



Chapter 7 Practice Test 3

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 Oscar Wilde, "Lord Arthur Savile's Crime," originally published in 1887.

It was Lady Windermere's last reception before Easter, and Bentinck House was even more crowded than usual. Six Cabinet Ministers had come on from the Speaker's Levée in their stars and ribands, all the
 5 pretty women wore their smartest dresses, and at the end of the picture-gallery stood the Princess Sophia of Carlsruhe, a heavy Tartar-looking lady, with tiny black eyes and wonderful emeralds, talking bad French at the top of her voice, and laughing immoderately
 10 at everything that was said to her. It was certainly a wonderful medley of people. Gorgeous peeresses chatted affably to violent Radicals, popular preachers brushed coat-tails with eminent sceptics, a perfect bevy of bishops kept following a stout prima-donna from
 15 room to room, on the staircase stood several Royal Academicians, disguised as artists, and it was said that at one time the supper-room was absolutely crammed with geniuses. In fact, it was one of Lady Windermere's best nights, and the Princess stayed till nearly half-past
 20 eleven.

As soon as she had gone, Lady Windermere returned to the picture-gallery, where a celebrated political economist was solemnly explaining the scientific theory of music to an indignant virtuoso
 25 from Hungary, and began to talk to the Duchess of Paisley. Lady Windermere looked wonderfully beautiful with her grand ivory throat, her large blue forget-me-not eyes, and her heavy coils of

golden hair. *Or pur* ("pure gold") they were—not that pale straw colour that nowadays usurps the gracious name of gold, but such gold as is woven into sunbeams or hidden in strange amber; and they gave to her face something of the frame of a saint, with not a little of the fascination of a sinner. She was
 30 a curious psychological study. Early in life she had discovered the important truth that nothing looks so like innocence as an indiscretion; and by a series of reckless escapades, half of them quite harmless, she had acquired all the privileges of a personality. She had
 35 more than once changed her husband; indeed, Debrett credits her with three marriages; but as she had never changed her lover, the world had long ago ceased to talk scandal about her. She was now forty years of age, childless, and with that inordinate passion for pleasure
 40 which is the secret of remaining young.

Suddenly she looked eagerly round the room, and said, in her clear contralto voice, 'Where is my chiromantist?'

'Your what, Gladys?' exclaimed the Duchess, giving
 50 an involuntary start.

'My chiromantist, Duchess; I can't live without him at present.'

'Dear Gladys! you are always so original,' murmured the Duchess, trying to remember what
 55 a chiromantist really was, and hoping it was not the same as a chiropodist.

'He comes to see my hand twice a week regularly,' continued Lady Windermere, 'and is most interesting about it.'

CONTINUE 

60 'Good heavens!' said the Duchess to herself, 'he is a sort of chiropodist after all. How very dreadful. I hope he is a foreigner at any rate. It wouldn't be quite so bad then.'

'I must certainly introduce him to you.'

65 'Introduce him!' cried the Duchess; 'you don't mean to say he is here?' and she began looking about for a small tortoise-shell fan and a very tattered lace shawl, so as to be ready to go at a moment's notice.

70 'Of course he is here; I would not dream of giving a party without him. He tells me I have a pure psychic hand, and that if my thumb had been the least little bit shorter, I should have been a confirmed pessimist, and gone into a convent.'

'Oh, I see!' said the Duchess, feeling very much relieved; 'he tells fortunes, I suppose?'

80 'And misfortunes, too,' answered Lady Windermere, 'any amount of them. Next year, for instance, I am in great danger, both by land and sea, so I am going to live in a balloon, and draw up my dinner in a basket every evening. It is all written down on my little finger, or on the palm of my hand, I forget which.'

1

Which choice best summarizes the passage?

- A) A woman tries to introduce a guest to the practice of chiromancy.
- B) A woman hosts a large party and engages another woman in conversation.
- C) A detailed description of a party and its host.
- D) A woman hosts her last party before fleeing danger.

2

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

- A) most fashionable.
- B) most clever.
- C) most painful.
- D) brightest.

3

The description of "gorgeous peeresses...violent Radicals, popular preachers...eminent sceptics" and "a perfect bevy of bishops" (lines 11-14) mainly serves to

- A) contrast political and artistic types of people.
- B) illustrate the variety of people attending the reception.
- C) compare the women to the men.
- D) underscore the discrepancy between social classes.

4

The narrator implies that Lady Windermere's reception is

- A) sparsely attended.
- B) a dignified affair.
- C) a reckless escapade.
- D) a success.

5

As presented in the passage, Lady Windermere is best described as having

- A) kind intentions but tactless actions.
- B) innocent looks but a mischievous personality.
- C) an extravagant spirit but frugal practices.
- D) warm friendships but a shy nature.

6

As used in line 50, the word "start" most nearly means

- A) opening.
- B) commencement.
- C) twitch.
- D) procedure.

CONTINUE 

7

The narrator indicates that the chiromantist is

- A) a mysterious foreign visitor.
- B) a charlatan preying on partygoers.
- C) a well-known professional.
- D) a frequent visitor at Lady Windermere's home.

8

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

- A) Lines 53–56 (“Dear . . . chiropodist”)
- B) Lines 57–59 (“He comes . . . it”)
- C) Lines 60–61 (“Good . . . dreadful”)
- D) Lines 74–75 (“Oh, I . . . suppose”)

9

The passage most clearly implies that Lady Windermere is

- A) nearing the end of her hostessing days.
- B) uninterested in discussions of political economy.
- C) less gracious than the Duchess of Paisley.
- D) less serious about fortune-telling than she claims.

10

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

- A) Lines 1–3 (“It was . . . usual”)
- B) Lines 46–48 (“Suddenly . . . chiromantist”)
- C) Lines 69–70 (“Of course . . . him”)
- D) Lines 77–81 (“Next . . . which”)



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

This passage is adapted from Michael W. Kraus and Bennett Callaghan, “Noblesse Oblige? Social Status and Economic Inequality Maintenance among Politicians.” ©2014 by Public Library of Science.

The United States is in the midst of unprecedented levels of economic inequality. These large scale economic disparities place the most strain on those at the bottom of the social hierarchy—poor and working class families—who must contend with increased poverty, unemployment, problems with health and social support, and homelessness. Americans have few options to combat economic inequality, but they can turn to the democratic system to enact social and fiscal policies that protect individuals from growing wealth disparities. Given that political participation is one of the only avenues available for individuals to combat this economic trend, investigations into the factors that predict whether politicians will support the reduction or increase of economic inequality remain an important area of research.

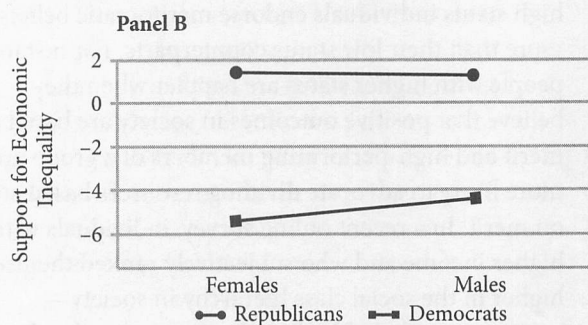
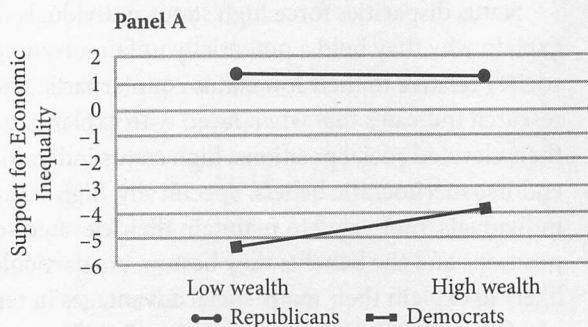
Social status is broadly defined as the rank-based value of individuals, and can be measured by one’s leadership role in organizations, by assessing levels of socioeconomic status (SES; e.g., occupation prestige, annual income), or by one’s membership in one or more social categories—such as one’s race or gender. However social status is measured, most research finds that higher status confers greater benefits than lower status. For example, when compared to high SES individuals, men, and European Americans, lower status individuals (i.e., low SES individuals, women, and African Americans) experience stereotype threat—*anxiety about confirming negative stereotypes about their low status group—that impedes their academic performance.* In general, individuals belonging to higher status positions in society benefit from greater access to material and social resources, increased workplace opportunities, and reduced discrimination based on their social status. High status individuals also tend to hold public office more than their low status counterparts, and as a result, have unique access to decision-making power on matters related to economic policy and wealth distribution.

Status disparities force high status individuals to explain why they hold a potentially unfair advantage in society relative to their low status counterparts. Recent research indicates that when faced with explaining their elevated social positions, high status individuals endorse meritocratic beliefs. Specifically, high status individuals, motivated to maintain their elevated social positions and the benefits they bestow, are particularly likely to explain their many social advantages in terms of a fair application of effort, talent, and skill.

Several lines of empirical evidence suggest that high status individuals endorse meritocratic beliefs more than their low status counterparts. For instance, people with higher status are happier when they believe that positive outcomes in society are based on merit and high-performing members of a group are more likely to advocate dividing resources based solely on merit. In a recent online survey, individuals with higher income and who subjectively ranked themselves higher in the social class hierarchy in society—using rungs of a ladder based on ascending levels of education, income, and occupation status—reported a greater belief that the world is fair and that society’s structure is based on merit than did their lower status counterparts.

The present research aligns with mounting evidence suggesting that an individual’s social status is a reliable predictor of support for economic inequality in society. That social status predicts support for economic inequality among members of Congress—individuals with direct access to creating and implementing policies that shape the future of economic inequality in the US—is a potentially important piece of information for US citizens to consider in future elections.

CONTINUE 



Relationships between social status and the tendency to sponsor legislation supporting economic inequality

11

What function does the first paragraph (lines 1–16) serve in the passage as a whole?

- A) It advocates embracing the trend supported by subsequent research in following paragraphs.
- B) It illustrates a practice favored by the authors that should be implemented according to correlational research.
- C) It acknowledges that a discrepancy exists and offers solutions to the problem based on research results.
- D) It gives an overview of a discrepancy and indicates why research on that discrepancy might be important.

12

Which choice do the authors explicitly cite as an advantage of individuals with higher socioeconomic status?

