Preliminary SAT/National Merit Scholarship Qualifying Test
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2015 Practice Test #1

PSAT/NMSQT®

Preliminary SAT/National Merit Scholarship Qualifying Test

IMPORTANT REMINDERS

1

A No. 2 pencil is required for the test. Do not use a mechanical pencil or pen.

2

Sharing any questions with anyone is a violation of Test Security and Fairness policies and may result in your scores being canceled.

This cover is representative of what you'll see on test day.

Test begins on the next page.

Reading Test

60 MINUTES, 47 QUESTIONS

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

DIRECTIONS

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

Questions 1-9 are based on the following passage.

This passage is adapted from Jane Austen, *Emma*, originally published in 1815.

Emma Woodhouse, handsome, clever, and rich, with a comfortable home and happy disposition, seemed to unite some of the best blessings of existence; and had lived nearly twenty-one years in the world with very little to distress or vex her.

She was the youngest of the two daughters of a most affectionate, indulgent father, and had, in consequence of her sister's marriage, been mistress of his house from a very early period. Her mother had died too long ago for her to have more than an indistinct remembrance of her caresses, and her place had been supplied by an excellent woman as governess, who had fallen little short of a mother in affection.

Sixteen years had Miss Taylor been in Mr. Woodhouse's family, less as a governess than a friend, very fond of both daughters, but particularly of Emma. Between *them* it was more the intimacy of sisters. Even before Miss Taylor had ceased to hold the nominal office of governess, the mildness of her temper had hardly allowed her to impose any restraint; and the shadow of authority being now long passed away, they had been living together as friend and friend very mutually attached, and Emma doing just what she liked; highly esteeming Miss Taylor's judgment, but directed chiefly by her own.

The real evils indeed of Emma's situation were the power of having rather too much her own way, and a disposition to think a little too well of herself; these were the disadvantages which threatened alloy to her many enjoyments. The danger, however, was at present so unperceived, that they did not by any means rank as misfortunes with her.

Sorrow came—a gentle sorrow—but not at all in the shape of any disagreeable consciousness.—Miss Taylor married. It was Miss Taylor's loss which first brought grief. It was on the wedding-day of this beloved friend that Emma first sat in mournful thought of any continuance. The wedding over and the bride-people gone, her father and herself were left to dine together, with no prospect of a third to cheer a long evening. Her father composed himself to sleep after dinner, as usual, and she had then only to sit and think of what she had lost.

The event had every promise of happiness for her friend. Mr. Weston was a man of unexceptionable character, easy fortune, suitable age and pleasant manners; and there was some satisfaction in considering with what self-denying, generous friendship she had always wished and promoted the match; but it was a black morning's work for her. The want of Miss Taylor would be felt every hour of every day. She recalled her past kindness—the kindness, the affection of sixteen years—how she had taught and how she had played with her from five years old—how she had devoted all her powers to attach and amuse her in health—and how nursed her through the various illnesses of childhood. A large

CONTINUE

debt of gratitude was owing here; but the intercourse of the last seven years, the equal footing and perfect unreserve which had soon followed Isabella's marriage on their being left to each other, was yet a dearer, tenderer recollection. It had been a friend and companion such as few possessed, intelligent, well-informed, useful, gentle, knowing all the ways of the family, interested in all its concerns, and peculiarly interested in herself, in every pleasure, every scheme of her's;—one to whom she could speak every thought as it arose, and who had such an affection for her as could never find fault.

How was she to bear the change?—It was true that her friend was going only half a mile from them; but Emma was aware that great must be the difference between a Mrs. Weston only half a mile from them, and a Miss Taylor in the house; and with all her advantages, natural and domestic, she was now in great danger of suffering from intellectual solitude. She dearly loved her father, but he was no companion for her. He could not meet her in conversation, rational or playful.

The evil of the actual disparity in their ages (and Mr. Woodhouse had not married early) was much increased by his constitution and habits; for having been a valetudinarian* all his life, without activity of mind or body, he was a much older man in ways than in years; and though everywhere beloved for the friendliness of his heart and his amiable temper, his talents could not have recommended him at any time.

* a person in weak health who is overly concerned with his or her ailments

1

The main purpose of the passage is to

A) describe a main character and a significant change in her life.

B) provide an overview of a family and a nearby neighbor.

C) discuss some regrettable personality flaws in a main character.

D) explain the relationship between a main character and her father.

2

Which choice best summarizes the first two paragraphs of the passage (lines 1-14)?

A) Even though a character loses a parent at an early age, she is happily raised in a loving home.

B) An affectionate governess helps a character to overcome the loss of her mother, despite the indifference of her father.

C) Largely as a result of her father's wealth and affection, a character leads a contented life.

D) A character has a generally comfortable and fulfilling life, but then she must recover from losing her mother.

3

The narrator indicates that the particular nature of Emma's upbringing resulted in her being

A) despondent.

B) self-satisfied.

C) friendless.

D) inconsiderate.

4

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

A) Lines 1-5 ("Emma . . . her")

B) Lines 9-14 ("Her . . . affection")

C) Lines 28-32 ("The real . . . enjoyments")

D) Lines 32-34 ("The danger . . . her")

5

As used in line 26, "directed" most nearly means

A) trained.

B) aimed.

C) guided.

D) addressed.

CONTINUE

6

As used in line 54, "want" most nearly means

A) desire.

B) lack.

C) requirement.

D) request.

7

It can most reasonably be inferred that after Miss Taylor married, she had

A) less patience with Mr. Woodhouse.

B) fewer interactions with Emma.

C) more close friends than Emma.

D) an increased appreciation for Emma.

8

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

A) Line 37 ("Miss . . . married")

B) Lines 47-48 ("The event . . . friend")

C) Lines 60-65 ("A large . . . recollection")

D) Lines 73-79 ("How . . . solitude")

9

Which situation is most similar to the one described in lines 83-91 ("The evil . . . time")?

A) A mother and her adult son have distinct tastes in art and music that result in repeated family arguments.

B) The differences between an older and a younger friend are magnified because the younger one is more active and athletic.

C) An older and a younger scientist remain close friends despite the fact that the older one's work is published more frequently.

D) The age difference between a high school student and a college student becomes a problem even though they enjoy the same diversions.

Questions 10-19 are based on the following passage and supplementary material.

This passage is adapted from Marina Gorbis, *The Nature of the Future: Dispatches from the Socialstructed World*. ©2013 by Marina Gorbis.

Visitors to the Soviet Union in the 1960s and 1970s always marveled at the gap between what they saw in state stores—shelves empty or filled with things no one wanted—and what they saw in people's homes: nice furnishings and tables filled with food. What filled the gap? A vast informal economy driven by human relationships, dense networks of social connections through which people traded resources and created value. The Soviet people didn't plot how they would build these networks. No one was teaching them how to maximize their connections the way social marketers eagerly teach us today. Their networks evolved naturally, out of necessity; that was the only way to survive.

Today, all around the world, we are seeing a new kind of network of relationship-driven economics emerging, with individuals joining forces sometimes to fill the gaps left by existing institutions—corporations, governments, educational establishments—and sometimes creating new products, services, and knowledge that no institution is able to provide. Empowered by computing and communication technologies that have been steadily building village-like networks on a global scale, we are infusing more and more of our economic transactions with social connectedness.

The new technologies are inherently social and personal. They help us create communities around interests, identities, and common personal challenges. They allow us to gain direct access to a worldwide community of others. And they take anonymity out of our economic transactions. We can assess those we don't know by checking their reputations as buyers and sellers on eBay or by following their Twitter streams. We can look up their friends on Facebook and watch their YouTube videos. We can easily get people's advice on where to find the best shoemaker in Brazil, the best

CONTINUE

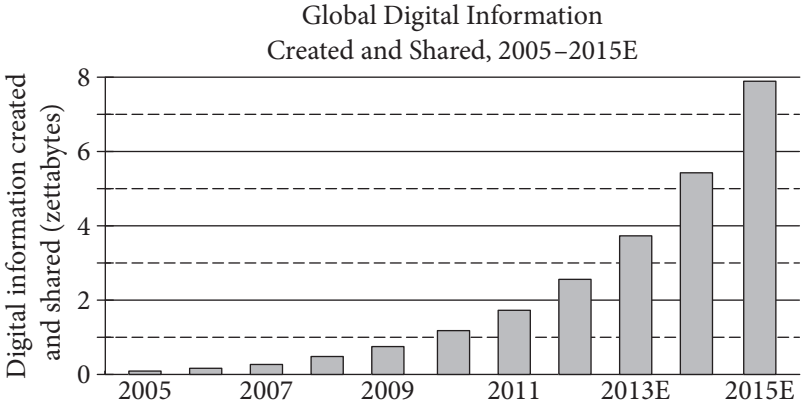
programmer in India, and the best apple farmer in our local community. We no longer have to rely on bankers or venture capitalists as the only sources of funding for our ideas. We can raise funds directly from individuals, most of whom we don't even know, through websites that allow people to post descriptions of their projects and generate donations, investments, or loans.

We are moving away from the dominance of the depersonalized world of institutional production and creating a new economy around social connections and social rewards—a process I call *socialstructing*. Others have referred to this model of production as social, commons-based, or peer-to-peer. Not only is this new social economy bringing with it an unprecedented level of familiarity and connectedness to both our global and our local economic exchanges, but it is also changing every domain of our lives, from finance to education and health. It is rapidly ushering in a vast array of new opportunities for us to pursue our passions, create new types of businesses and charitable organizations, redefine the nature of work, and address a wide range of problems that the prevailing formal economy has neglected, if not caused.

Socialstructing is in fact enabling not only a new kind of global economy but a new kind of society, in which amplified individuals—individuals empowered with technologies and the collective intelligence of others in their social network—can take on many functions that previously only large organizations could perform, often more efficiently, at lower cost or no cost at all, and with much greater ease. Socialstructing is opening up a world of what my colleagues Jacques Vallée and Bob Johansen describe as the world of impossible futures, a world in which a large software firm can be displaced by weekend software hackers, and rapidly orchestrated social movements can bring down governments in a matter of weeks. The changes are exciting and unpredictable. They threaten many established institutions and offer a wealth of opportunities for individuals to empower themselves, find rich new connections, and tap into a fast-evolving set of new resources in everything from health care to education and science.

Much has been written about how technology distances us from the benefits of face-to-face communication and quality social time. I think those are important concerns. But while the quality of our face-to-face interactions is changing, the countervailing force of socialstructing is connecting us at levels never seen before, opening up new opportunities to create, learn, and share.

The following graph, from a 2011 report from the International Data Corporation, projects trends in digital information use to 2015 (E=Estimated).



Note: 1 zettabyte = 1 trillion gigabytes

CONTINUE

10

As used in line 10, "plot" most nearly means

A) mark.
B) form.
C) plan.
D) claim.

11

The references to the shoemaker, the programmer, and the apple farmer in lines 37-40 ("We can easily . . . community") primarily serve to

A) illustrate the quality of products and services in countries around the world.
B) emphasize the broad reach of technologies used to connect people.
C) demonstrate that recommendations made online are trustworthy.
D) call attention to the limits of the expansion of the global economy.

12

The passage's discussion of life in the Soviet Union in the 1960s and 1970s primarily serves to

A) introduce the concept of social networking.
B) demonstrate that technology has improved social connections.
C) list differences between the Soviet Union and other countries.
D) emphasize the importance of examining historical trends.

13

As used in line 45, "post" most nearly means

A) publish.
B) transfer.
C) assign.
D) denounce.

14

The author indicates that, in comparison to individuals, traditional organizations have tended to be

A) more innovative and less influential.
B) larger in size and less subject to regulations.
C) less reliable and less interconnected.
D) less efficient and more expensive.

15

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

A) Lines 22-26 ("Empowered . . . connectedness")
B) Lines 40-42 ("We no longer . . . ideas")
C) Lines 47-50 ("We are moving . . . *socialstructing*")
D) Lines 66-72 ("amplified . . . ease")

16

The author recognizes counterarguments to the position she takes in the passage by

A) acknowledging the risks and drawbacks associated with new technologies and social networks.
B) admitting that some people spend too much time unproductively on the Internet.
C) drawing an analogy between conditions today and conditions in the Soviet Union of the 1960s and 1970s.
D) conceding that the drawbacks of socialstructing may prove over time to outweigh the benefits.

17

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

A) Lines 35-37 ("We can look . . . videos")
B) Lines 74-76 ("a world . . . hackers")
C) Lines 79-84 ("They . . . science")
D) Lines 85-87 ("Much . . . time")

CONTINUE

18

Which statement best summarizes the information presented in the graph?

A) Far more people around the world own computers and cell phones today than in 2005.

B) The number of people sharing digital information has more than tripled since 2005.

C) The volume of digital information created and shared has increased tremendously in recent years.

D) The amount of digital information created and shared is likely to be almost 8 zettabytes in 2015.

19

According to the graph, which statement is true about the amount of digital information projected to be created and shared globally in 2012?

A) Growth in digital information creation and sharing was projected to be wildly out of proportion to growth in 2011 and 2013E.

B) The amount of digital information created and shared was projected to begin a new upward trend.

C) The amount of digital information created and shared was projected to peak.

D) The amount of digital information created and shared was projected to pass 2 zettabytes for the first time.

CONTINUE

Questions 20-28 are based on the following passage and supplementary material.

This passage is adapted from Tina Hesman Saey, "Lessons from the Torpid." ©2012 by Society for Science & the Public.

Understanding how hibernators, including ground squirrels, marmots and bears, survive their long winter's naps may one day offer solutions for problems such as heart disease, osteoporosis and muscular dystrophy.

