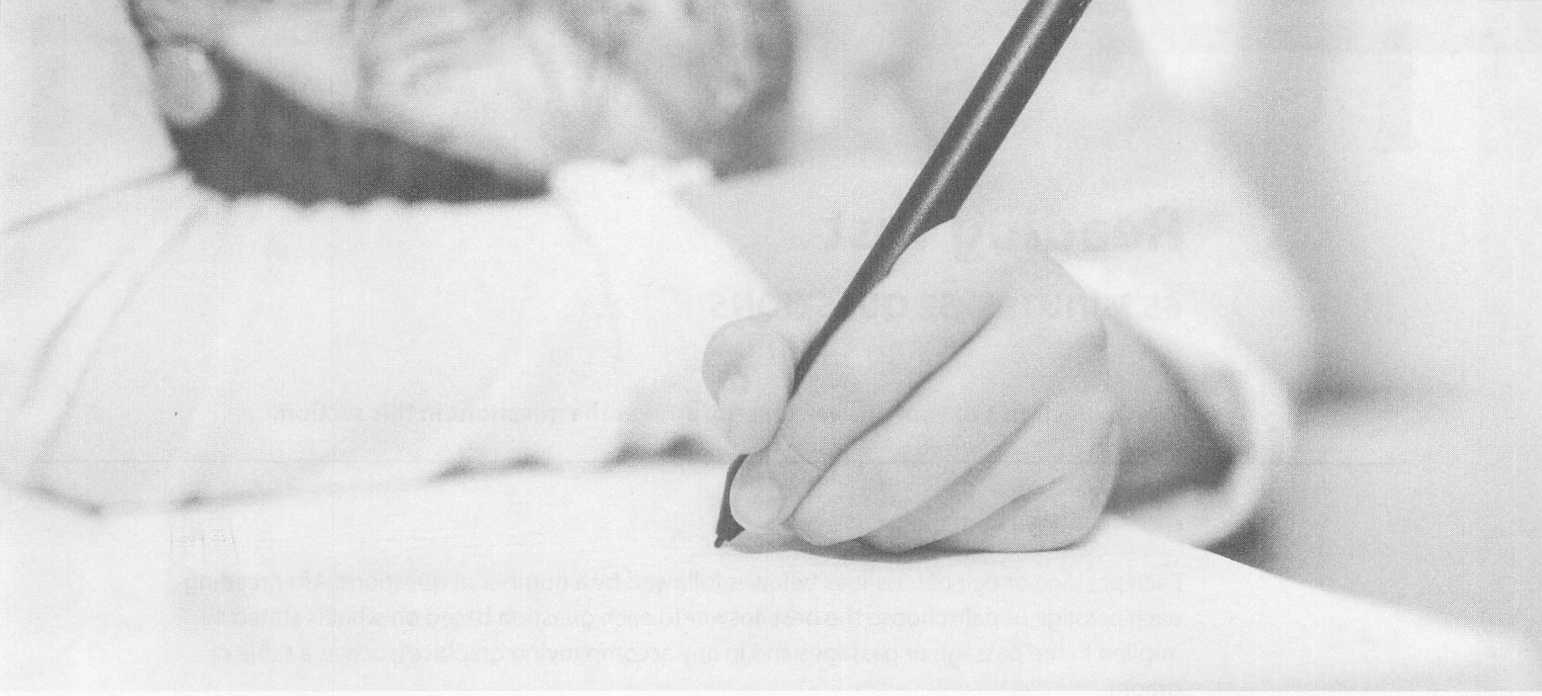


Chapter 11
Practice Test 5

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 excerpted from Robert Louis Stevenson, *Treasure Island,* originally published in 1883. The narrator and his parents own an inn on the English coast.

The stranger kept hanging about just inside the inn door, peering round the corner like a cat waiting for a mouse. Once I stepped out myself into the road, but he immediately called me back, and as I did not obey quick enough for his fancy, a most horrible change came over his tallowy face, and he ordered me in with an oath that made me jump. As soon as I was back again he returned to his former manner, half fawning, half sneering, patted me on the shoulder, told me I was a good boy and he had taken quite a fancy to me. "I have a son of my own," said he, "as like you as two blocks, and he's all the pride of my 'art. But the great thing for boys is discipline, sonny—discipline. Now, if you had sailed along of Bill, you wouldn't have stood there to be spoke to twice—not you. That was never Bill's way, nor the way of sich as sailed with him. And here, sure enough, is my mate Bill, with a spy-glass under his arm, bless his old 'art, to be sure. You and me'll just go back into the parlour, sonny, and get behind the door, and we'll give Bill a little surprise—bless his 'art, I say again."

So saying, the stranger backed along with me into the parlour and put me behind him in the corner so that we were both hidden by the open door. I was very uneasy and alarmed, as you may fancy, and it rather added to my fears to observe that the stranger was certainly frightened himself. He cleared the hilt of his cutlass and loosened the blade in the sheath; and all the time we were waiting there he kept swallowing as if he felt what we used to call a lump in the throat.

At last in strode the captain, slammed the door behind him, without looking to the right or left, and marched straight across the room to where his breakfast awaited him.

"Bill," said the stranger in a voice that I thought he had tried to make bold and big.

The captain spun round on his heel and fronted us; all the brown had gone out of his face, and even his nose was blue; he had the look of a man who sees a ghost, or the evil one, or something worse, if anything can be; and upon my word, I felt sorry to see him all in a moment turn so old and sick.

"Come, Bill, you know me; you know an old shipmate, Bill, surely," said the stranger.

The captain made a sort of gasp.

"Black Dog!" said he.

"And who else?" returned the other, getting more at his ease. "Black Dog as ever was, come for to see his old shipmate Billy, at the Admiral Benbow Inn. Ah, Bill, Bill, we have seen a sight of times, us two, since I lost them two talons," holding up his mutilated hand.

"Now, look here," said the captain; "you've run me down; here I am; well, then, speak up; what is it?"

"That's you, Bill," returned Black Dog, "you're in the right of it, Billy. I'll have a glass of rum from this dear child here, as I've took such a liking to; and we'll sit down, if you please, and talk square, like old shipmates."

CONTINUE

When I returned with the rum, they were already seated on either side of the captain's breakfast-table—Black Dog next to the door and sitting sideways so as to have one eye on his old shipmate and one, as I thought, on his retreat.

He bade me go and leave the door wide open. "None of your keyholes for me, sonny," he said; and I left them together and retired into the bar.

For a long time, though I certainly did my best to listen, I could hear nothing but a low gattling; but at last the voices began to grow higher, and I could pick up a word or two, mostly oaths, from the captain.

"No, no, no, no; and an end of it!" he cried once. And again, "If it comes to swinging, swing all, say I."

1

Which choice is the best synopsis of what happens in the passage?

A) Two characters make a plan to surprise a third character.

B) One character shows another character how to properly behave in a parlour.

C) One character unpleasantly surprises another character with an unexpected reunion.

D) Two characters reminisce about their time together on a ship.

2

Which choice best describes the developmental pattern of the passage?

A) A detailed analysis of an enthusiastic encounter

B) An inaccurate dictation of a notable conference

C) An apprehensive account of a contentious meeting

D) A dismissive description of an important homecoming

3

As it is used in line 5 and line 10, "fancy" most nearly means

A) elaboration.

B) impatience.

C) imagination.

D) preference.

4

Which emotion does the narrator most sense from the stranger regarding his imminent meeting with the captain?

A) The stranger is fearful about the captain's reaction to seeing him.

B) The stranger is overjoyed to reunite with the captain.

C) The stranger is worried the captain won't remember him.

D) The stranger is concerned the captain will be more interested in his breakfast than in conversation.

5

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

A) Lines 24–27 ("I was . . . himself")

B) Lines 31–34 ("At last . . . him")

C) Lines 43–44 ("Come . . . stranger")

D) Line 71 ("No, no, . . . once")

6

In the passage, the stranger addresses the narrator with

A) respect but not friendliness.

B) violence but not anger.

C) disgust but not hatred.

D) affection but not trust.

CONTINUE

7

The main purpose of the first paragraph is to

A) introduce a character.

B) criticize a belief.

C) describe a relationship.

D) investigate a discrepancy.

8

As it is used in line 51, "talons" most nearly means

A) weapons.

B) claws.

C) fingers.

D) hooks.

9

Why does the narrator describe the captain's face as something from which "all the brown had gone out of" (line 38)?

A) The captain has grown pale after being on land so long.

B) The captain has washed his face before the meal.

C) The captain has become ill during his walk.

D) The captain has gone pale with fright.

10

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

A) Lines 22–24 ("So saying . . . door")

B) Lines 39–42 ("he had . . . sick")

C) Lines 52–53 ("Now, look . . . it")

D) Lines 59–63 ("When . . . retreat")

CONTINUE

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

This passage is adapted from Russell W. Belk, "It's the Thought that Counts." ©1976 by University of Illinois at Urbana-Champaign.

The phenomenon of selecting an object or service "X" to present as a gift to person "Y" on occasion "Z" is a unique and important act of consumer behavior. Not only must the gift giver attempt to infer the recipient's tastes, needs, desires, and reactions, the gift selection may also be affected by the information which it would appear to convey about the giver and the giver-recipient relationship. The ancient practice of gift-giving is still pervasive and significant in modern cultures. For instance, Lowes, Turner, and Willis (1971) cite a series of British Gallup Polls from 1963–1967, in which it was found that over 90 percent of the adult population did some Christmas gift-giving each year. Another limited sample of middle and upper income families in Montreal, Caron and Ward (1975) found that third- and fifth-grade children received an average of between five and six gifts for Christmas. Both because of its prevalence and because of its strong interpersonal meanings, gift-giving offers a potentially rich area for consumer behavioral explanation.

Gift-giving has been treated from a variety of related theoretical perspectives, focusing primarily on the functions and effects of giving. The preeminent theoretical analysis of the gift-giving process is an essay by French anthropologist-sociologist Marcell Mauss (1923). Based on his examination of gift-giving among numerous primitive, remote, or ancient societies, Mauss concluded that gift-giving is a self-perpetuating system of reciprocity. More specifically, Mauss outlined three types of obligations, which perpetuate gift-giving:

1. The obligation to give,
2. The obligation to receive,
3. The obligation to repay.

The obligation to give may be based on moral or religious imperatives, the need to recognize and maintain a status hierarchy, the need to establish or maintain peaceful relations, or simply the expectation of reciprocal giving. These motives, which do not admit purely selfless giving, become institutionalized in a society so that under appropriate conditions an individual is socially obligated to give. Receiving is seen as similarly obligatory, and avoiding or refusing gifts is construed as an unfriendly or even hostile act. Mauss noted however that there is a certain tension created in receiving a gift since acceptance is an implicit recognition of dependence on the giver. This tension may then be reduced by fulfilling the third obligation, the obligation to repay. Failure to repay or failure to repay adequately results in a loss of status and self-esteem. Adequate or overly adequate repayment, on the other hand, creates an obligation to repay on the part of the original giver, and the cycle is reinitiated.