- A) Stereotype threat
- B) Increased workplace opportunities
- C) Political activism
- D) Discrimination

13

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

- A) Lines 2–7 (“These . . . homelessness”)
- B) Lines 23–25 (“However . . . status”)
- C) Lines 25–31 (“For example . . . performance”)
- D) Lines 31–35 (“In general . . . status”)

14

Which choice best supports the conclusion that members of Congress are likely to be of high social status?

- A) Lines 35–39 (“High . . . distribution”)
- B) Lines 50–52 (“Several . . . counterparts”)
- C) Lines 52–57 (“For instance . . . merit”)
- D) Lines 65–68 (“The present . . . society”)

CONTINUE

15

The central idea of the third paragraph (lines 40–49) is that

- A) some individuals with higher socioeconomic status cite reasons other than socioeconomic status for their perceived advantage.
- B) the world is fair and society's structure is based on merit for both high and low socioeconomic status individuals.
- C) individuals of high socioeconomic status seek to keep those of lower socioeconomic status from succeeding.
- D) socioeconomic status predicts social inequality in most societies.

16

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

- A) Lines 17–19 (“Social . . . organizations”)
- B) Lines 40–42 (“Status . . . counterparts”)
- C) Lines 42–45 (“Recent . . . beliefs”)
- D) Lines 57–64 (“In a . . . counterparts”)

17

As used in line 47, “bestow” most nearly means

- A) withhold.
- B) grant.
- C) earn.
- D) promote.

18

As used in line 65, “aligns” most nearly means

- A) arranges.
- B) straightens.
- C) agrees.
- D) focuses.

19

Which choice is supported by the data in the figure?

- A) Males are slightly less likely to sponsor legislation supporting economic inequality than females.
- B) The number of individuals polled who identify as low socioeconomic status is higher than the number of individuals who identify as high socioeconomic status.
- C) The number of Republicans endorsing legislation that supports economic inequality, and the number of Democrats supporting such legislation is roughly the same.
- D) A female Democrat self-reporting a lower wealth status is most likely to vote for legislation reducing economic inequality.

20

Taken together, the two figures suggest that most people who are likely to sponsor legislation supporting economic inequality

- A) are employed and have upward mobility with increased work opportunities.
- B) are from all socioeconomic backgrounds and social categories.
- C) are Democrats who identify as female and low wealth.
- D) are Republicans, regardless of gender.

CONTINUE 

Questions 21–30 are based on the following passage.

This passage is adapted from PLoS, “No Rest for the Weary: Migrating Songbirds Keep Their Wits without Sleep.” ©2004 by Public Library of Science.

Every spring and fall, billions of songbirds fly thousands of miles between their summer breeding grounds in North America and their wintering grounds in the more hospitable climates of southern California, Mexico, and Central and South America. While some birds fly during the day, most, including the white-crowned sparrow, fly under cover of night. Many aspects of this remarkable voyage remain obscure, especially if, and how, nocturnal migrators get any sleep at night.

A tracking study of the Swainson’s thrush found that the roughly seven-inch birds flew up to seven hours straight on six of seven nights, racking up over 930 miles. While the study didn’t track their daytime behavior, the birds’ migratory pace—as well as the increased activity required to sustain migrations—suggests little time for sleep. Yet field observations indicate that presumably sleep-deprived fliers appear no worse for wear, foraging, navigating, and avoiding predators with aplomb. Researchers are left trying to reconcile this observation with the vast body of evidence linking sleep deprivation to impaired neurobehavioral and physiological function. How do songbirds cope with so little sleep? Do they take power naps? Have they taken “sleep walking” to new heights? Or have they managed to selectively short-circuit the adverse effects of sleep deprivation during migratory stints?

To investigate these questions, Ruth Benca and colleagues studied cognitive and sleep behaviors in captive white-crowned sparrows over the course of a year. The sparrows fly nearly 2,700 miles twice a year between their Alaska and southern California homes. In laboratory cages, the birds’ migratory instincts manifest as increased restlessness at night during the migratory season, with lots of hopping around and wing flapping.

Niels Rattenborg et al. characterized the birds’ activity levels with motion-detection measurements and video recordings, and placed sensors on their brains to monitor their seasonal sleep patterns. The brain recordings showed a marked seasonal difference in both the amount and type of sleep during a 24-hour period. Cognitive tests—birds performed a task

45 that involved pecking a key in exchange for seed—revealed that birds in the nonmigrating state suffered cognitive deficits when sleep-deprived but displayed an “unprecedented” ability to maintain cognitive function in the face of ongoing sleep loss in the migratory state.

50 These results suggest that wild songbirds drastically reduce sleep time during migration, though Benca and colleagues concede it’s impossible to know for sure without recording the birds in action. Such an ability to temporarily circumvent the need for sleep, however, could prove useful for humans in situations that demand continuous performance.

Whatever the mechanism, the unprecedented imperviousness of migrating songbirds to sleep deprivation, the authors conclude, clearly warrants further testing. But it also raises interesting questions about the role of sleep, which recent studies suggest is required to incorporate novel perceptions into the brain’s memory banks. If this is true, how do songbirds consolidate memories of migratory events with so little sleep?

Understanding the mechanisms that power the sleepless flight of songbirds promises to unravel one of the longstanding mysteries of their improbable journey. It may also shed light on the origins of sleep-related seasonal disorders and the much-debated role of sleep itself.

21

Which choice best reflects the overall sequence of events in the passage?

- A) A phenomenon is observed and a series of experiments seek to explain it, yet further research is necessary to fully understand the data found.
- B) An anomaly is observed and recorded; the results are analyzed and declared inconclusive.
- C) A new discovery revolutionizes a current theory, disproving old assumptions, and a new hypothesis is formed.
- D) An unexpected finding arises during a study, spawning a secondary study; both studies are interpreted and summarized.

CONTINUE 

22

As used in line 21, “reconcile” most nearly means

- A) reunite.
- B) appease.
- C) clarify.
- D) integrate.

23

Which statement best captures an assumption Ruth Benca made in setting up her research?

- A) The acquisition of sleepwalking from their evolutionary ancestors allows songbirds to travel great distances while migrating.
- B) The tendency for songbirds to hop and flap their wings indicates increased cognitive function.
- C) Songbirds’ ability to fly long distances without sleeping is key to their survival.
- D) Songbirds in a controlled research setting will exhibit sleep patterns similar to those of songbirds in the wild.

24

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

- A) Lines 6–7 (“While . . . night”)
- B) Lines 14–17 (“While . . . sleep”)
- C) Lines 32–33 (“The sparrows . . . homes”)
- D) Lines 50–53 (“These . . . action”)

25

In the fourth paragraph (lines 38–49), the results of Niels Rattenborg’s findings mainly serve to

- A) show how unexpected results can upset an entire hypothesis.
- B) reinforce the findings of Ruth Benca’s laboratory research and previous field observations.
- C) introduce a component of previous research on the songbirds’ migration patterns.
- D) underscore certain differences between other researchers and Benca’s research.

26

After researchers noted the “unprecedented’ ability to maintain cognitive function” during migratory state, (line 48), they

- A) concluded that it was impossible to know how the birds maintain normal levels of cognition during migratory seasons.
- B) acknowledge that the correlation raises other questions about how the birds function during migration.
- C) observed the birds’ cognitive deficits when sleep-deprived in a nonmigratory state.
- D) consulted other researchers in the field to compare their results.

27

The passage identifies which of the following as a factor necessitating that the team of researchers concede that further research is necessary?

- A) The speed at which the birds flapped and hopped
- B) The birds’ increased activity levels
- C) The controlled environment of the study
- D) The decreased cognitive levels during sleep-deprived, nonmigratory states

28

As used in line 68, “improbable” most nearly means

- A) dubious.
- B) unconvincing.
- C) remarkable.
- D) supposed.



29

What can reasonably be inferred about songbirds from the passage?

- A) Their activity levels may correlate to migratory seasons.
- B) Their activity levels while migrating are similar to those of sleepwalkers.
- C) Their mechanisms of migration are impossible to fully understand.
- D) Their cognition and memories increase during migration.

30

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

- A) Line 25 (“Have . . . heights”)
- B) Lines 34–37 (“In laboratory . . . flapping”)
- C) Lines 57–60 (“Whatever . . . testing”)
- D) Lines 60–63 (“But it . . . banks”)



Questions 31–41 are based on the following passages.

Passage 1 is adapted from Carol Boston, “High School Report Cards. ERIC Digest,” originally published in 2003. Passage 2 is adapted from Winnie Hu, “Report Cards Give Up A’s and B’s for 4s and 3s,” originally published in 2009.

Passage 1

Most states have embraced standards-based education, a process that requires them to identify what specific knowledge and skills students are expected to master at each grade level and then align
 Line 5 curriculum, teaching, and testing with those standards. Some schools are now experimenting with changes in their report cards to better reflect student progress toward achieving the standards.

Rather than the familiar A through F in each
 10 subject, standards-based report cards might feature numbers or phrases that represent whether students have reached, exceeded, or not yet met various specific performance expectations. As an example, a third-grade mathematics grade might include a number or
 15 phrase that would denote whether students exceed, meet, approach, or begin to achieve standards in comparing, adding, and subtracting fractions and identifying place values. Such a report card actually provides more detailed, specific information than a
 20 traditional grade, though parents and students may find the change disconcerting, and concerns have been expressed about how colleges might evaluate report cards that don’t show traditional grade point averages (Manzo, 2001).

Report cards that combine traditional grades and information about progress toward standards are also an option. Wiggins (1994) advocates a performance-based report card that plots overall student achievement against norms and standards,
 30 identifies strengths and weaknesses in specific areas, and also includes teacher judgments about students’ academic progress, growth, intellectual character, and work habits. Marzano (1998) shows an example report card that includes a transcript indicating how many
 35 times each standard has been assessed, the average score obtained, as well as the highest, lowest, and most recent scores.

Passage 2

Thomas R. Guskey, a professor at Georgetown College in Kentucky and an author of *Developing*
 40 *Standards-Based Report Cards*, a book that is soon to be released, said the new approach was more accurate, because it measures each student against a stated set of criteria, rather than grading on a curve, which compares members of a class with one another. “The
 45 dilemma with that system is you really don’t know whether anybody has learned anything. They could all have done miserably, just some less miserably than others.”

