

## Chapter 19

# Practice Test 9

# Reading Test

65 MINUTES, 52 QUESTIONS

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

## DIRECTIONS

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

### Questions 1–10 are based on the following passage.

This passage is adapted from *Revolutionary Road* by Richard Yates. ©1961 by Richard Yates.

With parched, hard-breathing mouths, with wobbling heads and shaking limbs, they settled themselves in the car like very old and tired people.

Line He started the engine and drove carefully away, down  
5 to the turn at the base of Revolutionary Hill and on up the winding blacktop grade of Revolutionary Road.

This was the way they had first come, two years ago, as cordially nodding passengers in the station wagon of Mrs. Helen Givings, the real-estate broker.  
10 She had been polite but guarded over the phone – so many city people were apt to come out and waste her time demanding impossible bargains – but from the moment they'd stepped off the train, as she would later tell her husband, she had recognized them as  
15 the kind of couple one did take a little trouble with, even in the low-price bracket. “They’re sweet,” she told her husband. “The girl is absolutely ravishing, and I think the boy must do something very brilliant in town – he’s very nice, rather reserved – and really, it  
20 is so refreshing to deal with people of that sort.” Mrs. Givings had understood at once that they wanted something out of the ordinary – a small remodeled barn or carriage house, or an old guest cottage – something with a little charm – and she did hate  
25 having to tell them that those things simply weren’t available any more. But she implored them not to lose heart; she did know of one little place they might like.

“Now of course it isn’t a very desirable road down at this end,” she explained, her glance twitching  
30 birdlike between the road and their pleased, attentive faces as she made the turn off Route Twelve. “As you see, it’s mostly these little cinderblocky, pickup-trucky places – plumbers, carpenters, little people of that sort. And then eventually” – she aimed the stiff pistol  
35 of her index finger straight through the windshield in fair warning, causing a number of metal bracelets to jingle and click against the steering wheel – “eventually it leads up and around to a perfectly dreadful new development called Revolutionary Hill Estates – great  
40 hulking split levels, all in the most nauseous pastels and dreadfully expensive too, I can’t think why. No, but the place I want to show you has absolutely no connection with that. One of our nice little local builders put it up right after the war, you see, before all the really awful building began. It’s really rather a sweet  
45 little house and a sweet little setting. Simple, clean lines, good lawns, marvelous for children. It’s right around this next curve, and you see the road is nicer along in here, isn’t it? Now you’ll see it – there. See the  
50 little white one? Sweet, isn’t it? The perky way it sits there on its little slope?”

“Oh yes,” April said as the house emerged through the spindly trunks of second-growth oak and slowly turned toward them, small and wooden, riding high  
55 on its naked concrete foundation, its outsized central window staring like a big black mirror. “Yes, I think it’s sort of – nice, don’t you, darling? Of course it does

CONTINUE

have the picture window; I guess there's no escaping that."

60 "I guess not," Frank said. "Still, I don't suppose one picture window is necessarily going to destroy our personalities."

"Oh, that's *marvelous*," Mrs. Givings cried, and her laughter enclosed them in a warm shelter of flattery  
65 as they rolled up the driveway and climbed out to have a look. She hovered near them, reassuring and protective, while they walked the naked floors of the house in whispering speculation. The place did have possibilities. Their sofa could go here and their  
70 big table there; their solid wall of books would take the curse off the picture window; a sparse, skillful arrangement of furniture would counteract the prim suburban look of this too-symmetrical living room. On the other hand, the very symmetry of the  
75 place was undeniably appealing – the fact that all its corners made right angles, that each of its floorboards lay straight and true, that its doors hung in perfect balance and closed without scraping in efficient clicks. Enjoying the light heft and feel of these doorknobs,  
80 they could fancy themselves at home here. Inspecting the flawless bathroom, they could sense the pleasure of steaming in its ample tub; they could see their children running barefoot down this hallway free of mildew and splinters and cockroaches and grit. It did have  
85 possibilities. The gathering disorder of their lives might still be sorted out and made to fit these rooms, among these trees; and what if it did take time? Who could be frightened in as wide and bright, as clean and quiet a house as this?

1

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

- A) the views of Helen Givings to those of Frank and April.
- B) an interaction between Frank and April to a monologue by Mrs. Givings.
- C) the description of a setting to an evaluation of the characters.
- D) tragic past events to possibilities of a hopeful future.

2

The main purpose of the first paragraph is to

- A) establish a mood that will be maintained throughout the passage.
- B) clarify the ages of the main characters through descriptive imagery.
- C) present circumstances that the rest of the passage explains.
- D) introduce a setting that is central to the passage.

3

Mrs. Givings's primary impression of her "cordially nodding passengers" (line 8) is that they

- A) are unusually troublesome clients.
- B) merit some degree of special attention.
- C) remind her of herself and her husband.
- D) project unique sophistication and charm.

4

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

- A) Lines 10–16 ("She had . . . bracket")
- B) Lines 20–26 ("Mrs. Givings . . . more")
- C) Lines 26–27 ("But she . . . like")
- D) Lines 41–43 ("No, but . . . that")

5

While describing Revolutionary Hill Estates, Mrs. Givings emphasizes the contrast between the

- A) quality of local homes with that of houses in other towns.
- B) appearance of one house and that of the nearby homes.
- C) affordability of one home and the luxury of another nearby.
- D) lifestyles of plumbers and those of her more affluent clients.



6

Which choice best supports the conclusion that Mrs. Givings prefers older homes?

- A) Lines 28–31 (“Now of . . . Twelve”)
- B) Lines 31–41 (“As you . . . why”)
- C) Lines 43–45 (“One of . . . began”)
- D) Lines 47–50 (“It’s right...isn’t it”)

7

It can be reasonably inferred that Frank and April find the “central window” (lines 55–56) to be

- A) an aesthetically pleasing piece of architecture.
- B) a matter of potential disagreement between them.
- C) overly symmetrical but ultimately appealing.
- D) out of proportion with other features of the house.

8

The primary impression created by the narrator’s description of Mrs. Givings in lines 63–68 (“Oh . . . speculation”) is that she is

- A) formal and professional.
- B) amiable and amusing.
- C) anxious and compulsive.
- D) doting and attentive.

9

As used in line 80, “fancy” most nearly means

- A) elaborate.
- B) embellish.
- C) envision.
- D) enshrine.

10

The main idea of the last paragraph is that the new house

- A) can accommodate a great deal of furniture.
- B) incorporates perfect symmetry into its design.
- C) is somewhere Frank and April can imagine living.
- D) causes feelings of ambivalence in Frank and April.

**CONTINUE** 

**Questions 11–20 are based on the following passage and supplementary material.**

This passage is adapted from John Byers, et al, “The Groupon Effect on Yelp Ratings: A Root Cause Analysis.” Submitted to ACM EC ’12 ACM X, X, Article X (February 2012).

In previous work examining Groupon, we measured and evaluated aspects of Groupon’s operational strategy, as well as observed the impact of customer behaviors including word-of-mouth effects and how running a Groupon offer affects a merchant’s reputation. One specific finding that received significant interest and attention was that Yelp reviews that contained the word “Groupon” provided, on average, significantly lower ratings than reviews that did not, to the extent that it significantly lowered the average rating for businesses that used Groupon. In the original paper, we did not examine reasons to explain this finding, leaving it to future work. Our analysis met with a variety of reactions, ranging from disbelief, to a number of plausible explanations for why this phenomenon should be expected: for example, Groupon users are fussy reviewers, Groupon businesses provide worse service than their peers, businesses discriminate by providing worse service specifically to Groupon customers, and Groupon users are less of a good fit for the businesses where they redeem Groupons.

In this paper, we return to our finding of a sharp decline in Yelp ratings scores that coincides with Groupon offers, a phenomenon we term the *Groupon effect*, and consider possible explanations through the lens of data analysis, based on an extensive dataset we gathered from Groupon and Yelp. Through this undertaking, we learn significantly more about the daily deals model, including the behavior of Groupon users and businesses. *A priori*, one or more of the suggested explanations might be valid, and as such we examine where data provides positive and negative evidence for each.

However, we also suggest and provide evidence for an alternative explanation that we have not heard previously. It is well known that a potential problem with review sites is that businesses may actively solicit positive reviews for their business, either through unscrupulous means such as hiring people to write positive reviews for them, or by less questionable means such as encouraging reviews from obviously

enthusiastic customers. (In some cases, they may also attempt to place negative reviews for their competitors, although this is arguably a less effective strategy.) Indeed, Yelp filters its reviews to prevent “spam reviews” from affecting its ratings.

Our hypothesis is that one reason for the discrepancy in review scores is that reviews that mention Groupon correspond almost exclusively to reviews written by actual customers who use the service, and that other reviews are significantly more likely to be “fake” or otherwise introduced in an arguably artificial manner. Hence, we suggest that, at least in part, the issue is not that reviews mentioning Groupon are somehow unusually low, but that the baseline of other reviews is on average artificially high, most likely because of actions taken by businesses designed specifically to generate high-scoring reviews.

We investigate the question of whether one class of reviewers is generally more critical than another. A more critical class of reviewers would review all businesses more critically on average, irrespective of whether they ran a Groupon. The fairest comparison to isolate this effect is to compare evaluation on non-Groupon businesses. The results are surprising. We do not see strong evidence that Groupon reviewers are much more critical on average. Instead, they are more moderate! They provide fewer 1- and 5-star ratings than their non-Groupon counterparts and more 3- and 4-star ratings.

Our interpretation is that this evidence strongly points not to critical reviewers, but to unrealized expectations between reviewers and merchants. Moreover, while this mismatch appears to occur relatively infrequently, when it does occur, the result is a much more negative review than is typical for that reviewer.

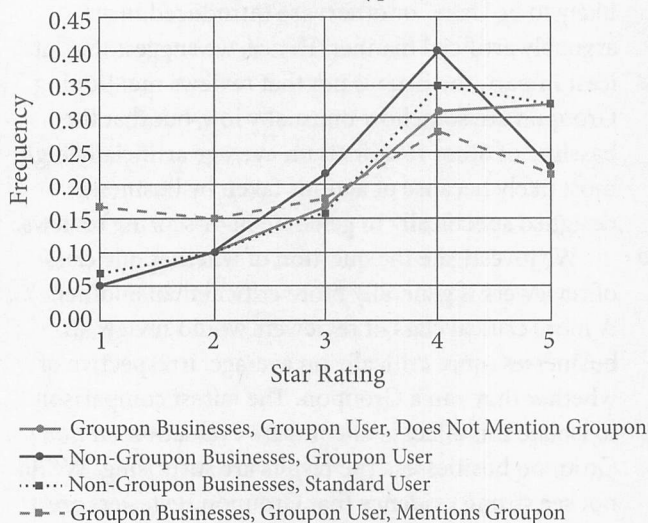
We have examined a number of hypotheses for explaining what we have dubbed the Groupon effect. While there remain challenges in trying to exactly quantify the different issues at play, we have shown that a combination of poor business behavior, Groupon user experimentation, and an artificially high baseline all play a role.