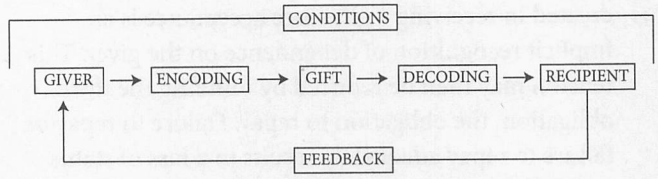
Schwartz (1967) noted that beyond the functions served by the general process of gift exchange, the characteristics of the gift itself also act as a powerful statement of the giver's perception of the recipient. He also suggested that acceptance of a particular gift constitutes an acknowledgment and acceptance of the identity that the gift is seen to imply. Among children this may lead to lasting changes in self-perceptions, but presumably gifts have less influence on the self-concept of an adult.

Nevertheless, the importance of this symbolic function of gift selection appears clear enough in a gift shop's recent advertisement, which asks, "Do you want your gifts to tell someone how creative you are, how thoughtful you are, or just how big your Christmas bonus was? Do you buy with a specific price or a specific personality in mind?" While the answers to such basic questions about gift selection may be personally evident, the underlying behavioral questions have not been addressed by empirical research.

There can be little doubt that gift-giving is a pervasive experience in human life and consumer behavior. Despite the additional variables which gift-giving introduces to conceptions of consumer behavior (e.g., characteristics of the recipient, gifter-receiver similarity, nature of the occasion), the present findings suggest that preference for cognitive balance is a concept which can go far toward explaining gift selection and evaluation.

CONTINUE

GIFT-GIVING AS COMMUNICATION



11

The author most likely uses the examples in lines 10–17 of the passage ("For instance . . . Christmas") to highlight the

A) recent increase in consumerism around Christmas time.

B) discrepancies in gift-giving between ancient and modern times.

C) apprehension between gift-givers and receivers.

D) pervasiveness of gift-giving on special occasions.

12

In line 20, the word "rich" most nearly means

A) opulent.

B) embellished.

C) fertile.

D) saccharine.

13

The passage indicates that the gift-giving described in lines 28–29 may be:

A) oppressive to gift recipients.

B) repeated between the same two people.

C) one-sided in most cases.

D) the result of deception.

14

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

A) Lines 38–41 ("These . . . give")

B) Lines 50–53 ("Adequate . . . reinitiated")

C) Lines 58–60 ("He also . . . imply")

D) Lines 70–74 ("While . . . research")

15

The author indicates that Marcell Mauss believes people's reasons for giving gifts may

A) be based somewhat on their own needs.

B) shift over the course of their lifetimes.

C) differ from culture to culture.

D) influence the timing of gift-giving.

16

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

A) Lines 21–23 ("Gift-giving . . . giving")

B) Lines 23–26 ("The preeminent . . . 1923")

C) Lines 34–38 ("The obligation . . . giving")

D) Lines 41–43 ("Receiving . . . act")

17

Schwartz, mentioned in paragraph 4 (lines 54–63), would likely describe the process of gift-exchanging as

A) stressful.

B) unnerving.

C) intentional.

D) symbolic.

CONTINUE

18

As it is used in line 65, "function" most nearly means

A) purpose.

B) tradition.

C) occasion.

D) occupation.

19

The author refers to a gift shop's recent advertisement (lines 65–66) in order to

A) question a former claim.

B) offer a motive.

C) introduce a counter explanation.

D) support an argument.

20

The graph and the passage offer evidence that the communication process of gift-giving predicts that a gift will demonstrate

A) the receiver's self-concept.

B) the amount the gift-giver spent.

C) encoded meaning.

D) the thoughtfulness of the gift-giver.

21

The author would likely explain the encoding phase represented in the figure in part as the gift-giver's attempt to convey information about

A) the occasion for gift-giving.

B) the giver's personal preferences.

C) the location where the gift was purchased.

D) the relationship between giver and receiver.

CONTINUE

Questions 22–31 are based on the following passage and supplementary material.

This passage is adapted from Nils Ekholm, "On the Variations of the Climate of the Geological and Historical Past and Their Causes." ©1901 by *Quarterly Journal of the Royal Meteorological Society.* Ekholm's studies are based on new mathematical calculations that show discrepancies among earlier scientists' findings in the study of historical changes in climate.

The atmosphere plays a very important part of a double character as to the temperature at the earth's surface. Firstly, the atmosphere may act like the glass of a green-house, letting through the light rays of the sun relatively easily, and absorbing a great part of the dark rays emitted from the ground, and it thereby may raise the mean temperature of the earth's surface. Secondly, the atmosphere acts as a heat store placed between the relatively warm ground and the cold space, and thereby lessens in a high degree the annual, diurnal, and local variations of the temperature.

There are two qualities of the atmosphere that produce these effects. The one is that the temperature of the atmosphere generally decreases with the height above the ground or the sea-level, owing partly to the dynamical heating of descending air currents and the dynamical cooling of ascending ones, as is explained in the mechanical theory of heat. The other is that the atmosphere, absorbing but little of the insolation and most of the radiation from the ground, receives a considerable part of its heat store from the ground by means of radiation, contact, convection, and conduction, whereas the earth's surface is heated principally by direct radiation from the sun through the transparent air.

It follows from this that the radiation from the earth into space does not go on directly from the ground, but on average from a layer of the atmosphere having a considerable height above sea-level. The height of that layer depends on the thermal quality of the atmosphere, and will vary with that quality. The greater is the absorbing power of the air for heat rays emitted from the ground, the higher will that layer be. But the higher the layer, the lower is its temperature relatively to that of the ground; and as the radiation from the layer into space is the less the lower its temperature is, it follows that the ground will be hotter the higher the radiating layer is.

Now if we are able to calculate or estimate how much the mean temperature that layer is lower than the mean temperature of the ground, we may apply Table I for calculating the mean temperature of the ground, as soon as we know by direct measurements the quantity of solar heat absorbed by the ground. Owing to the clouds and dust floating in the atmosphere, this heat is probably only about a third of that derived by using Langley's solar constant; and is thus about 360 calories per square centimeter during twenty-four hours. This gives, by means of Table I, a temperature of –31°C to the radiating layer. But, according to Arrhenius's estimate, this is at a height of about 7600 meters; and assuming a corresponding decrease of 0.6°C per 100 meters, we find its temperature to be 46°C lower than that of the ground, and thus the mean temperature of the ground equal to 15°C, as it is according to observations.

The table shows the loss of heat by radiation into space from a perfectly black body of the temperature $t°$ centigrade. In gram-calories per square centimeter per 24 hours at 7600 meters.

t	Loss of Heat	t	Loss of Heat	t	Loss of Heat
100	2023	20	770	–60	215
80	1624	0	581	–80	145
60	1285	–20	428	–100	94
40	1003	–40	308	–120	57

22

A student claims that over half of solar radiation influences the ground temperature on the earth's surface. Which of the following statements in the passage contradicts the student's claim?

A) Lines 3–7 ("Firstly . . . surface")

B) Lines 13–18 ("The one . . . heat")

C) Lines 45–49 ("Owing . . . hours")

D) Lines 49–50 ("This . . . layer")

CONTINUE

1

23

In the first paragraph (lines 1–11), what does the author claim is the atmosphere's importance to the temperature of the earth's surface?

A) The trapping of all hot air and energy from the sun

B) Controlling the heat energy that is admitted and released

C) The enclosure of all the earth's heat-producing mechanisms

D) The free passage of heat energy to and from the surface

24

The author uses the word "green-house" in line 4 to indicate that

A) the heat on the ground and in the atmosphere of the earth is provided exclusively by solar radiation.

B) most of the heat in the atmosphere comes from radiation from the ground.

C) the agricultural and botanical sectors of the economy are those most affected by climate fluctuations.

D) solar heat enters the atmosphere relatively unobstructed but the same does not apply as it leaves.

25

Based on the passage, the author's statement "the earth's surface is heated principally by direct radiation from the sun through the transparent air" (lines 23–25) implies that

A) when the sun is obscured by clouds, the ground is heated principally by other sources of energy.

B) heat generated independently by the ground and by the sun is held in the atmosphere and released as cool air.

C) the heat from the sun that warms the ground must be partially absorbed by the earth's atmosphere.

D) the solar heat reflected back from the earth does not account for all the heat in the atmosphere.

26

The author's use of the words "if," "may," and "as soon as" in lines 39–43 functions mainly to

A) provide definitive evidence that the author's mathematical calculations predict the span of global warming with accuracy.

B) demonstrate that many of the author's conclusions rely on both observable and non-observable factors.

C) support the hypothesis that ground temperatures are warmer than higher temperatures.

D) warn against the indiscretion of earlier scientists who made incorrect claims with insufficient evidence.

27

The author's main purpose in noting the observations of ground temperature is to

A) indicate that the mathematical calculations given in this paragraph correspond to data recorded by others.

B) show the limitations of mathematical formulas in providing precise measurements of observable phenomena.

C) provide an example of one place in which the global temperature has risen because of human activity.

D) underline the importance of mathematical calculations in determining the influence of solar radiation.

28

Based on the table and passage, which choice gives the correct temperature on the ground when the loss of heat is approximately 300 gram-calories per square centimeter for 24 hours?

A) 40°C

B) 6°C

C) −6°C

D) −40°C

CONTINUE

29

Does the data in the table support the author's claim regarding the atmosphere as a heat store?

A) Yes, because at each given temperature, as the temperature decreases, the heat loss decreases as well but by larger and larger intervals.

B) Yes, because at each given temperature, as the temperature decreases, the heat loss decreases as well but by smaller and smaller intervals.

C) No, because at each given temperature, as the temperature decreases, the heat loss fluctuates according to an irregular pattern and series of intervals.

D) No, because at each given temperature, as the temperature decreases, the heat loss increases by larger and larger intervals.

30

According to the table, which of the following pairs of heat-loss values at different temperatures provide evidence in support of the answer to the previous question?

A) 2023 to 1624 and 2023 to 57

B) 1003 to 581 and 581 to 94

C) 1003 to 770 and 770 to 581

D) 308 to 94 and 581 to 57

31

Based on the passage and the table, does the temperature of the atmosphere of the earth stay the same or does it vary with distance from the earth, and which statement made by the authors is most consistent with this data?

A) The same; "Secondly . . . temperature" (lines 7–11)

B) The same; "It follows . . . sea-level" (lines 26–29)

C) It varies; "Now if . . . ground" (lines 39–44)

D) It varies; "But, according . . . observations" (lines 50–56)

CONTINUE

Questions 32–41 are based on the following passage.

This passage is adapted from Frederick Douglass's speech "On Women's Suffrage" delivered in 1888 to a gathering of women's suffrage activists.

Mrs. President, Ladies and Gentlemen:— I come to this platform with unusual diffidence. Although I have long been identified with the Woman's Suffrage movement, and have often spoken in its favor, I am somewhat at a loss to know what to say on this really great and uncommon occasion, where so much has been said.