The executive director of the National Association of Secondary School Principals, Gerald Tirozzi—who supports standards-based report cards—said that many educators and parents were far from ready to scrap letter grades, especially for older students, in part because they worry about the ripple effects on
 50 things like the honor roll and class rank. “I think the present grading system—A, B, C, D, F—is ingrained in us,” Mr. Tirozzi said. “It’s the language which college admissions officers understand; it’s the language which parents understand.”

Outside San Francisco, the San Mateo-Foster City district delayed plans to expand standards-based report cards to its four middle schools from its elementary schools, where they have been used since 2006, after parents packed school board meetings and
 65 collected more than 500 signatures in opposition

Addressing these parental complaints, Pelham district officials said they planned to change the system next year to use benchmarks for each marking period—rather than a year-end standard—to give
 70 more timely snapshots of students’ progress (and allow many more students to earn 4’s from the beginning). They also plan to bring back teacher comments, and are looking for ways to recognize student effort and attitude.

CONTINUE 

31

As used in line 10, “feature” most nearly means

- A) present.
- B) attribute.
- C) report.
- D) promote.

32

It can be inferred that the author of Passage 1 believes that a standards-based report card

- A) will be challenging for colleges and universities to evaluate.
- B) provides a more specific way for teachers to evaluate students.
- C) is unnecessarily complicated compared to a traditional report card.
- D) is more effective for a student in third grade than a student in high school.

33

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

- A) Lines 6–8 (“Some . . . standards”)
- B) Lines 9–13 (“Rather . . . expectations”)
- C) Lines 13–18 (“As an . . . values”)
- D) Lines 18–23 (“Such . . . averages”)

34

Passage 2 states that the new approach to grading

- A) introduces a dilemma into the system.
- B) does not truly measure whether learning has occurred.
- C) is supported by experts in educational theory.
- D) does not compare members of a class to each other.

35

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

- A) Lines 38–44 (“Thomas . . . another”)
- B) Lines 44–46 (“The dilemma . . . anything”)
- C) Lines 46–48 (“They . . . others”)
- D) Lines 72–74 (“They . . . attitude”)

36

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

- A) save.
- B) fragment.
- C) discard.
- D) detach.

37

According to the author of Passage 2, the use of standards-based report cards in elementary schools

- A) led to plans for expansion into higher grades.
- B) encountered much resistance.
- C) has proven more accurate than other systems.
- D) has been successfully implemented.

38

The author of Passage 2 includes the quote by Thomas Guskey (lines 44–48) in order to address which concern not mentioned in Passage 1?

- A) Colleges might favor traditional report cards over standards-based report cards.
- B) Students might be disconcerted by a change from letter grades to number grades.
- C) Student learning might be less accurately measured on a curve than by set criteria.
- D) Traditional report cards might not provide information as specific as that in a standards-based report card.



39

Which best describes the overall relationship between Passage 1 and Passage 2?

- A) Passage 2 examines different responses to the argument presented in Passage 1.
- B) Passage 2 strongly challenges the point of view in Passage 1.
- C) Passage 2 draws alternative conclusions from the evidence presented in Passage 1.
- D) Passage 2 elaborates on the proposal presented in Passage 1.

40

The authors of both passages would most likely agree with which of the following statements about standards-based report cards?

- A) Parental insistence on including traditional information has helped to improve the new system.
- B) Despite encountering some resistance, standards-based report cards may provide more information than do previous systems.
- C) Standards-based report cards remove the flawed system of grading on a curve.
- D) Although concerns are understandable, standards-based report cards are superior to the alternatives.

41

How would the author of Passage 1 most likely respond to the points made in the final paragraph (lines 66–74) of Passage 2?

- A) The author of Passage 1 would sympathize with the parental worries.
- B) The author of Passage 1 would caution against the use of benchmarks.
- C) The author of Passage 1 would agree with the proposed changes.
- D) The author of Passage 1 would insist that intellectual character be included.



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

This passage is adapted from Nadav S. Bar, Sigurd Skogestad, Jose M. Marçal, Nachum Ulanovsky, and Yossi Yovel, “A Sensory-Motor Control Model of Animal Flight Explains Why Bats Fly Differently in Light Versus Dark,” published in 2015 by the Public Library of Science. A series of flight experiments are performed with live and simulated bats.

Animal flight requires fine motor control. However, it is unknown how flying animals rapidly transform noisy sensory information into adequate motor commands. Here we developed a sensorimotor control model that explains vertebrate flight guidance with high fidelity. This simple model accurately reconstructed complex trajectories of bats flying in the dark.

To test our model, we used behavioral data from Egyptian fruit bats (*Rousettus aegyptiacus*)—flying mammals that possess an advanced biosonar (echolocation) system, as well as an excellent visual system. We found that a simple model, which considers only the angle-to-target and its derivative, was able to reconstruct complex, several-meter-long flight trajectories very accurately—with an average error of only 14.6 cm.

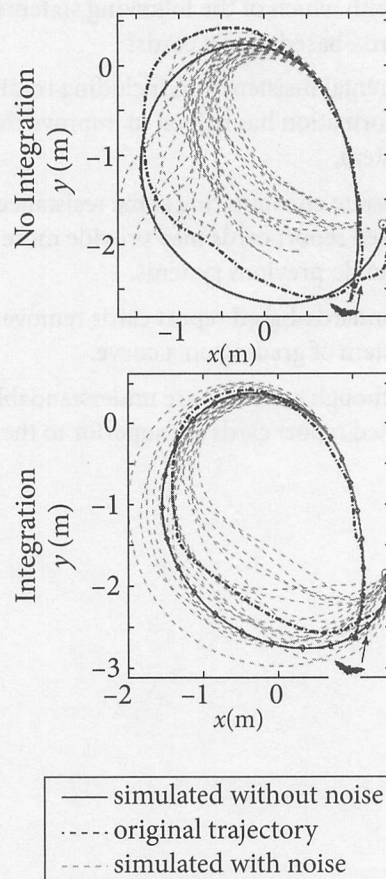
In reality, however, all organisms have sensory errors. To assess the effect of this sensory noise, we tested two models of angle-dependent additive Gaussian noise, which mimic the sensory errors found in the auditory system of several vertebrates. As expected, sensory noise had strong implications for the convergence of the model: in many trials, adding the noise resulted in increased maneuvering errors, and oftentimes led to complete failure to converge.

We therefore hypothesized that the bat must use a noise-suppression strategy and integrate (average) over several sensory measurements to overcome the noise. An exponentially decaying integrator, which only takes into account the three to four most recent measurements, was found to outperform uniform and linearly decaying integrators. This simple exponential integrator exhibited successful noise suppression and reproduced the bat’s flight trajectories with high fidelity.

An important prediction of our model is that sensory noise determines motor performance. To test this hypothesis, we conducted new experiments in

- 40 which the same individual bats (five of the six bats) flew under a light level that is considered optimal for bat vision (1 lux), while performing the same landing task. We found that, as we hypothesized, the simulated bat exhibited significantly larger gain parameters in light versus dark. Further, the simulated bat exerted significantly stronger forces when flying in the light. Moreover, flight trajectories in light conditions were more direct than in darkness, as quantified by their higher straightness index.
- 50 Taken together, these results imply the surprising conclusion that the highly curved flight trajectories often exhibited by bats in the dark are due to sensory limitations—not motor limitations.

The Effect of Noise on Sensorimotor Control



The figure above indicates the results of the experiments described in the 3rd and 4th paragraphs of the passage.

CONTINUE

42

The words “must,” “exhibited,” and “reproduced” in the fourth paragraph (lines 27–36) have what impact on the tone of the paragraph?

- A) They display a hopeful tone that demonstrates the authors want the reader to agree with their uncertain results.
- B) They display a confident tone that demonstrates the authors have faith in some elements of their conclusions.
- C) They display an argumentative tone that demonstrates the authors disagree with researchers who conclude that bats do not use a noise-suppression strategy.
- D) They display a commanding tone that demonstrates the authors desire to instruct others in the reproduction of simulated bat trajectories.

43

In line 49, the passage indicates that particular experiments resulted in a “higher straightness index.” According to the passage, which of the following choices represents the theory these experiments were performed in order to verify?

- A) In order to maintain experimental control conditions, it is vital to use the same bats in both the original and later experiments.
- B) Inaccurate perceptions caused by common sensory errors have a significant detrimental impact on physical movements and coordination.
- C) Mathematical models designed to test average measurements should always avoid uniform or linearly decaying integrators.
- D) Bats which fly under light conditions that differ significantly from 1 lux, either brighter or darker, will not likely demonstrate optimal gain parameters.

44

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

- A) Lines 30–33 (“An exponentially . . . integrators”)
- B) Lines 37–38 (“An important . . . performance”)
- C) Lines 38–43 (“To test . . . task”)
- D) Lines 43–45 (“We found . . . dark”)

45

It can be inferred from the passage that including a simple exponential integrator countered what inaccuracy in the described experiments?

- A) It can replace information the bats lose when they fly.
- B) It accounted for sub-optimal light conditions.
- C) It combined sensory input data for more accurate predictions.
- D) It increased errors due to sensory noise.

46

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

- A) Line 1 (“Animal . . . control”)
- B) Lines 6–8 (“This . . . dark”)
- C) Lines 33–36 (“This . . . fidelity”)
- D) Lines 50–53 (“Taken . . . limitations”)

47

As used in line 36, “fidelity” most nearly means

- A) an accurate reproduction of the significant details.
- B) a consistent performance of lower quality.
- C) a complete perfection in all areas.
- D) a rough, approximate similarity.

48

The main purpose of the fourth paragraph (lines 27–36) is to

- A) describe a theory and experimental verification regarding the method a bat uses to handle imperfect perception.
- B) suggest a trial in which three to four measurements are taken of several vertebrates to assess noise reduction.
- C) introduce the probable pitfalls of the earlier theory briefly summarized in the following paragraph (lines 37–49).
- D) detail the resulting data of a test that supports the authors' claim involving the accuracy of uniform integrators as applied to bat trajectories.

49

Before the study, the authors assumed that highly curved flight trajectories

- A) are atypical of the *Rousettus aegyptiacus*.
- B) never straighten for any brief period of time.
- C) were not replaced by significantly straighter trajectories by bats flying in bright light.
- D) were caused by physical limitations of the bat.

50

The passage and the figures are in agreement that the addition of a noise-suppression strategy to trials simulated with noise resulted in convergence with the original trajectory in

- A) all trials.
- B) only one trial.
- C) roughly half of the trials.
- D) none of the trials.