Nearly everything about the way an animal's body works changes when it hibernates, and preparations start weeks or months in advance. The first order of business is to fatten up.

"Fat is where it's at for a hibernator," says Matthew Andrews, a molecular biologist at the University of Minnesota Duluth who studies 13-lined ground squirrels. "You bring your own lunch with you." Packing lunch is necessary because the animals go on the world's strictest diet during the winter, surviving entirely off their white fat. "They have their last supper in October; they don't eat again until March," Andrews says.

Bigger fat stores mean a greater chance of surviving until spring. "If they go in really chunky, nice and roly-poly, that's going to be a good hibernator," he says.

Bears also watch their waistlines expand in the months before settling in for the season. The brown bears cardiologist Ole Fröbert studies pack on the pounds by chowing down on up to 40 kilograms of blueberries a day. Such gluttony among humans could have severe consequences: Obesity is associated with a greater risk of heart attack and diabetes, among other ailments.

To see how fattening up affects Scandinavian brown bears, Fröbert and his colleagues ventured into the wilds of Sweden following signals given off by radio transmitters or GPS devices on tagged bears.

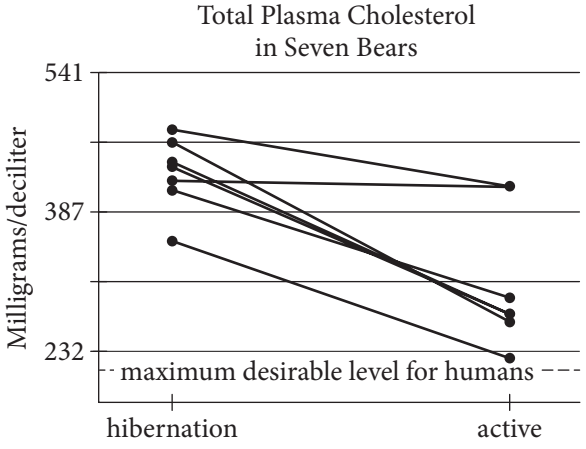
Bears can be dangerous close-up. Even hibernating bears can rouse to action quickly, so scientists tracking down bears in the winter use darts to tranquilize the animals from a distance. Scientists studying the bears in the summer tranquilize them from a helicopter.

Once a bear is under the tranquilizer's influence (which takes about five minutes), the scientists have 60 minutes max to get the animal from its den, weigh and measure it, draw blood samples and do minor surgeries to collect fat and other tissues. The bear is returned to its den by minute 61.

Precious materials collected during this high-pressure encounter need to be analyzed within 24 hours, so the researchers often test for levels of cholesterol or certain proteins in the blood while working in the snow or at a nearby research station. A pilot sometimes flies samples from field sites to a lab in Denmark in order to meet the deadline, Fröbert says. Samples such as bones and arteries that can't be collected from live bears come from bears killed by hunters during the legal hunting season.

Recent analyses revealed that Scandinavian brown bears spend the summer with plasma cholesterol levels considered high for humans; those values then increase substantially for hibernation, Fröbert and his colleagues reported. These "very, very fat" bears with high cholesterol also get zero exercise during hibernation. Lolling about in the den pinches off blood vessels, contributing to sluggish circulation. "That cocktail would not be advisable in humans," Fröbert says. It's a recipe for hardened arteries, putting people at risk for heart attacks and strokes.

Even healthy young adult humans can develop fatty streaks in their arteries that make the blood vessels less flexible, but the bears don't build up such artery-hardening streaks. "Our bears, they had nothing," Fröbert says. It's not yet clear how the bears keep their arteries flexible, but Fröbert hopes to find some protective molecule that could stave off hardened arteries in humans as well.



CONTINUE

20

The passage is written from the perspective of someone who is

A) actively involved in conducting hibernator research.

B) a participant in a recent debate in the field of cardiology.

C) knowledgeable about advances in hibernator research.

D) an advocate for wildlife preservation.

21

It is reasonable to conclude that the main goal of the scientists conducting the research described in the passage is to

A) learn how the hibernation patterns of bears and squirrels differ.

B) determine the role that fat plays in hibernation.

C) illustrate the important health benefits of exercise for humans.

D) explore possible ways to prevent human diseases.

22

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

A) Lines 1-5 ("Understanding . . . dystrophy")

B) Lines 10-13 ("Fat . . . squirrels")

C) Lines 31-35 ("To . . . bears")

D) Lines 42-46 ("Once . . . tissues")

23

What main effect do the quotations by Andrews in lines 10-18 have on the tone of the passage?

A) They create a bleak tone, focusing on the difficulties hibernators face during the winter.

B) They create a conversational tone, relating scientific information in everyday language.

C) They create an ominous tone, foreshadowing the dire results of Andrews's research.

D) They create an absurd tone, using images of animals acting as if they were human.

24

As used in line 19, "stores" most nearly means

A) preservatives.

B) reserves.

C) stacks.

D) shelters.

25

Based on the passage, what is Fröbert's hypothesis regarding why bears' arteries do not harden during hibernation?

A) The bears' increased plasma cholesterol causes the arteries to be more flexible.

B) Sluggish circulation pinches off the blood vessels rather than hardening the arteries.

C) Bears exercise in short, infrequent bursts during hibernation, which staves off hardened arteries.

D) Bears possess a molecule that protects against hardened arteries.

CONTINUE

26

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

A) Lines 19-20 ("Bigger . . . spring")

B) Lines 24-27 ("The brown . . . day")

C) Lines 69-72 ("Even . . . streaks")

D) Lines 73-76 ("It's . . . well")

27

What information discussed in paragraph 10 (lines 58-68) is represented by the graph?

A) The information in lines 58-62 ("Recent . . . reported")

B) The information in lines 62-64 ("These . . . hibernation")

C) The information in lines 64-65 ("Lolling . . . circulation")

D) The information in lines 67-68 ("It's . . . strokes")

28

Which statement about the effect of hibernation on the seven bears is best supported by the graph?

A) Only one of the bears did not experience an appreciable change in its total plasma cholesterol level.

B) Only one of the bears experienced a significant increase in its total plasma cholesterol level.

C) All of the bears achieved the desirable plasma cholesterol level for humans.

D) The bear with the lowest total plasma cholesterol level in its active state had the highest total plasma cholesterol level during hibernation.

CONTINUE

Questions 29-37 are based on the following passage.

This passage is from Andrew Carnegie, "Wealth," originally published in 1889. Arriving penniless in Pennsylvania from Scotland in 1848, Carnegie became one of the richest people in the United States through the manufacture of steel.

The problem of our age is the proper administration of wealth, that the ties of brotherhood may still bind together the rich and poor in harmonious relationship. The conditions of human life have not only been changed, but revolutionized, within the past few hundred years. In former days there was little difference between the dwelling, dress, food, and environment of the chief and those of his retainers. . . . The contrast between the palace of the millionaire and the cottage of the laborer with us to-day measures the change which has come with civilization. This change, however, is not to be deplored, but welcomed as highly beneficial. It is well, nay, essential, for the progress of the race that the houses of some should be homes for all that is highest and best in literature and the arts, and for all the refinements of civilization, rather than that none should be so. Much better this great irregularity than universal squalor. Without wealth there can be no Maecenas.* The "good old times" were not good old times. Neither master nor servant was as well situated then as to-day. A relapse to old conditions would be disastrous to both—not the least so to him who serves—and would sweep away civilization with it. But whether the change be for good or ill, it is upon us, beyond our power to alter, and, therefore, to be accepted and made the best of. It is a waste of time to criticize the inevitable.

It is easy to see how the change has come. One illustration will serve for almost every phase of the cause. In the manufacture of products we have the whole story. It applies to all combinations of human industry, as stimulated and enlarged by the inventions of this scientific age. Formerly, articles were manufactured at the domestic hearth, or in small shops which formed part of the household. The master and his apprentices worked side by side, the latter living with the master, and therefore subject to the same conditions. When these apprentices rose to be masters, there was little or no change in their mode of life, and they, in turn, educated succeeding apprentices in the same routine. There was, substantially, social equality, and even political equality, for those engaged in industrial pursuits had then little or no voice in the State.

The inevitable result of such a mode of manufacture was crude articles at high prices. To-day the world obtains commodities of excellent quality at prices which even the preceding generation would have deemed incredible. In the commercial world similar causes have produced similar results, and the race is benefited thereby. The poor enjoy what the rich could not before afford. What were the luxuries have become the necessaries of life. The laborer has now more comforts than the farmer had a few generations ago. The farmer has more luxuries than the landlord had, and is more richly clad and better housed. The landlord has books and pictures rarer and appointments more artistic than the king could then obtain.

The price we pay for this salutary change is, no doubt, great. We assemble thousands of operatives in the factory, and in the mine, of whom the employer can know little or nothing, and to whom he is little better than a myth. All intercourse between them is at an end. Rigid castes are formed, and, as usual, mutual ignorance breeds mutual distrust. Each caste is without sympathy for the other, and ready to credit anything disparaging in regard to it. Under the law of competition, the employer of thousands is forced into the strictest economies, among which the rates paid to labor figure prominently, and often there is friction between the employer and the employed, between capital and labor, between rich and poor. Human society loses homogeneity.

The price which society pays for the law of competition, like the price it pays for cheap comforts and luxuries, is also great; but the advantages of this law are also greater still than its cost—for it is to this law that we owe our wonderful material development, which brings improved conditions in its train.

* Gaius Maecenas (70–8 B.C.E.) was a great patron of the arts.

CONTINUE

29

Which choice best describes the structure of the first paragraph?

A) A personal history is narrated, historical examples are given, and a method is recommended.

B) A position is stated, historical context is given, and earnest advice is given.

C) Certain principles are stated, opposing principles are stated, and a consensus is reached.

D) A historical period is described, and its attributes are reviewed.

30

The author most strongly implies which of the following about "the ties of brotherhood" (line 2)?

A) They were always largely fictitious and are more so at present.

B) They are stronger at present than they ever were before.

C) They are more seriously strained in the present than in the past.

D) They will no longer be able to bring together the rich and the poor.

31

The author uses "dwelling, dress, food, and environment" (lines 7-8) as examples of

A) things more valued in the present than in the past.

B) bare necessities of life.

C) things to which all people are entitled.

D) possible indications of differences in status.

32

The author describes the people who live in the "houses of some" (line 15) as interested in the

A) materials from which their houses are constructed.

B) size of their homes.

C) advantages of culture.

D) pedigree of their guests.

33

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

A) Lines 9-10 ("the palace . . . laborer")

B) Lines 15-16 ("all . . . arts")

C) Lines 18-19 ("Much . . . squalor")

D) Lines 19-20 ("Without . . . Maecenas")

34

The author uses the phrase "good old times" (line 20) as an example of

A) a cliché that still has life and usefulness left in it.

B) a bit of folk wisdom from his childhood.

C) something said by those who have acquired great riches.

D) something said by people who do not share his viewpoint.

35

What is the author's main point about the disadvantages of the modern economic system?

A) It provides only a few people with the advantages of culture.

B) It replicates many of the problems experienced in the past.

C) It creates divisions between different categories of people.

D) It gives certain people great material advantages over others.

CONTINUE

36

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

A) Lines 37-39 ("The master . . . conditions")

B) Lines 43-45 ("There was . . . State")

C) Lines 46-47 ("The inevitable . . . prices")

D) Lines 65-66 ("All intercourse . . . end")

37

As used in line 82, "in its train" is closest in meaning to

A) before it.

B) with it.

C) anticipating it.

D) advancing it.

CONTINUE

Questions 38-47 are based on the following passages.

Passage 1 is adapted from Stewart Brand, "The Case for Reviving Extinct Species." ©2013 by the National Geographic Society. Passage 2 is adapted from the editors at *Scientific American*, "Why Efforts to Bring Extinct Species Back from the Dead Miss the Point." ©2013 by Nature America, Inc.

Passage 1

Many extinct species—from the passenger pigeon to the woolly mammoth—might now be reclassified as "bodily, but not genetically, extinct." They're dead, but their DNA is recoverable from museum specimens and fossils, even those up to 200,000 years old.

Thanks to new developments in genetic technology, that DNA may eventually bring the animals back to life. Only species whose DNA is too old to be recovered, such as dinosaurs, are the ones to consider totally extinct, bodily and genetically.

But why bring vanished creatures back to life? It will be expensive and difficult. It will take decades. It won't always succeed. Why even try?

Why do we take enormous trouble to protect endangered species? The same reasons will apply to species brought back from extinction: to preserve biodiversity, to restore diminished ecosystems, to advance the science of preventing extinctions, and to undo harm that humans have caused in the past.

Furthermore, the prospect of de-extinction is profound news. That something as irreversible and final as extinction might be reversed is a stunning realization. The imagination soars. Just the thought of mammoths and passenger pigeons alive again invokes the awe and wonder that drives all conservation at its deepest level.

Passage 2

The idea of bringing back extinct species holds obvious gee-whiz appeal and a respite from a steady stream of grim news. Yet with limited intellectual bandwidth and financial resources to go around, de-extinction threatens to divert attention from the modern biodiversity crisis. According to a 2012 report from the International Union for Conservation of Nature, some 20,000 species are currently in grave danger of going extinct. Species today are vanishing in such great numbers—many from hunting and habitat destruction—that the trend has been called a sixth mass extinction, an event on par with such die-offs as the one that befell the dinosaurs 65 million years ago. A program to restore extinct species poses a risk of selling the public on a false promise that technology alone can solve our ongoing environmental woes—an implicit assurance that if a species goes away, we can snap our fingers and bring it back.