When I look around on this assembly, and see the many able and eloquent women, full of the subject, ready to speak, and who only need the opportunity to impress this audience with their views and thrill them with "thoughts that breathe and words that burn," I do not feel like taking up more than a very small space of your time and attention, and shall not. I would not, even now, presume to speak, but for the circumstance of my early connection with the cause, and of having been called upon to do so by one whose voice in this Council we all gladly obey. Men have very little business here as speakers, anyhow; and if they come here at all they should take back benches and wrap themselves in silence. For this is an International Council, not of men, but of women, and woman should have all the say in it. This is her day in court. I do not mean to exalt the intellect of woman above man's; but I have heard many men speak on this subject, some of them the most eloquent to be found anywhere in the country; and I believe no man, however gifted with thought and speech, can voice the wrongs and present the demands of women with the skill and effect, with the power and authority of woman herself. The man struck is the man to cry out. Woman knows and feels her wrongs as man cannot know and feel them, and she also knows as well as he can know, what measures are needed to redress them. I grant all the claims at this point. She is her own best representative. We can neither speak for her, nor vote for her, nor act for her, nor be responsible for her; and the thing for men to do in the premises is just to get out of her way and give her the fullest opportunity to exercise all the powers inherent in her individual personality, and allow her to do it as she herself shall elect to exercise them. Her right to be and to do is as full, complete and perfect as the right of any man on earth. I say of her, as I say of the colored people, "Give her fair play, and hands off." There was a time when, perhaps, we men could help a little. It was when this woman suffrage cause was in its cradle, when it was not big enough to go alone, when it had to be taken in the arms of its mother from Seneca Falls, N.Y., to Rochester, N.Y., for baptism. I then went along with it and offered my services to help it, for then it needed help; but now it can afford to dispense with me and all of my sex. Then its friends were few—now its friends are many. Then it was wrapped in obscurity—now it is lifted in sight of the whole civilized world, and people of all lands and languages give it their hearty support. Truly the change is vast and wonderful.

There may be some well-meaning people in this audience who have never attended a woman suffrage convention, never heard a woman suffrage speech, never read a woman suffrage newspaper, and they may be surprised that those who speak here do not argue the question. It may be kind to tell them that our cause has passed beyond the period of arguing. The demand of the hour is not argument, but assertion, firm and inflexible assertion, assertion which has more than the force of an argument. If there is any argument to be made, it must be made by opponents, not by the friends of woman suffrage. Let those who want argument examine the ground upon which they base their claim to the right to vote. They will find that there is not one reason, not one consideration, which they can urge in support of man's claim to vote, which does not equally support the right of woman to vote.

32

The main purpose of the passage is to

A) qualify the credentials of a speaker.

B) provide support for the suffrage movement.

C) argue for the equal rights of women.

D) compare the sufferings of women to those of African Americans.

CONTINUE

33

The central claim of the passage is that

A) women should have the floor at this assembly.

B) men should act for women in this movement.

C) women and men have the same justification for voting.

D) the suffrage movement should be less obscure.

34

Douglass uses the word "cause" throughout the passage mainly to

A) clarify his early connection to the suffrage movement.

B) explain why the suffrage movement deserves support.

C) compare the suffrage movement to a baby in a cradle.

D) describe the suffrage movement.

35

According to the passage, Douglass is hesitant to speak at the gathering because

A) he had an early association with the suffrage movement.

B) he believes that women should be the featured speakers.

C) he does not consider himself an eloquent and forceful speaker.

D) it is improper to speak from the back benches.

36

Douglass indicates that men

A) should not be speakers in such a movement.

B) should not take too much time and attention.

C) should primarily listen at such a gathering.

D) should voice the wrongs of women publicly.

37

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

A) Lines 8–14 ("When I . . . not")

B) Lines 15–18 ("I would . . . obey")

C) Lines 18–21 ("Men have . . . silence")

D) Lines 27–31 ("and I . . . herself")

38

Douglass characterizes the "demands of women" in line 29 as related to injuries that

A) women can best describe and suggest solutions for.

B) men should speak about more eloquently.

C) the civilized world should support heartily.

D) men and women should both be responsible for.

39

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

A) Lines 25–27 ("but I . . . country")

B) Lines 32–34 ("Woman . . . them")

C) Lines 42–44 ("Her right . . . earth")

D) Lines 45–46 ("There . . . little")

CONTINUE

40

Which choice most closely captures the meaning of the figurative "cradle" referred to in line 47?

A) Nest

B) Rock

C) Hold

D) Beginnings

41

The surprise referred to in lines 58–74 mainly serves to emphasize how

A) some attendees may have expected different sorts of speeches.

B) male attendees may have expected more arguments than assertions.

C) audience members may not have expected speeches on women's suffrage.

D) speakers may have presented unexpected arguments for the right to vote.

CONTINUE

Questions 42–52 are based on the following passages.

Passage 1 is adapted from Michael B. McElroy and Xi Li, "Fracking's Future." ©2013 by *Harvard Monthly*. Passage 2 is adapted from Natural Resources Defense Council, "Unchecked Fracking Threatens Health, Water Supplies." ©2015.

Passage 1

Supplies of natural gas now economically recoverable from shale in the United States could accommodate the country's domestic demand for natural gas at current levels of consumption for more than a hundred years: an economic and strategic boon, and, at least in the near term, an important stepping-stone toward lower-carbon, greener energy.

The first step in extracting gas from shale involves drilling vertically to reach the shale layer, typically a kilometer or more below the surface. Drilling then continues horizontally, extending a kilometer or more from the vertical shaft, and the vertical and horizontal components of the well are lined with steel casing, cemented in place. The horizontal extension of the casing is then perforated, using explosives; thereafter, water, carrying sand and proprietary chemicals, is injected into the well at high pressure. The water encounters the shale through the perforations, generating a series of small fractures in the rock (hence the nickname, "fracking"); the sand in the water keeps the cracks open, while the chemicals enhance release of gas from the shale. The injected water flows back up to the surface when the pressure in the well is released following completion of the fracking procedure. Then the well starts to produce natural gas.

As many as 25 fracture stages (per horizontal leg) may be involved in preparing a single site for production, each requiring injection of more than 400,000 gallons of water—a possible total of more than 10 million gallons before the well is fully operational. A portion of the injected water flows back to the surface, heavily contaminated with the fracking chemicals and others it has absorbed from the shale. Depending on the local geology, this "return water" may also include radioactive elements.

Drillers developing a well must take exceptional care to minimize contact between the wellbore and the surrounding aquifer—often the source of nearby residents' fresh water. Serious problems have arisen in the past from failures to isolate the drilling liquids, including cases where well water used for drinking became so contaminated that human and animal health was threatened. It is essential that monitoring be in place to ensure the continuing integrity of the seal isolating the well from the aquifer even *after* the well has been fully exploited and abandoned.

Passage 2

The oil and gas industry is rapidly expanding production across the nation, as new technology makes it easier to extract oil or gas from previously inaccessible sites. Over the last decade, the industry has drilled hundreds of thousands of new wells all across the country. These wells are accompanied by massive new infrastructure to move, process, and deliver oil and gas, together bringing full-scale industrialization to often previously rural landscapes.

The sector's growth is spurred by the use of hydraulic fracturing, or fracking, in which often-dangerous chemicals are mixed with large quantities of water (or other base fluid) and sand and injected into wells at extremely high pressure. Unconventional development using advanced fracking methods poses threats to water, air, land, and the health of communities. Studies have shown dangerous levels of toxic air pollution near fracking sites; and oil and gas extraction have caused smog in rural areas at levels worse than downtown Los Angeles. Oil and gas production have been linked to increased risk of cancer and birth defects in neighboring areas; as well as to a risk of increased seismic activity. Constant massive truck traffic associated with large-scale development disrupts communities and creates significant hazards. The millions of gallons of water used in fracking operations not only strain water resources, but end up as vast amounts of contaminated wastewater. Fracking has been reported as a suspect in polluted drinking water around the country. And methane—a potent climate change pollutant—leaks rampantly throughout the extraction, processing, and distribution of oil and gas.

Weak safeguards and inadequate oversight have allowed oil and gas producers to run roughshod over communities across the country with their extraction and production activities for too long, resulting in

CONTINUE

contaminated water supplies, dangerous air pollution, destroyed streams, and devastated landscapes. Our state and federal leaders have failed to hold them to account, leaving the American people unprotected. Many companies don't play by the few rules that do exist; and industry has used its political power at every turn to gain exemptions from environmental laws designed to protect our air and water.

42

The author of Passage 1 indicates that fracking could have which positive effect?

A) It could support small, local economies that do not have other sources of income.

B) It could alter the way scientists understand the shale layer of the Earth.

C) It could provide resources that meet the needs of contemporary consumers.

D) It could lower the price that large-scale industrial firms pay for natural gas.

43

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

A) Lines 1–5 ("Supplies . . . years")

B) Lines 17–22 ("The water . . . shale")

C) Lines 22–25 ("The injected . . . gas")

D) Lines 30–35 ("A portion . . . elements")

44

In lines 26–30, the author of Passage 1 mentions the number of gallons of water primarily to

A) warn of the inevitable dangers of industrial fracking in small communities.

B) show the variety of ways that natural gas can be extracted from shale.

C) expand upon the idea that fracking uses only a few basic elements.

D) establish the size and scope of a fracking operation.

45

What function does the discussion of the aquifer in lines 36–46 serve in Passage 1?

A) It outlines one significant risk involved in the process described in earlier paragraphs.

B) It addresses and disputes the concerns of those whose attitude toward fracking is cautious.

C) It extends a discussion of a significant term that begins in the previous paragraph.

D) It presents an unexpected new finding that undermines industry arguments for a certain practice.

46

As used in line 44, "integrity" most nearly means

A) morality.

B) impermeability.

C) moisture.

D) confidence.

47

The central claim of Passage 2 is that fracking mines useful resources but

A) the wells that have been built are not sufficiently productive to justify all the cost.

B) some experts believe that natural gas can be acquired just as easily from other sources.

C) it may lead some industry executives to believe that they can mine resources from any place they choose.

D) it is currently not sufficiently regulated in a way that is safe for local populations.

CONTINUE

48

As used in line 80, "oversight" most nearly means

A) error.

B) planning.

C) regulation.

D) omission.

49

Which statement best describes the relationship between the passages?

A) Passage 2 undermines the optimistic confidence of the author of Passage 1.

B) Passage 2 expands upon some of the concerns expressed less explicitly in Passage 1.

C) Passage 2 argues for certain regulations of which the author of Passage 1 does not approve.

D) Passage 2 describes the process discussed in Passage 1 but does so with more detail and statistics.

50

The author of Passage 2 would most likely respond to the discussion of drillers in lines 36–46, Passage 1, by claiming that these drillers

A) cite their successes in having grown the mining industry throughout the country.

B) often come from small towns themselves and are not likely to abuse the land.

C) have already caused irreparable harm to the American landscape.

D) can be difficult to contact when their work is conducted so far underground.

51

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

A) Lines 47–52 ("The oil . . . country")

B) Lines 56–60 ("The sector's . . . pressure")

C) Lines 66–72 ("Oil and . . . hazards")

D) Lines 80–85 ("Weak . . . landscapes")

52

Which point about the potential effects of fracking is implicit in Passage 2 and explicit in Passage 1?