Our compilation of evidence about Groupon users highlights that on average, Groupon users provide detailed reviews that are valued more highly by their Yelp peers. Contrary to what some would believe, the

**CONTINUE** 

- 90 evidence suggests that Groupon users are no more critical than their peers, although they may well be experimenting with a new business when using a Groupon. Although it seems obvious, we would advise businesses to treat Groupon customers as well as (or possibly better than?) their other customers to avoid negative reputational impact.

Distribution of Yelp Star-Ratings by User and Review Type



11

Over the course of the passage, the main focus shifts from describing a known phenomenon and potential theories for its existence to

- an evaluation of evidence that addresses the possibility of several hypotheses.
- an explanation of the method used to detect the original observation.
- a critical review of the research and its implicit results.
- an absolute reason for the previously identified dynamic.

12

The authors of the passage suggest that the *Groupon effect* may be defined by

- ascribing great importance to Yelp ratings instead of multiple reviews.
- combining disparate causes rather than just a single factor.
- providing “spam reviews” more often than honest customer opinions.
- speculating about Groupon users’ behavior as compared to that of the general public.

13

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

- Lines 29–31 (“we learn . . . businesses”)
- Lines 43–45 (“In some . . . strategy”)
- Lines 72–74 (“Our interpretation . . . merchants”)
- Lines 81–85 (“While . . . role”)

14

As used in line 53, “fake” most nearly means

- plastic.
- imaginary.
- counterfeit.
- planted.

15

Which action would best address a concern regarding the introduction of artificial Yelp reviews?

- Requiring a verifiable receipt image to submit a review
- Decreasing the scale from five stars to three stars
- Implementing baseline ratings for online businesses
- Soliciting only positive opinions of participating businesses

CONTINUE 

16

Which choice best describes the “unrealized expectations” (lines 73–74)?

- A) Lines 1–5 (“we measured . . . effects”)
- B) Lines 17–22 (“Groupon . . . Groupons”)
- C) Lines 37–43 (“It is . . . customers”)
- D) Lines 86–89 (“Our compilation . . . peers”)

17

As used in line 86, “compilation” most nearly means

- A) collection.
- B) summary.
- C) anthology.
- D) yearbook.

18

According to the figure, which category of Yelp user showed the most evenly distributed star ratings?

- A) Standard users of non-Groupon businesses
- B) Groupon users of Groupon businesses who mention Groupon
- C) Groupon users of Groupon businesses who do not mention Groupon
- D) Groupon users of non-Groupon businesses

19

In the figure, which Yelp rating is a non-Groupon user most likely to give a business?

- A) 1 star
- B) 2 stars
- C) 4 stars
- D) 5 stars

20

Data presented in the figure most directly supports which idea from the passage?

- A) The patterns of Yelp star ratings are directly correlated to the type of business the customers are patronizing.
- B) The customers most likely to post reviews on Yelp are those that produce “spam reviews.”
- C) The Yelp scores of Groupon users are more moderate than non-Groupon user reviews of the same businesses.
- D) The number of Groupon mentions in a review directly correlates with the relative ranking of that review.



**Questions 21–31 are based on the following passage.**

This passage is adapted from Malcolm Macleod, “Some Salt with Your Statin, Professor?” ©2014 by PLOS Biology.

We know that clinical trials sponsored by the pharmaceutical industry are likely to exaggerate benefit and minimize harms. But do these biases extend to their sponsorship of non-human animal research?

5 Are the findings of such studies credible? And how do those findings compare with “proper” research conducted by dispassionate academics?

10 These are important questions, but how could we find this stuff out? In the same way that it would be difficult to conduct a randomized controlled trial of the effect of living in Scotland on your chance of having a stroke, it is difficult to do an experiment to test whether the funding source for a study influences the outcome. Since clinical trials sponsored by the pharmaceutical industry seem to be at greater risk of bias than others, a lazy assumption might be that their non-human animal research is similarly confounded, as they seek to rush compounds to market to maximize profitability.

20 However, a few straws in the wind hint this might not be the case. One way companies identify drug targets is by reading what’s out there in the literature and, if something looks interesting, seeking to replicate the findings. Bayer scientists found inconsistencies in 43 of 65 studies when they tried to replicate them in-house. Implementation of good laboratory practice standards is much more advanced in industry labs, and for some types of experiments these standards are a legal requirement. So, could it be that industry-sponsored research is actually more rigorous than academic research?

35 Taking the example of statin treatments for atheroma, David Krauth, Andrew Anglemyer, Rose Philipps, and Lisa Bero address this issue head-on. Using systematic review, they identified non-human animal studies describing the efficacy of statins. Focusing on those studies where sponsorship status was known, they found that the results of nine of 19 industry-sponsored studies (43%) and 18 of 28 non-industry-sponsored studies (72%) supported

the efficacy of statins. As interesting, however, is the analysis of the interpretation placed on the findings in each of the included studies. Of 19 industry-sponsored studies, the conclusion of 18 favored the use of statins (95%), while of 28 non-industry-sponsored studies, only 21 did so (75%).

45 It does therefore appear that findings from research sponsored by industry are more conservative than those sponsored by non-industry sources, but the interpretation of those data is, in contrast, less conservative. Why might this be?

50 In my view it is likely that the impact of approaches to research management and the regulatory environment that apply to some parts of industry—particularly standards for internal reporting—extends to most of the non-human animal research activity with which they are involved, whether or not it is performed in-house. That is, non-human animal work sponsored by industry is likely to be performed and reported to a higher quality, and to be at lower risk of bias, than work sponsored by others. This would explain the difficulty industry has in replicating the results of research conducted in academic labs. However, the interpretation, or “spin,” with which industry-sponsored work is presented does appear to be an issue, with exaggeration of the conclusions to favor the drug being tested.

65 This makes sense—for industry there is a clear financial interest in being absolutely secure in the non-human animal data for a compound before embarking on a clinical trial, so there is a real motivation to get the preclinical data as good as they can be. But when that money has been spent (and for statins it largely has been), the motivation is to present an analysis of the available data that is most supportive for clinical use. So, if a drug is a turkey, try to find that out before spending a fortune taking it to clinical trial—and if it’s too late for that, try to convince everyone that the non-human animal and clinical trial data supporting an efficacy for *Meleagris gallopavo* (commonly known as the wild turkey) are more convincing than they might at first appear.

**CONTINUE** 



21

As used in line 3, “extend” most nearly means

- A) reach.
- B) require.
- C) apply.
- D) stretch.

22

The questions posed in lines 3–7 are chiefly intended to

- A) introduce a set of considerations that may not have been investigated in prior research.
- B) show confusion about the nature of results provided by similar forms of research.
- C) declare that non-human animal research is an improper method of conducting trials.
- D) stir controversy about the quality of research performed by academics.

23

Which question was the research of Bero’s team primarily intended to answer?

- A) Does industry-sponsored research make it more difficult to analyze statins than academic research sponsored by non-industry sources?
- B) Do experiments funded by invested corporations get performed with a greater level of attention to detail than those that are not?
- C) What prevents industry-sponsored research from being conducted with the same level of rigor as academic research?
- D) Does non-human animal research funded by industry sources lead to fewer clinical trials than research performed by academics?

24

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

- A) Lines 29–31 (“So, could . . . research”)
- B) Lines 32–34 (“Taking . . . head-on”)
- C) Lines 37–41 (“Focusing . . . statins”)
- D) Lines 61–63 (“This . . . labs”)

25

The main purpose of the fourth paragraph (lines 32–46) is to

- A) question the implications of the surprising findings of Bero’s team.
- B) note significant results of Bero’s team’s study regarding sources of research.
- C) shift from a description of Bero’s team’s study to an overview of a question.
- D) connect research performed on human subjects to research performed on non-human animals.

26

As used in line 48, “conservative” most nearly means

- A) old-fashioned.
- B) dramatic.
- C) traditional.
- D) reserved.

27

According to the passage, when compared to non-human animal research sponsored by industry, the non-human research sponsored by others

- A) shows a lower risk of bias.
- B) is easier to accurately reproduce in clinical trials.
- C) is not always performed at as high a quality.
- D) costs more to complete.

**CONTINUE** 

28

According to the passage, the findings of Bero's team are surprising because they

- A) give support to an obvious conclusion.
- B) apparently contradict a sensible assumption.
- C) undermine the studies of clinical trials.
- D) confirm the existence of unknown statistics.

29

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

- A) Lines 24–26 (“Bayer . . . in-house”)
- B) Lines 43–46 (“Of 19 . . . (75%)”)
- C) Lines 47–51 (“It does . . . be”)
- D) Lines 64–67 (“However . . . tested”)

30

The author of the passage would most likely agree that industry-sponsored research may be rigorous because it

- A) applies standards of internal reporting to employees who cut corners.
- B) hires scientists who excel in their respective fields.
- C) risks scrutiny from legislators if it fails to adhere to adequate standards.
- D) utilizes elements of documentation that are also applied to purposes other than research.

31

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

- A) Lines 21–24 (“One way . . . findings”)
- B) Lines 35–36 (“Using . . . statins”)
- C) Lines 41–43 (“As interesting . . . studies”)
- D) Lines 52–58 (“In my . . . in-house”)



**Questions 32–42 are based on the following passages.**

Passage 1 is adapted from P. G. Hubert, "Occupations for Women," originally published in 1894. Passage 2 is adapted from Virginia Penny, *Think and Act*, originally published in 1869.

**Passage 1**

The fact that women are paid less than men for apparently the same service seems to disturb a great many people, who find here a conspiracy upon the part of man to keep women out of the wage-earning field so far as this can be done. The maxim, "Business is business," applies here with as much force as anywhere. Both men and women earn, as a rule, just what they are worth. The law of supply and demand comes into play as relentlessly here as elsewhere. If a woman wants more money than a man, she has only to do better and more work in the long run than the man, and she will get more pay as surely as business rules remain in force in the business world.

There are some reasons for the apparent discrepancy between the pay of men and women, which may serve to clear away some of the false impressions that have grown up about this question. In the first place, women as a class of workers are beginners, comparatively speaking, in the great field of industry; they lack the hereditary instinct for such work, and as beginners their wages are low. Woman's preparation for work is seldom so thorough as with a man, and long technical training for any work is often considered superfluous for a woman because she may marry. Even should she remain a wage earner, the woman has seldom the strong incentive of others dependent upon her; the man has a wife and children who will suffer, should he relax his efforts; the woman is usually alone.

A curious feature of work by women is that, while in this century and in America work and money-earning have always been considered to be proper in every way for men, there is still some slight social stigma pertaining to money-getting by women. This may be trusted to die out as fast as women show that they can retain all the most attractive attributes of womanhood and yet earn their own living.

The old-time fiction to the effect that woman was a tender flower, blooming only when sheltered from the world, and likely either to droop or lose its fragrance when brought into contact with a vulgar, work-a-day, money-grubbing world, has been called into question before now. Some eminent thinkers and essayists, such as Mr. Frederic Harrison, the English writer, dread the effect of political, professional, and business life upon woman. They fear the appearance of the mannish woman upon the scene.

**Passage 2**

In woman's work and wages the times are a century or more behind the improvements made in science and art. Society is tardy, dragging, in the matter. A woman may be defined to be a creature that receives half price for all she does, and pays full price for all she needs. She earns as a child—she pays as a man. Besides, her sex, if not barbarous custom, cuts her off from the best rewarded colleges. Her hands, feet, and brain are clogged. We ask our readers to pause and inquire if this is not true.