51

Based on the data in the figure, which of the following trajectories most nearly matched the original trajectory?

- A) The simulated trajectory with no noise and no integration
- B) The simulated trajectory with no noise and integration
- C) The simulated trajectory with noise and integration
- D) The simulated trajectory with noise and no integration

52

Is the claim made by the authors that bat flight trajectories under optimal light conditions are more direct supported by the information in the figure?

- A) Yes, because the simulated trajectories most nearly like the original trajectory are some of the 30 of those trajectories that included both noise and integration.
- B) Yes, because the simulations with and without integration demonstrate that sensory noise caused bats to develop a compensating factor.
- C) No, because they do not provide comparative data regarding the flights under optimal light conditions.
- D) No, because the simulations with and without integration fail to clarify whether noise was a causal factor.

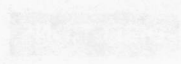
STOP

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.



Some questions will be based on the reading passage and audio recording that appear on the next page. You will have 10 minutes to read the passage and listen to the audio recording. You will then have 20 minutes to answer the questions. You will have 5 minutes to review your answers.

No Test Material On This Page

After reading the passage and listening to the audio recording, you will have 20 minutes to answer the questions. You will have 5 minutes to review your answers.

Some questions will be based on the reading passage and audio recording that appear on the next page. You will have 10 minutes to read the passage and listen to the audio recording.

You will have 20 minutes to answer the questions. You will have 5 minutes to review your answers.

Some questions will be based on the reading passage and audio recording that appear on the next page. You will have 10 minutes to read the passage and listen to the audio recording.

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.

The Agents of the FDA

When you go to the grocery store, **1** can't it be fun to go with your friends and family? Why do you trust the chicken that you buy from the grocery store more than the chicken you could buy off the back of some guy's truck? Beyond common sense, the answer is pretty simple: the Food and Drug Administration, or FDA. The **2** agency's beginnings came in 1906, when politicians and consumer

1

Which choice provides the most appropriate introduction to the passage?

- A) NO CHANGE
- B) which way do you take when you drive or walk?
- C) how is it possible to buy only the things that you need?
- D) how do you know what you're buying is safe?

2

- A) NO CHANGE
- B) agency's beginning's
- C) agencies beginnings
- D) agencies' beginnings'

CONTINUE 

advocates began to realize how harmful unregulated food, cosmetics, and drugs could be. The FDA **3** for we know it today was formally created in 1930.

The FDA is everywhere in American culture.

4 In fact, the FDA regulates nearly \$1 trillion worth of American consumer goods. This \$1 trillion constitutes approximately 25% of all that is bought and sold in the United States. A large portion of this money is devoted to goods imported into the United States. The FDA operates on a budget of nearly \$5 billion a year, much of which is generated by user fees, **5** which come primarily from pharmaceutical companies, whose drugs require FDA approval.

3

- A) NO CHANGE
- B) how
- C) as
- D) DELETE the underlined portion.

4

In context, which choice best combines the underlined sentences?

- A) In fact, the FDA regulates nearly \$1 trillion worth of American consumer goods, approximately 25% of all that is bought and sold in the United States.
- B) The FDA, in fact, which regulates nearly \$1 trillion worth of American consumer goods, moreover regulates what amounts to 25% of all that is bought and sold.
- C) A quarter of all that is bought and sold in the United States, which amounts to \$1 trillion dollars approximately, is approved in some way by the FDA.
- D) The \$1 trillion dollars of goods in the United States, the same goods that constitute 25% of United States trade, are regulated by the FDA.

5

- A) NO CHANGE
- B) thus coming
- C) those come
- D) they come

CONTINUE 

6 Still, while many people are familiar with the FDA's warning labels and health warnings, few know who actually *works* there. After all, an "agency" requires some agents, and the FDA must be a huge operation with all the food and pharmaceutical drugs needed in a population of hundreds of millions. The FDA is certainly large:

7 you've almost certainly seen its approvals on some of the products you use.

While the largest group of FDA employees comprises consumer safety officers, the central work of the FDA is conducted by scientists. **8** Relying on scientists makes sense, since the science of acceptable food is something most of us never think about. But how is it possible to know whether a type of food is safe for general consumption?

6

- A) NO CHANGE
- B) Stunningly,
- C) Therefore,
- D) For safety's sake,

7

Which choice best supports the statement made in the first part of the sentence?

- A) NO CHANGE
- B) it has played a large role in reducing the amount of tobacco use in the United States.
- C) Teddy and Franklin Roosevelt were proud of it, and you should be too.
- D) it has over 200 offices in the United States and employs many thousands of people.

8

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

The FDA employs nearly 1,000 chemists, 500 biologists, 300 pharmacologists, 40 epidemiologists, and many, many more.

Should the writer make this addition here?

- A) Yes, because it lists the employment statistics for the FDA last year.
- B) Yes, because it gives some data that will be elaborated upon later in the paragraph.
- C) No, because it interrupts the paragraph's discussion of consumer safety officers.
- D) No, because it does not account for the non-scientists who work at the FDA.

CONTINUE 

How can one possibly be confident that a packaged good on a supermarket shelf will be safe **9** with confidence? This can't be a matter of taste: it must be a matter of chemistry, **10** biology, and a matter of physics. The average consumer simply does not have the knowledge to be able to assess the quality of food. The same goes for drugs. Imagine you were taking five prescription drugs at once—if the pills got mixed up, what would you do?

In short, the FDA is omnipresent in American life, even if it is a bit hidden. The truly remarkable thing about the FDA, other than its high rates of success, **11** are being the collection of expertise it has amassed among its workforce. Perhaps no other government agency requires such an incredible amount of brainpower on the cutting edge of scientific thought.

9

- A) NO CHANGE
- B) certainly?
- C) with sureness?
- D) DELETE the underlined portion and end the sentence with a question mark.

10

- A) NO CHANGE
- B) biology, including some
- C) biology, and
- D) biological sciences, and

11

- A) NO CHANGE
- B) have had
- C) is
- D) are

CONTINUE

Questions 12–22 are based on the following passage.

Drop the Puck!

For anyone aspiring to play ice hockey professionally, the National Hockey League (NHL) represents the pinnacle of hockey greatness in North America, if not the world. But how did the NHL rise to these remarkable ranks?

The story begins with that elusive trophy: the Stanley Cup. In many ways, this goal is as old as the history of professional hockey **12** its self. It was commissioned in 1892 as the Dominion Hockey Challenge Cup and was given to Canada's top-ranking amateur team each year. The name was later changed to commemorate the contributions of then-Governor General of Canada, Lord Stanley of Preston, **13** who did a great deal to grow the sport in the country.

12

- A) NO CHANGE
- B) themselves
- C) itself
- D) himself

13

Which choice provides the most logical conclusion to the sentence?

- A) NO CHANGE
- B) who was born in London and educated at Eton and Sandhurst.
- C) who served as Governor General under British Queen Victoria.
- D) DELETE the underlined portion and end the sentence with a period after the word *Preston*.

CONTINUE 

One of the early contenders for this prize was the National Hockey Association (NHA). When the NHA folded in 1917, it was replaced by the NHL that same year. Despite the name change, the NHL followed from the NHA in just about every way. Just as the NHA had before,

14 also competing annually for the Stanley Cup. This competition came against a variety of other professional and amateur teams and leagues, most notably the Pacific Coast Hockey Association (PCHA), which had formalized its relations with the NHA in 1915. The Boston Bruins, established in **15** 1924; they began the NHL's expansion into the United States.

By 1926, however, all other competing leagues had folded or merged, and the only remaining league was the NHL. **16** While other leagues and teams have issued challenges for the Cup, no non-NHL team has played for the Cup since that time. The NHL's sole dominion over Lord Stanley's Cup also symbolized its **17** supremacy in the world of professional hockey.

14

- A) NO CHANGE
- B) so too did the NHL compete
- C) so too competed
- D) so too was competing

15

- A) NO CHANGE
- B) 1924,
- C) 1924. They
- D) 1924:

16

The writer is considering deleting the previous sentence. Should the writer make this change?

- A) Yes, because it breaks with the logical flow of the previous paragraph.
- B) Yes, because it provides a topic sentence that would be better placed elsewhere in the passage.
- C) No, because it contains the central argument of the passage as a whole.
- D) No, because it provides a logical introduction and relevant information for this paragraph.

17

Which choice best maintains the tone established in the passage?

- A) NO CHANGE
- B) awesomeness
- C) tyranny
- D) swagger

CONTINUE

This high position was firmly cemented in the 1940s when the “Original Six” NHL franchises competed with one another each year. **18** There were two Canadian teams that were especially ascendant, even dominant, and many of the players from the era are still considered all-time greats. The league has only continued to expand. Six more teams were added during the first expansion of 1967. Today, the league has 30 teams. **19**

18

- A) NO CHANGE
- B) Ascendant, even dominant, were the Canadian teams especially,
- C) Canadian teams were especially ascendant, even dominant,
- D) Canadian teams especially were dominant,

19

Which choice most logically follows the previous sentence?

- A) There are even plans to expand the league to 32, with teams in Las Vegas and Quebec City.
- B) My personal favorite team is the Philadelphia Flyers, who were part of the 1967 expansion.
- C) Many of the “Original Six” teams have won the Stanley Cup in recent years.
- D) It can seem a little bit odd to have hockey teams in places with no natural ice, but that’s the way it goes.

CONTINUE 

Since the early days of professional **20** hockey, but other leagues have come and gone. There are other **21** leagues. These, however, are “minor leagues,” where young players develop the skills necessary for NHL play, or where players spend whole careers waiting for their chance at the big leagues. Still, while the NHL, made up of players from all over the world, **22** hold the sway that it does, the short history given here provides the important reminder that leagues come and go. The only thing that remains, the only unadulterated constant, is the passion both men and women have for the game.

20

- A) NO CHANGE
- B) hockey,
- C) hockey;
- D) hockey:

21

The writer is considering revising the underlined portion of the sentence to read:

leagues, such as the AHL, OHL, and QMJHL.

Should the writer add this information here?

- A) Yes, because it lays the groundwork for the shift in this paragraph’s focus.
- B) Yes, because it provides examples of some current leagues other than the NHL.
- C) No, because it suggests that the NHL is not such an important league after all.
- D) No, because it provides details that should be given earlier in the passage.