Already conservationists face difficult choices about which species and ecosystems to try to save, since they cannot hope to rescue them all. Many countries where poaching and trade in threatened species are rampant either do not want to give up the revenue or lack the wherewithal to enforce their own regulations. Against that backdrop, a costly and flamboyant project to resuscitate extinct flora and fauna in the name of conservation looks irresponsible: Should we resurrect the mammoth only to let elephants go under? Of course not.

That is not to say that the de-extinction enterprise lacks merit altogether. Aspects of it could conceivably help save endangered species. For example, extinct versions of genes could be reintroduced into species and subspecies that have lost a dangerous amount of genetic diversity, such as the black-footed ferret and the northern white rhino. Such investigations, however, should be conducted under the mantle of preserving modern biodiversity rather than conjuring extinct species from the grave.

38

The author of Passage 1 suggests that the usefulness of de-extinction technology may be limited by the

A) amount of time scientists are able to devote to genetic research.

B) relationship of an extinct species to contemporary ecosystems.

C) complexity of the DNA of an extinct species.

D) length of time that a species has been extinct.

CONTINUE

39

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

A) Lines 7-9 ("Thanks . . . life")
B) Lines 9-11 ("Only . . . genetically")
C) Line 13 ("It will be . . . difficult")
D) Lines 13-14 ("It will take . . . succeed")

40

As used in line 27, "deepest" most nearly means

A) most engrossing.
B) most challenging.
C) most extensive.
D) most fundamental.

41

The authors of Passage 2 indicate that the matter of shrinking biodiversity should primarily be considered a

A) historical anomaly.
B) global catastrophe.
C) scientific curiosity.
D) political problem.

42

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

A) Lines 37-41 ("Species . . . ago")
B) Lines 42-45 ("A program . . . woes")
C) Lines 53-56 ("Against . . . irresponsible")
D) Lines 65-67 ("Such . . . grave")

43

As used in line 37, "great" most nearly means

A) lofty.
B) wonderful.
C) large.
D) intense.

44

The reference to the "black-footed ferret and the northern white rhino" (line 64) serves mainly to

A) emphasize a key distinction between extinct and living species.
B) account for types of animals whose numbers are dwindling.
C) provide examples of species whose gene pools are compromised.
D) highlight instances of animals that have failed to adapt to new habitats.

45

Which choice best states the relationship between the two passages?

A) Passage 2 attacks a political decision that Passage 1 strongly advocates.
B) Passage 2 urges caution regarding a technology that Passage 1 describes in favorable terms.
C) Passage 2 expands on the results of a research study mentioned in Passage 1.
D) Passage 2 considers practical applications that could arise from a theory discussed in Passage 1.

CONTINUE

46

How would the authors of Passage 2 most likely respond to the "prospect" referred to in line 21, Passage 1?

A) With approval, because it illustrates how useful de-extinction could be in addressing widespread environmental concerns.

B) With resignation, because the gradual extinction of many living species is inevitable.

C) With concern, because it implies an easy solution to a difficult problem.

D) With disdain, because it shows that people have little understanding of the importance of genetic diversity.

47

Which choice would best support the claim that the authors of Passage 2 recognize that the "imagination soars" (line 24, Passage 1) in response to de-extinction technology?

A) Lines 28-30 ("The . . . news")

B) Lines 30-33 ("Yet . . . crisis")

C) Lines 58-59 ("That . . . altogether")

D) Lines 61-63 ("For . . . diversity")

STOP

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

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 Nod to Nodding Off

With 30 percent of United States workers not getting enough sleep at night, according to the *Wall Street Journal*, US companies 1 lose a yearly sum of $63.2 billion annually due to the drop in employee productivity resulting from sleep deprivation. Sleep-deprived workers generally have lower morale and are less able to retain information than their better-rested colleagues.

1

A) NO CHANGE
B) see an annual loss of $63.2 billion each year
C) lose $63.2 billion annually
D) have a yearly loss of $63.2 billion annually

CONTINUE

[1] One of the 2 big reasons behind workers' lack of sleep is the work itself. [2] To combat the problem of sleep deprivation in a demanding work environment, some companies have begun allowing workers to take naps. [3] The hours the average American 3 spend working have increased dramatically since the 1970s, making it hard for many workers to get a good night's sleep. [4] Although employees who sleep on the job are often considered lazy and unproductive, napping in the workplace has been shown to improve workers' efficiency and quality of life. [5] As long as companies continue to demand long hours from 4 workers, and managers should champion napping as a means to keep employees happy, healthy, and functional. 5

2

A) NO CHANGE
B) main things leading up to
C) huge things about
D) primary causes of

3

A) NO CHANGE
B) have spent
C) spends
D) are spent

4

A) NO CHANGE
B) workers; managers
C) workers, managers,
D) workers, managers

5

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

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

CONTINUE

Such a proposition may seem counterintuitive, but, in fact, allowing employees to nap could save companies hours of lost productivity. Studies reveal that napping improves memory and boosts wakefulness for the remainder of the day. 6 Napping can also have a positive effect on mood and overall job satisfaction, while constant drowsiness reduces reaction time and hampers one's ability to concentrate. Employee naps might also lead to reduced health care costs for companies, since regular napping leads to long-term health benefits, 7 and it improves workers' average weekly attendance.

6

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

> Even fifteen-minute power naps improve alertness, creativity, and concentration.

Should the writer make this addition here?

A) Yes, because it demonstrates that the benefits of napping can be gained without sacrificing large amounts of work time.

B) Yes, because it explains the methodology of the studies mentioned in the previous sentence.

C) No, because a discussion of the type of nap workers take is not important to the writer's main point in the paragraph.

D) No, because it contradicts the writer's discussion of napping in the previous sentences.

7

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

A) NO CHANGE

B) including a lower risk of cardiovascular problems such as heart attack and stroke.

C) which are essential in an era of rising health care costs.

D) in addition to making employees more efficient.

CONTINUE

Napping at work has already won corporate advocates in the worlds of technology, finance, and news media, and some businesses are beginning to set aside special nap rooms. A few companies, such as Google, have even invested in high-tech nap pods that block out light, play soothing music, and **8** gently waking nappers.

Zephrin Lasker, CEO of the mobile-advertising firm Pontiflex, has observed that employees are happier and more productive since he created a nap room in the company's Brooklyn headquarters. Ryan Hodson of Kodiak Capital Group and Arianna Huffington of the Huffington Post Media Group have promoted napping **9** throughout their workers and have been effusive about the results. In light of the benefits not only to employees' efficiency **10** and again to their health and sense of well-being, these executives' enthusiasm is not surprising. **11** These executives are among the most successful leaders in their respective fields.

8

A) NO CHANGE
B) gently wake
C) gently to wake
D) gentle waking of

9

A) NO CHANGE
B) among
C) between
D) into

10

A) NO CHANGE
B) but it benefits
C) as also to
D) but also to

11

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

A) NO CHANGE
B) Clearly, employers should consider reducing employees' hours when they are overworked.
C) Companies should consider employee schedules carefully when implementing a napping policy.
D) More businesses should follow their lead and embrace napping on the job.

CONTINUE

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

Vanishing Honeybees: A Threat to Global Agriculture

Honeybees play an important role in the agriculture industry by pollinating crops. An October 2006 study found that as much as one-third of global agriculture depends on animal pollination, including honeybee **12** pollination—to increase crop output. The importance of bees **13** highlights the potentially disastrous affects of an emerging, unexplained crisis: entire colonies of honeybees are dying off without warning.

14 They know it as colony collapse disorder (CCD), this phenomenon will have a detrimental impact on global agriculture if its causes and solutions are not determined. Since the emergence of CCD around 2006, bee mortality rates have **15** exceeded 25 percent of the population each winter. There was one sign of hope: during the 2010–2012 winter seasons, bee mortality rates decreased slightly, and beekeepers speculated that the colonies would recover. Yet in the winter of 2012–2013, the **16** portion of the bee population lost fell nearly 10 percent in the United States, with a loss of 31 percent of the colonies that pollinate crops.

12

A) NO CHANGE
B) pollination: this is
C) pollination,
D) pollination;

13

A) NO CHANGE
B) highlights the potentially disastrous effects
C) highlight the potentially disastrous effects
D) highlight the potentially disastrous affects

14

A) NO CHANGE
B) Known as colony
C) It is known as colony
D) Colony

15

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

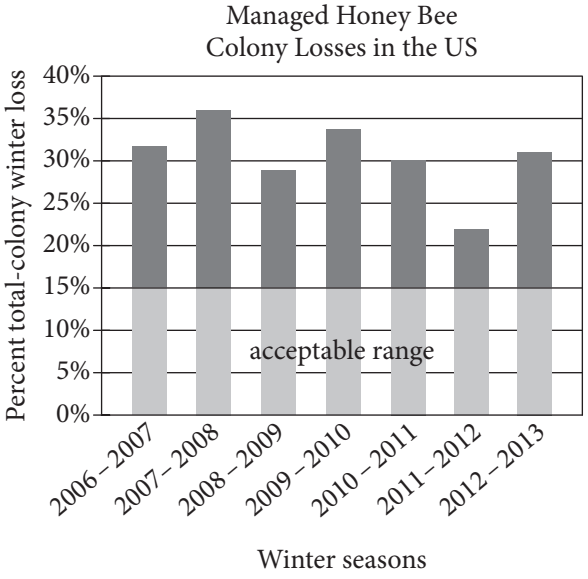
A) NO CHANGE
B) been above the acceptable range.
C) not changed noticeably from year to year.
D) greatly increased every year.

16

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

A) NO CHANGE
B) portion of bees lost was double what it had been the previous year, rising to
C) number of losses, which had fallen within the acceptable range the previous year, rose to
D) portion of total colonies lost rose almost 10 percentage points, with a loss of

CONTINUE



Adapted from Dennis van Engelsdorp et al., "Preliminary Results: Honey Bee Colony Losses in the United States, Winter 2012-2013." ©2013 by the Bee Informed Partnership.

17 Studies have offered several possible reasons that bees are vanishing. One reason that is often cited is the use of pesticides called neonicotinoids, which are absorbed by plants and linger much longer than do topical pesticides. 18 Chemicals such as herbicides and fungicides may also play a role, contaminating the pollen that bees typically feed on and inhibiting healthy insect maturation.

17

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

A) NO CHANGE

B) Bees are vanishing, and according to studies there are several possible reasons for this trend.

C) Several possible reasons, offered by studies, may explain why bees are vanishing.

D) DELETE the underlined sentence.

18

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

> Prolonged exposure to neonicotinoids has been shown to increase bees' vulnerability to disease and parasitic mites.

Should the writer make this addition here?

A) Yes, because it provides support for the claim made in the previous sentence.

B) Yes, because it introduces a new idea that will become important later in the passage.

C) No, because it would be better placed elsewhere in the passage.

D) No, because it contradicts the main idea of the passage.

CONTINUE

Given the role that honeybees play in agriculture, the impact of this loss of hives on fruit, vegetable, seed, and nut crops **19** is not to be scoffed at. A reduction in bee numbers leads to less pollination, which in turn leads to smaller harvests and higher food prices. Some farmers have resorted to renting hives from beekeepers to pollinate their **20** crops; when there is a shortage of bees this being an expensive proposition. Other farmers have increased **21** they're dependence on costly hand-pollination by human workers. Furthermore, there may be sociological repercussions. Agroecologist Alexandra-Maria Klein has suggested that rising produce prices could lead to an increase in obesity as people turn to cheaper, less wholesome fare.

Though the precise causes of CCD are yet unclear, some commonsense measures may be taken. A decrease in the use of certain pesticides, herbicides, and fungicides, as well as greater attention to the nutrition, habitat, and genetic diversity of managed hives, could begin a shift in a favorable direction. **22**

19

A) NO CHANGE
B) is a pretty big deal.
C) can't be put on the back burner.
D) cannot be ignored.

20

A) NO CHANGE
B) crops, this is an expensive proposition when there is a shortage of bees.
C) crops, an expensive proposition when there is a shortage of bees.
D) crops; an expensive proposition when there is a shortage of bees.

21

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

22

The writer wants a conclusion that addresses the future of efforts to combat CCD. Which choice results in the passage having the most appropriate concluding sentence?

A) NO CHANGE
B) Still, bee colonies have experienced such devastating losses that the consequences of the issue have been felt worldwide.
C) Although CCD is a relatively new phenomenon, scientists have been studying other aspects of honeybees for over a century.
D) Genetic variation in bee colonies generally improves bees' productivity, disease resistance, and ability to regulate body temperature.

CONTINUE

Questions 23-33 are based on the following passage.

Lunar Farming

Late last autumn, Giuseppe Ferrua 23 stood, on the hillside he farms overlooking Italy's Serchio River valley, a landscape of low mountains dotted 24 with vineyards. Ferrua grows grapes and olives, and he does so according to the phases of the Moon. He didn't always farm this way. When he began, he exercised modern, one-size-fits-all farming methods but says he soon became convinced that "plants are completely prone to elements in the cosmos, the rhythms of day and night."

Following the lunar calendar, this type of farming is driven by the belief that the Moon influences levels of moisture in the soil, just as the Moon's gravitational pull affects great bodies of water. Lunar farmers believe, 25 for example, that from the new Moon to quarter Moon phases, when the Moon is waxing, a soil's moisture content increases, whereas drier periods occur during the waning phase. 26 Although moisture influences seed germination, a lunar guide on when to plant and weed can be advantageous to a grower.

23

A) NO CHANGE
B) stood;
C) stood—
D) stood

24

A) NO CHANGE
B) inside
C) for
D) on

25

A) NO CHANGE
B) however,
C) by contrast,
D) thereafter,

26

A) NO CHANGE
B) Given that
C) So
D) DELETE the underlined portion and begin the sentence with a capital letter.