It requires just as much to support a woman as a man. Her dress requires more. Often infirm, sick, or aged parents are relying on her for a support, or, it may be, orphan brothers and sisters. Or, even if it were not so, a woman needs to lay up something for times of sickness, old age, and want of employment, as well as a man. When men and women are employed in the same establishments, women have not the lightest, most healthy, and most pleasant parts of the labor. They have the hardest, worst paid, and most unhealthy work. In civilized countries it is a remnant of the former degradation of the sex. Over-work and under-pay are the curse of workwomen. While they last, the poverty, and suffering, of women, will continue.

To pay women better prices for labor will give it a dignity in public estimation. The effect will prove beneficial not only to workers, pecuniarily and socially, but its influence will extend to those indirectly affected. If women were paid in proportion to the quality and quantity of their work, at the same rate that men are paid, there could be no reasonable objection to women entering any occupation they desire to. It is unmanly and unjust to cut short a woman's wages merely because she is a woman.

**CONTINUE** 

32

In Passage 1, Hubert makes which point about working women relative to working men?

- A) Women make disturbingly less than men, and women also supply more conspiracies than men.
- B) Women are able to earn as much as men, but women choose to become parents more often than men.
- C) Women are newer to the workforce than men, and women have less training than men.
- D) Women can currently perform as well as men, but women receive less pay than men.

33

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

- A) Lines 1–5 (“The fact . . . done”)
- B) Lines 18–25 (“In the . . . marry”)
- C) Lines 25–29 (“Even . . . alone”)
- D) Lines 30–34 (“A curious . . . women”)

34

In Passage 1, Hubert implies that the wage gap between women and men is

- A) inevitable, because women’s genes do not prepare them for the same work as men’s.
- B) avoidable, because women and men can either support themselves or marry.
- C) misunderstood, because workers are paid based on experience.
- D) regrettable, because women and men deserve fair treatment in the working world.

35

As used in line 28, “relax” most nearly means

- A) lessen.
- B) chill.
- C) recuperate.
- D) calm.

36

As used in line 30, “curious” most nearly means

- A) interested.
- B) nosy.
- C) mischievous.
- D) peculiar.

37

What is Penny’s central claim in Passage 2?

- A) Women must protest the gender-based wage gap.
- B) Society should progress by reducing the gender-based wage gap.
- C) Women should not have to pay full price when they are paid half price.
- D) Societies that underpay women while overpaying men will be punished.

38

In Passage 2, Penny makes which point about women’s working conditions?

- A) They are similar to the working conditions of children.
- B) They may involve lighter tasks than those expected of men in similar jobs.
- C) They can involve harder and less pleasant tasks than men are asked to do.
- D) They have been improved through acts of civil disobedience.



39

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

- A) Line 50 (“Society . . . matter”)
- B) Lines 59–61 (“Often . . . sisters”)
- C) Lines 64–66 (“When . . . labor”)
- D) Lines 73–75 (“The effect . . . affected”)

40

Which choice best states the relationship between the two passages?

- A) Passage 2 promotes several theories offered in Passage 1.
- B) Passage 2 outlines the results of a plan defended in Passage 1.
- C) Passage 2 supports changing a discrepancy discussed in Passage 1.
- D) Passage 2 offers reasons for a view presented in Passage 1.

41

Based on the passages, both authors would agree with which of the following claims?

- A) Businesses often overwork and underpay women.
- B) Social disapproval of working women may decline over time.
- C) The wage gap between men and women is more apparent than real.
- D) Educated women should earn higher salaries.

42

Hubert would most likely have reacted to lines 72–73 (“To pay . . . estimation”) of Passage 2 with

- A) disagreement, because men and women are paid fairly according to the labor market.
- B) panic, because affirmative action amounts to reverse discrimination.
- C) empathy, because women deserve this sort of respect as much as men do.
- D) elation, because pay raises for working women will remove the stigma that working women currently suffer from.


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**Question 43–52 are based on the following passage and supplementary material.**

This passage is excerpted from Jane Smith, “Desalination: Is It Really Sustainable?” ©2021 by Jane Smith.

When it comes to our species, nobody would disagree that clean drinking water is essential. It’s so elemental to human life that people never challenge the government regulation of this utility, even when they call for resistance to public regulation of other essentials. Clean drinking water allows us to maintain many aspects of public health, which include all the great strides that have been made since the turn of the last century. In a world of rising temperatures, access to clean water is the best way to guarantee a decent quality of life. Everybody in the developing and developed world would agree.

For centuries, relying on traditional sources of water, such as rainfall, has served most of the world well. This has become even easier to do for many regions in the world that are experiencing higher rates of precipitation. According to the National Centers for Environmental Information, 2019 was the second-wettest year in the history of the United States, specifically in the Great Plains and Great Lakes regions. Thanks to climate change, rainfall in Puerto Rico has increased by 33 percent during heavy storms alone. All this added moisture, combined with longer growing seasons owing to higher average yearly temperatures, might seem to contribute to a more stable food supply as well.

But that’s not how most advocates of desalination view the changes occurring in the earth’s climate. They have embraced desalination as a godsend that is better for the species—making drinkable the vast amounts of saltwater encircling the globe—than depending on what they view as unstable sources of natural water. Noting the increasing municipal, agricultural, and industrial need for fresh water, its proponents cite a recent study concluding that, by 2071, half of the 204 freshwater basins in the United States may be unable to meet demands. In contrast, there are currently 1400 desalination plants in the US alone—and all of them treat the ocean water, brackish water, and wastewater that would otherwise be undrinkable.

However, a new study looking at the numbers shows the hard truth: desalination is expensive.

Desalinated water costs about \$2000 per acre foot, which is enough water for a family of five to use in one year. This is four times more expensive than other methods of reducing dependence on traditional water supply, such as giving rebates to homeowners to purchase more efficient toilets, sinks, and showers—and that means that increased desalination may not mean the end of water scarcity.

A study by the Advisian Worley Group analyzed the various factors that contribute to the expense of these desalination plants. It found that the two types of technology used in the process—either thermal or membrane—cost wildly different amounts. Other factors that need to be considered include the location of the plants, the raw water quality, the type of intake and outfall, and others. Furthermore, because of the complexity of the variables, the report advised that it was nearly impossible to make predictions about future costs of desalination.

The main difference between traditional water sourcing and desalination is consistency. In places such as California, having a reliable source of water—even if it is expensive—is sometimes seen as preferable to relying upon melted snowpack from the Sierra Nevada Mountains, or piped-in water from the Colorado River. When we discuss the growing popularity of desalination plants, we’re really discussing stability.

And traditional water sources are by no means problem-free. Flooding that accompanies once-in-a-century climate events—which are now occurring much more often than that—pollutes watersheds. Many lakes, rivers, and wetlands are being overexploited by human activity and are declining at a rapid rate. Runoff from agriculture is damaging local water supplies. In short, having a lot of fresh water in one’s community is no guarantee, in the twenty-first century, that it will be drinkable.

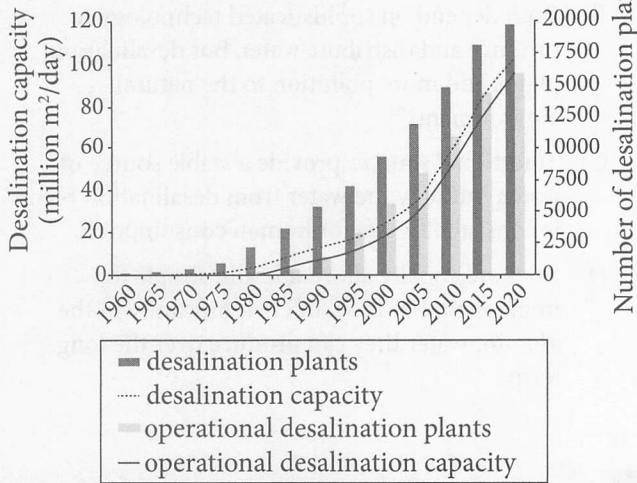
All of this simply means that there are a lot of trade-offs. While desalination is more consistent, its cost and relatively small output leads us to conclude that it will be difficult to ever rely fully upon it. In fact, the ideal national water system may borrow from both systems, as different regions of the world consider their own particular needs before subscribing to a top-down

**CONTINUE** 

order from an overarching body. A one-size-fits-all model may have worked in the past, but like the energy grid, the new century may force cities and states to rely upon a patchwork of different solutions.

**Figure 1**

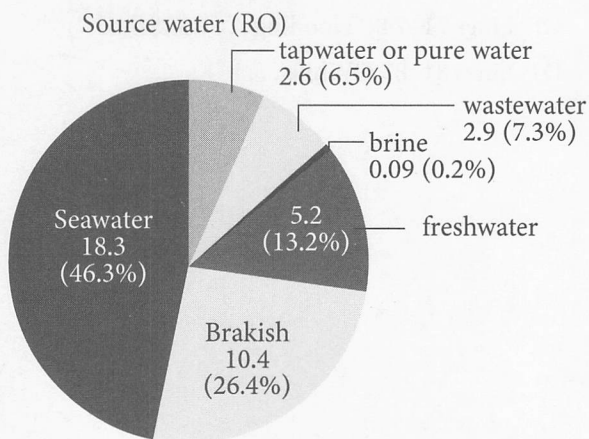
Growth of Desalination Globally, 1960–2020



Published by DesalData, the Worldwide Desalination Inventory in 2013.

**Figure 2**

Water Sources for Reverse Osmosis Desalination



Published by DesalData, the Worldwide Desalination Inventory in 2013.

The global reverse osmosis desalination capacity (in millions of cubic meters per day) as of June 2013 with regards to source water.

43

According to the passage, one advantage of acquiring water from traditional sources is that they

- A) provide high-quality water for drinking and cooking.
- B) are sufficient to meet the global demand.
- C) are readily accessible in many regions.
- D) lessen the demand for desalination plants.

44

As used in line 26, “stable” most nearly means

- A) balanced.
- B) rational.
- C) dependable.
- D) fixed.

45

Which choice best reflects the perspective of the “advocates” (line 27) on traditional water sources?

- A) They are readily available in many regions and essential for public health.
- B) They are not reliable and may not meet people’s need for water.
- C) They are able to provide a stable supply only temporarily.
- D) They depend on climate change but are cost-effective.

46

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

- A) Lines 27–28 (“But that’s . . . climate”).
- B) Lines 28–32 (“They . . . water”)
- C) Lines 41–42 (“However . . . expensive”)
- D) Lines 62–63 (“The main . . . consistency”)

CONTINUE

47

According to the Advisian Worley Group (line 51), the desalination process

- A) varies based on the amount of water supplied and local demand.
- B) is impacted by the quality of the equipment used.
- C) may involve unforeseen investments due to its variable components.
- D) varies in cost primarily according to plant location.

48

As used in line 57, “raw” most nearly means

- A) unprocessed.
- B) inexperienced.
- C) unchecked.
- D) underdone.

49

Which statement best expresses a relationship between traditional sources of water and desalination that is presented in the passage?