22

- A) NO CHANGE
- B) holds the sway that they do,
- C) hold the sway that they do,
- D) holds the sway that it does,

CONTINUE 

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

Is Sitting the New Smoking?

[1] Health scientists have a new warning: “Sitting is the new smoking.” [2] However, excessive sitting and stillness, particularly when it is uninterrupted sedentary, can have terrible consequences for health. [3] Indeed, now that many Americans have accepted the health risks of smoking and **23** puffed away from that deadly pastime, researchers worry that the sedentary lifestyle of many Americans may have replaced smoking as a national health risk. [4] This may sound odd because everyone has to sit at some point, whether at a job, in class, or in a car. **24**

25 Nearly 20 studies conducted in about as many years have confirmed this grim conclusion, and these studies have covered over 800,000 people overall. While this number does not cover the entire population, it is safely representative as a sample. In one study, researchers found a 46 percent increase in deaths from any cause among people who sat for more than four hours a day while watching television, **26** which is as compared to people who sat for only two. Other studies found links between excessive sitting and obesity, diabetes, and heart problems.

23

- A) NO CHANGE
- B) run
- C) fired
- D) veered

24

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

- A) where it is now.
- B) at the beginning of the paragraph.
- C) before sentence 2.
- D) before sentence 3.

25

Which choice most effectively combines the underlined sentences?

- A) 800,000 is safely representative of the entire population, and that’s precisely the number that nearly 20 studies used to confirm the grim conclusion that was mentioned above.
- B) 20 tests used 800,000 subjects over the course of twenty or so years to confirm the grim conclusion and did so with a representative sample that was safe.
- C) Nearly 20 studies conducted in about as many years have confirmed this grim conclusion, and these studies have covered over 800,000 people overall, a safely representative sample.
- D) 800,000 people were safe from the grim conclusion of representative samples, as they were the 20 experiments of people in their 20s.

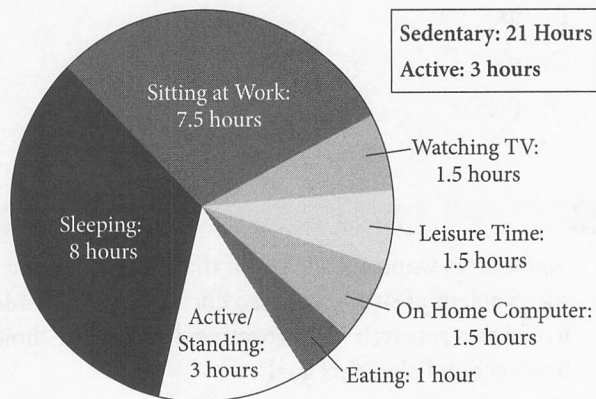
26

- A) NO CHANGE
- B) having
- C) this is
- D) DELETE the underlined portion.

CONTINUE 

The problem, it seems, is that the human body has not evolved for this kind of idleness. Consider our primate **27** ancestors for example, if they were not incredibly active at all times, they would not have survived. Even many humans throughout history had to live actively—not just as hunters, but as farmers or machinists. Now, as most white-collar jobs involve sitting at a desk, human bodies aren't sure what to do with all the free time. And there is a lot of it, with some estimates showing that the average American is upright and active **28** for only 8 hours of a day. This data shows that the sitting epidemic is not restricted to the workplace: **29** standing desks have become increasingly popular in the American workplace.

How Sedentary is the Typical American Each Day?



27

- A) NO CHANGE
- B) ancestors. For example,
- C) ancestors, for example,
- D) ancestors, for example:

28

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

- A) NO CHANGE
- B) for only 3 hours of the 24-hour day.
- C) for nearly one-third of an average day.
- D) for less than an hour a day.

29

Which choices offers an accurate interpretation of the data in the graph?

- A) NO CHANGE
- B) the sitting done at work accounts for more than half of all sedentary time on an average day.
- C) the average American also eats far too much, sometimes for hours at a time.
- D) less than half of all sedentary time during an average day is done at work.

CONTINUE 

There may be a message of hope in this news, however. For one, this research suggests that much of the American obesity epidemic could be solved with a change in sitting habits rather than a change in eating habits. More walking (not to mention more running, biking, or other strenuous activity) can reduce weights significantly over time.

Also, the mantra that “sitting is the new smoking” may not apply to those **30** that, of all things, fidget. Researchers in the U.K. tracked the habits of nearly 13,000 women over the course of 12 years. In controlling for other factors, they found that the women who fidgeted—who moved their hands and feet in small, seemingly negligible ways—were less at risk for the perils of sitting than those who **31** sit perfectly still. The leader of the study, Janet Cade, says that fidgeting may not help with body-mass index, but it could improve metabolism.

Thus, while sitting is not likely to come with a warning label, we can see some of **32** their detrimental effects. We can also see, however, how easy those detrimental effects are to counteract. Perhaps you can’t avoid sitting down on the job, but you can do yourself all kinds of favors by standing up, stretching out, or tapping your toes. **33** You don’t have to take this national health threat sitting down.

30

- A) NO CHANGE
- B) who
- C) we
- D) which

31

- A) NO CHANGE
- B) went
- C) are
- D) sat

32

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

33

The writers wants a conclusion that acknowledges the problem of sitting but also encourages the reader to use this research in a proactive way. Which choice best accomplishes this goal?

- A) NO CHANGE
- B) You should also really go to the gym once in a while.
- C) You might consider applying for a job that allows you to go outside sometimes.
- D) There’s not all that much you can do, frankly.



Questions 34–44 are based on the following passage.

It's So Rustic It's Chic

For many people, “fashion”—the latest lines of shoes, suits, dresses, or **34** furniture; refers to new things. Increasingly, however, the new things are considered *less* fashionable than the old ones. Granted, “retro” has been popular for a long time, as people have sported the clothes and **35** furnished their homes with the knick-knacks of yesteryear. The newest style of all is both newer and older than mere “retro.” This new style, rustic chic, rooted in the various attempts by the stylish to glorify old things, **36** seeks to take its proponents back even further to... well, no one's quite sure.

34

- A) NO CHANGE
- B) furniture
- C) furniture,
- D) furniture—

35

- A) NO CHANGE
- B) have furnished
- C) furnish
- D) furnishing

36

- A) NO CHANGE
- B) has sought
- C) seek
- D) seeking

CONTINUE 

Poking fun at this trend, the creators of a popular comedy **37** show IFC's *Portlandia*, changed their early theme song "The Dream of the '90s is Alive in Portland." Framed by men riding nineteenth-century bicycles, chipping their own ice, curing their own meats, and coiffing their handlebar **38** mustaches; these parts of the song jokes that the dream of the 1890s is alive in Portland. In fact, this joke is rooted in reality. Go into many coffee shops, restaurants, clothing stores, and furniture stores, and **39** the results may surprise you; salvaged furniture repainted in such a way that its age shows, handmade goods from artisans and craftspeople, and facial-hair configurations last seen on William Howard Taft.

This concept of "rustic chic" may seem a little odd. First, there's the question of economics. **40** Why, for instance, would anyone want to pay good money for a piece of furniture that is not only out of style but shows its signs of age? Or why would someone want to pay *more* money for something that is worn and broken than for something that is new?

37

- A) NO CHANGE
- B) show, IFC's *Portlandia*,
- C) show, IFC's, *Portlandia*
- D) show, IFC's, *Portlandia*,

38

- A) NO CHANGE
- B) mustaches, the song
- C) mustaches. These parts of the song
- D) mustaches. The song

39

Which choice most effectively sets up the examples that follow?

- A) NO CHANGE
- B) you'll notice something peculiar:
- C) you'll see the look of yesteryear:
- D) everything will be curiously expensive;

40

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

The effect of "rustic chic" on the American gross domestic product is yet to be determined.

Should the writer make this addition here?

- A) Yes, because it adds a note of economic seriousness to the passage.
- B) Yes, because the passage goes on to describe the global economy.
- C) No, because it is not relevant to the main focus of the passage.
- D) No, because it contradicts information given in the following paragraph.



Moreover, “rustic chic” is difficult to understand because it does not have a clear **41** interest. At least we know that hippies are trying to dress like people from the 1960s and flappers are trying to dress like people from the 1920s. How about people who are interested in the rustic chic aesthetic? When people plan barn weddings, they do so because they want to get married like “they” did.

42 Why do you think people are getting married later now?

[1] These questions may be unanswerable, but that does not mean that we cannot speculate as to why rustic chic has become such a popular style. [2] Wear the clothes that men and women did *before* the existence of the fashion industry. [3] The simple answer would seem to be this: people want authenticity, so they want to free themselves of all the things that would seem to have created our contemporary, inauthentic world. [4] Have corporations ruined everything? [5] Buy from individual sellers and farmers. [6] Has the fashion industry ruined everything? **43**

In a culture wherein advertisements tell us every day to be ourselves, many have found that command to be restricting rather than liberating. Truly being yourself is the work of a lifetime. Even so, rustic chic provides one way to **44** prevent the capitalist system from turning us all into drones, though depending on whose side you’re on, you might just think of it as a different type of clutter.

41

- A) NO CHANGE
- B) choice.
- C) fashion.
- D) source.

42

The writer wants to link this paragraph with the ideas that follow. Which choices best accomplishes this goal?

- A) NO CHANGE
- B) But who are “they”?
- C) As it was famously said, “There’s no accounting for the public’s taste.”
- D) It’s one thing to have a beard, but who actually likes mustaches?

43

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

- A) where it is now.
- B) after sentence 4.
- C) after sentence 5.
- D) after sentence 6.

44

- A) NO CHANGE
- B) reduce some of the clutter of contemporary life,
- C) halt the military-industrial complex of today,
- D) go off the grid and live a pure life,

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

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

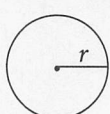
DIRECTIONS

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

NOTES

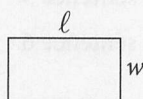
1. The use of a calculator is **not permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated, the domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE

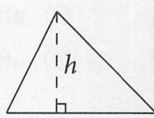


$$A = \pi r^2$$

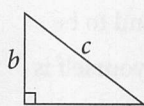
$$C = 2\pi r$$



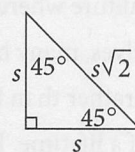
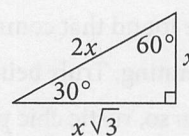
$$A = \ell w$$



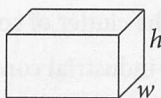
$$A = \frac{1}{2}bh$$



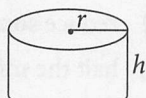
$$c^2 = a^2 + b^2$$



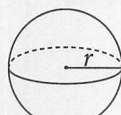
Special Right Triangles



$$V = \ell wh$$



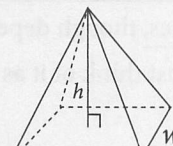
$$V = \pi r^2 h$$



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



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



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

The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is 2π .