CONTINUE

27 Nature has been around forever. First-century Roman naturalist Pliny the Elder stated in his *Natural History* that the Moon "replenishes the Earth; when she approaches it, she fills all bodies, while, when she recedes, she empties them." Chinese and Egyptian people performed agricultural tasks according to the lunar calendar for millennia, and, to this day, the vaunted *Old Farmer's Almanac* includes regional lunar calendars and advice on 28 when to conduct farm chores. The 29 almanacs editor, Janice Stillman, says, "That information is of value to our readers who practice these traditional methods—and claim great success."

27

Which choice most effectively sets up the paragraph?

A) NO CHANGE
B) People all over the world farm by the Moon.
C) Farming by the Moon is not new.
D) Talk of the Moon's influence is far-reaching.

28

Which choice provides the most specific information on the type of advice a lunar calendar offers?

A) NO CHANGE
B) actions relevant to farming.
C) points in time at which to undertake certain tasks.
D) optimal times to plant, weed, prune, and harvest.

29

A) NO CHANGE
B) almanacs's
C) almanac's
D) almanacs'

CONTINUE

Lunar farming has its **30** skeptics, who are not sure of the method's efficacy. Recalling advice he received on the best lunar time to plant potatoes, an English farmer says his first reaction was "Hoopla." Current mainstream agriculture does not factor the Moon into **31** their practices, so the concept might seem quaint or irrational. Additionally, lunar farming is based in astrology as opposed to astronomy, and no extensive scientific studies have yet been conducted that measure the Moon's overall influence on farming, **32** so supporters continue to wait for their practices to be verified scientifically.

Stillman says, "We are of the mind that you accept or believe by choice." Indeed, despite his doubts, the skeptical English farmer wound up planting his potatoes according to the lunar cycle and claims they were "the best I have tasted." Agricultural professor Jennifer Coffman has a similar response to Ferrua's bounty in Italy. **33** "Smell this rosemary," she says. "Smell how amazingly fragrant that is." At this stage, one could say that the evidence must be experienced to be believed.

30

A) NO CHANGE
B) skeptics, who have yet to be convinced.
C) skeptics—those who doubt the method.
D) skeptics.

31

A) NO CHANGE
B) those
C) it's
D) its

32

The writer wants to conclude the paragraph effectively while also reinforcing the point that skepticism toward lunar farming still exists. Which choice best accomplishes this goal?

A) NO CHANGE
B) and therefore no sound scientific data on the subject exist to date.
C) yet many continue to practice lunar farming.
D) leading many to conclude that the practice is based in folklore, not fact.

33

Which choice gives an additional supporting example that emphasizes the importance of the senses in judging the success of the lunar farming method?

A) NO CHANGE
B) She has taken photographs of the grapevines and landscape.
C) She takes careful notes about Ferrua's farming methods, asking Ferrua to clarify how he prepares the soil.
D) She dips bread into Ferrua's olive oil as he explains a soil preparation he does in the fall.

CONTINUE

Questions 34 -44 are based on the following passage.

Recipes for History: The Szathmary Cookbook Collection

In 1990, chef Louis Szathmary, a voracious collector of cookbooks, donated approximately 20,000 culinary artifacts to the University of Iowa library. The gift included more than 100 manuscript recipe books **34** —collections of recipes handwritten by the people who used them. The manuscripts, some of which date back to the seventeenth century, are an invaluable resource for food historians as well as the general public.

35 Because of the astonishing size and range of Szathmary's **36** donation to the University of Iowa, making this cornucopia of information available to readers was a challenge. Working in conjunction with the library, the University of Iowa Press published volumes as varied as *The P.E.O. Cookbook*, written in rural Iowa in 1908, and *Ladie Borlase's Receiptes Booke*, written in the English countryside from 1665 to 1822. Librarians were happy to show the Szathmary collection to people who were able to visit the library, **37** so the manuscripts, too delicate to be checked out to library patrons, remained largely unexplored.

34

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

A) Yes, because the underlined portion detracts from the paragraph's focus on the Szathmary collection.
B) Yes, because the information in the underlined portion is provided in the previous sentence.
C) No, because the underlined portion defines a term that is important to the passage.
D) No, because the underlined portion gives an example of a particular culinary artifact.

35

A) NO CHANGE
B) Regardless of
C) In contrast to
D) In addition to

36

A) NO CHANGE
B) donation of so many culinary artifacts,
C) massive donation of cookbooks,
D) donation,

37

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

CONTINUE

This all started to change in 2012, when the university expanded its DIY History Project ("DIY" stands for "do it yourself") to include the manuscripts. The project enlists volunteers to transcribe the recipes: working from **38** our home computers, the volunteers type up the scanned handwritten recipes. After a page is transcribed and proofread, it is digitized and becomes part of a searchable online archive. Volunteer transcribers need no particular expertise; **39** prosaic directives are provided on the DIY History website. Transcribing is easy. The ingredients (one recipe requires something called "ringon root") and measurements (a "ditto" of baking soda), **40** moreover, can be puzzling. The goal is to digitize all the manuscripts in the Szathmary collection, making them available to anyone with **41** access of a computer and the Internet.

38

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

39

A) NO CHANGE
B) simple directions
C) bare-bones how-tos
D) facile protocols

40

A) NO CHANGE
B) therefore,
C) however,
D) in short,

41

A) NO CHANGE
B) access to
C) excess of
D) excess to

CONTINUE

[1] The library is working hard to publicize the project and encourage the public to try the recipes. [2] It has formed a club dedicated to cooking manuscript recipes. [3] Some recipes don't fare well in the twenty-first century (one club member called her 1800s gingerbread a "molasses-laden brick"), while others **42** had worked just fine. [4] In another instance of library outreach, a competition at the 2013 Iowa State Fair, contestants baked desserts in three categories—**43** almond cheesecake, summer mince pie, and Marlborough pie—using recipes from the Szathmary collection. **44**

The efforts of the library and the volunteers are clearly bearing fruit. By January 2014, more than 38,000 manuscript pages had been transcribed, thanks to the volunteers who answered DIY History's call to "help build the historical record by doing it yourself."

42

A) NO CHANGE
B) work
C) worked
D) could have worked

43

A) NO CHANGE
B) almond, cheesecake summer, mince,
C) almond cheesecake summer, mince
D) almond, cheesecake, summer, mince,

44

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

> The judges reported that the entries were delicious.

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

A) after sentence 1.
B) after sentence 2.
C) after sentence 3.
D) after sentence 4.

STOP

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

No Test Material On This Page

Math Test – No Calculator

25 MINUTES, 17 QUESTIONS

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

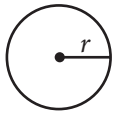
DIRECTIONS

For questions **1-13**, solve each problem, choose the best answer from the choices provided, and fill in the corresponding circle on your answer sheet. For questions **14-17**, solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 14 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

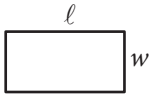
NOTES

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

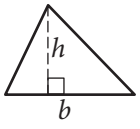
REFERENCE



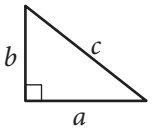
$A = \pi r^2$
$C = 2\pi r$



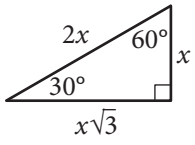
$A = \ell w$

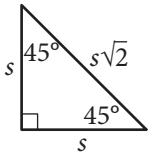


$A = \frac{1}{2}bh$

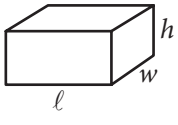


$c^2 = a^2 + b^2$

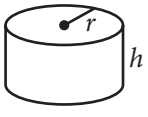




Special Right Triangles

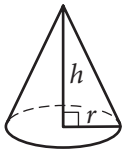


$V = \ell wh$

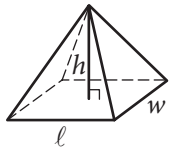


$V = \pi r^2 h$

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



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



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

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

CONTINUE

1

A babysitter earns \$8 an hour for babysitting 2 children and an additional \$3 tip when both children are put to bed on time. If the babysitter gets the children to bed on time, what expression could be used to determine how much the babysitter earned?

A) $8x + 3$, where x is the number of hours

B) $3x + 8$, where x is the number of hours

C) $x(8 + 2) + 3$, where x is the number of children

D) $3x + (8 + 2)$, where x is the number of children

2

$$3(x + y) = y$$

If (x, y) is a solution to the equation above and $y \neq 0$, what is the ratio $\frac{x}{y}$?

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

B) $-\frac{2}{3}$

C) $\frac{1}{3}$

D) $\frac{2}{3}$

3

$$\frac{1}{2}x - \frac{1}{4}y = 10$$
$$\frac{1}{8}x - \frac{1}{8}y = 19$$

Which ordered pair (x, y) satisfies the system of equations above?

A) $(-112, -264)$

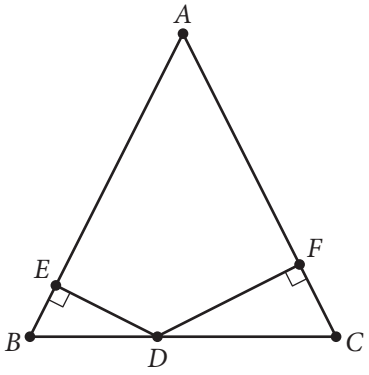
B) $(64, 88)$

C) $\left(\frac{232}{3}, \frac{224}{3}\right)$

D) $(288, 536)$

CONTINUE

4



Note: Figure not drawn to scale.

Triangle ABC above is isosceles with $AB = AC$ and $BC = 48$. The ratio of DE to DF is $5 : 7$. What is the length of $\overline{DC}$?

A) 12

B) 20

C) 24

D) 28

5

In a certain game, a player can solve easy or hard puzzles. A player earns 30 points for solving an easy puzzle and 60 points for solving a hard puzzle. Tina solved a total of 50 puzzles playing this game, earning 1,950 points in all. How many hard puzzles did Tina solve?

A) 10

B) 15

C) 25

D) 35

6

$$2x^2 + 7x - 15 = 0$$

If r and s are two solutions of the equation above and $r > s$, which of the following is the value of $r - s$?

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

B) $\frac{13}{2}$

C) $\frac{11}{2}$

D) $\frac{3}{2}$

7

To cut a lawn, Allan charges a fee of \$15 for his equipment and \$8.50 per hour spent cutting a lawn. Taylor charges a fee of \$12 for his equipment and \$9.25 per hour spent cutting a lawn. If x represents the number of hours spent cutting a lawn, what are all the values of x for which Taylor's total charge is greater than Allan's total charge?

A) $x > 4$

B) $3 \leq x \leq 4$

C) $4 \leq x \leq 5$

D) $x < 3$

CONTINUE

8

$$n = 456 - 3T$$

The equation above is used to model the relationship between the number of cups, n, of hot chocolate sold per day in a coffee shop and the average daily temperature, T, in degrees Fahrenheit. According to the model, what is the meaning of the 3 in the equation?

A) For every increase of 3°F, one more cup of hot chocolate will be sold.

B) For every decrease of 3°F, one more cup of hot chocolate will be sold.

C) For every increase of 1°F, three more cups of hot chocolate will be sold.

D) For every decrease of 1°F, three more cups of hot chocolate will be sold.

9

A truck enters a stretch of road that drops 4 meters in elevation for every 100 meters along the length of the road. The road is at 1,300 meters elevation where the truck entered, and the truck is traveling at 16 meters per second along the road. What is the elevation of the road, in meters, at the point where the truck passes t seconds after entering the road?

A) $1{,}300 - 0.04t$

B) $1{,}300 - 0.64t$

C) $1{,}300 - 4t$

D) $1{,}300 - 16t$

10

If $f(x-1) = 2x + 3$ for all values of x, what is the value of $f(-3)$?

A) -7

B) -5

C) -3

D) -1

11

Which of the following is equivalent to $(s-t)\left(\frac{s}{t}\right)$?

A) $\frac{s}{t} - s$

B) $\frac{s}{t} - st$

C) $\frac{s^2}{t} - s$

D) $\frac{s^2}{t} - \frac{s}{t^2}$

CONTINUE

12

$$p(x) = 3(x^2 + 10x + 5) - 5(x - k)$$

In the polynomial $p(x)$ defined above, k is a constant. If $p(x)$ is divisible by x, what is the value of k ?

A) -3

B) -2

C) 0

D) 3

13

In the xy-plane, if the parabola with equation $y = ax^2 + bx + c$, where a, b, and c are constants, passes through the point $(-1, 1)$, which of the following must be true?