- A) While traditional water sources provide larger quantities of water at a lower cost, desalination offers a more reliable source.
- B) Both depend on sophisticated technology to produce and distribute water, but desalination plants add more pollution to the natural environment.
- C) Traditional sources provide a stable source of water, but only the water from desalination plants is consistently safe for human consumption.
- D) Both are equally affordable and simple to implement, but they differ significantly in the amount water they can produce over the long term.

50

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

- A) Lines 1–2 (“When . . . essential”)
- B) Lines 58–61 (“Furthermore . . . desalination”)
- C) Lines 71–74 (“Flooding . . . watersheds”)
- D) Lines 81–83 (“While . . . it”)


 CONTINUE 



51

Which statement about reverse osmosis desalination capacity in 2013 is best supported by the information provided in figure 2?

- A) Seawater yielded 46.3 million cubic meters of water per day.
- B) The desalination capacity from brine was greater than that from wastewater.
- C) Reverse osmosis desalination was most commonly used to remove salt from water extracted from the ocean.
- D) Tap water and pure water together made up 2.6% of the global desalination capacity.

52

Which of the following claims is supported by figure 1?

- A) Although desalination is not running at its full capacity, the growth of desalination has been steady since 1960.
- B) Operational desalination capacity in 2020 was less than 17,500 cubic meters per day.
- C) The number of operational desalination plants was more than 40 for the first time in 2005.
- D) Desalination capacity exceeded operational desalination capacity by approximately 20 million cubic meters per day in 2010.

**STOP**

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

# Writing and Language Test

35 MINUTES, 44 QUESTIONS

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

## 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.

### Lions and Tigers and... Deer?

A large majority of the six million auto accidents each year are preventable. Many are caused by the traditional risks, like cell phone use, drunk driving, or excessive speed. **1**

1

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

Statistics show that people are 23 times more likely to be involved in collisions when they are texting and driving.

Should the writer make this addition here?

- A) Yes, because it provides a useful transition from the previous sentence to the next.
- B) Yes, because it provides evidence for a claim made in the paragraph's first sentence.
- C) No, because it gives a detail that contradicts the paragraph's main focus.
- D) No, because it deviates from the paragraph's main topic and argument.

CONTINUE 

A recent set of research findings, however, 2 has been suggesting that nearly one-sixth of these accidents could be prevented by a single factor: mountain lions.

3 We probably want to start conjuring funny images of mountain lions with speed guns or a taste for cell phones. Before we do that, let's back up a bit. The fact is that nearly 1.2 million collisions each year occur between automobiles and deer. 4 The eastern part of the United States is at a special risk for these collisions because deer tend to roam freely and plentifully around the region. For all their adaptations to human life, deer have not developed a way to deal with traffic. If you drive regularly in the northeast, you know that the proof is usually on the side of the road.

2

- A) NO CHANGE
- B) would suggest
- C) have suggested
- D) suggests

3

Which choice most effectively combines the underlined sentences?

- A) Before we start conjuring funny images of mountain lions with speed guns or a taste for cell phones, let's back up a bit.
- B) Let's back up a bit before we start conjuring images like the funny ones we want of mountain lions with speed guns or a taste for cell phones.
- C) We probably want to start conjuring funny images of mountain lions with speed guns or a taste for cell phones; before we do that, however, let's back up a bit.
- D) Let's back up a bit before we can talk about mountain lions with speed guns and a taste for cell phones that we conjured in funny ways.

4

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

- A) Kept, because it provides a detail that explains the statistic given in the previous sentence.
- B) Kept, because it helps to explain why car travel is so dangerous in the United States.
- C) Deleted, because it skews the passage's focus on the more serious causes of auto accidents.
- D) Deleted, because it undermines the passage's claim that deer are useful members of an ecosystem.

**CONTINUE** 

[1] Part of the reason that deer populations have grown as much as **5** they have is that deer face no natural predators in the eastern states. [2] Large-scale development and hunting have eliminated this threat. [3] In areas where these predators continue to exist, such as California, deer-related collisions are significantly lower. [4] Deer are thus able to reproduce without restriction.

6

For a kind of natural solution to this problem, University of Washington wildlife biologist Laura Pugh has proposed reintroducing mountain lions into ecosystems along the eastern seaboard. The shock for the carnivorous cats would not be so significant because these species of mountain lion are actually indigenous to the area. Pugh **7** opines the mountain lion populations of the west as evidence **8** that these big cats “can coexist in close proximity with people, with very few conflicts.”

5

- A) NO CHANGE
- B) we have
- C) it has
- D) one has

6

To make this paragraph most logical, sentence 4 should be placed

- A) before sentence 1.
- B) after sentence 1.
- C) after sentence 2.
- D) where it is now.

7

- A) NO CHANGE
- B) cites
- C) says
- D) proclaims

8

- A) NO CHANGE
- B) or
- C) which
- D) when



Obviously, it will be difficult to get public sentiment on her side. The thought of encountering mountain lions in the wild chills most of us to the bone, and it doesn't seem that introducing this fierce animal back into the wild would be beneficial enough to offset its terrorizing costs.

**9** Therefore, Pugh and her team say, these predators could save approximately five times as many people from deer-related deaths as they might endanger through unprovoked attacks.

The question now is whether the data are **10** sufficiently overcoming public concerns. If we've accepted the risks of driving tons of metal many miles an hour down the road, is it possible that **11** our fear of mountain lions could be the next human instinct to be cast aside?

9

- A) NO CHANGE
- B) Still,
- C) Inevitably,
- D) Furthermore,

10

- A) NO CHANGE
- B) a good amount in overcoming
- C) enough to overcome
- D) enough for overcoming

11

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

**CONTINUE** 

Questions 12–22 are based on the following passage.

### The Original Music of New Orleans

The city of New Orleans, Louisiana, has always been a kind of national treasure with **12** routes in French, American, African, and indigenous cultures. This has become even more apparent since 2005, when Hurricane Katrina nearly wiped the city off the map.

**13** For example, Katrina brought new attention to the city, demonstrating how much would be lost if New Orleans were to disappear.

While the city has always been praised as the place to “let the good times roll,” its status in the popular imagination has changed significantly over the years and **14** shifts with broader national interests. Today, for instance, New Orleans is seen as the birthplace of jazz music. **15** Louis Armstrong was born in New Orleans in 1901 and began playing trumpet at an early age. The annual Jazzfest celebrates this heritage, and groups like the New Orleans Preservation Hall Jazz Band continue to commemorate the long tradition of jazz in the city.

12

- A) NO CHANGE
- B) roots in
- C) roots of
- D) routes of

13

- A) NO CHANGE
- B) However,
- C) Thus,
- D) DELETE the underlined portion.

14

- A) NO CHANGE
- B) have shifted
- C) shifted
- D) shifting

15

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

- A) Kept, because it supports the passage’s claim that jazz is a significant part of musical history.
- B) Kept, because it adds a crucial detail about a resident of New Orleans that supports the passage’s main idea.
- C) Deleted, because it suggests that the type of music discussed in the passage is insignificant.
- D) Deleted, because it introduces a piece of information that is only vaguely related to the paragraph’s main idea.

CONTINUE 

The musical history of New Orleans does not stop here, however. In a way, jazz gets the attention because it is a kind of national **16** music has roots all over the American South, the East Coast, and the Midwest. But there is at least one style of music that is unique to New Orleans and the areas to the south: zydeco. **17** Some people find this name curious, and you may be one of them. If you are, you're not alone. Scholars disagree on its origins, though most believe that it comes from some combination of words in creole French, the dialect spoken by the early European settlers of Louisiana.

Wherever the name comes from, one of its earliest recorded uses is on the 1929 recording "It Ain't Gonna Rain No' Mo'" by the Zydeco Skillet Lickers. This song is one of the earliest examples of a genre that has **18** remained and impressively stayed both durable and adaptable with the changing times and technologies. Early zydeco music was primarily performed with a button or piano accordion and a washboard, and it was **19** influenced by the polkas and waltzes of the late nineteenth century.

16

- A) NO CHANGE
- B) music that it has
- C) music, with
- D) music, which

17

Which choice most effectively combines the underlined sentences?

- A) Finding this name curious as many people do means that you're not alone.
- B) If you find this name curious, you're not alone.
- C) You're not alone if you find this name a curious one like many people.
- D) Like many people who find this name curious, you're not alone if you do.

18

- A) NO CHANGE
- B) remained, impressively stayed
- C) remained
- D) remained and stayed

19

- A) NO CHANGE
- B) influenced, by the polkas and waltzes,
- C) influenced by the polkas and waltzes—
- D) influenced by the polkas and waltzes,



The form changed throughout the twentieth century, perhaps crystallizing in the work of the “King of Zydeco” Clifton **20** Chenier. Today, groups like **21** BeauSoleil continue to help zydeco to evolve, incorporating rock and country influences as well. As a testament to the endurance and popularity of zydeco music, the Grammys even introduced a new category in 2007: Best Zydeco or Cajun Music Album.

Zydeco is a pleasure to listen to, but it is just as important as a cultural **22** memorial. Indeed, zydeco provides an important reminder that a region is never merely defined by its most popular exports. Lots of things go into creating “local color,” and the “local” in any place is much richer than we typically recognize.

20

Which choice adds the most relevant supporting information to the paragraph?

- A) Chenier, born in the Creole-French speaking town of Opelousas, Louisiana.
- B) Chenier, who infused the uptempo music with blues and jazz from the region.
- C) Chenier; he is best known for how well he played the accordion and once won a Grammy.
- D) Chenier, who was greatly respected at the time of his death in 1987.

21

- A) NO CHANGE
- B) BeauSoleil continue to help zydeco, to evolve
- C) BeauSoleil continue, to help zydeco, to evolve
- D) BeauSoleil, continue to help zydeco to evolve,

22

- A) NO CHANGE
- B) agreement.
- C) victory.
- D) artifact.


 CONTINUE



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

### Between Land and Sea

The separation between land and water seems a relatively simple one. Land is for walking, for cars, and for trains, whereas water is for swimming, for bathing, and for ships. The two come into contact in riverbeds, on banks, and on beaches, but the separation between them is clear.

Or is it?

**23** Excavations in San Francisco, conducted over the past fifty years have revealed that the boundary between land and water is not so distinct. Digging into the surface of San Francisco's downtown Financial District has unearthed some unlikely building foundations: ships.

**24** In fact, one of the tunnels for San Francisco's subway system, the BART, passes right through one of these interred ships. How did those massive vessels all get down there?

**25** The answer may seem counterintuitive. San Francisco manufactured a bit of its land. If this seems odd, consider that many cities throughout the world—among them Chicago, Singapore, and New York—have created landmasses in this way. The solution may seem bizarre until we consider that one of the major problem in cities is overcrowding. What better way to ease this problem than to create more land?

23

- A) NO CHANGE
- B) Excavations—in San Francisco conducted over the past fifty years—
- C) Excavations, in San Francisco conducted, over the past fifty years,
- D) Excavations in San Francisco conducted over the past fifty years

24

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

The area that was to become San Francisco was for many years known as Yerba Buena.

Should the writer make this addition here?

- A) Yes, because it gives an interesting detail that delves further into San Francisco's history.
- B) Yes, because it explains why so many ships should be buried in San Francisco's downtown.
- C) No, because it obscures the focus of the passage by introducing a detail that does not have an obvious connection.
- D) No, because the passage is primarily concerned with the importance of mass transit in San Francisco.