The sum of the measures in degrees of the angles of a triangle is 180.

CONTINUE



1

If $4s = 28$, what is the value of $8s + 13$?

- A) 7
- B) 56
- C) 69
- D) 84

2

Which of the following is equal to $b^{\frac{3}{4}}$, for all values of b ?

- A) $\sqrt[4]{b^3}$
- B) $\sqrt[4]{\frac{1}{b^3}}$
- C) $\sqrt[4]{\frac{1}{b^4}}$
- D) $\sqrt[4]{b^4}$

3

A landscaper will sod p plots of land with the same dimensions with a particular type of grass. The landscaper charges based on the equation $Cost = pGlw$, where p is the number of plots, G is a constant in dollars per square meter, l is the length of a plot in meters, and w is the width of a plot in meters. If the customer asks the landscaper to use a cheaper type of grass for sodding, the value of which of the following would change?

- A) p
- B) G
- C) l
- D) w

4

$$3x + 2y = -21$$

$$5x + 6y = -35$$

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

- A) -14
- B) -7
- C) 14
- D) 56

CONTINUE



5

The number of countries that were members of the European Union in 2008 was three times the number of countries in the European Union (then called the European Communities) in 1974. If the European Union had 27 members in 2008 and m members in 1974, which of the following equations is true?

- A) $m + 27 = 3$
- B) $\frac{m}{3} = 27$
- C) $3m = 27$
- D) $27m = 3$

6

If $\frac{7}{y} = \frac{17}{y + 30}$, what is the value of $\frac{y}{7}$?

- A) $\frac{1}{3}$
- B) 3
- C) 7
- D) 21

7

$$cx - 6y = 8$$

$$3x - 7y = 5$$

In the system of equations shown above, c is a constant and x and y are variables. For what value of c will the system of equations have no solution?

- A) $\frac{24}{5}$
- B) $\frac{18}{7}$
- C) $-\frac{18}{7}$
- D) $-\frac{24}{5}$

8

x	$g(x)$
0	2
1	5
3	-1
7	0

The function g is defined by a polynomial. Some of the values of x and $g(x)$ are shown in the table above. Which of the following must be a factor of $g(x)$?

- A) $x - 1$
- B) $x - 2$
- C) $x - 3$
- D) $x - 7$

CONTINUE

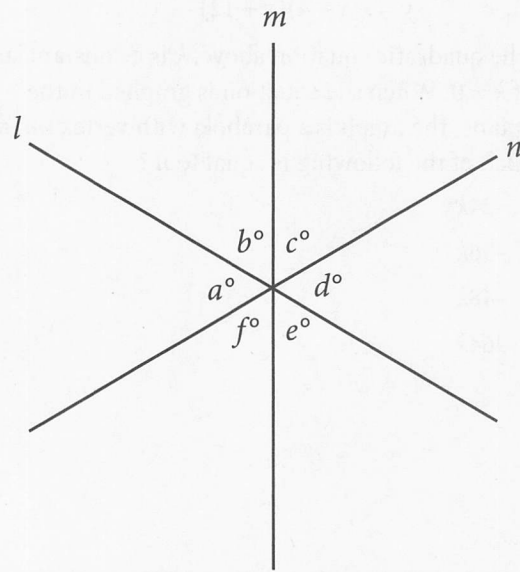


9

The line $y = cx + 6$, where c is a constant, is graphed in the xy -plane. If the point (r, s) lies on the line, where $r \neq 0$ and $s \neq 0$, what is the slope of the line, in terms of r and s ?

- A) $\frac{r-6}{s}$
 B) $\frac{6-s}{r}$
 C) $\frac{6-r}{s}$
 D) $\frac{s-6}{r}$

10



Note: Figure not drawn to scale.

In the figure above, lines l , m , and n intersect at a single point. If $a + b = c + d$, which of the following must be true?

- I. $b = c$
 II. $e = f$
 III. $a = e$
- A) I and II only
 B) II and III only
 C) I and III only
 D) I, II, and III

CONTINUE



11

$$y = k(x - 4)(x + 12)$$

In the quadratic equation above, k is a constant such that $k \neq 0$. When the equation is graphed in the xy -plane, the graph is a parabola with vertex (m, n) . Which of the following is equal to n ?

- A) $-24k$
- B) $-36k$
- C) $-48k$
- D) $-64k$

12

In the xy -plane, a parabola defined by the equation $y = (x - 8)^2$ intersects the line defined by the equation $y = 36$ at two points, P and Q . What is the length of \overline{PQ} ?

- A) 8
- B) 10
- C) 12
- D) 14

13

$$F(C) = \frac{9}{5}C + 32$$

The function above describes the relationship between temperatures measured in degrees Fahrenheit, F , and in degrees Celsius, C . Based on the function, which of the following must be true?

- I. A temperature decrease of 1.8 degrees Celsius is equivalent to a temperature decrease of 1 degree Fahrenheit.
- II. A temperature decrease of 1 degree Celsius is equivalent to a temperature decrease of $\frac{9}{5}$ degrees Fahrenheit.
- III. A temperature decrease of $\frac{5}{9}$ degree Fahrenheit is equivalent to a temperature decrease of 1 degree Celsius.

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



14

$$\frac{80x^2 + 84x - 13}{kx - 4} = -16x - 4 - \frac{29}{kx - 4}$$

The equation above is true for all values of $x \neq \frac{4}{k}$, where k is a constant. What is the value of k ?

- A) -5
- B) -2
- C) 2
- D) 5

15

What are the solutions to $5x^2 + 30x + 15 = 0$?

- A) $x = -2 \pm 2\sqrt{6}$
- B) $-2 \pm \sqrt{6}$
- C) $x = -3 \pm \frac{\sqrt{60}}{10}$
- D) $x = -3 \pm \sqrt{6}$

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 $\begin{array}{|c|c|c|c|} \hline 3 & 1 & / & 2 \\ \hline \bullet & \bullet & \bullet & \bullet \\ \hline \end{array}$ 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: $\frac{7}{12}$

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

Write answer in boxes. → ← Fraction line

Grid in result. →

Answer: 2.5

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

← Decimal point

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

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

.	6	6	6
•	•	•	•
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	•	•	•
7	7	7	7
8	8	8	8
9	9	9	9

.	6	6	7
•	•	•	•
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
7	7	7	•
8	8	8	8
9	9	9	9

Answer: 201 – either position is correct

2	0	1
•	•	•
0	•	0
1	1	•
2	•	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

2	0	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

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

CONTINUE →



16

If $\frac{21}{25}z - \frac{16}{25}z = \frac{1}{2} + \frac{3}{10}$, what is the value of z ?

17

$$y^3(y^2 - 10) = -9y$$

If $y > 0$, what is one possible solution to the equation above?

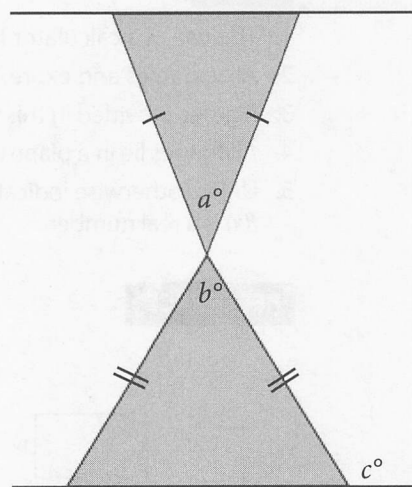
18

At a music school, each long session lasts twenty minutes longer than each short session. If 3 long sessions and 4 short sessions last a total of 270 minutes, how many minutes does a long session last?

19

In triangle UVW , the measure of $\angle U$ is 90° , $WV = 39$, and $UV = 36$. Triangle XYZ is similar to triangle UVW , where $\angle X$, $\angle Y$, and $\angle Z$ correspond to $\angle U$, $\angle V$, and $\angle W$, respectively. If each side of triangle XYZ is $\frac{3}{5}$ the length of its corresponding side of triangle UVW , what is the value of $\cos Z$?

20



Note: Figure not drawn to scale.

Two isosceles triangles are shown above. If $b = 180 - 4a$ and $a = 35$, what is the value of c ?

STOP

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



Math Test – Calculator

55 MINUTES, 38 QUESTIONS

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

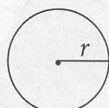
DIRECTIONS

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

NOTES

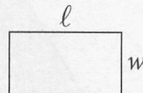
1. The use of a calculator **is permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated,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

REFERENCE

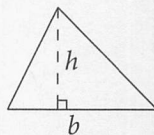


$$A = \pi r^2$$

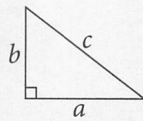
$$C = 2\pi r$$



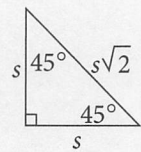
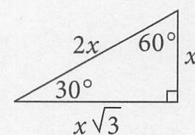
$$A = \ell w$$



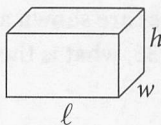
$$A = \frac{1}{2}bh$$



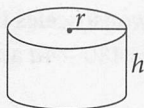
$$c^2 = a^2 + b^2$$



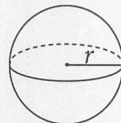
Special Right Triangles



$$V = \ell wh$$



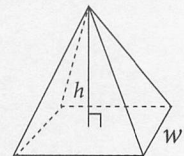
$$V = \pi r^2 h$$



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



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



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

The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is 2π .

The sum of the measures in degrees of the angles of a triangle is 180.