A) $a - b = 1$

B) $-b + c = 1$

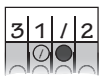
C) $a + b + c = 1$

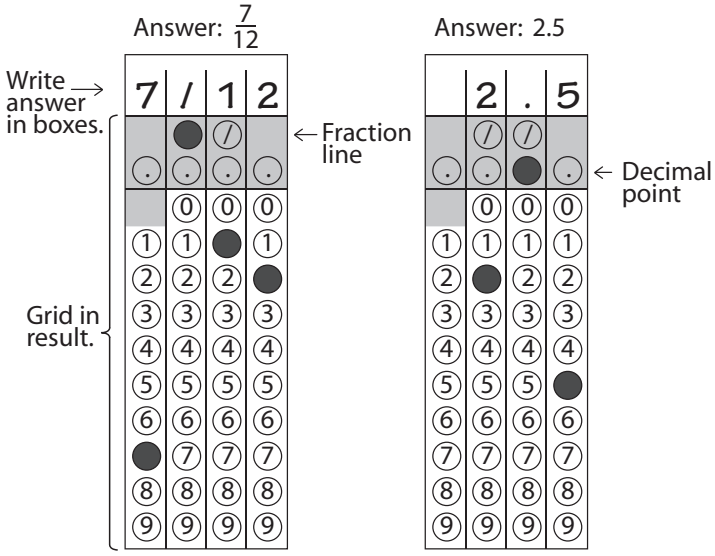
D) $a - b + c = 1$

CONTINUE

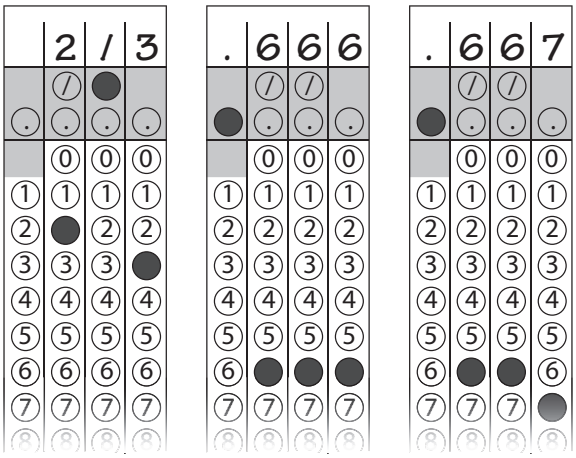
DIRECTIONS

For questions 14–17, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

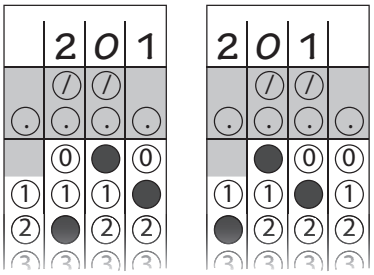
1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
2. Mark no more than one circle in any column.
3. No question has a negative answer.
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 $3\frac{1}{2}$.)
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

14

For what value of h is $24 = \frac{h}{10} - 6$?

15

What is the value of a if $(2a + 3) - (4a - 8) = 7$?

16

If x is not equal to zero, what is the value of $\frac{4(3x)^2}{(2x)^2}$?

17

If $x - 2$ is a factor of $x^2 - bx + b$, where b is a constant, what is the value of b ?

STOP

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

No Test Material On This Page

Math Test – Calculator

45 MINUTES, 31 QUESTIONS

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

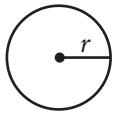
DIRECTIONS

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

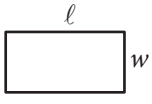
NOTES

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

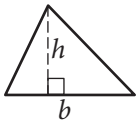
REFERENCE



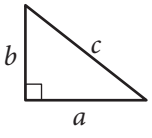
$A = \pi r^2$
$C = 2\pi r$



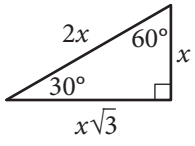
$A = \ell w$

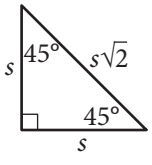


$A = \frac{1}{2}bh$

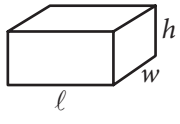


$c^2 = a^2 + b^2$

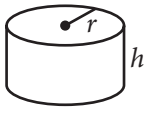




Special Right Triangles

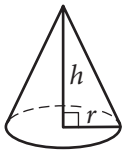


$V = \ell wh$

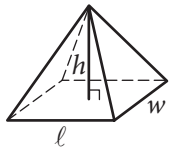


$V = \pi r^2 h$

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



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



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

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

CONTINUE

1

Tyra subscribes to an online gaming service that charges a monthly fee of $5.00 and $0.25 per hour for time spent playing premium games. Which of the following functions gives Tyra's cost, in dollars, for a month in which she spends x hours playing premium games?

A) $C(x) = 5.25x$

B) $C(x) = 5x + 0.25$

C) $C(x) = 5 + 0.25x$

D) $C(x) = 5 + 25x$

2

A grocery store sells a brand of juice in individual bottles and in packs of 6 bottles. On a certain day, the store sold a total of 281 bottles of the brand of juice, of which 29 were sold as individual bottles. Which equation shows the number of packs of bottles, p, sold that day?

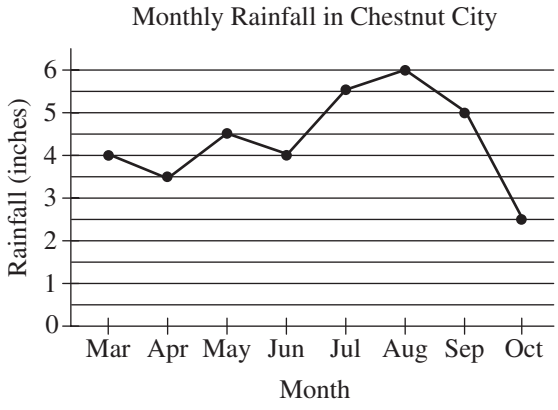
A) $p = \frac{281 - 29}{6}$

B) $p = \frac{281 + 29}{6}$

C) $p = \frac{281}{6} - 29$

D) $p = \frac{281}{6} + 29$

3



The line graph above shows the monthly rainfall from March to October last year in Chestnut City. According to the graph, what was the greatest change (in absolute value) in the monthly rainfall between two consecutive months?

A) 1.5 inches

B) 2.0 inches

C) 2.5 inches

D) 3.5 inches

CONTINUE

4

A rectangle has perimeter P, length ℓ and width w. Which of the following represents ℓ in terms of P and w ?

A) $\ell = P - w$

B) $\ell = \dfrac{2P - w}{2}$

C) $\ell = \dfrac{P - 2w}{2}$

D) $\ell = 2P - 2w$

5

Which ordered pair (x, y) satisfies the system of equations shown below?

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

A) $(-6, 2)$

B) $(-2, 2)$

C) $(2, -2)$

D) $(4, 2)$

6

A soda company is filling bottles of soda from a tank that contains 500 gallons of soda. At most, how many 20-ounce bottles can be filled from the tank? (1 gallon = 128 ounces)

A) 25

B) 78

C) 2,560

D) 3,200

7

A car traveled at an average speed of 80 miles per hour for 3 hours and consumed fuel at a rate of 34 miles per gallon. Approximately how many gallons of fuel did the car use for the entire 3-hour trip?

A) 2

B) 3

C) 6

D) 7

CONTINUE

8

What is the slope of the line in the xy-plane that passes through the points $\left(-\frac{5}{2}, 1\right)$ and $\left(-\frac{1}{2}, 4\right)$?

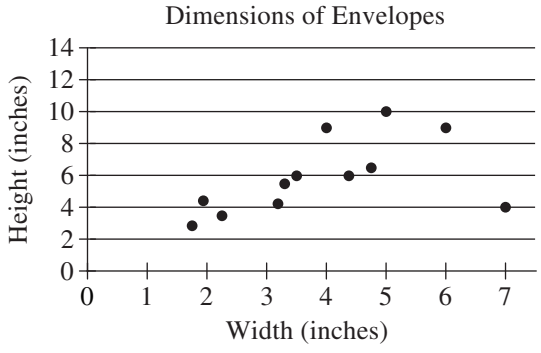
A) -1

B) $-\frac{2}{3}$

C) 1

D) $\frac{3}{2}$

9



The scatterplot above shows the widths and the heights of 12 types of rectangular envelopes. What is the width, in inches, of the envelope represented by the data point that is farthest from the line of best fit (not shown) ?

A) 2

B) 5

C) 7

D) 12

10

A high school basketball team won exactly 65 percent of the games it played during last season. Which of the following could be the total number of games the team played last season?

A) 22

B) 20

C) 18

D) 14

11

$$110x + y = 1{,}210$$

A coffee shop is running a promotion where a number of free coffee samples are given away each day. The equation above can be used to model the number of free coffee samples, y, that remain to be given away x days after the promotion began. What does it mean that $(11, 0)$ is a solution to this equation?

A) During the promotion, 11 samples are given away each day.

B) It takes 11 days during the promotion to see 1,210 customers.

C) It takes 11 days during the promotion until none of the samples are remaining.

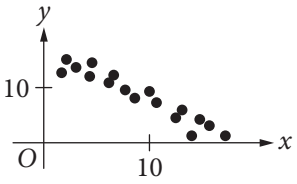
D) There are 11 samples available at the start of the promotion.

CONTINUE

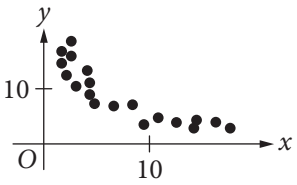
12

Which scatterplot shows a negative association that is not linear? (Note: A negative association between two variables is one in which higher values of one variable correspond to lower values of the other variable, and vice versa.)

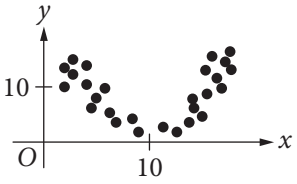
A)



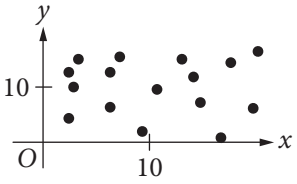
B)



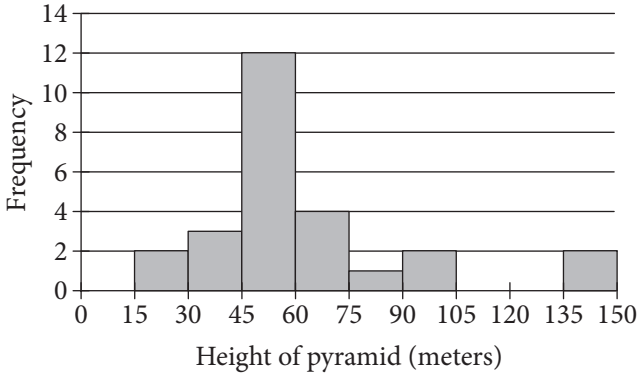
C)



D)



13



The histogram above shows the distribution of the heights, in meters, of 26 pyramids in Egypt. Which of the following could be the median height of the 26 pyramids represented in the histogram?

A) 44 meters

B) 48 meters

C) 63 meters

D) 77 meters

CONTINUE

Questions 14-16 refer to the following information.

A survey of 170 randomly selected teenagers aged 14 through 17 in the United States was conducted to gather data on summer employment of teenagers. The data are shown in the table below.

	Have a summer job	Do not have a summer job	Total
Ages 14–15	20	69	89
Ages 16–17	39	42	81
Total	59	111	170

14

Which of the following is closest to the percent of those surveyed who had a summer job?

A) 22%

B) 35%

C) 47%

D) 53%

15

In 2012 the total population of individuals in the United States who were between 14 and 17 years old (inclusive) was about 17 million. If the survey results are used to estimate information about summer employment of teenagers across the country, which of the following is the best estimate of the total number of individuals between 16 and 17 years old in the United States who had a summer job in 2012 ?

A) 8,200,000

B) 3,900,000

C) 2,000,000

D) 390,000

16

Based on the data, how many times more likely is it for a 14 year old or a 15 year old to NOT have a summer job than it is for a 16 year old or a 17 year old to NOT have a summer job? (Round the answer to the nearest hundredth.)

A) 0.52 times as likely

B) 0.65 times as likely

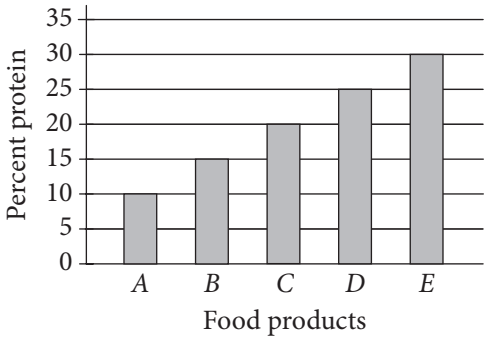
C) 1.50 times as likely

D) 1.64 times as likely

CONTINUE

17

Percent Protein in Five Food Products



The graph above shows the amount of protein supplied by five different food products, *A*, *B*, *C*, *D*, and *E*, as a percentage of their total weights. The costs of 10 grams of products *A*, *B*, *C*, *D*, and *E* are \$2.00, \$2.20, \$2.50, \$4.00, and \$5.00, respectively. Which of the five food products supplies the most protein per dollar?

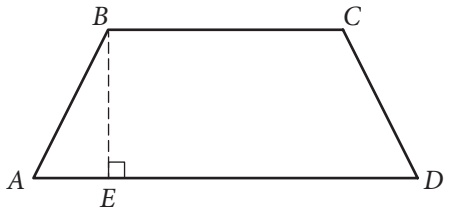
A) *A*

B) *B*

C) *C*

D) *E*

18



In quadrilateral *ABCD* above, $\overline{BC}$ is parallel to $\overline{AD}$, and $AB = CD$. If *BC* and *AD* were each doubled and *BE* was reduced by 50 percent, how would the area of *ABCD* change?

A) The area of *ABCD* would be decreased by 50 percent.

B) The area of *ABCD* would be increased by 50 percent.

C) The area of *ABCD* would not change.

D) The area of *ABCD* would be multiplied by 2.

19

Boyd grows only tomatoes and raspberries in his garden. Last year, he grew 140 pounds of tomatoes and 60 pounds of raspberries. This year, the production, by weight, of tomatoes declined by 20 percent, and the production, by weight, of raspberries declined by 50 percent. By what percentage did the total yield, by weight, of Boyd's garden decline?