25

Which choice most effectively combines the underlined sentences?

- A) San Francisco, an answer that may seem counterintuitive, manufactured some of its land.
- B) The answer may seem counterintuitive, so San Francisco manufactured some of its land.
- C) Even though the answer may be seeming counterintuitive, San Francisco was a place that manufactured some of its land.
- D) The answer may seem counterintuitive: San Francisco manufactured some of its land.

CONTINUE 

[1] One outgrowth of these recent discoveries has been a blurring of traditional scholarly boundaries. [2] Each of these disciplines has historically stuck to **26** its own area of expertise. [3] What happens, though, when geologists want to study landmasses containing man-made items such as ships and building fragments? [4] Both groups of experts are starting to work together on many projects, as it becomes clear that, particularly in the last 150 years, humans have shaped their natural environments to such an extent that nothing can be considered purely “natural” any longer. [5] For example, archaeology focused on human history, while geology concerned itself with natural history. **27**

Researchers have called this new layer of land the “archaeosphere.” **28** Because we may think of the ground as something that is relatively constant, the archaeosphere suggests that quite the opposite is true.

26

- A) NO CHANGE
- B) our
- C) their
- D) his

27

To make this paragraph most logical, sentence 5 should be placed

- A) where it is now.
- B) after sentence 1.
- C) after sentence 2.
- D) after sentence 3.

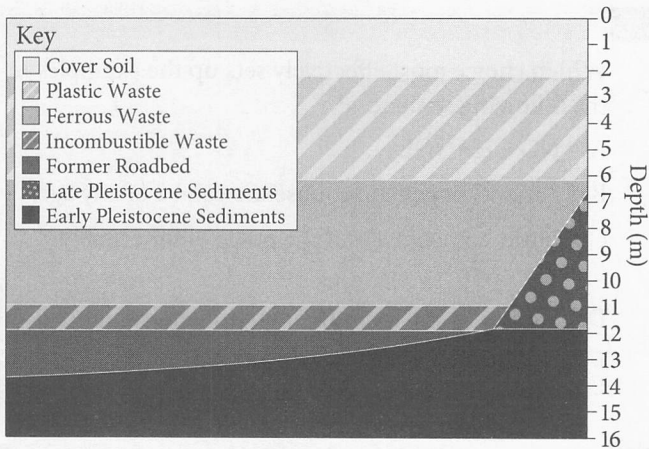
28

- A) NO CHANGE
- B) But
- C) While
- D) Since


 CONTINUE

On the one hand, this is disturbing because it shows that the solid ground **29** built on by them may not be so solid after all. On the other hand, the classification and study of the archaeosphere could be beneficial and not just for the work of archaeologists and geologists. **30** In a sense, some companies in Scandinavia have begun to mine the archaeosphere for **31** resources that may have been wasted or discarded in earlier ages. Perhaps the world is not running out of resources in the way that we believed. Maybe it has instead found **32** its' own way to recycle those resources, and we just need to catch up.

Cross-section of Waste Deposits



Question **33** asks about the graphic.

**29**

- A) NO CHANGE
- B) they build on
- C) built on by us
- D) we build on

**30**

- A) NO CHANGE
- B) Nonetheless,
- C) For example,
- D) Therefore,

**31**

- A) NO CHANGE
- B) resources to have been
- C) resources, they have been
- D) resources, being

**32**

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

**33**

Which choice offers an accurate interpretation of the data in the figure?

- A) The cover soil is made up primarily of human and industrial waste products.
- B) The soil as deep as 14 meters below the surface contains traces of human development.
- C) The soil above 14 meters deep is made up of approximately 75% human and industrial waste products.
- D) At depths of less than 10 meters below the surface, there is some human influence, but at depths greater than 10 meters, there is none.

CONTINUE

Questions 34–44 are based on the following passage.

### The Sequence

Advances in the medical sciences have saved countless lives and made the lives of many, even the seriously ill, much more **34** healthy and medical. Since the Human Genome Project declared its work complete in 2003, genetic sequencing has begun to reveal some of its most significant contributions, and the breadth of those contributions is likely to extend well beyond what is currently known.

**35** One affect, genetic sequencing, as it relates to family history and lifetime health, has spawned a whole new field of wellness. Genetic counseling enables expectant parents to estimate the risks of having children based on hereditary patterns. This growing field is primarily concerned with the transmission of potentially harmful genes from parents to their offspring. **36** Children are particularly susceptible to illness just after birth. A large category of patients are expectant mothers, who seek prenatal testing to predict the likelihood of **37** medical risks, transmittable diseases, inborn illnesses, and birth defects for their unborn children.

34

- A) NO CHANGE
- B) tolerable and manageable.
- C) complicated and expensive.
- D) patient and tolerant.

35

- A) NO CHANGE
- B) An affect
- C) Effecting
- D) In effect

36

Which choice most effectively sets up the examples in the following sentences?

- A) NO CHANGE
- B) Patients of genetic counselors can be of any age.
- C) Little is known about the range of inheritable diseases.
- D) Parents' behaviors can often influence their children's health.

37

- A) NO CHANGE
- B) the dark side of medicine,
- C) unpleasant things,
- D) DELETE the underlined portion.

CONTINUE 

If she decides to continue with the pregnancy after a potential risk has been identified, **38** a mother might seek the guidance of a genetic counselor to help manage a child with inborn medical issues. Older parents might even consider genetic testing before trying to conceive, thus reducing the **39** risks associated with: conceptions after the primary maternal or paternal periods of fertility.

As in the case of expectant mothers, genetic counseling has many **40** facets, the two primary divisions are diagnosis and support. The diagnostic side of genetic counseling involves the actual testing of genes and an estimation of risk. The support side involves managing and assessing risks to the child and mother that are associated with certain medical conditions. The work of these groups is often **41** complicated, particularly since modern adults more frequently have children in their 30s and 40s.

38

- A) NO CHANGE
- B) a genetic counselor who can advise how to manage a child with inborn medical issues may be sought.
- C) a child with inborn medical issues may be born to a mother who seeks the help of a genetic counselor.
- D) advice of a genetic counselor may be sought by a mother who fears inborn medical issues.

39

- A) NO CHANGE
- B) risks, associated with
- C) risks associated with
- D) risks: associated with

40

- A) NO CHANGE
- B) facet's;
- C) facet's—
- D) facets:

41

Which choice most effectively suggests that the “two primary divisions” are often not separate from one another?

- A) NO CHANGE
- B) specialized,
- C) intertwined,
- D) enriching,



For all of genetic counseling's benefits, **42** therefore, the field and its accomplishments are still not widely known. The National Society of Genetic Counselors was founded in 1979, and the field has had some breakthroughs (such as prenatal testing for Down syndrome) become popular knowledge. **43** Even so, there remains abundant opportunity for publicity and many genetic counselors are determined to get the word out—not only to patients, but also the general public.

[1] The field is perfect for those with an interest in science and education. [2] How effectively they communicate their findings can, at the most basic level, be a matter of life and death. [3] The technical aspects can be gained with a Master of Science in genetic counseling. [4] The ability to share these findings with patients, however, requires a special skill set. [5] Genetic counselors, like addiction or employment counselors, are fundamentally educators. **44**

42

- A) NO CHANGE
- B) for instance,
- C) thus,
- D) however,

43

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

The number of children born with Down syndrome has decreased significantly since this type of genetic prediction became available in the mid-1970s.

Should the writer make this addition here?

- A) Yes, because it offers an important reminder for those who believe that genetic counseling is not a morally demanding job.
- B) Yes, because it provides evidence that genetic counseling has resulted in new diagnostic possibilities.
- C) No, because it gives an example that is inconsistent with the work of genetic counselors as they are described in the passage.
- D) No, because it offers an illustration that does not have a significant bearing on this particular paragraph.

44

For the sake of the logic and cohesion of the paragraph, sentence 2 should be

- A) placed where it is now.
- B) placed before sentence 1.
- C) placed after sentence 5.
- D) DELETED from the paragraph.

**STOP**

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

Math Test - No Calculator

25 MINUTES 20 QUESTIONS

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# Math Test – No Calculator

25 MINUTES, 20 QUESTIONS

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

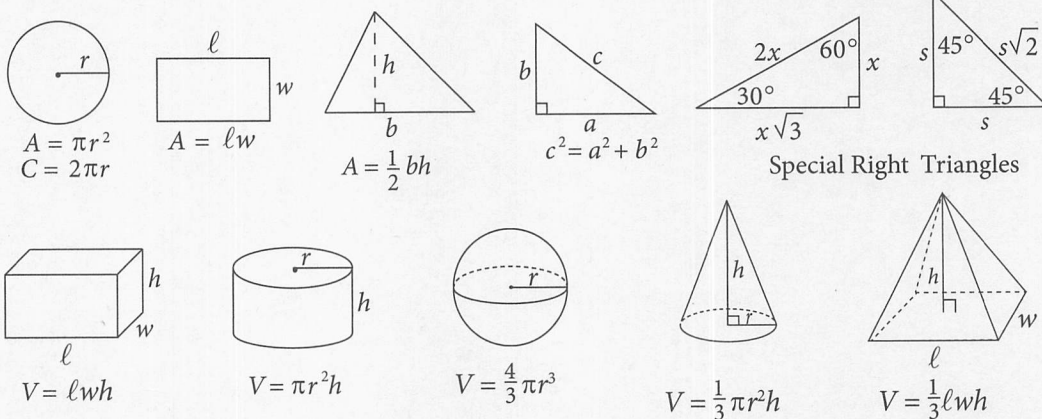
## DIRECTIONS

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

## NOTES

- The use of a calculator is **not permitted**.
- All variables and expressions used represent real numbers unless otherwise indicated.
- Figures provided in this test are drawn to scale unless otherwise indicated.
- All figures lie in a plane unless otherwise indicated.
- 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



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.

CONTINUE





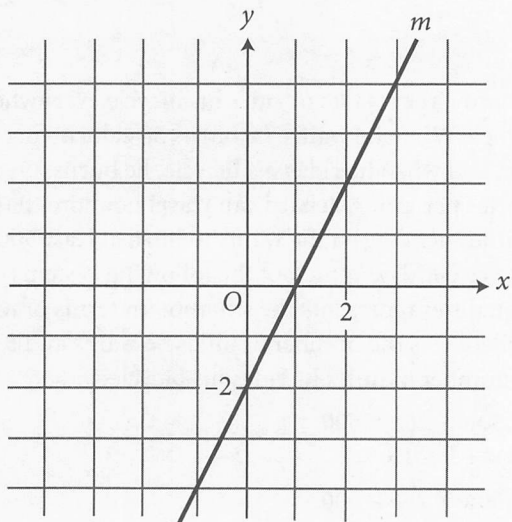
1

What are the solutions of the quadratic equation

$$-3x^2 - 3x + 18 = 0?$$

- A)  $x = -3$  and  $x = 2$
- B)  $x = -3$  and  $x = -2$
- C)  $x = 3$  and  $x = -2$
- D)  $x = 3$  and  $x = 2$

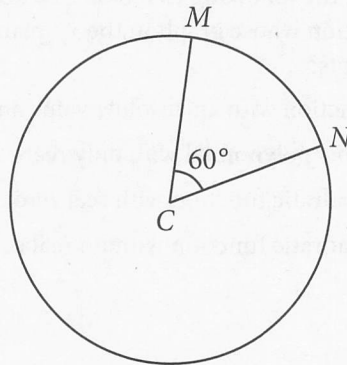
2



Which of the following is an equation of line  $m$ ?

