5 | C |
| 6 | A |
| 7 | A |
| 8 | B |
| 9 | B |
| 10 | D |
| 11 | D |
| 12 | A |
| 13 | C |
| 14 | 1 |
| 15 | 64 <= x <= 80 |
| 16 | 9/2, 4.5 |
| 17 | 5/2, 2.5 |

| Math Test – Calculator | |
|---|---|
| SECTION 4 | |
| 1 | B |
| 2 | C |
| 3 | C |
| 4 | C |
| 5 | D |
| 6 | B |
| 7 | C |
| 8 | A |
| 9 | A |
| 10 | C |
| 11 | B |
| 12 | B |
| 13 | B |
| 14 | C |
| 15 | D |
| 16 | B |
| 17 | C |
| 18 | B |
| 19 | A |
| 20 | D |
| 21 | D |
| 22 | C |
| 23 | A |
| 24 | B |
| 25 | B |
| 26 | C |
| 27 | C |
| 28 | 15 |
| 29 | 5/2, 2.5 |
| 30 | 1/2, .5 |
| 31 | 24 |

NOTE: For schools participating in the test administration study given in fall 2017, correct answers will not be provided.

## Saturday, Oct. 14, Test Form

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

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

| Math Test – No Calculator | |
|---|---|
| SECTION 3 | |
| 1 | C |
| 2 | A |
| 3 | C |
| 4 | D |
| 5 | U |
| 6 | B |
| 7 | C |
| 8 | A |
| 9 | A |
| 10 | B |
| 11 | C |
| 12 | B |
| 13 | D |
| 14 | 64 |
| 15 | 22.4 |
| 16 | 3/2, 1.5 |
| 17 | 121 |

| Math Test – Calculator | |
|---|---|
| SECTION 4 | |
| 1 | C |
| 2 | B |
| 3 | A |
| 4 | B |
| 5 | B |
| 6 | C |
| 7 | A |
| 8 | C |
| 9 | D |
| 10 | A |
| 11 | D |
| 12 | C |
| 13 | B |
| 14 | C |
| 15 | B |
| 16 | D |
| 17 | D |
| 18 | A |
| 19 | C |
| 20 | C |
| 21 | D |
| 22 | B |
| 23 | B |
| 24 | A |
| 25 | D |
| 26 | A |
| 27 | D |
| 28 | 20 |
| 29 | 28 |
| 30 | 4 |
| 31 | 2.84 |

U = This question will not be scored.

# Answer Key (continued)

**Wednesday, Oct. 25, Test Form**

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

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

| Math Test – No Calculator | |
|---|---|
| SECTION 3 | |
| 1 | C |
| 2 | A |
| 3 | B |
| 4 | A |
| 5 | C |
| 6 | B |
| 7 | A |
| 8 | C |
| 9 | B |
| 10 | D |
| 11 | D |
| 12 | C |
| 13 | B |
| 14 | 8 |
| 15 | 60 |
| 16 | 12 |
| 17 | 11 |

| Math Test – Calculator | |
|---|---|
| SECTION 4 | |
| 1 | A |
| 2 | C |
| 3 | D |
| 4 | C |
| 5 | D |
| 6 | D |
| 7 | B |
| 8 | C |
| 9 | C |
| 10 | A |
| 11 | A |
| 12 | D |
| 13 | A |
| 14 | B |
| 15 | D |
| 16 | D |
| 17 | D |
| 18 | B |
| 19 | C |
| 20 | B |
| 21 | C |
| 22 | B |
| 23 | A |
| 24 | D |
| 25 | A |
| 26 | B |
| 27 | B |
| 28 | 1320 |
| 29 | 1/8, .125 |
| 30 | 33 |
| 31 | 7/10, .7 |

# Score Conversion

Score conversions shows how raw scores are converted into test scores, cross-test scores, and subscores.