A) 29 percent

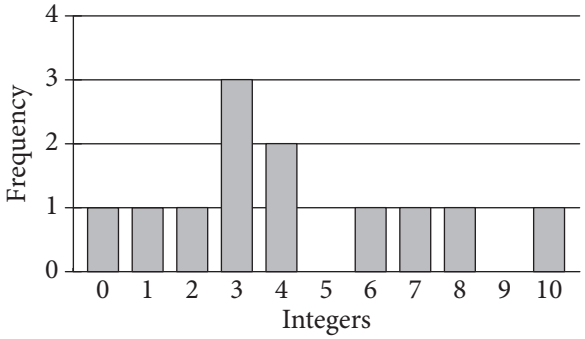
B) 30 percent

C) 35 percent

D) 70 percent

CONTINUE

20



The graph above shows the frequency distribution of a list of randomly generated integers between 0 and 10. What is the mean of the list of numbers?

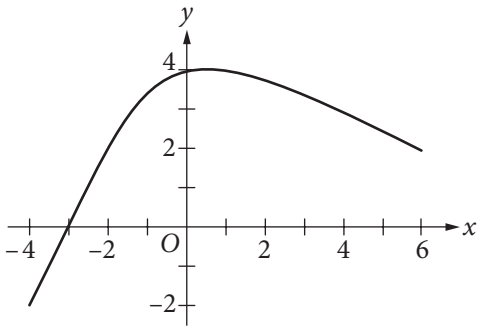
A) 3.0

B) 3.5

C) 4.25

D) 12.0

21



What is the minimum value of the function graphed on the xy-plane above, for $-4 \le x \le 6$?

A) $-\infty$

B) -4

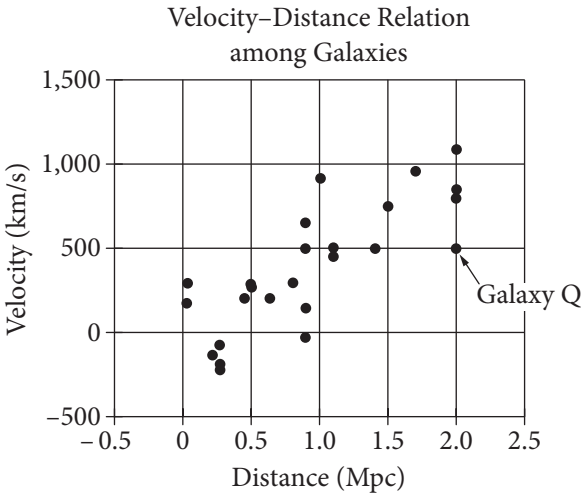
C) -2

D) 1

CONTINUE

Questions 22-24 refer to the following information.

In 1929, the astronomer Edwin Hubble published the data shown. The graph plots the velocity of galaxies relative to Earth against the distances of galaxies from Earth.



Hubble's data can be modeled by the equation $v = 500d$, where v is the velocity, in kilometers per second, at which the galaxy is moving away from Earth and d is the distance, in megaparsecs, of the galaxy from Earth. Assume that the relationship is valid for larger distances than are shown in the graph. (A megaparsec (Mpc) is 3.1×10^{19} kilometers.)

22

According to Hubble's data, how fast, in meters per second, is Galaxy Q moving away from Earth?

A) 2×10^6 m/s

B) 5×10^5 m/s

C) 5×10^2 m/s

D) 2.5×10^2 m/s

23

There are four galaxies shown in the graph at approximately 0.9 Mpc from Earth. Which of the following is closest to the range of velocities of these four galaxies, in kilometers per second?

A) 100

B) 200

C) 450

D) 700

24

Based on the model, what is the velocity, in kilometers per second, of a galaxy that is 15 Mpc from Earth?

A) 7,500 km/s

B) 5,000 km/s

C) 1,100 km/s

D) 750 km/s

CONTINUE

25

Janice puts a fence around her rectangular garden. The garden has a length that is 9 feet less than 3 times its width. What is the perimeter of Janice's fence if the area of her garden is 5,670 square feet?

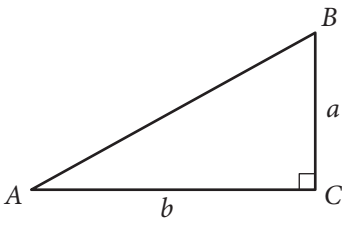
A) 342 feet

B) 318 feet

C) 300 feet

D) 270 feet

26



Given the right triangle ABC above, which of the following is equal to $\frac{b}{a}$?

A) $\sin A$

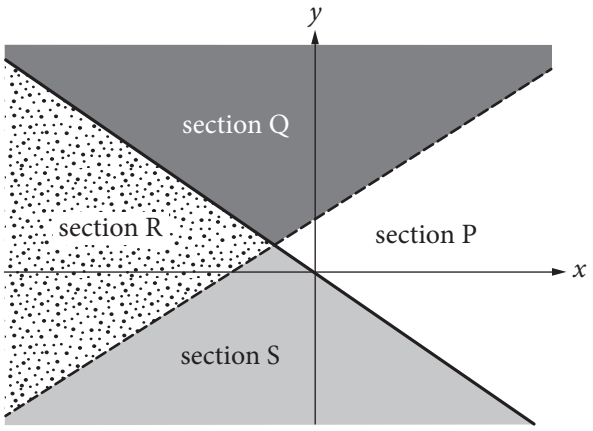
B) $\sin B$

C) $\tan A$

D) $\tan B$

27

$$\begin{cases} y \leq -x \\ 2y > 3x + 2 \end{cases}$$



A system of inequalities and a graph are shown above. Which section or sections of the graph could represent all of the solutions to the system?

A) Section R

B) Sections Q and S

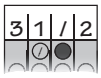
C) Sections Q and P

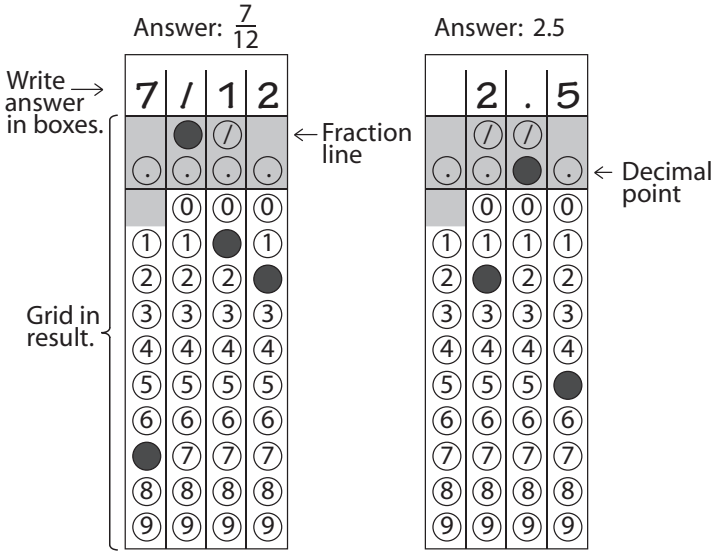
D) Sections Q, R, and S

CONTINUE

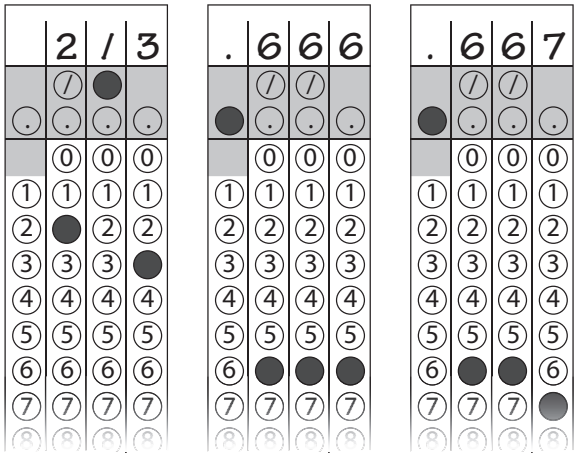
DIRECTIONS

For questions 28-31, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

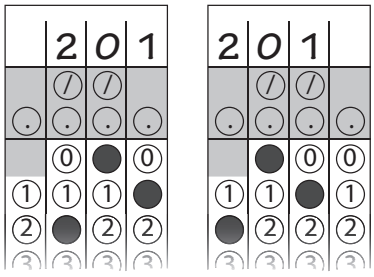
1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
2. Mark no more than one circle in any column.
3. No question has a negative answer.
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 $3\frac{1}{2}$.)
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:



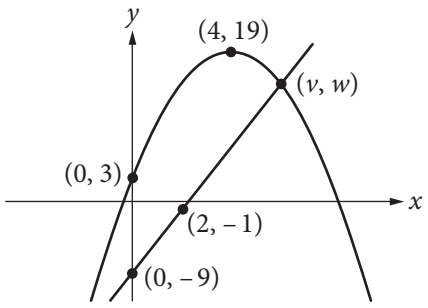
Answer: 201 – either position is correct



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

CONTINUE

28



The xy-plane above shows one of the two points of intersection of the graphs of a linear function and a quadratic function. The shown point of intersection has coordinates (v, w). If the vertex of the graph of the quadratic function is at $(4, 19)$, what is the value of v ?

29

In a college archaeology class, 78 students are going to a dig site to find and study artifacts. The dig site has been divided into 24 sections, and each section will be studied by a group of either 2 or 4 students. How many of the sections will be studied by a group of 2 students?

CONTINUE

Questions 30 and 31 refer to the following information.

$v = v_0 - gt$ (speed-time)

$h = v_0 t - \frac{1}{2} g t^2$ (position-time)

$v^2 = v_0^2 - 2gh$ (position-speed)

An arrow is launched upward with an initial speed of 100 meters per second (m/s). The equations above describe the constant-acceleration motion of the arrow, where v_0 is the initial speed of the arrow, v is the speed of the arrow as it is moving up in the air, h is the height of the arrow above the ground, t is the time elapsed since the arrow was projected upward, and g is the acceleration due to gravity (9.8 m/s^2).

30

What is the maximum height from the ground the arrow will rise to the nearest meter?

31

How long will it take for the arrow to reach its maximum height to the nearest tenth of a second?

STOP

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

No Test Material On This Page

YOUR NAME (PRINT) .....

LAST FIRST MI

TEST CENTER .....

NUMBER NAME OF TEST CENTER ROOM NUMBER

PSAT/NMSQT®

GENERAL DIRECTIONS

- You may work on only one section at a time.
- If you finish a section before time is called, check your work on that section. You may NOT turn to any other section.

MARKING ANSWERS

- Be sure to mark your answer sheet properly.

COMPLETE MARK ● EXAMPLES OF INCOMPLETE MARKS 

- You must use a No. 2 pencil.
- Carefully mark only one answer for each question.
- Make sure you fill the entire circle darkly and completely.
- Do not make any stray marks on your answer sheet.
- If you erase, do so completely. Incomplete erasures may be scored as intended answers.
- Use only the answer rows that correspond to the question numbers.

USING YOUR TEST BOOK

- You may use the test book for scratch work, but you will not receive credit for anything that you write in your test book.
- After time has been called, you may not transfer answers from your test book to your answer sheet or fill in circles.
- You may not fold or remove pages or portions of a page from this book, or take the book or answer sheet from the testing room.

SCORING

- For each correct answer, you receive one point.
- You do not lose points for wrong answers; therefore, you should try to answer every question even if you are not sure of the correct answer.

IMPORTANT

The codes below are unique to your test book. Copy them on your answer sheet in boxes 21 and 22 and fill in the corresponding circles exactly as shown.

22 TEST ID
(Copy from back of test book.)

21 FORM CODE
(Copy and grid as on back of test book.)

A	A	A	A	0	0	0
B	B	B	B	1	1	1
C	C	C	C	2	2	2
D	D	D	D	3	3	3
E	E	E	E	4	4	4
F	F	F	F	5	5	5
G	G	G	G	6	6	6
H	H	H	H	7	7	7
I	I	I	I	8	8	8
J	J	J	J	9	9	9
K	K	K	K			
L	L	L	L			
M	M	M	M			
N	N	N	N			
O	O	O	O			
P	P	P	P			
Q	Q	Q	Q			
R	R	R	R			
S	S	S	S			
T	T	T	T			
U	U	U	U			
V	V	V	V			
W	W	W	W			
X	X	X	X			
Y	Y	Y	Y			
Z	Z	Z	Z			

Follow this link for more information on scoring your practice test: **www.collegeboard.org/psatscoring**

Ideas contained in passages for this test, some of which are excerpted or adapted from published material, do not necessarily represent the opinions of the College Board or National Merit Scholarship Corporation.

5KPT06

DO NOT OPEN THIS BOOK UNTIL THE SUPERVISOR TELLS YOU TO DO SO.

PSAT/NMSQT® | CollegeBoard | NATIONAL MERIT SCHOLARSHIP CORPORATION

Scoring Your **PSAT/NMSQT** Practice Test #1

Congratulations on completing a PSAT/NMSQT® practice test. To score your test, follow the instructions in this guide.