A) The pollution caused by fracking can affect both the water and the air.

B) The process of fracking requires the use of many billions of gallons of water.

C) The process can contaminate drinking water and thus harm both animals and humans.

D) The economic costs of preparing wells can often cost more than the profits gained from mining.

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.

No Test Material On This Page

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.

A Horse of a Different Doctor

Although medical science has made huge bounds in understanding many parts of the body, the brain remains a kind of mystery. A heart attack, for instance, is much easier to identify and prevent than a brain stroke. And mental illness aside, 1 the variety of neurological disorders can make specific brain diagnoses complicated and often unreliable. As a result, the therapeutic resources available to neurologists and those with neurological disorders must necessarily be as vast and diverse as the patient base itself. Disciplines like art therapy, aromatherapy, and horticultural therapy have begun to gain some traction in the popular imagination. Some fields, however, are still awaiting 2 the okay from the people, although their achievements and successes are just as significant. One such field is that of hippotherapy.

1

A) NO CHANGE
B) the variety of different kinds of neurological disorders
C) the differing variety of disorders in neurology
D) disorders that show a variety of differences

2

A) NO CHANGE
B) broader public acceptance
C) something elusive from the public
D) a public to give the thumbs up

CONTINUE

Hippotherapy positions itself at the intersection of physical, occupational, and speech therapy. In this discipline, the characteristic movements of a horse (*hippo-* in Greek) [3] is used to build a foundation for improvements in human neurological functions and sensory processing. Its main difference from therapeutic horseback riding is that hippotherapy uses the movement of the horse as a way to treat a specific ailment. [4] Thus, it is more concerned with learning a skill set and establishing a bond between rider and horse.

3

A) NO CHANGE

B) has been used

C) are used

D) used

4

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

> Therapeutic horseback riding teaches riding skills and is more concerned with emotional and behavioral disabilities.

Should the writer make this addition here?

A) Yes, because it makes the argument that hippotherapy is the more effective of the two disciplines.

B) Yes, because it further clarifies the difference between the two disciplines discussed in this paragraph.

C) No, because it undermines the point the author is trying to make about the validity of hippotherapy.

D) No, because a discussion of therapeutic horseback riding has no place in this particular paragraph.

CONTINUE

[1] Many fields use the basic tenets of hippotherapy, but they each provide a unique spin on the practice. [2] Physical therapists may incorporate hippotherapy to manage a variety of disabilities and, hopefully, cure diseases. [3] Occupational therapists use many of the same features of the horse's movement, but they 5 are similarly plagued by the lack of laboratory support. [4] The research on the effectiveness of hippotherapy is still in the early stages of development, but therapists in a variety of fields, even including speech and language pathology, regularly achieve success with this technique and 6 eagerly to recommended it to their patients. [5] As the name suggests, these therapists are concerned mainly with the movement of the horse as it relates to physical aspects such as balance, posture, and strengthening the core. 7

The American Hippotherapy Association can provide certification for those wishing to work in the discipline. Physical therapists, occupational therapists, and speech-language pathologists must have practiced for at least three years and had 100 hours of hippotherapy practice before they can sit for the Hippotherapy Clinical Specialty Certification Exam, and the certification lasts for five years. Because the discipline is relatively 8 new, certified, hippotherapists have stringent requirements for staying current on the research within the field.

5

Which choice provides a supporting example that reinforces the main point of the sentence?

A) NO CHANGE
B) use the therapy to develop the cognitive and fine motor skills.
C) work on different maladies and different parts of the body.
D) have a whole different set of requirements and backgrounds.

6

A) NO CHANGE
B) eager recommending of
C) eagerly recommending
D) eagerly recommend

7

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

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

8

A) NO CHANGE
B) new, certified
C) new, and certified
D) new; certified

CONTINUE

Just as medical science is constantly evolving, 9 so are its alternatives. Hippotherapy may seem a bit out of the ordinary, but if it provides effective relief or treatment for people in pain, the skeptics 10 between doctors and researchers will not hesitate to embrace it. 11 Becoming a hippotherapist is pretty hard, as evidenced by all those hours one has to spend keeping up with the literature.

9

A) NO CHANGE
B) so too are its alternatives.
C) its alternatives also are.
D) its alternatives are, too.

10

A) NO CHANGE
B) above
C) within
D) among

11

The writer wants a concluding sentence that restates the main argument of the passage. Which choice best accomplishes that goal?

A) NO CHANGE
B) Hippotherapy has positioned itself at the crossroads of many disciplines, and it may just be the practice to provide relief in ways the other therapies have not done yet.
C) Many people used bloodletting and radiation regularly before the medical establishment showed how unsafe these practices were.
D) It makes you wonder whether the medical profession is ready for such a crazy discovery.

CONTINUE

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

The Call of the Wilderness

The way science textbooks teach about different ecosystems **12** elicit responses primarily from our visual and tactile senses. We have all seen pictures of the silent sands of the desert and can almost feel the heat radiating from the sands. We all know the ballet of fish and marine life coursing through the vast ocean. Some recent studies, however, have expanded our ideas about these ecosystems by incorporating another one of our senses: sound.

13 It was Marco Polo who crossed the desert on his way to China, he described the sound he heard as "a variety of musical instruments." Researchers now understand that the curious sound that Polo heard, that odd confluence of pipe organ and **14** cello, probably resulted from the wind blowing across the sand dunes. In a study conducted in the deserts of California, scientists found that the "singing" dunes had dry, tightly packed layers of sand, with dry sand on top of layers of damp sand. This variation creates an effect similar to that of a musical **15** instrument, a tonal quality coming from the trapping and release of certain frequencies.

12

A) NO CHANGE
B) elicits responses
C) illicit responses
D) illicits responses

13

A) NO CHANGE
B) Marco Polo crossed the desert
C) They called him Marco Polo, he who crossed the desert
D) As Marco Polo crossed the desert

14

A) NO CHANGE
B) cello;
C) cello—
D) cello: it has

15

A) NO CHANGE
B) instrument; a tonal quality coming
C) instrument, a tonal quality that is said to be coming
D) instrument, this quality comes

CONTINUE

16 From among the world's countless ecosystems and throughout that world, the ocean, too, has recently been given a kind of "voice." Although Jacques Cousteau referred to this body of water as *le monde du silence*—"the silent world"—recent research has shown the ocean to be anything but silent. University of Washington biologist Kate Stafford has, for the past five years, recorded sounds in the deep waters of the Bering Strait. 17 For Stafford, sound provides advantage that sight cannot: one can continue to record sound at night or underneath ice cover, and the challenges of deep-sea sound-recording are not nearly as problematic as those of deep-sea diving.

16

Which choice most smoothly and effectively introduces the writer's discussion of the sounds of the ocean in this paragraph?

A) NO CHANGE

B) Ecosystems are filled with sound, and one such sound in one such ecosystem is the "voice" of the ocean.

C) Another place that has recently been given a kind of "voice" is the ocean.

D) DELETE the underlined sentence.

17

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

> If you go far enough from the coast, the only sounds you will hear are those of distant ships passing in the night.

Should the writer make this addition here?

A) Yes, because it creates a poetic image that complements the main idea of the paragraph.

B) Yes, because it supports the main idea of the passage as a whole.

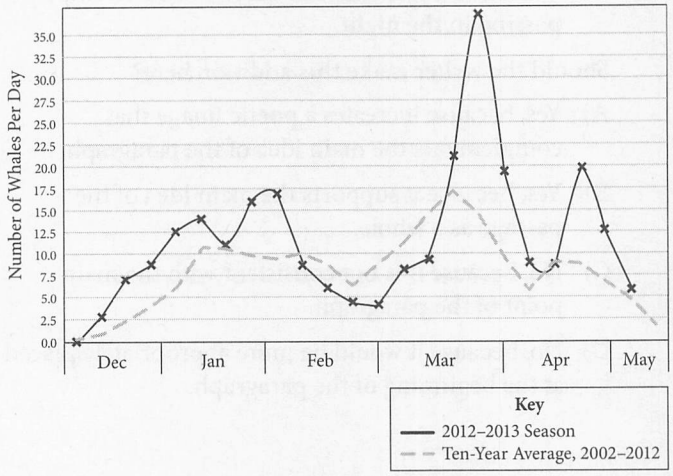
C) No, because it is not consistent with the main point of the paragraph.

D) No, because it would be more appropriately placed at the beginning of the paragraph.

CONTINUE

According to Stafford's research, one of the most interesting aspects of the sound of the ocean is **18** its unwillingness to **19** not act so weird. Stafford's team found inconsistencies among the sounds at any particular time of year. This may help to explain the **20** lack of any consistency in whale migrations during 2012–2013 as compared to previous seasons. Data from the 2012–2013 season shows that on many days the number of whales migrating was **21** more than twice the ten-year average. This gives some hint as to how marine animals are currently adapting to climate change, and how they may adapt in the future. It seems that those with the most flexibility will be those who are least affected.

2012–2013 Season, Compared to the Average of the Previous Ten Seasons



18

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

19

A) NO CHANGE
B) follow any discernible patterns.
C) chill out and be normal for a second.
D) play nice with others.

20

Which choice offers the most accurate interpretation of the data in the chart?

A) NO CHANGE
B) definable inverse relationship
C) absolute confluence
D) notable increases

21

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

A) NO CHANGE
B) more than ten times the ten-year average.
C) less than half of the ten-year average.
D) more than twice the number of shorebirds migrating.

CONTINUE

The work that Stafford and others are doing adds another dimension to how we understand different ecosystems. 22 Sound may clarify the processes of these ecosystems in ways that were not available to researchers before.

22

The writer wants a conclusion that points toward the role that sound might play in future research into different ecosystems. Which choice results in the passage having the most appropriate concluding sentence?

A) NO CHANGE

B) This is not, of course, to say that no research has ever been done on sound before; that would be an overstatement.

C) Researchers may have missed this sound component, but you have to hand it to them for covering the other parts as thoroughly as they have.

D) The vividness of soundscapes is nowhere more evident than in the experiences of the blind, who can use sound in much the way that sighted people use sight.

CONTINUE

Questions 23–33 are based on the following passage.

Roosevelt's 100 Days

In the 1932 presidential election, up-and-comer Franklin D. Roosevelt 23 won— in a landslide over the incumbent Herbert Hoover, who had done little to avert the crisis that would become known as the Great Depression. 24 And Hoover took office in 1929, the unemployment rate was a mere 3.2%. By 1932, that rate had skyrocketed to 25%.

25 Roosevelt took office with a clear mandate for action. Even so, no one was quite ready for the legislative whirlwind that would follow. This period became known as Roosevelt's "100 Days." Roosevelt's first action came on March 5, 1933, when an executive order shut down all the nation's banks. At that time, he sent government workers to inspect each bank, 26 although determining which banks would be safe and sustainable to reopen. Four days later, the banks reopened and started business anew.

23

A) NO CHANGE
B) won;
C) won,
D) won

24

A) NO CHANGE
B) Because
C) When
D) DELETE the underlined portion and begin the sentence with a capital letter.