CONTINUE



1

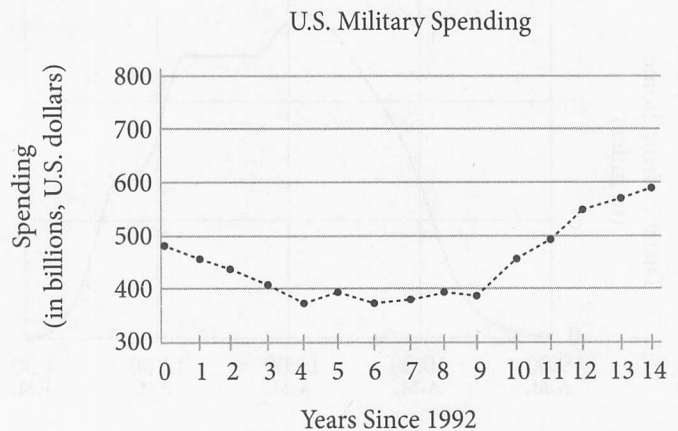
Species	Eye color		Total
	Yellow	Brown	
Grey wolf	16	2	18
Coyote	7	5	12
Total	23	7	30

The table above shows the distribution by species and eye color for the 30 canids living in a nature conservancy. If one canid is selected at random, what is the probability that it will be either a grey wolf with yellow eyes or a coyote with brown eyes?

- A) $\frac{11}{30}$
- B) $\frac{17}{30}$
- C) $\frac{21}{30}$
- D) $\frac{23}{30}$

2

The graph below shows U.S. military spending, in billions of dollars, each year from 1992 through 2006.



Based on the graph, which of the following best describes the overall trend in U.S. military spending from 1992 through 2006?

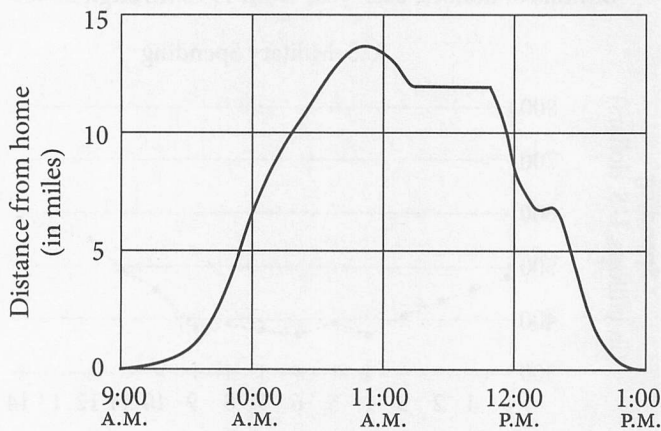
- A) Spending generally decreased in every year since 1992.
- B) Spending generally increased in every year since 1992.
- C) Spending generally remained constant in every year from 1992 through 2006.
- D) Spending decreased until 1996 and increased after 2001.

CONTINUE



3

Eddie's Bike Ride



The graph above represents Eddie's distance from home during a 4-hour bike ride. He stopped for 40 minutes during his bike ride to repair a flat tire. According to the graph, which of the following is nearest to the time he finished repairing his flat tire and continued on his ride?

- A) 11:10 A.M.
- B) 11:50 A.M.
- C) 12:10 P.M.
- D) 12:50 P.M.

4

At the Acme automobile factory, approximately 4 percent of male employees and 6 percent of female employees received performance bonuses last month. If there were 648 male employees and 519 female employees at the Acme automobile factory last month, which of the following is closest to the total number of male and female employees at the Acme automobile factory who received performance bonuses last month?

- A) 26
- B) 31
- C) 57
- D) 113

5

What is the sum of the polynomials $4x^2 + 3x - 2$ and $2x^2 - 8x + 9$?

- A) $6x^2 - 5x - 7$
- B) $6x^2 - 5x + 7$
- C) $6x^4 - 5x - 7$
- D) $6x^4 - 5x + 7$



6

k	1	2	3	4	5
$g(k)$	-3	1	5	9	13

The table above shows selected values of the linear function g . Which of the following best defines g ?

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

7

The total annual rainfall, in inches, in Brown County from 2005 to 2015 can be modeled by the equation $y = -0.14x + 7.8$, where x is the number of years since 2005 and y is the total annual rainfall. Which of the following best describes the meaning of the number -0.14 in the equation?

- A) The total annual rainfall in 2005
- B) The total annual rainfall in 2015
- C) The estimated difference between the total rainfall in 2005 and the total rainfall in 2015
- D) The estimated decrease in the average rainfall per year from 2005 to 2015

8

An insect crawls 30 inches in 16.3 minutes. If the insect continues to crawl at the same rate, approximately how many inches will it crawl in 6 hours?

- A) 200
- B) 300
- C) 650
- D) 960

CONTINUE



9

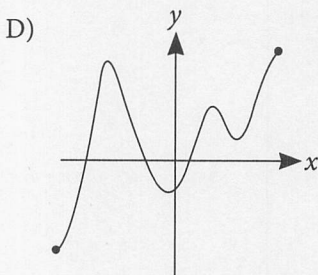
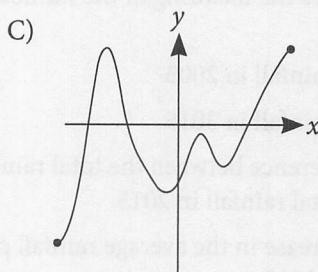
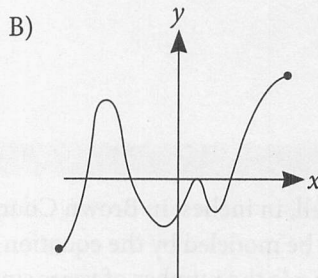
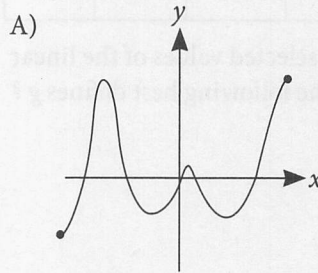
$$\frac{8}{5}v = \frac{7}{4}$$

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

- A) $\frac{56}{20}$
- B) $\frac{35}{32}$
- C) $\frac{32}{35}$
- D) $\frac{20}{56}$

10

The function g has four distinct zeros. Which of the following could be the complete graph of g in the xy -plane?



CONTINUE



Questions 11 and 12 refer to the following information.

Substance	Specific heat capacity $\left(\frac{\text{J}}{\text{g}}\right)$
Aluminum	0.90
Copper	0.39
Glass	0.67
Gold	0.13
Olive oil	1.79
Porcelain	1.08
Rubber	1.25
Water	4.18

The chart above gives approximations for the specific heat capacity, in joules per gram $\left(\frac{\text{J}}{\text{g}}\right)$, for eight common substances. The heat energy required to raise the temperature of a substance by 1° Celsius can be represented by the expression $Q = mC$, where Q is heat energy measured in joules (J), m is the mass of the substance measured in grams (g), and C is the specific heat capacity measured in $\frac{\text{J}}{\text{g}}$.

11

A piece of copper has a mass of 75 grams. How much heat energy, in joules, is needed to raise the temperature of the piece of copper by 1° Celsius?

- A) 29.25
- B) 50.25
- C) 111.95
- D) 192.30

12

A piece of porcelain requires 80 joules of heat energy to raise its temperature by 1° Celsius. If a piece of another substance with the same mass requires approximately 67 joules of heat energy to raise its temperature by 1° Celsius, the piece could be composed of which substance?

- A) Aluminum
- B) Glass
- C) Olive oil
- D) Rubber

CONTINUE



13

A medical study was conducted in order to determine whether product K could help people with hearing loss improve their hearing. The administrators of the study selected 200 subjects at random from a large group of people who had severe hearing loss. Half of the subjects were randomly assigned to be given product K and half were not. The resulting data demonstrated that subjects who were given product K had significantly improved hearing compared to those who were not given product K . Based on this study, which of the following conclusions is most appropriate?

- A) Product K will enable all people who take it to significantly improve their hearing.
- B) Product K is more effective than all other hearing-improvement products.
- C) Product K will help people significantly improve their hearing.
- D) Product K is likely to help people with severe hearing loss improve their hearing.

14

A car accelerates for t seconds at a constant rate of a meters per second squared $\left(\frac{\text{m}}{\text{s}^2}\right)$ until it reaches a velocity of v meters per second. The distance in meters the car travels is given by $d = vt - \frac{1}{2}at^2$. Which of the following gives a , in terms of v , d , and t ?

- A) $a = 2\left(v - \frac{d}{t}\right)$
- B) $a = 2\left(v + \frac{d}{t}\right)$
- C) $a = 2\left(\frac{v}{t} - \frac{d}{t^2}\right)$
- D) $a = 2\left(\frac{v}{t} + \frac{d}{t^2}\right)$

15

A certain type of ribbon costs \$0.15 per inch. Which of the equations below gives the total price, p , in dollars, for y yards of ribbon? (1 yard = 36 inches)

- A) $p = 0.15y + 36$
- B) $p = 0.15(36y)$
- C) $p = \frac{0.15y}{36}$
- D) $p = \frac{36y}{0.15}$

CONTINUE 



Questions 16 and 17 refer to the following information.

$$C(q) = 60q + 300$$

$$R(q) = 75q$$

The cost of producing a product and the revenue earned from selling a product are functions of the number of units sold. The functions shown above are the estimated cost and revenue functions for a certain product. The function $C(q)$ gives the total cost, in dollars, of producing a quantity of q units of the product, and the function $R(q)$ gives the total revenue, in dollars, earned from selling a quantity of q units of the product.

16

How will the total cost of producing q units change if the quantity is decreased by 20 units?

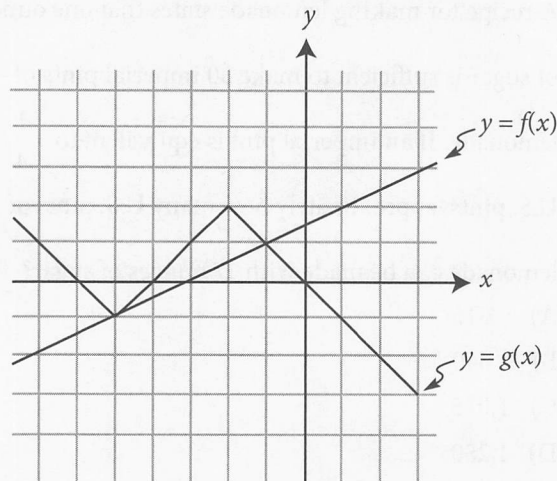
- A) The total cost will decrease by \$1,200.
- B) The total cost will decrease by \$320.
- C) The total cost will decrease by \$20.
- D) The total cost will increase by \$1,200.