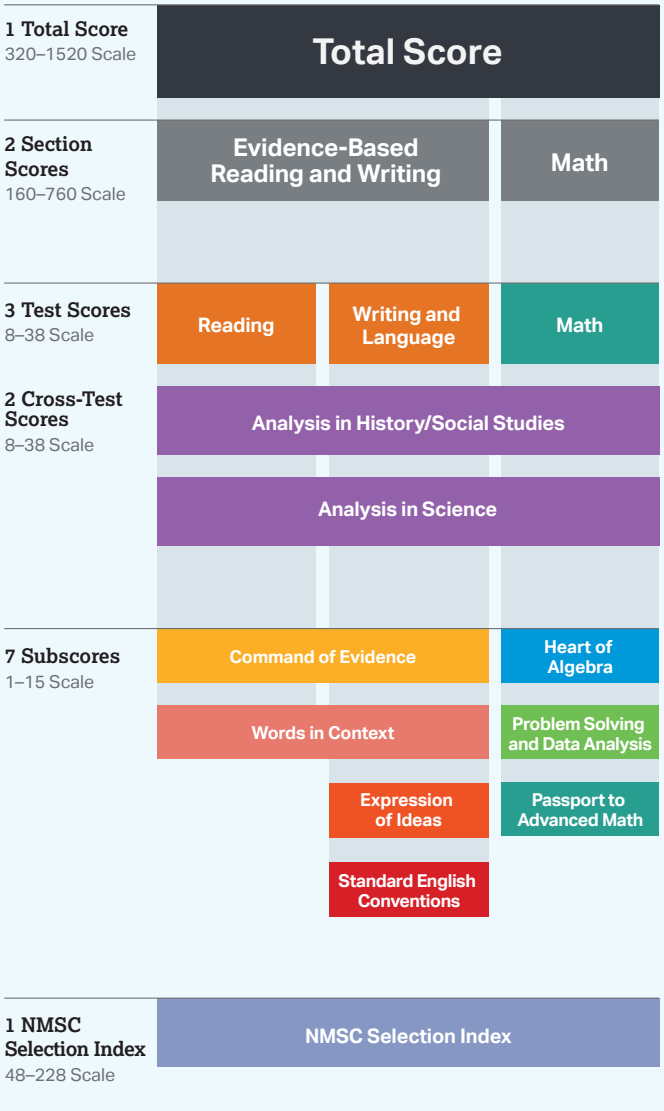
Scores Overview

Each assessment in the SAT Suite (SAT®, PSAT/NMSQT, PSAT™ 10, and PSAT™ 8/9) reports test scores and cross-test scores on a common scale.

The assessments also report subscores, which provide more information to students, educators, and parents. For more details about scores, visit **collegereadiness.collegeboard.org**.

The NMSC Selection Index score is used by National Merit Scholarship Corporation (NMSC) as an initial screen of students who enter the National Merit® Scholarship Program. The Selection Index scores of all students who meet entry requirements will be considered for program recognition. See the *PSAT/NMSQT Student Guide* for more information about the National Merit Scholarship Program.

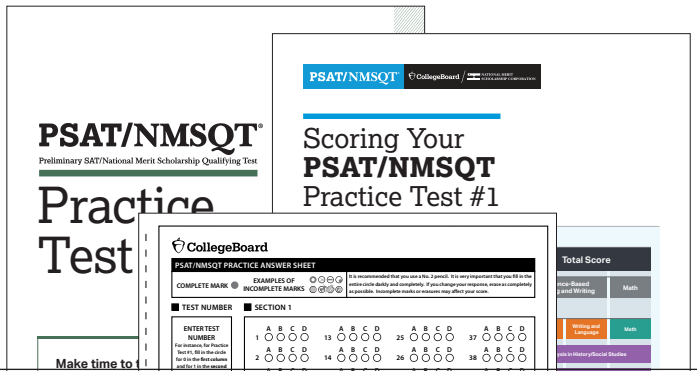
The College Board Assessment Design & Development team wrote the practice test using the same processes and standards they use when writing the actual PSAT/NMSQT. Everything from the way questions are written to how they look on the page accurately reflects what you'll see on test day.



How to Calculate Your Practice Test Scores and Selection Index Score

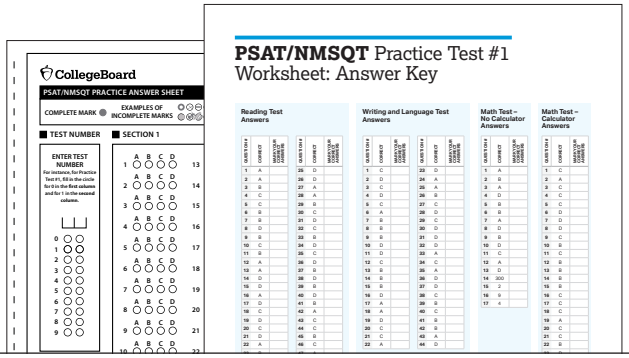
GET SET UP

1. You'll need the answer sheet that you bubbled in while taking the practice test. You'll also need the conversion tables and answer key at the end of this guide.



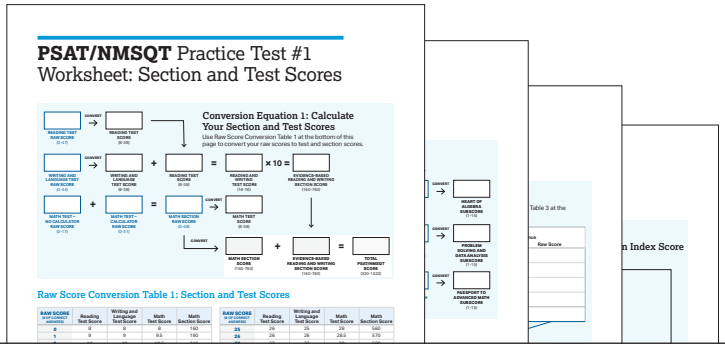
SCORE YOUR PRACTICE TEST

2. Using the answer key on page 8, count your total correct answers for each section. Write the number of correct answers for each section in the answer key at the bottom of that section.



CALCULATE YOUR SCORES

3. Using your marked-up answer key and the conversion tables, follow the directions on pages 3–7 to get all of your scores.



Get Section, Test, and Total Scores

Your total score on the PSAT/NMSQT practice test is the sum of your Evidence-Based Reading and Writing Section score and your Math Section score. To get your total score, you'll convert what we call the "raw score" for each section—the number of questions you got right in that section—into the "scaled score" for that section and then calculate the total score.

GET YOUR EVIDENCE-BASED READING AND WRITING SECTION SCORE

Calculate your PSAT/NMSQT Evidence-Based Reading and Writing Section score (it's on a scale of 160–760) by first determining your Reading Test score and your Writing and Language Test score. Here's how:

1. Using the answer key on page 8, count the number of correct answers you got on Section 1 (the Reading Test). The number of correct answers is your raw score.
2. Go to Raw Score Conversion Table 1: Section and Test Scores on page 9. Find your raw score in the "Raw Score" column and match it to the number in the "Reading Test Score" column.
3. Do the same with Section 2 to determine your Writing and Language Test score.
4. Add your Reading Test score to your Writing and Language Test score.
5. Multiply that number by 10. This is your Evidence-Based Reading and Writing Section score.

EXAMPLE: *Jennifer answered 29 of the 47 questions correctly on the PSAT/NMSQT Reading Test and 20 of the 44 questions correctly on the PSAT/NMSQT Writing and Language Test. Using the table on page 9, she calculates that she received a PSAT/NMSQT Reading Test score of 28 and a PSAT/NMSQT Writing and Language Test score of 22. She adds 28 to 22 (gets 50) and then multiplies by 10 to determine her PSAT/NMSQT Evidence-Based Reading and Writing Section score is 500.*

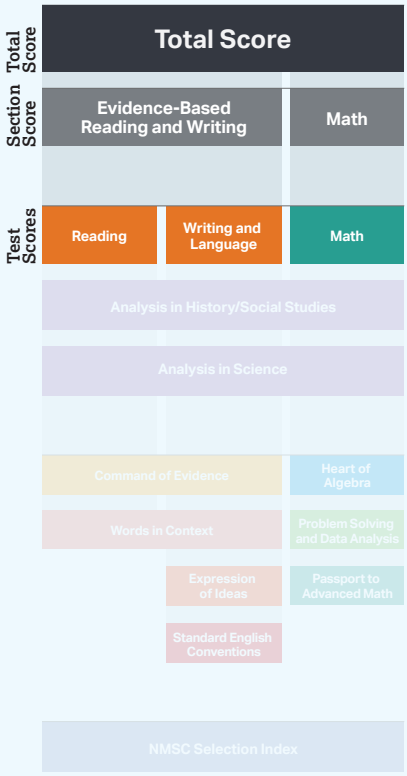
GET YOUR MATH SECTION SCORE

Calculate your PSAT/NMSQT Math Section score (it's on a scale of 160–760).

1. Using the answer key on page 8, count the number of correct answers you got on Section 3 (Math Test – No Calculator) and Section 4 (Math Test – Calculator).
2. Add the number of correct answers you got on Section 3 (Math Test – No Calculator) and Section 4 (Math Test – Calculator).
3. Use Raw Score Conversion Table 1 to turn your raw score into your Math Test and Math Section score. (Your Math Section score is your Math Test score multiplied by 20.)

GET YOUR TOTAL SCORE

Add your Evidence-Based Reading and Writing Section score to your Math Section score. The result is your total score (on a scale of 320–1520) on the PSAT/NMSQT Practice Test.



Your total score on the PSAT/NMSQT practice test is the sum of your Evidence-Based Reading and Writing Section score and your Math Section score.

Use worksheet pages 8 and 9 to calculate your section, test, and total scores.

Get Subscores

Subscores provide more detailed information about your strengths in specific areas within literacy and math. They are reported on a scale of 1–15.

COMMAND OF EVIDENCE

The Command of Evidence subscore is based on questions from both the Reading Test and the Writing and Language Test that ask you to interpret and use evidence found in a wide range of passages and informational graphics, such as graphs, tables, and charts.

1. Add up your total correct answers from the following questions:
   - Reading Test: Questions 8; 17-18; 22; 26-28; 36; 39; 42
   - Writing and Language Test: Questions 6-7; 15-16; 18; 27; 33-34

   Your raw score is your total correct answers from all of these questions.
2. Use Raw Score Conversion Table 2: Subscores on page 10 to determine your Command of Evidence subscore.

WORDS IN CONTEXT

The Words in Context subscore is based on questions from both the Reading Test and the Writing and Language Test that address word/phrase meaning in context and rhetorical word choice.

1. Add up your total correct answers from the following questions:
   - Reading Test: Questions 5-6; 10; 13; 23-24; 34; 37; 40; 43
   - Writing and Language Test: Questions 1-2; 17; 19; 28; 30; 36; 39

   Your raw score is your total correct answers from all of these questions.
2. Use Raw Score Conversion Table 2 to determine your Words in Context subscore.

EXPRESSION OF IDEAS

The Expression of Ideas subscore is based on questions from the Writing and Language Test that focus on topic development, organization, and rhetorically effective use of language.

1. Add up your total correct answers from the following set of questions:
   - Writing and Language Test: Questions 1-2; 5-7; 11; 15-19; 22; 25; 27-28; 30; 32-36; 39-40; 44

   Your raw score is your total correct answers from all of these questions.
2. Use Raw Score Conversion Table 2 to determine your Expression of Ideas subscore.

Subscores provide more detailed information about your strengths in specific areas within literacy and math.

Use worksheet pages 8 and 10 to calculate your subscores.

STANDARD ENGLISH CONVENTIONS

The Standard English Conventions subscore is based on questions from the Writing and Language Test that focus on sentence structure, usage, and punctuation.

1. Add up your total correct answers from the following questions:
   - Writing and Language Test: Questions 3-4; 8-10; 12-14; 20-21; 23-24; 26; 29; 31; 37-38; 41-43

   Your raw score is your total correct answers from all of these questions.
2. Use Raw Score Conversion Table 2 to determine your Standard English Conventions subscore.

HEART OF ALGEBRA

The Heart of Algebra subscore is based on questions from the Math Test that focus on linear equations and inequalities.

1. Add up your total correct answers from the following questions:
   - Math Test – No Calculator: Questions 1; 3; 5; 7-9; 14-15
   - Math Test – Calculator: Questions 1-2; 5; 8; 11; 24; 27; 29

   Your raw score is your total correct answers from all of these questions.
2. Use Raw Score Conversion Table 2 to determine your Heart of Algebra subscore.

PROBLEM SOLVING AND DATA ANALYSIS

The Problem Solving and Data Analysis subscore is based on questions from the Math Test that focus on quantitative reasoning, the interpretation and synthesis of data, and solving problems in rich and varied contexts.

1. Add up your total correct answers from the following questions:
   - Math Test – Calculator: Questions 3; 6-7; 9-10; 12-17; 19-23

   Your raw score is your total correct answers from all of these questions.
2. Use Raw Score Conversion Table 2 to determine your Problem Solving and Data Analysis subscore.

PASSPORT TO ADVANCED MATH

The Passport to Advanced Math subscore is based on questions from the Math Test that focus on topics central to the ability of students to progress to more advanced mathematics, such as understanding the structure of expressions, reasoning with more complex equations, and interpreting and building functions.

1. Add up your total correct answers from the following questions:
   - Math Test – No Calculator: Questions 2; 6; 10-13; 16-17
   - Math Test – Calculator: Questions 4; 18; 25; 28; 30-31

   Your raw score is your total correct answers from all of these questions.
2. Use Raw Score Conversion Table 2 to determine your Passport to Advanced Math subscore.

Use worksheet pages 8 and 10 to calculate your subscores.

Get Cross-Test Scores

The PSAT/NMSQT also reports two cross-test scores: Analysis in History/Social Studies and Analysis in Science. These scores are based on questions in the Reading, Writing and Language, and Math Tests that ask students to think analytically about texts and questions in these subject areas. Cross-test scores are reported on a scale of 8–38.