25

Which choice most effectively sets up the paragraph?

A) NO CHANGE
B) Politics could move a bit more quickly in those days.
C) That unemployment rate is remarkably low.
D) Hoover had given up all hope of ending the Depression.

26

A) NO CHANGE
B) for
C) thereby
D) whereupon

CONTINUE

Roosevelt's main goal was to lift the country from depression and to get the 27 economy operating again. In the 100 days, Roosevelt established programs to aid the poor, such as the $500 million Federal Emergency Relief Association. The Civilian Conservation Corps was established to give unemployed men six-month job assignments on environmental projects, such as national parks. In agricultural regions, Roosevelt sought to control supply as a way to level 28 with demand, and certain projects were geared toward electrifying until-then remote regions. The Tennessee Valley Authority (TVA) brought dams to the non-coastal southern states, 29 including Tennessee itself, of course, but also the northern parts of Alabama and Mississippi.

27

Which choice provides the most specific information on the areas that Roosevelt hoped to stimulate?

A) NO CHANGE
B) industrial and agricultural sectors
C) whole thing
D) money flowing and the economy

28

A) NO CHANGE
B) on
C) off
D) to

29

Which choice gives an additional supporting detail that emphasizes the importance of the TVA in Roosevelt's larger economic project?

A) NO CHANGE
B) taking account of the fact that farming is difficult without a reliable large body of water.
C) establishing not only more reliable sources of water and work but electricity for millions of Americans.
D) one of many impressive public-works projects completed throughout Roosevelt's tenure.

CONTINUE

Many of the programs, including the Tennessee Valley Authority, continue to exist to this day. Roosevelt's 100 Days were unique in that they not only jumpstarted the American economy at a time when a stimulus was most needed but also laid the groundwork for programs that could persist into the 30 future, past their own moment. Indeed, Roosevelt's "New Deal" remains new even though, at this point, 31 it's more than eighty years old.

Still, Roosevelt's 100 Days remain the subject of controversy. In Roosevelt's day, there was widespread criticism from those who thought government should play a smaller rather than a larger role in 32 people's day-to-day lives. For many others, Roosevelt's government interventions are a model for how governments should aid citizens in times of need. 33 Clearly, Roosevelt's unadulterated successes would seem odd in an era of political wrangling characterized by gridlock rather than swift action.

30

A) NO CHANGE
B) future.
C) future, which is to say after the present.
D) future, many years beyond when they were created.

31

A) NO CHANGE
B) its
C) they're
D) there

32

A) NO CHANGE
B) peoples'
C) peoples
D) peoples's

33

The writer wants to conclude the paragraph effectively without dismissing the debate described in this paragraph. Which choice best accomplishes this goal?

A) NO CHANGE
B) Unfortunately, even Roosevelt's obvious failures can
C) In either case, Roosevelt's achievements in the first 100 Days of his presidency
D) Both sides are obviously unfounded, but everyone can agree that Roosevelt's 100 Days

CONTINUE

Questions 34–44 are based on the following passage.

Setsuko Hara: In and Out of the Tokyo Spotlight

One of the 34 hammiest board-treaders in the history of Japanese cinema was also one of the most mysterious. Setsuko Hara died in September 2015 at the age of 95, and while she is remembered as perhaps the most formidable actress in Japan's long cinematic tradition, no one had seen her in anything since the 1960s. The actress went into seclusion after the death of her longtime collaborator, the director Yasujiro Ozu.

Hara's first acting role came when she was only 15. The Japanese film industry had divided loyalties at the time, 35 despite its obvious debt to American cinema amid the increasing international tensions with the United States and others that would lead to World War II. Hara's first film, a German-Japanese production called *The Daughter of the Samurai* (1937), emerged among these tensions, 36 using the conventions of the American melodrama to promote an early version of what would become Axis propaganda. After her success in this film, Hara became one of the faces of the Japanese propaganda effort during the Second World War.

34

A) NO CHANGE
B) most exquisite thespians
C) most emotive of histrionists
D) greatest actresses

35

A) NO CHANGE
B) as evidenced by
C) contrasting with
D) enabled by

36

The writer is considering deleting the underlined portion (ending the sentence with a period). Should the writer make this deletion?

A) Yes, because the information is provided in the previous sentence.
B) Yes, because the underlined portion undermines the paragraph's description of the Axis propaganda effort.
C) No, because the underlined portion gives a specific example of how the Axis powers conducted their propaganda campaign.
D) No, because the underlined portion provides information that clarifies an idea central to this paragraph.

CONTINUE

After Japan's defeat in the war, however, Hara's career changed significantly. Directors and audiences discovered her incredible talent acting in quieter dramas. The masterpieces in this mode were Ozu's *Late Spring* (1949) and *Tokyo Story* (1953), in which Hara plays a woman who is torn between the demands of various family members, who in turn **37** represented different generational expectations. Hara could reveal incredible emotion through subtle, almost imperceptible facial expressions and voice modulations. **38** Moreover, her compelling and unique beauty kept screen audiences eagerly engaged.

The subtle conflicts in *Late Spring* capture Hara's particular **39** style of acting in films. Even in the 1940s, Hollywood films were characterized by grand conflicts and even grander emotions. The films of Ozu's late period, especially his collaborations with Hara, however, worked with a much smaller canvas, usually with very few sets, limiting the scenes to a character's **40** office kitchen, living room, or garden. In *Late Spring*, Hara's character

37

A) NO CHANGE
B) would represent
C) had represented
D) represent

38

A) NO CHANGE
B) In sum,
C) Nevertheless,
D) Meanwhile,

39

A) NO CHANGE
B) acting style.
C) acting methods that were unique to her.
D) acting style in film and presumably in the theater.

40

A) NO CHANGE
B) office, kitchen, living,
C) office, kitchen, living
D) office, kitchen living,

CONTINUE

Noriko is twenty-seven years old and has not married. Against the 41 council of her friends and family, she has instead chosen to care for her aging widowed father. The conflict and plot are that simple, 42 and Ozu's cinematography and Hara's expressive face show that sometimes the simplest and smallest domestic conflicts can have profound implications.

[1] Hara never formally announced her retirement, though she made her last film in 1963. [2] Rumors have always circulated about Hara's mysterious disappearance from the screen, and viewers' many theories show 43 their grief at having lost such a bright star. [3] Some believe that she had been going blind and did not want to do so in the public eye. [4] In either case, Hara left an indelible mark on the shape of world cinema. [5] Especially in a moment when all cinematic achievement seems to point toward bigger and louder, Setsuko Hara provides the important reminder that smaller and quieter can be just as powerful. 44

41

A) NO CHANGE
B) council from
C) counsel with
D) counsel of

42

A) NO CHANGE
B) for
C) so
D) yet

43

A) NO CHANGE
B) one's
C) his
D) your

44

The writer plans to add the following sentence to this paragraph.

> Others believe that her grief over Ozu's death in 1963 kept her from returning to the cinema.

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

A) after sentence 2.
B) after sentence 3.
C) after sentence 4.
D) after sentence 5.

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.

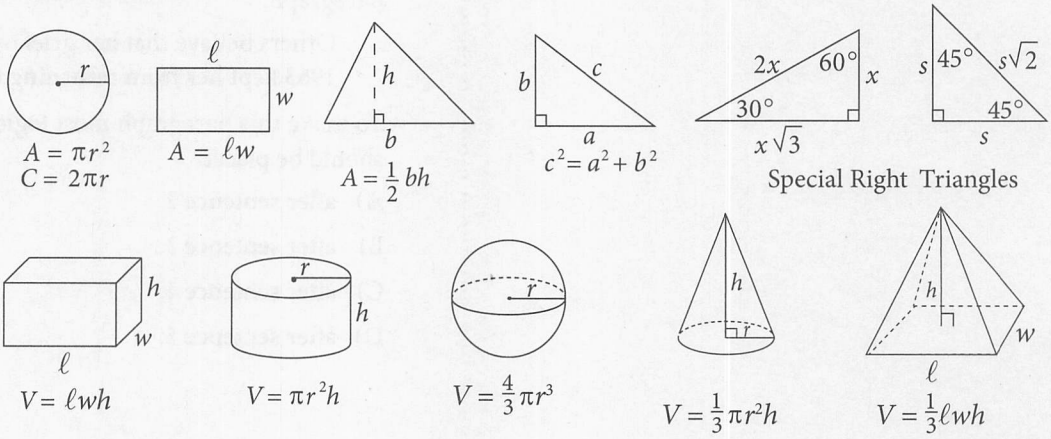
DIRECTIONS

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



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

When the equation $-5y - 2x = 10$ is graphed in the xy-plane, which of the following is true?

A) Both the slope and the y-intercept of the line are negative.

B) Both the slope and the y-intercept of the line are positive.

C) The slope of the line is negative, and the y-intercept is positive.

D) The slope of the line is positive, and the y-intercept is negative.

2

$$x + 3y = 9$$

$$3x - y = 17$$

What is the value of $x - y$ for the system of equations above?

A) 5

B) 6

C) 10

D) 20

3

$$6(y^3 + y^2) - 2(y^3 + y^2)$$

Which of the following is equivalent to the expression above?

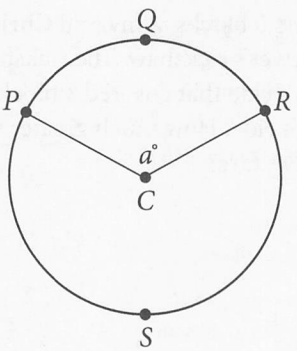
A) $4y^3$

B) $4y^5$

C) $4y^3 - 4y^2$

D) $4y^3 + 4y^2$

4



In the circle above with center C, $a = 120$. If the length of arc $\overset{\frown}{PSR}$ is 8π, what is the length of $\overset{\frown}{PQR}$?

A) 12π

B) 6π

C) 4π

D) 2π

CONTINUE

5

What is the value of a if $300 = \frac{12}{a}$?

A) 0.04

B) 25

C) 60

D) 3,600

6

The equation $F = 3b + 6$ gives the cost of the fare F, in dollars, that a rickshaw driver charges for a ride that covers b blocks. Amy and Chris each took a ride in this driver's rickshaw. The rickshaw driver took Chris on a ride that covered 3 blocks more than did Amy's ride. How much greater was Chris's fare than Amy's fare?

A) $15

B) $9

C) $6

D) $3

7

A glass marble is at the top of a flat ramp at a distance of 48 inches from the ground. If the marble rolls down the ramp such that its distance from the ground decreases at a constant rate of 7 inches per second, which of the following equations gives the distance d, in inches, between the glass marble and the ground t seconds after the marble begins rolling down the ramp?