### IMPORTANT TO NOTE

- The section score for the Evidence-Based Reading and Writing section is calculated by adding the Reading Test score to the Writing and Language Test score and multiplying that figure by 10.
- The section score for the Math section is calculated by multiplying the Math Test score by 20.
- There is no advantage or disadvantage in taking either the Wednesday, Oct. 11, Saturday, Oct. 14, or Wednesday, Oct. 25, test form.

## Score Conversion

**Wednesday, Oct. 11, Test Form**

| Raw Score (# of correct answers) | Reading Test Score | Writing and Language Test Score | Math Test Score |
|---|---|---|---|
| **48** | | | 38 |
| **47** | 38 | | 38 |
| **46** | 37 | | 37.5 |
| **45** | 36 | | 37.5 |
| **44** | 36 | 38 | 37 |
| **43** | 35 | 38 | 36.5 |
| **42** | 34 | 37 | 35.5 |
| **41** | 34 | 37 | 34.5 |
| **40** | 33 | 36 | 34 |
| **39** | 33 | 35 | 33 |
| **38** | 32 | 34 | 32 |
| **37** | 31 | 34 | 31.5 |
| **36** | 31 | 33 | 31 |
| **35** | 30 | 32 | 30.5 |
| **34** | 30 | 32 | 30 |
| **33** | 29 | 31 | 29.5 |
| **32** | 29 | 30 | 29 |
| **31** | 28 | 30 | 28.5 |
| **30** | 28 | 29 | 28 |
| **29** | 27 | 29 | 27.5 |
| **28** | 27 | 28 | 27 |
| **27** | 26 | 28 | 26.5 |
| **26** | 26 | 27 | 26 |
| **25** | 25 | 27 | 25.5 |
| **24** | 25 | 26 | 25 |
| **23** | 24 | 26 | 24.5 |
| **22** | 24 | 25 | 24 |
| **21** | 23 | 24 | 23.5 |
| **20** | 23 | 23 | 23 |
| **19** | 22 | 23 | 22.5 |
| **18** | 22 | 22 | 22 |
| **17** | 21 | 21 | 21.5 |
| **16** | 20 | 20 | 21 |
| **15** | 20 | 19 | 20.5 |
| **14** | 19 | 19 | 20 |
| **13** | 18 | 18 | 19.5 |
| **12** | 18 | 17 | 18.5 |
| **11** | 17 | 16 | 18 |
| **10** | 17 | 16 | 17.5 |
| **9** | 16 | 15 | 16.5 |
| **8** | 16 | 14 | 16 |
| **7** | 15 | 14 | 15 |
| **6** | 14 | 13 | 14 |
| **5** | 13 | 12 | 13 |
| **4** | 12 | 12 | 12 |
| **3** | 11 | 11 | 11 |
| **2** | 10 | 10 | 10 |
| **1** | 9 | 9 | 9 |
| **0** | 8 | 8 | 8 |