- A)  $x = -2$
- B)  $y = -2$
- C)  $y = 2x - 2$
- D)  $y = 2x + 2$

3



The circle above with center  $C$  has an area of 48. What is the area of sector  $\widehat{MN}$ ?

- A) 48
- B) 16
- C) 12
- D) 8

4

Which of the following is equivalent to the sum of the expressions  $x^2 + x$  and  $-x - 2$ ?

- A)  $x - 2$
- B)  $2x - 2$
- C)  $x^2 - 2$
- D)  $x^3 - x^2 - 2$

**CONTINUE**



5

Which of the following CANNOT be an example of a function whose graph in the  $xy$ -plane has two  $x$ -intercepts?

- A) A function with an absolute value and real zeros
- B) A cubic polynomial with only real zeros
- C) A quadratic function with real zeros
- D) A quadratic function with no real zeros

6

$$\sqrt{c-1} - t = 0$$

In the equation above,  $c$  is a constant. If  $t = 4$ , what is the value of  $c$ ?

- A) 17
- B) 15
- C) 5
- D) 3

7

$$x = y^2$$

$$6x + 9 = -3(2y - 3)$$

If  $(x, y)$  is a solution to the system of equations above and  $y < 0$ , what is the value of  $xy$ ?

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

8

Richard either walks or rides his bicycle everywhere he goes. When he walks, he burns 50 calories per mile, and when he rides his bicycle, he burns 25 calories per mile. Richard can travel no more than 15 miles per day, but he wants to burn at least 500 calories per day. Which of the following systems of inequalities represents the situation in terms of  $w$  and  $b$ , where  $w$  is the number of miles he walks and  $b$  is the number of miles he rides his bicycle?

- A)  $50w + 25b \leq 500$   
 $w + b \leq 15$
- B)  $50w + 25b \geq 500$   
 $w + b \leq 15$
- C)  $50w + 25b \geq 500$   
 $w + b \geq 15$
- D)  $50w + 25b \leq 500$   
 $w + b \geq 15$



9

The Rankine scale is an alternate scale for measuring temperature where the unit of temperature is a Rankine,  $R$ . The conversion from degrees Celsius,  $C$ , to degrees Rankine,  $R$ , is given by the function  $R(C) = 1.8C + 491.67$ . Which of the following statements is the best interpretation of the number 491.67 in this context?

- A) The increase in degrees Rankine that corresponds to a 1-degree Celsius increase in temperature
- B) The increase in degrees Rankine that corresponds to a 1.8-degree Celsius increase in temperature
- C) The temperature in degrees Rankine at 1.8 degrees Celsius
- D) The temperature in degrees Rankine at 0 degrees Celsius

10

Which of the following is equivalent to  $4^{\frac{5}{6}}$ ?

- A)  $2^{\sqrt[3]{4}}$
- B)  $\sqrt[3]{2}$
- C)  $\sqrt[5]{4}$
- D)  $\sqrt[6]{4}$

11

If  $x^2 + y^2 = c$  and  $-xy = b$ , which of the following is equivalent to  $c + 2b$ ?

- A)  $(-2x - y)^2$
- B)  $(-x - y)^2$
- C)  $(x - y)^2$
- D)  $(x + y)^2$

12

The volume of cone  $C$  is 12 cubic millimeters. What is the volume, in cubic millimeters, of a cone with one-third the radius and triple the height of cone  $C$ ?

- A) 2
- B) 4
- C) 12
- D) 36

**CONTINUE** 



13

Marcy spends an average of \$42 on coffee each month. She buys special pods of coffee that cost \$7 each. Recently, Marcy decided that she wanted to reduce the amount of coffee she drinks per month by 9 cups. Assuming these pods can brew four cups of coffee at a time, which equation can Marcy use to determine how many dollars,  $d$ , she will save each month?

- A)  $\frac{4}{7}d = 9$   
 B)  $\frac{4}{7}d = 33$   
 C)  $\frac{7}{4}d = 9$   
 D)  $\frac{7}{4}d = 33$

14

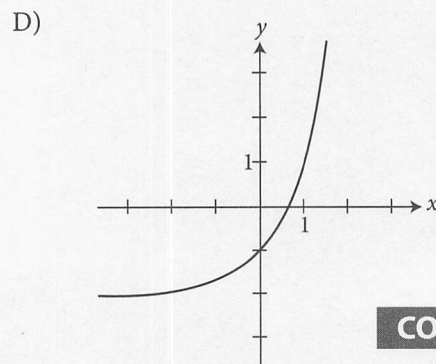
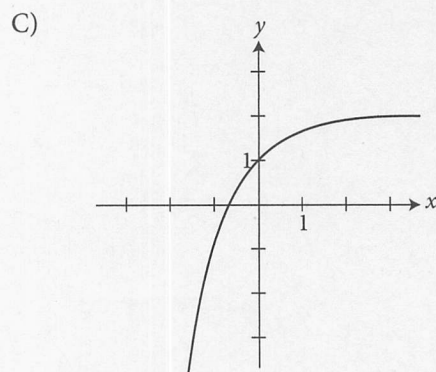
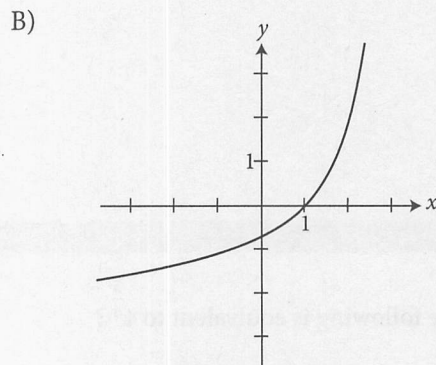
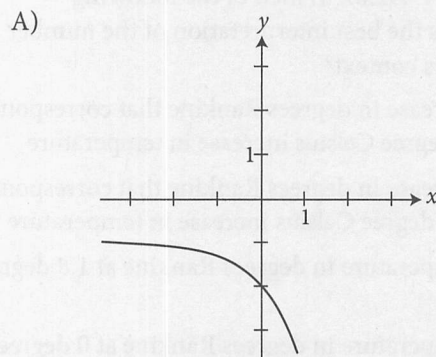
At a juice bar,  $s$  servings of banana smoothie are made by adding  $b$  bananas to a blender. If  $s = b - 4$ , how many additional servings of banana smoothie can be made with each additional banana?

- A) One  
 B) Two  
 C) Three  
 D) Four

15

$$g(x) = 2 - 3^x$$

The function  $g(x)$  is defined by the equation above. Which of the following is the graph of  $y = -g(x)$  in the  $xy$ -plane?



**CONTINUE**



**DIRECTIONS**

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

- Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
- Mark no more than one circle in any column.
- No question has a negative answer.
- Some problems may have more than one correct answer. In such cases, grid only one answer.

5. **Mixed numbers** such as  $3\frac{1}{2}$  must be gridded

as 3.5 or 7/2. (If 

3	/	2
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

 is entered into the grid, it will be interpreted as  $\frac{31}{2}$ , not as  $3\frac{1}{2}$ .)

6. **Decimal Answers:** If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid.

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

Write answer in boxes. →

	7	/	1	2	
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	← Fraction line
	0	0	0	0	
1	1	1	1	1	
2	2	2	2	2	
3	3	3	3	3	
4	4	4	4	4	
5	5	5	5	5	
6	6	6	6	6	
7	7	7	7	7	
8	8	8	8	8	
9	9	9	9	9	

Grid in result. →

Answer: 2.5

	2	.	5		
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	← Decimal point
	0	0	0	0	
1	1	1	1	1	
2	2	2	2	2	
3	3	3	3	3	
4	4	4	4	4	
5	5	5	5	5	
6	6	6	6	6	
7	7	7	7	7	
8	8	8	8	8	
9	9	9	9	9	

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

	2	/	3	
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

	.	6	6	6	
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

	.	6	6	7	
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

Answer: 201 – either position is correct

	2	0	1	
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

	2	0	1	
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

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

**CONTINUE** →



16

$$\frac{1}{3}(5m - n) = \frac{31}{3}$$

$$n = 3m$$

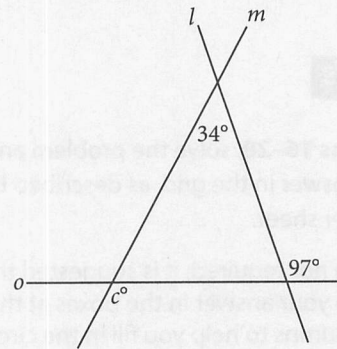
The system of equations above has solution  $(m, n)$ .  
What is the value of  $m$ ?

17

Asaf plans to start working out at a gym. The gym membership costs \$50 per month, and he will also have to pay a \$30 one-time registration fee. Asaf wants to spend no more than \$555 for the membership and the registration fee. If gym memberships are only available for a whole number of months, what is the maximum number of months for which Asaf can have his gym membership?

18

Intersecting lines  $l$ ,  $m$ , and  $o$  are shown below.



What is the value of  $c$ ?



19

$$9(s - 2) + 3(s + 2) = 7s$$

What value of  $s$  is the solution of the equation above?

20

$$\frac{4c + 1}{(2c - 3)^2} - \frac{2}{(2c - 3)}$$

The expression above is equivalent to  $\frac{x}{(2c - 3)^2}$ , where  $x$  is a positive constant and  $c \neq \frac{3}{2}$ . What is the value of  $x$ ?

**STOP**

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



# Math Test – Calculator

55 MINUTES, 38 QUESTIONS

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

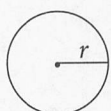
## DIRECTIONS

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

## NOTES

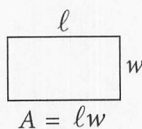
- The use of a calculator **is permitted**.
- All variables and expressions used represent real numbers unless otherwise indicated.
- Figures provided in this test are drawn to scale unless otherwise indicated.
- All figures lie in a plane unless otherwise indicated.
- Unless otherwise indicated, the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

## REFERENCE

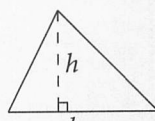


$$A = \pi r^2$$

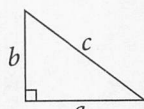
$$C = 2\pi r$$



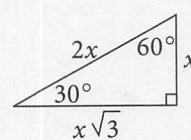
$$A = \ell w$$



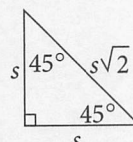
$$A = \frac{1}{2}bh$$



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

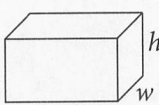


$$x\sqrt{3}$$

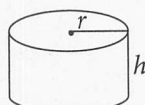


$$s$$

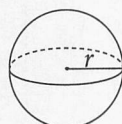
Special Right Triangles



$$V = \ell wh$$



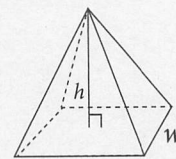
$$V = \pi r^2 h$$



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



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



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

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.