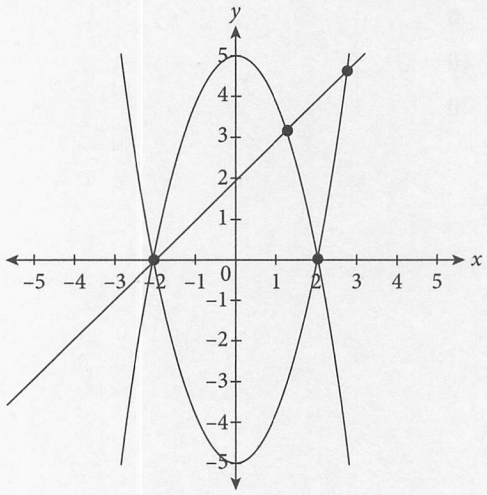
A) $d = \frac{155}{48} - 7t$

B) $d = 48 - 7t$

C) $d = 48t - \frac{155}{7}$

D) $d = 48t - 7$

8



The system of equations graphed in the xy-plane above has exactly n solutions. What is the value of n?

A) 1

B) 2

C) 3

D) 4

CONTINUE

9

$$9(x + 2) - 3(x + 3) = 3(cx + 5)$$

There is no value of x that satisfies the equation above, in which c is a constant. What is the value of constant c?

A) 2

B) 3

C) 4

D) 6

10

For $x > 1$, which of the following is equivalent to the expression $\frac{1}{3x - 2} + 4$?

A) $\frac{3x + 2}{3x - 2}$

B) $\frac{3x + 4}{3x - 2}$

C) $\frac{12x - 7}{3x - 2}$

D) $\frac{12x - 8}{3x - 2}$

11

$$4y^3 - 10y^2 - 36y + 48 = (2y + c)(ky^2 + 3y - 6)$$

In the equation above, c and k are constants. If the equation is true for all values of y, what is the value of ck?

A) -2

B) -16

C) -18

D) -24

12

Which of the following is the set of all solutions to the equation $\frac{2x + 4}{2} = \frac{15}{x}$?

A) {3}

B) {−5, 5}

C) {−5, 3}

D) {0, 3}

CONTINUE

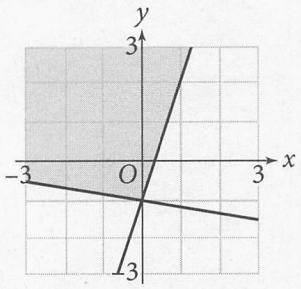
13

$$6y + x \geq -6$$

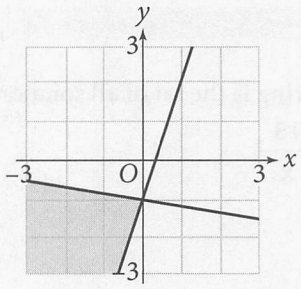
$$y \leq 3x - 1$$

The solution set of the system of inequalities above is represented by the shaded region of which of the following graphs?

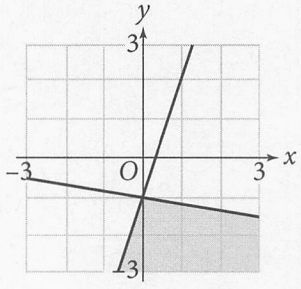
A)



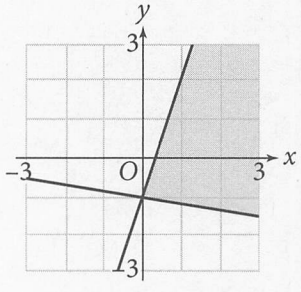
B)



C)



D)



14

$$x = \sqrt{30 - x}$$

Which of the following includes all solutions to the equation above?

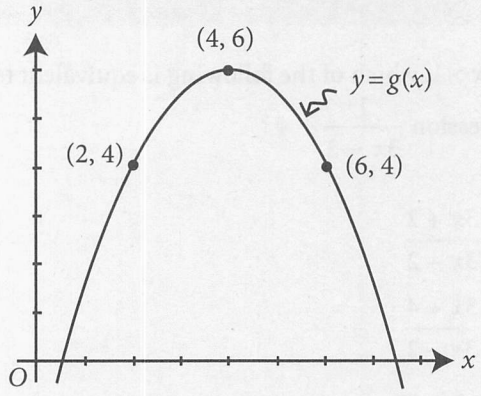
A) There are no values of x that satisfy the given equation.

B) -6 and 5

C) -6

D) 5

15



Which of the following equations defines function g graphed in the xy-plane above?

A) $g(x) = -\frac{1}{2}(x - 4)^2 - 6$

B) $g(x) = -\frac{1}{2}(x - 4)^2 + 6$

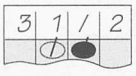
C) $g(x) = -\frac{1}{3}(x + 4)^2 + 6$

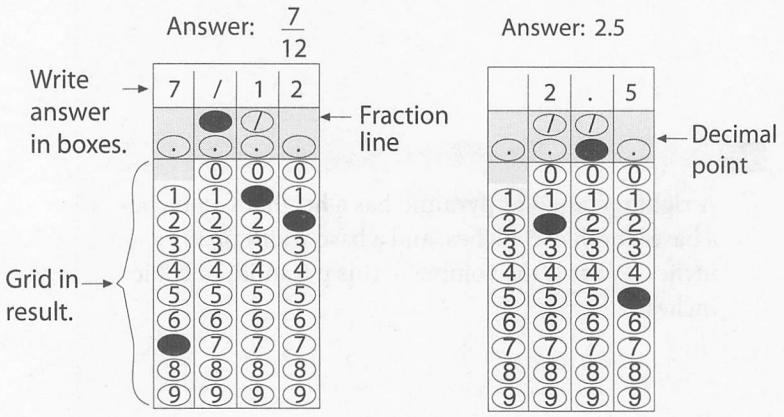
D) $g(x) = -(x + 4)^2 + 6$

CONTINUE

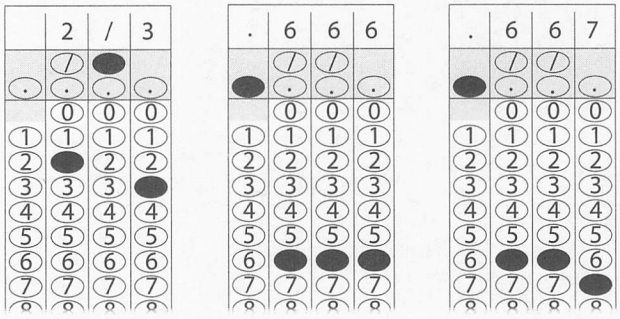
DIRECTIONS

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

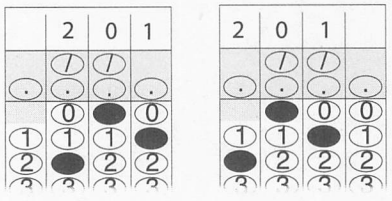
1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
2. Mark no more than one circle in any column.
3. No question has a negative answer.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



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



Answer: 201 – either position is correct



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

CONTINUE

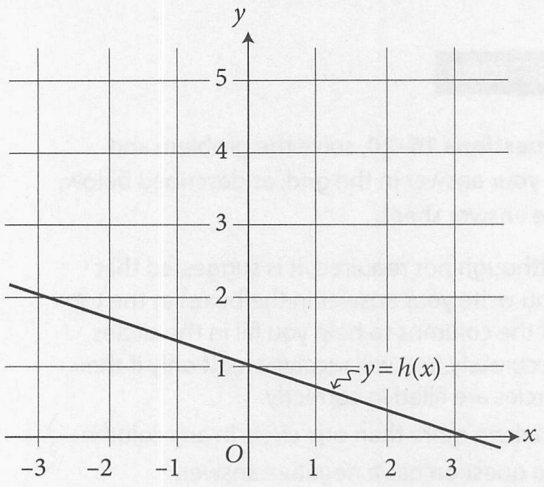
16

If a satisfies the equation $2a - 6 = 2$, what is the value of $4a - 12$?

17

A right rectangular pyramid has a height of 15 inches, a base length of 5 inches, and a base width of 20 inches. What is the volume of this pyramid, in cubic inches?

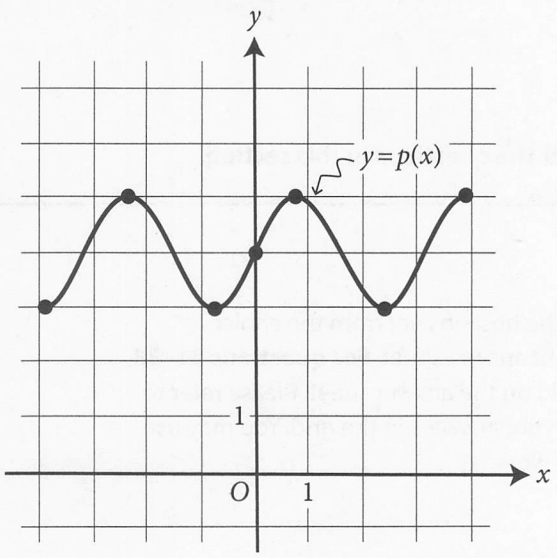
18



Function h is the linear function graphed in the xy-plane above. When linear function k (not shown) is graphed in the xy-plane, it contains the point $(-1, 2)$. If functions h and k are perpendicular, what is the value of $k(0)$?

CONTINUE

19



The complete graph of the function p in the xy-plane is shown in the figure above. Function r, which is defined by $r(x) = p(x) - 2$, is not shown. What is the minimum value of the function r?

20

In triangle ABC with right angle B, $\tan C = \frac{5}{12}$. What is the value of $\cos A$?

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.

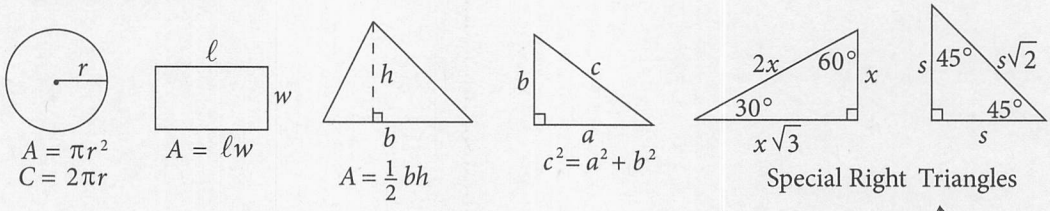
DIRECTIONS

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



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

David has a mobile data plan for which the monthly fee is $20.00 and the data usage fee is $2.50 per gigabyte. Which of the following functions expresses David's cost, in dollars, for a month in which he uses g gigabytes of data?