17

At what quantity will the cost of producing q units equal the revenue earned from selling q units?

- A) 2
- B) 15
- C) 20
- D) 45

18



The figure above shows the graphs of the functions f and g in the xy -plane. For which of the following values of x is it true that $f(x) + g(x) = 1$?

- A) -5
- B) -4
- C) -3
- D) -2

19

Of the four types of depreciation shown below, which one would yield exponential decay in the value of an item?

- A) The item loses 5% of its initial value in each successive year.
- B) The item loses 6% of its current value in each successive year.
- C) The value of the item decreases by \$50 in each successive year.
- D) The value of the item decreases by \$60 in each successive year.

CONTINUE



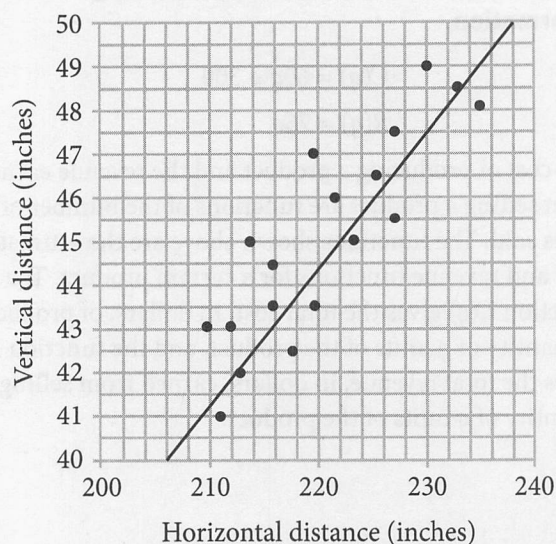
20

A recipe for making lemonade states that one ounce of sugar is sufficient to make 30 imperial pints of lemonade. If an imperial pint is equivalent to $1\frac{1}{4}$ U.S. pints, approximately how many U.S. pints of lemonade can be made with 17 ounces of sugar?

- A) 515
- B) 640
- C) 1,015
- D) 1,280

21

Horizontal Distance versus Vertical Distance



For a physics experiment, Hussain made 18 long jumps, and his classmates recorded the results. The scatterplot above shows both the vertical and horizontal distance of each jump. A line of best fit for the data is also shown. For the jump with a horizontal distance of 230 inches, the vertical distance was approximately how many inches more than the distance predicted by the line of best fit?

- A) 1.5
- B) 3
- C) 4.5
- D) 6



22

Mrs. Warren has b boxes of Girl Scout cookies that she wants to distribute to the members of her troop. If she gives each girl 4 boxes, she will have 11 boxes left over. If she wanted to give each student 5 boxes, she would need an additional 12 boxes. How many girls are in Mrs. Warren's Girl Scout troop?

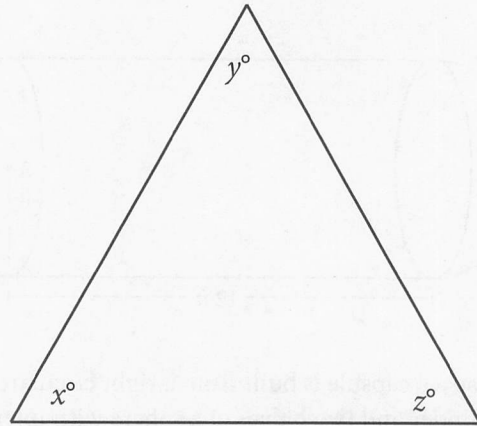
- A) 12
- B) 23
- C) 27
- D) 32

23

When three numbers are added together, the result is 665. The largest number is four-thirds the sum of the other two numbers. What is the value of the largest number?

- A) 95
- B) 245
- C) 350
- D) 380

24



Note: Figure not drawn to scale.

In the triangle shown above, $\cos(x^\circ) = \sin(z^\circ)$. If $x = 3j - 19$ and $z = 5j - 15$, what is the value of j ?

- A) 8.5
- B) 15.5
- C) 34.5
- D) 51.5

25

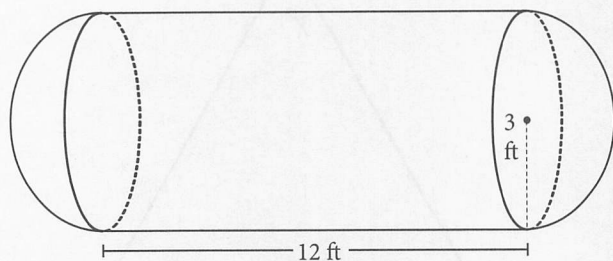
The length of a rectangle is decreased by 25 percent, and the width of the rectangle is increased by k percent. If the area of the rectangle increases by 5 percent, what is the value of k ?

- A) 25
- B) 30
- C) 35
- D) 40

CONTINUE



26



A space capsule is built from a right circular cylinder and two halves of a sphere with internal measurements as shown in the figure above. Which of the following is closest to the volume, in cubic feet, of the capsule?

- A) 339.9
- B) 396.3
- C) 452.4
- D) 565.6

27

The graph of line ℓ in the xy -plane passes through the origin and the points $(p, 4)$ and $(9, p)$. Which of the following is a possible value for p ?

- A) -6
- B) -3
- C) 0
- D) 12

28

	Decaffeinated	Caffeinated
Tea		
Coffee		
Total	28	116

The partially completed table above shows all the drinks that were sold on one day at a coffee shop. The shop sold 3 times as many cups of caffeinated tea as it did decaffeinated tea, and it sold 5 times as many cups of caffeinated coffee as it did decaffeinated coffee. If 28 cups of decaffeinated beverages and 116 cups of caffeinated beverages were sold, and one cup is selected at random out of all the caffeinated beverages that were sold, which of the following is closest to the probability that this cup contains coffee?

- A) 0.508
- B) 0.583
- C) 0.672
- D) 0.690



29

$$4x + j = 7x - 9$$

$$4y + k = 7y - 9$$

In the system of equations shown above, j and k are constants, and j is k plus $\frac{3}{2}$. Which of the following must be true?

- A) x is y minus $\frac{1}{2}$
- B) x is y plus $\frac{1}{2}$
- C) x is y minus $\frac{3}{2}$
- D) x is y plus $\frac{9}{2}$

30

Banerji currently owns 6,500 baseball cards. He is gradually selling his collection and estimates that the number of cards he owns will decrease by 20 percent every 6 months. Which of the following expressions best models Banerji's estimate of the number of baseball cards he will own m months from now?

- A) $6,500(0.2)^{\frac{m}{6}}$
- B) $6,500(0.2)^{6m}$
- C) $6,500(0.8)^{\frac{m}{6}}$
- D) $6,500(0.8)^{6m}$

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.

5. **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If

3	1	/	2
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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

Grid in result. →

← Fraction line

Answer: 2.5

	2	.	5
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
0	0	0	0
1	1	1	1
2	<input checked="" type="radio"/>	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

← Decimal point

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

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

.	6	6	6
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
7	7	7	7
8	8	8	8
9	9	9	9

.	6	6	7
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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	<input checked="" type="radio"/>	<input checked="" type="radio"/>	6
7	7	7	<input checked="" type="radio"/>
8	8	8	8
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	<input checked="" type="radio"/>	0
1	1	1	<input checked="" type="radio"/>
2	<input checked="" type="radio"/>	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

2	0	1	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	<input checked="" type="radio"/>	0	0
1	1	<input checked="" type="radio"/>	1
2	<input checked="" type="radio"/>	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

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



31

If the expression $(6x^2 - 7x + 5) - 3(x^2 - 5x + 4)$ is written in the form $ax^2 + bx + c$, what is the value of a ?

32

At a grocery store, potatoes are \$0.30 each, and onions are \$0.50 each. If Emeril plans to spend at least \$2.00 but no more than \$2.50 on p potatoes and 1 onion, what is one possible value for p ?

33

Height of 12 Infants in Mrs. Graham's Daycare Program

Student	Height	Student	Height
Angela	25	Letitia	22
Benjamin	22	Moishe	26
Charles	23	Nancy	30
Denise	27	Sasha	21
Elaine	24	Tormund	27
Johanna	30	Walter	25

The table above shows the heights, in inches, of 12 infants between the ages of 3 months and 6 months. According to the table, what is the mean height, in inches, of these infants? (Round your answer to the nearest tenth.)

34

In a certain course, students take 8 exams that are graded on a scale from 0 to 100, inclusive. Jacob received an average score of 65 on his first 4 exams. What is the lowest score he can receive on his 5th exam and still be able to score an average of 75 for all 8 exams?



35

$$y \leq 20x + 3,500$$

$$y \leq -8x$$

The graph in the xy -plane of the solution set of the system of inequalities above contains the point (j, k) . What is the greatest possible value of k ?

36

In the circle centered at P , the measure of central angle QPR is $\frac{7\pi}{6}$ radians. The length of the arc defined by central angle QPR is what fraction of the circumference of the circle?

Questions 37 and 38 refer to the following information.

According to a well-known statistics theorem, if patients enter a medical clinic at a rate of m patients per minute and each stays at the clinic an average of W minutes, the average number of patients, L , in the clinic at any point in time is given by $L = mW$.

The manager of the Kind Care clinic estimates that when the clinic is open, an average of 4 patients per minute enter the clinic and that on average, each of them stays 45 minutes. The manager uses the above theorem to estimate that at any point in time, there are 180 patients in the clinic.

37

A rival clinic, the Speedy Care clinic, recently opened across the street. The manager of this clinic estimates that, when the clinic is open, an average of 324 patients per hour enter the clinic and that, on average, each of them stays 40 minutes. The average number of patients in the Speedy Care clinic at any point in time is what percent greater than the average number of patients in the Kind Care clinic at any point in time? (Note: Disregard the percent sign when gridding in your answer. For example, if your answer is 38.4%, enter 38.4.)



38

The theorem above may be applied to any part of the clinic, such as the waiting room or a particular office. The manager observes that, when the clinic is open, approximately 36 patients per hour are being treated by a doctor, and that each of these patients spends an average of 15 minutes with his or her doctor. At any time when the clinic is open, approximately how many patients, on average, are being treated by a doctor at the Kind Care clinic?

END OF TEST**DO NOT RETURN TO A PREVIOUS SECTION.**