CONTINUE



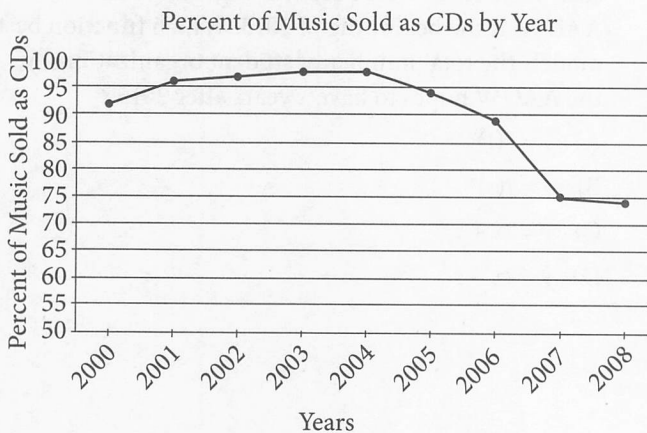


1

Sam's Special Hot Chocolate recipe calls for 4.5 fluid ounces of cream for every serving of hot chocolate. How many cups of cream are needed to make 24 servings of hot chocolate?  
(1 cup = 8 fluid ounces)

- A) 108
- B) 36
- C) 28.5
- D) 13.5

2



According to the line graph above, between which two consecutive years was there the greatest change in the percent of music sold as CDs?

- A) 2000–2001
- B) 2003–2004
- C) 2006–2007
- D) 2007–2008

3

$x$	$g(x)$
2	11
4	17
6	23

Some values of the linear function  $g$  are shown in the table above. Which of the following defines  $g$ ?

- A)  $g(x) = 2x + 7$
- B)  $g(x) = 3x + 5$
- C)  $g(x) = 4x + 3$
- D)  $g(x) = 5x + 1$

4

A souvenir store sells postcards and magnets. Each postcard costs \$1, and each magnet costs \$3. If Annalee purchased a total of 10 postcards and magnets that cost a total of \$22 before tax, how many magnets did she purchase?

- A) 3
- B) 4
- C) 5
- D) 6

**CONTINUE**



5

If  $7(x - y) = 4$ , what is the value of  $x - y$ ?

- A)  $\frac{4}{7}$
- B)  $\frac{7}{4}$
- C) 4
- D) 7

6

The average annual precipitation in Orlando is approximately  $\frac{13}{10}$  of the precipitation in Columbus.

The average annual precipitation in Saint Cloud is approximately  $\frac{7}{10}$  of the precipitation in Columbus.

If the average annual precipitation in Columbus is 1,000 millimeters, approximately how many more millimeters of precipitation fall in Orlando than in Saint Cloud each year?

- A) 600
- B) 700
- C) 1,150
- D) 1,300

7

Which of the following is an equivalent form of  $(2.6a - 3.5)^2 - (7.3a^2 - 4.1)$ ?

- A)  $-2.1a^2 - 2.9$
- B)  $-2.1a^2 + 11.1$
- C)  $-0.54a^2 - 18.2a - 8.15$
- D)  $-0.54a^2 - 18.2a + 16.35$

8

The American Association of University Women (AAUW) hopes to expand its reach by starting a total of  $t$  student organizations on college campuses each year. There were  $s$  student organizations in the AAUW at the beginning of 2015. Which function best models the total number of student organizations,  $y$ , the AAUW hopes to have  $x$  years after 2015?

- A)  $y = s(t)^x$
- B)  $y = t(s)^x$
- C)  $y = tx + s$
- D)  $y = tx - s$

**CONTINUE**



9

The resistance  $R$  of a conductor is found by dividing the voltage  $V$  across the conductor by the current  $I$  through the conductor. Which of the following gives the voltage  $V$ , in terms of  $R$  and  $I$ ?

- A)  $V = \frac{R}{I}$   
 B)  $V = \frac{I}{R}$   
 C)  $V = R - I$   
 D)  $V = IR$

10

In 1893, the Major League Baseball pitching distance from the pitcher's plate to home base was increased from 50 feet to 60.5 feet. Which of the following is closest to the increase in the pitching distance in Major League Baseball, in meters? (1 meter is approximately 3 feet.)

- A) 3.50  
 B) 3.25  
 C) 3.00  
 D) 2.75

11

Area of Focus	Highest Level of Education		Total
	Master's Degree	Doctoral Degree	
Pediatric	157	221	378
Adult	129	22	151
Total	286	243	529

In a survey, 529 social workers focusing on pediatric or adult services indicated their highest level of education. If one of the social workers is selected at random, which of the following is closest to the probability that the selected social worker is a pediatric social worker whose highest level of education is a doctoral degree?

- A) 0.297  
 B) 0.418  
 C) 0.459  
 D) 0.541

12

$$-3x + 4y = 5$$

In the  $xy$ -plane, the graph of which of the following equations is perpendicular to the graph of the equation above?

- A)  $3x + 6y = 5$   
 B)  $3x + 8y = 2$   
 C)  $4x + 3y = 5$   
 D)  $4x + 6y = 5$

CONTINUE



13

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

$$6 = \frac{1}{3}x$$

The system of equations above has solution  $(x, y)$ .  
What is the value of  $y$ ?

- A) 8
- B) 6
- C)  $\frac{9}{2}$
- D) 4

14

A community advocacy group recently polled 500 people who were selected at random from a small town and asked each person, "Are you in favor of the referendum to increase the property tax rate?" Of those surveyed, 67 percent stated that they were opposed to the property referendum. Which of the following statements must be true based on the results of the poll?

- I. If another 500 people selected at random from the town were polled, 67 percent of them would state they are opposed to the property tax referendum.
  - II. If 500 people selected at random from a different town were polled, 67 percent of them would report they are opposed to the property tax referendum.
  - III. Of all the people in the town, 67 percent are opposed to the property tax referendum.
- A) I only
  - B) I and III only
  - C) II and III only
  - D) None

15

$$4x - 1 \leq y$$

$$2 > x + y$$

Which of the following ordered pairs  $(x, y)$  satisfies the system of inequalities above?

- A)  $(-3, -1)$
- B)  $(2, -5)$
- C)  $(3, 1)$
- D)  $(4, -1)$



Questions 16–18 refer to the following information.

Type of Exercise	Burn Rate
Shooting baskets	3.0
Boxing punching bag	4.5
Light aerobics	2.0
Speed walking	5.0
Doubles tennis	2.5
Yoga	1.5
Moderate walking	3.5
Running sprints	7.5

One method of calculating the calories a person will burn by doing a particular exercise is to multiply the number of minutes doing the exercise by a constant called the burn rate for that exercise. The table above gives the burn rate for a 100-pound person for eight types of exercise.

16

Two 100-pound people have each been exercising for 1 hour, one speed walking and one doing yoga. Which of the following will be closest to the difference of their total exercise times, in minutes, when they have each burned an additional 20 calories? (1 hour = 60 minutes)

- A) 9.2
- B) 9.3
- C) 9.4
- D) 9.6

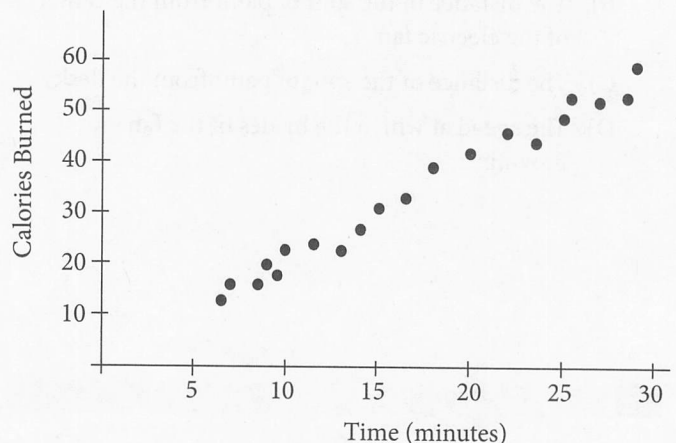
17

According to the information in the table, what is the approximate number of calories that will be burned by a 100-pound person shooting baskets for 30 minutes?

- A) 60 calories
- B) 70 calories
- C) 90 calories
- D) 120 calories

18

Calories Burned versus Time



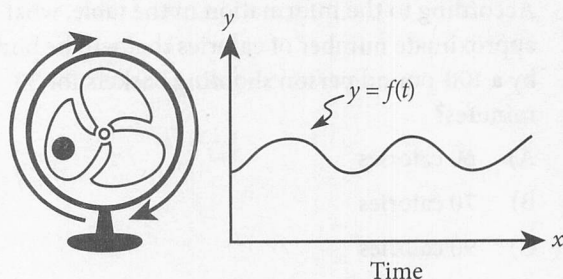
The scatterplot above gives the time spent exercising plotted against calories burned for 20 100-pound people doing a particular exercise. The burn rate of this exercise is closest to that of which of the following exercises?

- A) Boxing punching bag
- B) Light aerobics
- C) Moderate walking
- D) Running sprints

CONTINUE



19



The figure on the left above shows an electric fan with a spot of paint on one of its blades. The electric fan is sitting on a flat desk and is switched on to a constant low setting, causing the blades to rotate in a clockwise direction. The graph of  $y = f(t)$  on the right could represent which of the following as a function of time from when the electric fan was turned on?

- A) The distance traveled by the spot of paint
- B) The distance of the spot of paint from the center of the electric fan
- C) The distance of the spot of paint from the desk
- D) The speed at which the blades of the fan are moving

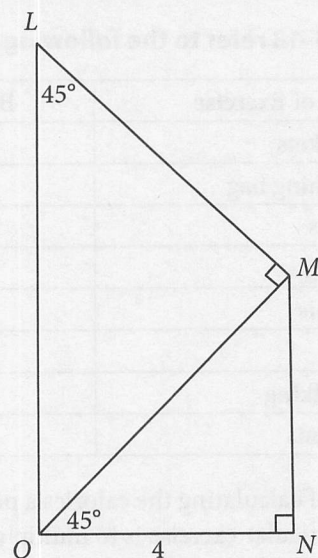
20

$$h = \frac{f - g}{g}$$

In the equation above, if  $f$  is positive and  $g$  is negative, which of the following must be true?

- A)  $h = 1$
- B)  $h > 1$
- C)  $h = -1$
- D)  $h < -1$

21



In quadrilateral  $LMNO$  above, what is the length of  $\overline{LM}$ ?

- A) 8
- B)  $4\sqrt{3}$
- C)  $4\sqrt{2}$
- D) 4



Questions 22 and 23 refer to the following information.

Neighborhoods in Forest City		
Neighborhood Name	Population	Area (square miles)
Cedar Vale	12,000	57
Fir Fen	2,000	22
Maple Mall	122,000	442
Old Oaks	85,000	312.5
Poplar Park	78,000	288

Forest City consists of five different neighborhoods, listed in the table above. The table above shows the population of each neighborhood and area, in square miles, as of January 1, 2015. Over the past decade, Forest City has redrawn the borders of its neighborhoods two times in an attempt to balance school enrollments.

22

Due to redrawing of borders, the population of the Maple Mall neighborhood increased by 30% from January 1, 2010 to January 1, 2012. That population then increased a further 20% by January 1, 2014. No other changes in the population of Maple Mall have occurred since 2014. Which of the following best approximates the population of Maple Mall on January 1, 2010 ?