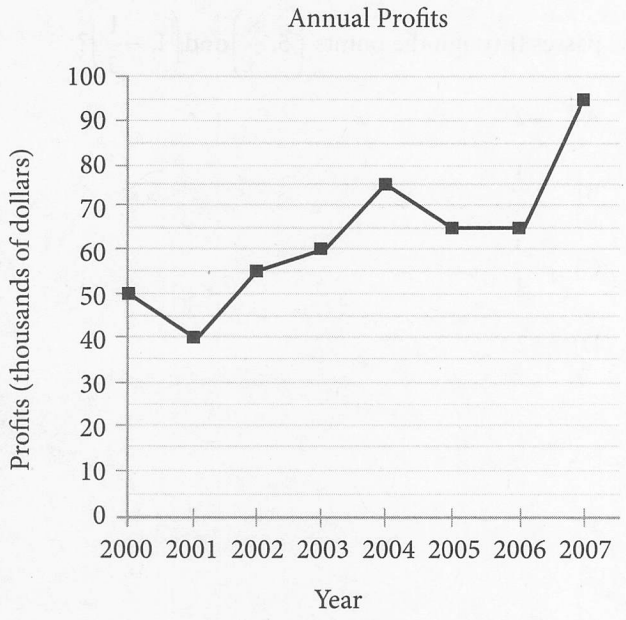
A) $f(g) = 22.50g$

B) $f(g) = 20g + 2.50$

C) $f(g) = 20 + 250g$

D) $f(g) = 20 + 2.50g$

2



The line graph above shows the annual profit of a particular clothing store from 2000 to 2007. According to the graph, what was the greatest change (in absolute value) in the annual profit between two consecutive years?

A) $25,000

B) $30,000

C) $35,000

D) $40,000

3

In order to qualify for a fitness competition, a person must be able to complete 30 pull-ups in one minute. Jim can currently do 14 pull-ups in one minute and believes that he can increase that amount by 7 pull-ups each year. Which of the following represents the number of pull-ups that Jim believes he will be able to complete in one minute y years from now?

A) $7y + 14$

B) $7y + 30$

C) $14y + 7$

D) $14 - 7y$

4

$$v = 17 + 2.5t$$

A constantly accelerating particle is moving in a straight line. After t seconds, the particle is moving at a velocity of v, in meters per second, as shown in the equation above. What is t when v is 67 ?

A) 184.5

B) 67

C) 33.6

D) 20

CONTINUE

5

When function h is graphed in the xy-plane, it has x-intercepts at -4, 2, and 4. Which of the following could define h?

A) $h(x) = (x - 4)(x - 2)(x + 4)$

B) $h(x) = (x - 4)(x + 2)(x + 4)$

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

D) $h(x) = (x + 2)(x + 4)^2$

6

When three times a number n is added to 9, the result is 3. What is the result when 4 times n is added to 14?

A) -2

B) 3

C) 6

D) 22

7

A coffee shop is filling coffee cups from an industrial urn that contains 64 gallons of coffee. At most, how many 16-ounce cups of coffee can be filled from the urn? (1 gallon = 128 ounces)

A) 4

B) 512

C) 1,024

D) 2,048

8

What is the slope of the line in the xy-plane that passes through the points $\left(5, \frac{8}{3}\right)$ and $\left(1, -\frac{1}{3}\right)$?

A) -2

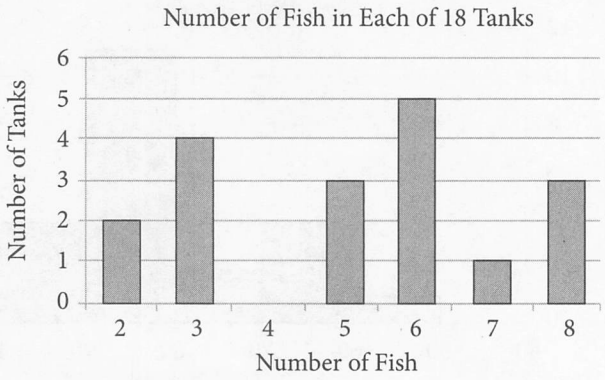
B) $-\frac{4}{3}$

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

D) 2

CONTINUE

9



Based on the bar graph above, which of the following is closest to the average (arithmetic mean) number of fish per tank?

A) 5

B) 6

C) 7

D) 8

10

A telephone survey was conducted in order to determine if people in City C are more likely to work 9-to-5 office jobs than other jobs. The research team called 5,000 random people between 12 P.M. and 4 P.M. on a Thursday. Of the 5,000 people called, 3,000 did not answer, and 250 refused to participate. Which of the following was the biggest flaw in the design of the survey?

A) The time the survey was taken

B) Population size

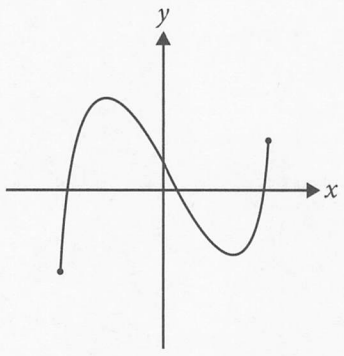
C) Sample size

D) The fact that the survey was done by telephone

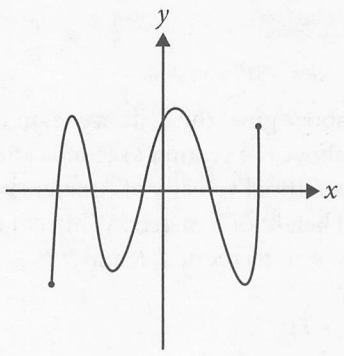
11

If the function p has exactly four distinct roots, which of the following could represent the complete graph of $y = p(x)$ in the xy-plane?

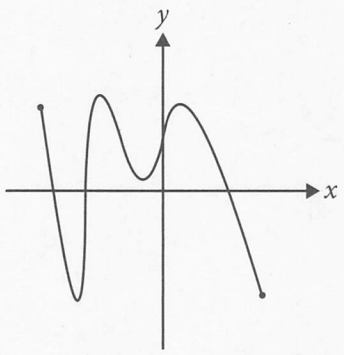
A)



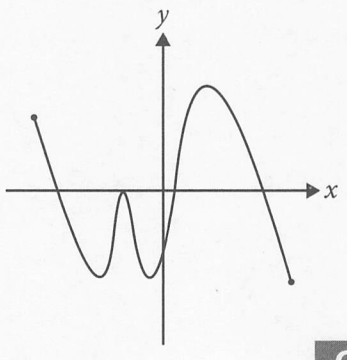
B)



C)



D)



CONTINUE

12

One morning in a particular restaurant, 85 percent of the customers ordered the brunch special. Which of the following could be the total number of customers in the restaurant that morning?

A) 40

B) 42

C) 44

D) 48

13

$$d = -8t^2 + vt + h$$

The equation above gives the distance, d, in meters, a projectile is above the ground t seconds after it is released with an initial velocity of v meters per second from an initial height of h meters. Which of the following gives v, in terms of d, t, and h?

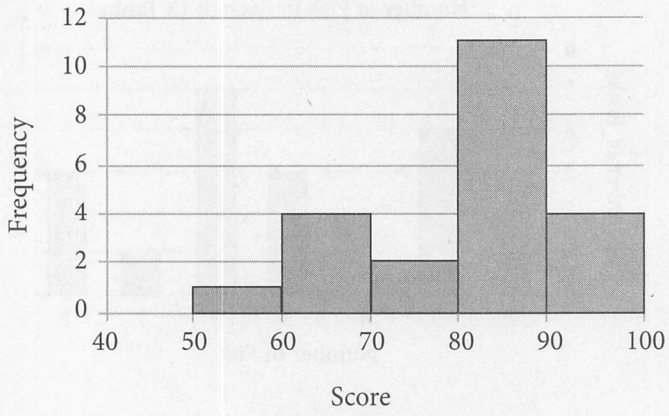
A) $v = \frac{d - h}{t} + 8t$

B) $v = \frac{d + h}{t} - 8t$

C) $v = \frac{d - h + 8}{t}$

D) $v = d + h - 8t$

14



The histogram above shows the distribution of the scores of 22 students on a recent biology test. Which of the following could be the median score of the 22 students represented in the histogram?

A) 68

B) 71

C) 77

D) 84

CONTINUE

Questions 15–17 refer to the following information.

A survey of 130 randomly selected workers in a particular metropolitan area was conducted to gather information about average daily commute times. The data is shown in the table below.

	Commutes by public transit	Does not commute by public transit	Total
Less than 1 hour	22	46	68
At least 1 hour	29	33	62
Total	51	79	130

15

Which of the following is closest to the percent of those surveyed who commute using public transit?

A) 65%

B) 46%

C) 39%

D) 32%

16

In 2014, the population of the metropolitan area from the survey was about 13 million. If the survey results were used to estimate information about commute times throughout the metropolitan area, which of the following is the best estimate for the number of individuals who used public transit and had an average daily commute of at least one hour?

A) 290,000

B) 2,200,000

C) 2,900,000

D) 6,200,000

17

Based on the data, how many times more likely is it for a person with a commute of less than 1 hour NOT to commute by public transit than it is for a person with a commute of at least one hour NOT to commute by public transit? (Round the answer to the nearest hundredth.)

A) 1.39 times as likely

B) 1.27 times as likely

C) 0.78 times as likely

D) 0.72 times as likely

CONTINUE

18

In order to determine the effect that caffeinated beverage *C* would have on sleep, researchers conducted a study. From a large population of people without sleep disorders, 500 subjects were randomly selected. Half the subjects were randomly selected to consume beverage *C* and the rest did not consume beverage *C*. The results of the study showed that the subjects who consumed beverage *C* slept less than those who did not consume beverage *C*. Based on the design and results of the study, which of the following statements is the best conclusion?

A) Beverage *C* will cause more loss in sleep than all other caffeinated beverages.

B) Beverage *C* will cause a substantial loss in sleep.

C) Beverage *C* is likely to reduce the amount of sleep of people without sleep disorders.

D) Beverage *C* will reduce sleep of anyone who consumes it.

19

The sum of four numbers is 1,764. One of the numbers, n, is 40% more than the sum of the other three numbers. What is the value of n ?

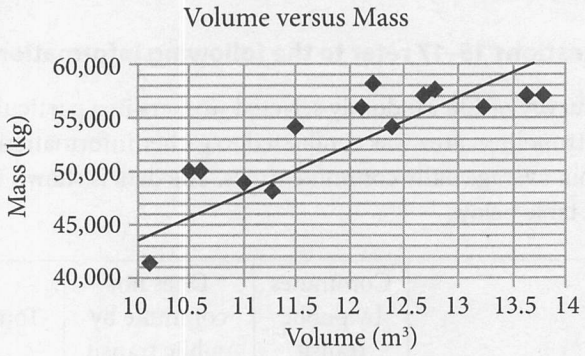
A) 287

B) 735

C) 1,029

D) 1,260

20



Selin weighs 14 different objects of similar density. The scatterplot shown above shows the volume of each object and the corresponding weight of each object. The line of best fit for the data is shown above. For the object that had a volume of 11.5 m^3, the actual mass was about how many kilograms more than the mass predicted by the line of best fit?

A) 1,000

B) 2,000

C) 3,000

D) 4,000

CONTINUE

21

Jessica owns a store that sells only laptops and tablets. Last week, her store sold 90 laptops and 210 tablets. This week, the sales, in number of units, of laptops increased by 50 percent, and the sales, in number of units, of tablets increased by 30 percent. By what percentage did total sales, in units, in Jessica's store increase?