# Score Conversion (continued)

### Saturday, Oct. 14, Test Form

| Raw Score (# of correct answers) | Reading Test Score | Writing and Language Test Score | Math Test Score |
|---|---|---|---|
| * | | | |
| 47 | 38 | | 38 |
| 46 | 38 | | 37.5 |
| 45 | 37 | | 37 |
| 44 | 37 | 38 | 36.5 |
| 43 | 36 | 38 | 35.5 |
| 42 | 36 | 37 | 34.5 |
| 41 | 35 | 37 | 33.5 |
| 40 | 34 | 36 | 33 |
| 39 | 34 | 36 | 32 |
| 38 | 33 | 35 | 31.5 |
| 37 | 32 | 34 | 31 |
| 36 | 32 | 33 | 30.5 |
| 35 | 31 | 32 | 30 |
| 34 | 30 | 31 | 29.5 |
| 33 | 29 | 31 | 29 |
| 32 | 29 | 30 | 28.5 |
| 31 | 28 | 30 | 28.5 |
| 30 | 28 | 29 | 28 |
| 29 | 27 | 28 | 27.5 |
| 28 | 27 | 28 | 27 |
| 27 | 26 | 27 | 26.5 |
| 26 | 26 | 27 | 26.5 |
| 25 | 25 | 26 | 26 |
| 24 | 25 | 26 | 25.5 |
| 23 | 24 | 25 | 25 |
| 22 | 24 | 25 | 24.5 |
| 21 | 23 | 24 | 24 |
| 20 | 22 | 23 | 23.5 |
| 19 | 22 | 23 | 23 |
| 18 | 21 | 22 | 23 |
| 17 | 21 | 21 | 22.5 |
| 16 | 20 | 20 | 22 |
| 15 | 19 | 20 | 21.5 |
| 14 | 19 | 19 | 21 |
| 13 | 18 | 18 | 20 |
| 12 | 18 | 17 | 19.5 |
| 11 | 17 | 16 | 19 |
| 10 | 17 | 16 | 18 |
| 9 | 16 | 15 | 17.5 |
| 8 | 16 | 14 | 16.5 |
| 7 | 15 | 14 | 15.5 |
| 6 | 14 | 13 | 14.5 |
| 5 | 13 | 12 | 13.5 |
| 4 | 12 | 12 | 12.5 |
| 3 | 11 | 11 | 11.5 |
| 2 | 10 | 10 | 10 |
| 1 | 9 | 9 | 9 |
| 0 | 8 | 8 | 8 |

*Due to the unscored question (see page 11) on the Oct. 14 Test Form, the highest possible Raw Score for Math is 47.

### Wednesday, Oct. 25, Test Form

| Raw Score (# of correct answers) | Reading Test Score | Writing and Language Test Score | Math Test Score |
|---|---|---|---|
| 48 | | | 38 |
| 47 | 38 | | 37.5 |
| 46 | 37 | | 37 |
| 45 | 37 | | 36 |
| 44 | 36 | 38 | 35 |
| 43 | 36 | 37 | 34 |
| 42 | 35 | 37 | 33 |
| 41 | 34 | 36 | 32.5 |
| 40 | 34 | 35 | 31.5 |
| 39 | 33 | 34 | 31 |
| 38 | 33 | 33 | 30.5 |
| 37 | 32 | 33 | 30 |
| 36 | 31 | 32 | 29.5 |
| 35 | 31 | 31 | 29 |
| 34 | 30 | 31 | 29 |
| 33 | 29 | 30 | 28.5 |
| 32 | 29 | 30 | 28 |
| 31 | 28 | 29 | 27.5 |
| 30 | 27 | 29 | 27 |
| 29 | 27 | 28 | 26.5 |
| 28 | 26 | 28 | 26.5 |
| 27 | 26 | 27 | 26 |
| 26 | 25 | 27 | 25.5 |
| 25 | 25 | 26 | 25 |
| 24 | 24 | 25 | 24.5 |
| 23 | 23 | 25 | 24 |
| 22 | 23 | 24 | 24 |
| 21 | 22 | 23 | 23.5 |
| 20 | 21 | 22 | 23 |
| 19 | 21 | 21 | 22.5 |
| 18 | 20 | 21 | 22 |
| 17 | 20 | 20 | 21.5 |
| 16 | 19 | 19 | 21 |
| 15 | 19 | 18 | 20.5 |
| 14 | 18 | 17 | 20 |
| 13 | 18 | 17 | 19 |
| 12 | 17 | 16 | 18.5 |
| 11 | 17 | 15 | 18 |
| 10 | 16 | 15 | 17 |
| 9 | 16 | 14 | 16.5 |
| 8 | 15 | 14 | 15.5 |
| 7 | 14 | 13 | 14.5 |
| 6 | 13 | 12 | 13.5 |
| 5 | 12 | 12 | 12.5 |
| 4 | 11 | 11 | 11.5 |
| 3 | 11 | 10 | 10.5 |
| 2 | 10 | 9 | 10 |
| 1 | 9 | 9 | 9 |
| 0 | 8 | 8 | 8 |