- A) 83,700
- B) 81,300
- C) 78,200
- D) 62,500

23

The relationship between the area  $A$ , in square miles, and the population  $n$ , in thousands of residents, of a neighborhood as of January 1, 2015 can be represented by a linear function. Which of the following functions represents the relationship?

- A)  $A(n) = 2n + 18$
- B)  $A(n) = 2.5n - 300$
- C)  $A(n) = 3.5n + 15$
- D)  $A(n) = 4.5n - 107$

24

In County C, the 132 employees at the small business Perfect Paper Products were surveyed and 62.9 percent of the employees responded that they had less than \$1,000 in savings. The average small business size in the county is 132 employees. If the employees at Perfect Paper Products are representative of employees in the county's small businesses and there are 270 small businesses in the county, which of the following best estimates the number of small business employees in the county who have at least \$1,000 in savings?

- A) 12,700
- B) 13,220
- C) 22,400
- D) 35,640



25

The volume of a cube is  $V = \frac{1}{8}c^3$ , where  $c$  is a positive constant. Which of the following gives the surface area of the cube?

- A)  $6\left(\frac{c}{2}\right)^2$   
 B)  $6\left(\frac{c^2}{2}\right)$   
 C)  $6c^2$   
 D)  $12c^2$

26

The mean weight of 6 people in an elevator is 160.5 pounds. If the person with the lowest weight gets off, the mean weight of the remaining 5 people becomes 168 pounds. What is the weight of the person with the lowest weight, in pounds?

- A) 89  
 B) 123  
 C) 140  
 D) 297

27

A sociologist designed an experiment to examine the likelihood of a person to favor members of a group to which that person belongs. In the experiment, 400 students from several different colleges watched a series of video-taped interviews in a random order. Each interview featured an actor identified as a professor from each of those colleges discussing issues affecting students. Each student was then asked to select the most trustworthy interviewee. Of the first 200 students,  $s$  students chose the interviewee associated with their college. Among the remaining 200 students, 58 chose the interviewee associated with their college. If less than 25% of all students chose the interviewee associated with their college, which of the following inequalities best describes the possible value of  $s$ ?

- A)  $s - 58 < 0.25(400)$ , where  $0 \leq s \leq 200$   
 B)  $s + 58 < 0.25(400)$ , where  $0 \leq s \leq 200$   
 C)  $s < 0.25(400 - 58)$ , where  $0 \leq s \leq 200$   
 D)  $s < 0.25(400 + 58)$ , where  $0 \leq s \leq 200$

28

$$y = c - x^2$$

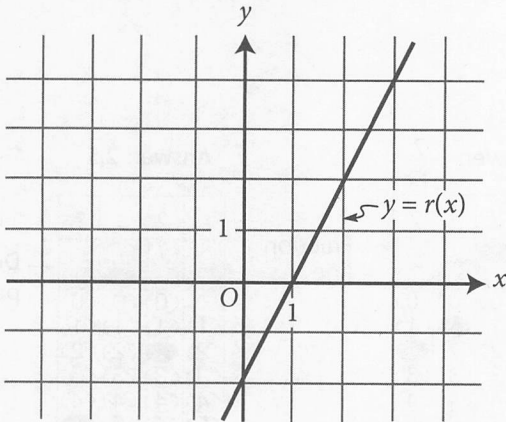
The graph of the equation above forms a parabola in the  $xy$ -plane. If  $c$  is a positive constant, which of the following is an equivalent form of the equation?

- A)  $y = (c - x)^2$   
 B)  $y = (c - x)(c + x)$   
 C)  $y = \left(\frac{c}{2} - x\right)\left(\frac{c}{2} + x\right)$   
 D)  $y = \left(\sqrt{c} - x\right)\left(\sqrt{c} + x\right)$





29



The graph of the linear function  $r$  is shown in the  $xy$ -plane above. The slope of the graph of the linear function  $s$  is  $\frac{1}{6}$  the slope of the graph of  $r$ . If the graph of  $s$  passes through the point  $(0, 2)$ , what is the value of  $s(15)$ ?

- A) 5
- B) 7
- C) 10
- D) 15

30

$$x^2 + 16x + y^2 - 12y = -19$$

The equation above defines a circle in the  $xy$ -plane. What are the coordinates of the center of the circle?

- A)  $(16, -12)$
- B)  $(8, -6)$
- C)  $(-8, 6)$
- D)  $(-16, 12)$

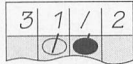
CONTINUE


**DIRECTIONS**

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

- Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
- Mark no more than one circle in any column.
- No question has a negative answer.
- Some problems may have more than one correct answer. In such cases, grid only one answer.

- Mixed numbers** such as  $3\frac{1}{2}$  must be gridded

as 3.5 or  $7/2$ . (If  is entered into the grid, it will be interpreted as  $\frac{31}{2}$ , not as  $3\frac{1}{2}$ .)

- Decimal Answers:** If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid.

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

Write answer in boxes. →

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Grid in result. →

Fraction line ←

Answer: 2.5

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Decimal point ←

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

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Answer: 201 – either position is correct

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5	5	5	5
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8	8	8	8

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

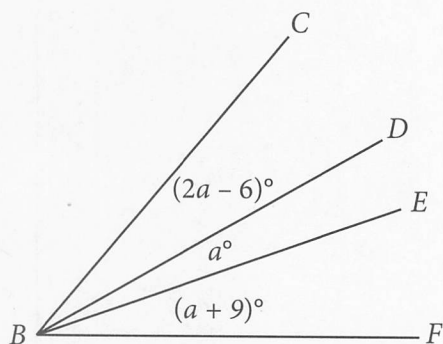
CONTINUE



31

The flag that was raised in 1814 at Fort McHenry, the original “Star Spangled Banner,” was rectangular in shape with height 30 feet and length 42 feet. If a reproduction is made where each dimension is  $\frac{1}{9}$  the corresponding original dimension, what is the length of the reproduction, in feet?

32



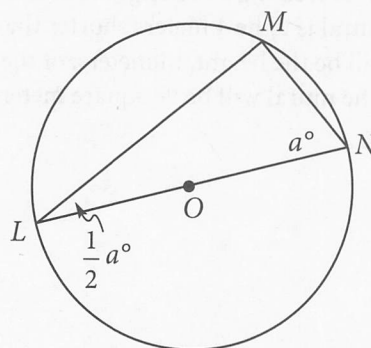
Note: Figure not drawn to scale.

In the figure above,  $\angle CBD = \angle EBF$ . What is the measure of  $\angle CBF$ , in degrees?

33

The square mile and the acre are units of measure of land area that are directly proportional. If 7 square miles are equal to 4,480 acres, how much area, in acres, is equal to 4 square miles?

34



Point  $O$  is the center of the circle in the figure above. What is the value of  $a$ ?



35

The point  $(4, 3)$  lies on the graph of the function  $h(x)$  in the  $xy$ -plane. If  $h(x) = \frac{1}{2}x^2 - a$ , where  $a$  is a constant, what is the value of  $a$ ?

36

An artist is creating a rectangular mural. The height of the mural is to be 4 meters shorter than the width. What will be the height, in meters, of the mural if the area of the mural will be 96 square meters?

**CONTINUE** 



Questions 37 and 38 refer to the following information.

Ms. McQueen's Sprint Triathlon Performance

Segment of triathlon	Average moving speed for segment (mph)	Distance (miles)
From start of race to end of swimming stage	2	0.25
From end of 1st transition to end of biking stage	20	12.4
From end of 2nd transition to end of running stage	8	3.1

Ms. McQueen competes in sprint triathlons consisting of swimming, biking, and running segments, with a transition period between segments. The table above shows the distance, in miles, and her average speed, in miles per hour, when she is between transition periods, for each segment of the sprint triathlon. The transition periods are not included in her speed or distance numbers.

37

When Ms. McQueen uses her triathlon bike to compete, she can complete a sprint triathlon at her average moving speed for each segment of the competition. When her triathlon bike is broken, she must use her hybrid bike instead. In those cases, the time it takes her to complete the biking segment of the sprint triathlon increases by 30% due to increased drag, but the time for each of the other segments of the competition does not change. Based on the table, how many more minutes did Ms. McQueen take to complete a sprint triathlon when she used her hybrid bike than when she used her triathlon bike? (Round your answer to the nearest minute.)

38

At one sprint triathlon, Ms. McQueen completed the course in 75 minutes, not including the time spent in transitions. What was her average speed, in miles per hour, during the sprint triathlon?

**END OF TEST**

**DO NOT RETURN TO A PREVIOUS SECTION.**

Completely darken bubbles with a No. 2 pencil. If you make a mistake, be sure to erase mark completely. Erase all stray marks.

1. YOUR NAME: \_\_\_\_\_  
(Print) Last First M.I.

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_/\_\_\_\_/\_\_\_\_

HOME ADDRESS: \_\_\_\_\_  
(Print) Number and Street

\_\_\_\_\_  
City State Zip Code

PHONE NO.: \_\_\_\_\_  
(Print)

5. YOUR NAME

First 4 letters of last name				FIRST INIT	MID INIT
A	A	A	A	A	A
B	B	B	B	B	B
C	C	C	C	C	C
D	D	D	D	D	D
E	E	E	E	E	E
F	F	F	F	F	F
G	G	G	G	G	G
H	H	H	H	H	H
I	I	I	I	I	I
J	J	J	J	J	J
K	K	K	K	K	K
L	L	L	L	L	L
M	M	M	M	M	M
N	N	N	N	N	N
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Q	Q	Q	Q	Q	Q
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IMPORTANT: Please fill in these boxes exactly as shown on the back cover of your test book.

2. TEST FORM

3. TEST CODE			4. REGISTRATION NUMBER							
0	A	J	0	0	0	0	0	0	0	0
1	B	K	1	1	1	1	1	1	1	1
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4	E	N	4	4	4	4	4	4	4	4
5	F	O	5	5	5	5	5	5	5	5
6	G	P	6	6	6	6	6	6	6	6
7	H	Q	7	7	7	7	7	7	7	7
8	I	R	8	8	8	8	8	8	8	8
9			9	9	9	9	9	9	9	9

6. DATE OF BIRTH

Month	Day		Year	
<input type="radio"/> JAN				
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<input type="radio"/> AUG		6	6	6
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<input type="radio"/> OCT		8	8	8
<input type="radio"/> NOV		9	9	9
<input type="radio"/> DEC				

7. SEX

MALE

FEMALE



**Test 9** Start with number 1 for each new section.  
 If a section has fewer questions than answer spaces, leave the extra answer spaces blank.

**Section 1—Reading**

1. (A) (B) (C) (D)
2. (A) (B) (C) (D)
3. (A) (B) (C) (D)
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51. (A) (B) (C) (D)
52. (A) (B) (C) (D)

**Section 2—Writing and Language Skills**

1. (A) (B) (C) (D)
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**Test 9**

Start with number 1 for each new section.  
If a section has fewer questions than answer spaces, leave the extra answer spaces blank.

**Section 3—Mathematics: No Calculator**

1. (A) (B) (C) (D)
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**Section 4—Mathematics: Calculator**

1. (A) (B) (C) (D)
2. (A) (B) (C) (D)
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9	9	9	9

38. 

	/	/	
.	.	.	.
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9