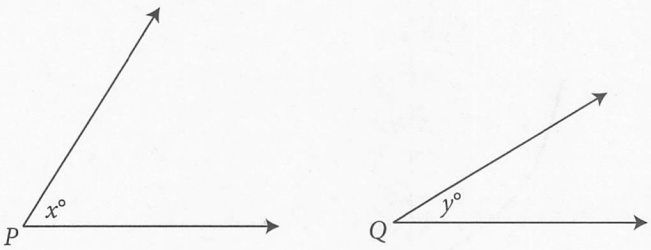
A) 20 percent

B) 25 percent

C) 36 percent

D) 80 percent

22



Note: Figures not drawn to scale.

For acute angles P and Q shown above, $\cos(x°) = \sin(y°)$. If $x = 3c - 23$ and $y = 7c - 42$, what is the value of c?

A) 24.5

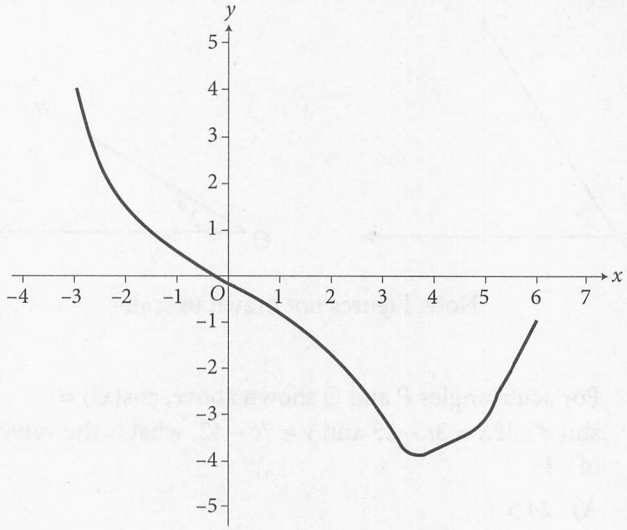
B) 15.5

C) 9.0

D) 6.0

CONTINUE

23



What is the maximum value of the function graphed in the xy-plane above, for $-3 \leq x \leq 6$?

A) 4

B) 5

C) 6

D) ∞

24

Matthew constructs a fence around a patch of grass in his backyard. The patch has a width that is 8 feet more than 4 times the length. What is the perimeter of the fence if Matthew's patch of grass has an area of 5,472 square feet?

A) 364 feet

B) 376 feet

C) 396 feet

D) 400 feet

25

In the xy-plane, the line determined by the points $(c, 3)$ and $(27, c)$ intersects the origin. Which of the following could be the value of c ?

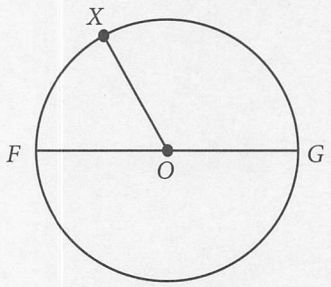
A) 0

B) 3

C) 6

D) 9

26



In the circle above, the length of arc $\overset{\frown}{FXG}$ is 14π. If $\overline{FG}$ is a chord that passes through the circle's center, O, what is the length of the segment $\overline{XO}$?

A) 7

B) 14

C) 28

D) 56

CONTINUE

27

Let p and q be numbers such that $-|p| < q < |p|$. Which of the following must be true?

I. $p > 0$

II. $|p| > -q$

III. $p > |q|$

A) I only

B) II only

C) II and III only

D) I, II, and III

28

A rectangular container with a base that measures 10 feet by 10 feet is filled with jelly beans. The container is divided into regions each with the same height as the container and a square base with sides that measure 1 foot each. Sherman randomly selects ten of these regions and counts the number of blue jelly beans in each region. The results are shown in the table below.

Region	Blue Jelly Beans	Region	Blue Jelly Beans
I	20	VI	22
II	21	VII	25
III	27	VIII	24
IV	31	IX	28
V	19	X	23

Which of the following is a reasonable approximation of the number of blue jelly beans in the entire container?

A) 25,000

B) 2,500

C) 250

D) 25

CONTINUE

29

	Flavor	
Product Type	Frozen Yogurt	Ice Cream
Vanilla		
Chocolate		
Total	32	152

The incomplete table above shows the sales for a particular sweet shop by product and flavor. There were 4 times as many vanilla ice creams sold as vanilla frozen yogurts, and there were 6 times as many chocolate ice creams sold as chocolate frozen yogurts. If there were a total of 32 frozen yogurts and 152 ice creams sold, and no flavors other than vanilla and chocolate were available, which of the following is closest to the probability that a randomly selected ice cream sold was vanilla?

A) 0.250

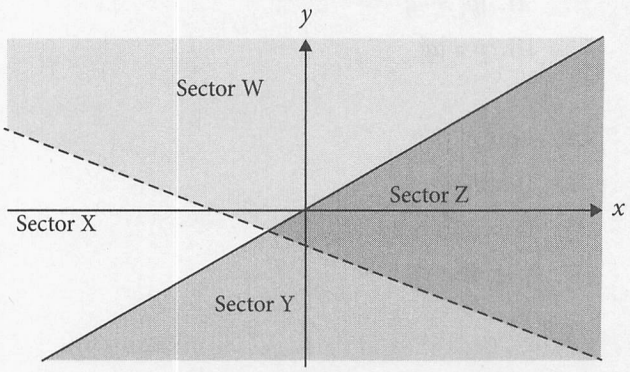
B) 0.435

C) 0.526

D) 0.667

30

$$\begin{cases} y \geq x \\ 3y < -2x - 3 \end{cases}$$



A system of inequalities is graphed above. Which sector or sectors on the graph could represent all of the solutions to the system shown?

A) Sectors Y and Z

B) Sectors W and Y

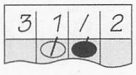
C) Sector W

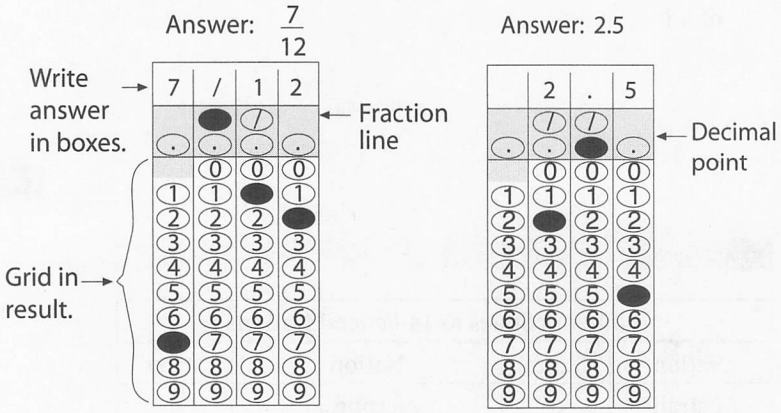
D) Sector X

CONTINUE

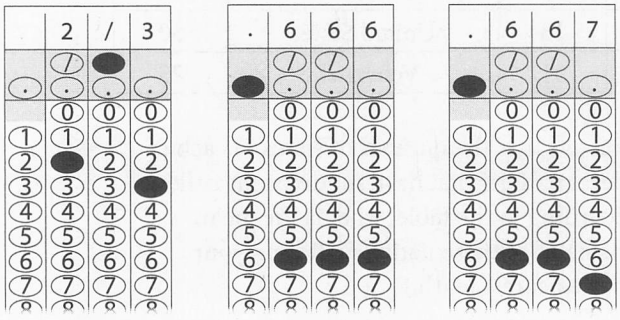
DIRECTIONS

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

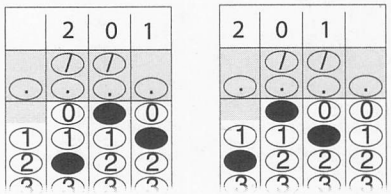
1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
2. Mark no more than one circle in any column.
3. No question has a negative answer.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



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



Answer: 201 – either position is correct



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

CONTINUE

31

At a certain food truck, hamburgers are sold for $5 each and hot dogs are $3 each. If Martina buys one hamburger and h hot dogs, and spends at least $20 and no more than $25, what is one possible value of h?

32

Number of States in 14 Federal Nations			
Nation	States	Nation	States
Australia	6	Micronesia	4
Austria	9	Nigeria	36
Brazil	26	Saint Kitts and Nevis	2
Germany	16	South Sudan	10
India	29	Sudan	17
Malaysia	13	United States	50
Mexico	31	Venezuela	23

The table above lists the number of states in each of the 14 federal nations that have subdivisions called states. According to the table, what is the mean number of states of these nations? (Round your answer to the nearest tenth.)

33

In the xy-plane, the point $(-2, 6)$ lies on the graph of the function $g(x) = 2x^2 + kx + 18$. What is the value of k?

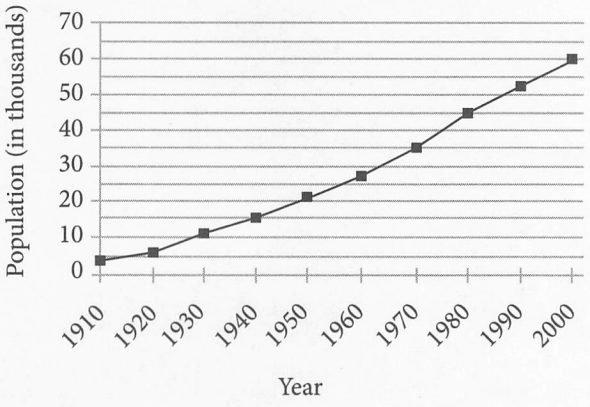
34

In a certain college dormitory, 108 students are assigned dorm rooms. The dormitory has 26 dorm rooms, each of which is assigned 3 or 5 students. How many of the dorm rooms will be assigned 3 students?

CONTINUE

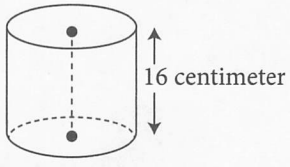
35

Population of Town A
Each Decade from 1910 to 2000



According to the figure shown above, the population of Town A in 1970 was what fraction of the population of Town A in 2000 ?

36



A wooden block is in the shape of the right circular cylinder shown above. If the volume of the wooden block is 64π cubic centimeters, what is the diameter of the base of the cylinder, in centimeters?

Questions 37 and 38 refer to the following information.

$\omega^2 = \omega_0^2 + 2\alpha\theta$ (angular position – angular velocity)

$\omega = \omega_0 + \alpha t$ (time – angular velocity)

$\theta = \omega_0 t + \frac{1}{2}\alpha t^2$ (time – angular position)

A carousel is rotating at an angular velocity of 90 degrees per second. The instant a particular point on the carousel reaches angular position $\theta = 0°$, the carousel operator flips a switch, causing the carousel at a constant angular acceleration to slow down and eventually change direction. The equations above describe the constant-acceleration motion of the carousel, where ω_0 represents the initial angular velocity, ω is the angular velocity as it travels, θ is the angular position of the particular point on the carousel, t is the time since the switch was flipped, and α is the constant angular acceleration ($-12.6°/s^2$).

37

To the nearest degree, at what angular position will the carousel change direction?

38

To the nearest second, how long will it take the carousel to come to a complete stop before it changes direction?

END OF TEST

DO NOT RETURN TO A PREVIOUS SECTION.