ANALYSIS IN HISTORY/SOCIAL STUDIES

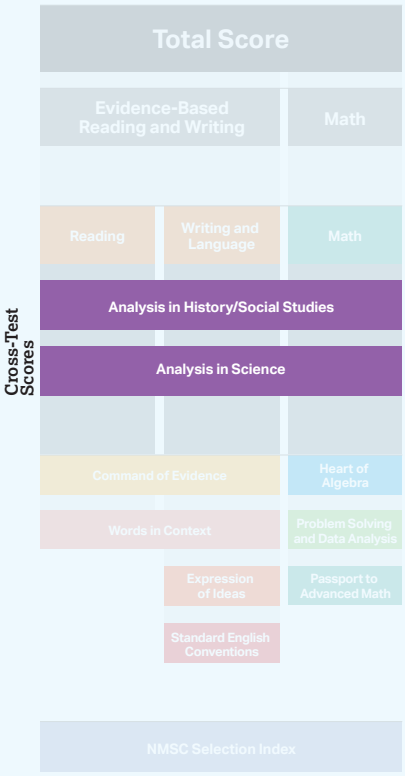
1. Add up your total correct answers from the following questions:
   - Reading Test: Questions 10-19; 29-37
   - Writing and Language Test: Questions 25; 27-28; 30; 32-33
   - Math Test – No Calculator: Questions 7-8
   - Math Test – Calculator: Questions 1; 13-16

   Your raw score is your total correct answers from all of these questions.
2. Use Raw Score Conversion Table 3: Cross-Test Scores on page 11 to determine your Analysis in History/Social Studies cross-test score.

ANALYSIS IN SCIENCE

1. Add up your total correct answers from the following questions:
   - Reading Test: Questions 20-28; 38-47
   - Writing and Language Test: Questions 15-19; 22
   - Math Test – No Calculator: No questions
   - Math Test – Calculator: Questions 17; 19; 22-24; 30; 31

   Your raw score is your total correct answers from all of these questions.
2. Use Raw Score Conversion Table 3 to determine your Analysis in Science cross-test score.



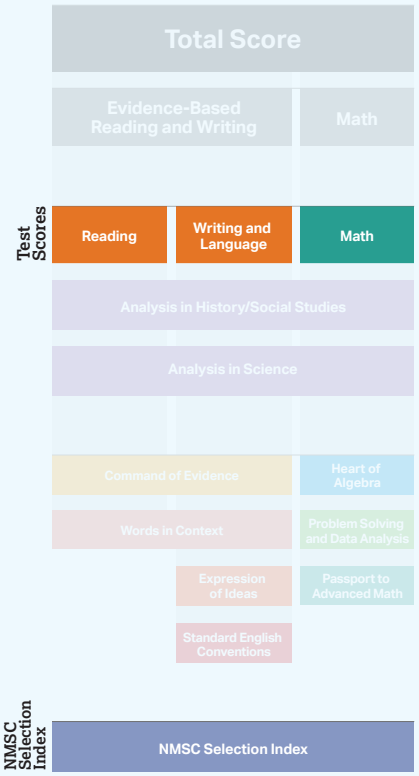
Cross-test scores are based on questions in the Reading, Writing and Language, and Math Tests. They show how you think analytically about text and questions in history/social studies and science contexts.

Use worksheet pages 8 and 11 to calculate your cross-test scores.

Get Selection Index Score

To calculate your Selection Index score, double the sum of your Reading, Writing and Language, and Math Test scores. Here's how:

1. Follow the instructions on page 3 to get your Reading, Writing and Language, and Math Test scores. (All of these scores are on a scale of 8–38.)
2. Add your Reading Test score, Writing and Language Test score, and Math Test score. Multiply the total test score by two. The result is your Selection Index score. (See Conversion Equation 4: Calculate Your Selection Index Score on page 12.)



The NMSC Selection Index score is based on questions in the Reading, Writing and Language, and Math Tests. The Selection Index score is used by National Merit Scholarship Corporation as an initial screen of students who enter the National Merit Scholarship Program.

Use worksheet pages 8, 9, and 12 to calculate your Selection Index score.

PSAT/NMSQT Practice Test #1 Worksheet: Answer Key

Reading Test Answers

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	A	
2	A	
3	B	
4	C	
5	C	
6	B	
7	B	
8	D	
9	B	
10	C	
11	B	
12	A	
13	A	
14	D	
15	D	
16	A	
17	D	
18	C	
19	D	
20	C	
21	D	
22	A	
23	B	
24	B	

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
25	D	
26	D	
27	A	
28	A	
29	B	
30	C	
31	D	
32	C	
33	B	
34	D	
35	C	
36	D	
37	B	
38	D	
39	B	
40	D	
41	B	
42	A	
43	C	
44	C	
45	B	
46	C	
47	A	

READING TEST RAW SCORE
(Total # of Correct Answers)

Writing and Language Test Answers

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	C	
2	D	
3	C	
4	D	
5	C	
6	A	
7	B	
8	B	
9	B	
10	D	
11	D	
12	C	
13	B	
14	B	
15	B	
16	D	
17	A	
18	A	
19	D	
20	C	
21	C	
22	A	

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
23	D	
24	A	
25	A	
26	B	
27	C	
28	D	
29	C	
30	D	
31	D	
32	D	
33	A	
34	C	
35	A	
36	D	
37	D	
38	C	
39	B	
40	C	
41	B	
42	B	
43	A	
44	D	

WRITING AND LANGUAGE TEST RAW SCORE
(Total # of Correct Answers)

Math Test – No Calculator Answers

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	A	
2	B	
3	A	
4	D	
5	B	
6	B	
7	A	
8	D	
9	B	
10	D	
11	C	
12	A	
13	D	
14	300	
15	2	
16	9	
17	4	

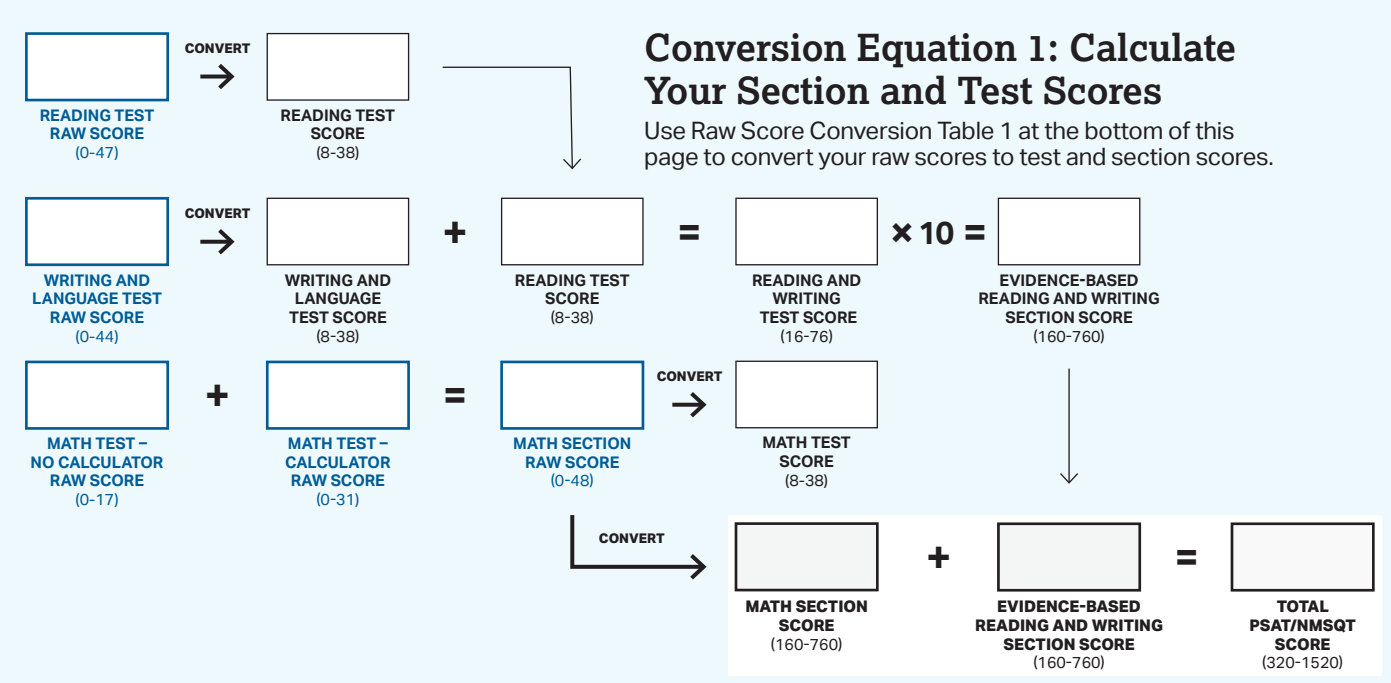
MATH TEST – NO CALCULATOR RAW SCORE
(Total # of Correct Answers)

Math Test – Calculator Answers

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	C	
2	A	
3	C	
4	C	
5	C	
6	D	
7	D	
8	D	
9	C	
10	B	
11	C	
12	B	
13	B	
14	B	
15	B	
16	C	
17	C	
18	C	
19	A	
20	C	
21	C	
22	B	
23	D	
24	A	
25	A	
26	D	
27	A	
28	6	
29	9	
30	510	
31	51/5 or 10.2	

MATH TEST – CALCULATOR RAW SCORE
(Total # of Correct Answers)

PSAT/NMSQT Practice Test #1 Worksheet: Section and Test Scores



Conversion Equation 1: Calculate Your Section and Test Scores

Use Raw Score Conversion Table 1 at the bottom of this page to convert your raw scores to test and section scores.

Raw Score Conversion Table 1: Section and Test Scores

RAW SCORE (# OF CORRECT ANSWERS)	Reading Test Score	Writing and Language Test Score	Math Test Score	Math Section Score
0	8	8	8	160
1	9	9	9.5	190
2	10	10	10.5	210
3	11	11	12	240
4	12	12	13.5	270
5	14	13	14.5	290
6	15	14	16	320
7	16	14	17	340
8	16	15	18	360
9	17	15	18.5	370
10	18	16	19.5	390
11	18	16	20	400
12	19	17	21	420
13	19	18	21.5	430
14	20	18	22	440
15	20	19	23	460
16	21	20	23.5	470
17	21	20	24	480
18	22	21	24.5	490
19	22	21	25	500
20	23	22	25.5	510
21	23	23	26	520
22	24	24	26.5	530
23	24	24	27	540
24	25	25	27.5	550

RAW SCORE (# OF CORRECT ANSWERS)	Reading Test Score	Writing and Language Test Score	Math Test Score	Math Section Score
25	26	25	28	560
26	26	26	28.5	570
27	27	27	29	580
28	27	27	29	580
29	28	28	29.5	590
30	28	28	30	600
31	29	29	30.5	610
32	29	29	31	620
33	30	30	31.5	630
34	30	30	32	640
35	31	31	32.5	650
36	31	32	33.5	670
37	32	32	34	680
38	32	33	34.5	690
39	33	34	35.5	710
40	34	35	36	720
41	34	36	36.5	730
42	35	37	36.5	730
43	36	37	37	740
44	37	38	37	740
45	37		37.5	750
46	38		37.5	750
47	38		38	760
48			38	760

PSAT/NMSQT Practice Test #1 Worksheet: Subscores

Conversion Equation 2: Calculate Your Subscores

Use Raw Score Conversion Table 2 at the bottom of this page to convert your raw scores to subscores.

☐ COMMAND OF EVIDENCE RAW SCORE (0-18) → CONVERT → ☐ COMMAND OF EVIDENCE SUBSCORE (0-15)	☐ EXPRESSION OF IDEAS RAW SCORE (0-24) → CONVERT → ☐ EXPRESSION OF IDEAS SUBSCORE (1-15)	☐ HEART OF ALGEBRA RAW SCORE (0-16) → CONVERT → ☐ HEART OF ALGEBRA SUBSCORE (1-15)
☐ WORDS IN CONTEXT RAW SCORE (0-18) → CONVERT → ☐ WORDS IN CONTEXT SUBSCORE (0-15)	☐ STANDARD ENGLISH CONVENTIONS RAW SCORE (0-20) → CONVERT → ☐ STANDARD ENGLISH CONVENTIONS SUBSCORE (1-15)	☐ PROBLEM SOLVING AND DATA ANALYSIS RAW SCORE (0-16) → CONVERT → ☐ PROBLEM SOLVING AND DATA ANALYSIS SUBSCORE (1-15)
		☐ PASSPORT TO ADVANCED MATH RAW SCORE (0-14) → CONVERT → ☐ PASSPORT TO ADVANCED MATH SUBSCORE (1-15)

Raw Score Conversion Table 2: Subscores

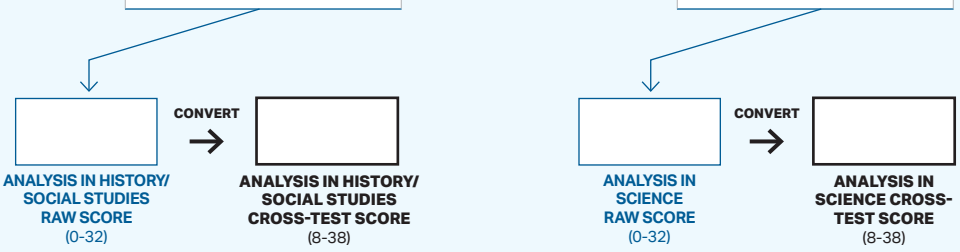
RAW SCORE (# OF CORRECT ANSWERS)	Command of Evidence	Words in Context	Expression of Ideas	Standard English Conventions	Heart of Algebra	Problem Solving and Data Analysis	Passport to Advanced Math
0	1	1	1	1	1	1	1
1	2	2	2	2	3	3	5
2	3	3	3	3	4	4	7
3	4	3	4	3	5	5	8
4	5	4	4	4	6	6	9
5	6	5	5	4	7	7	10
6	7	6	6	5	8	8	11
7	8	6	6	6	8	8	12
8	8	7	7	6	9	9	13
9	9	8	7	7	10	10	14
10	9	9	8	7	10	11	15
11	10	10	8	8	11	11	15
12	11	10	9	8	12	12	15
13	11	11	9	9	13	13	15
14	12	12	10	9	14	14	15
15	13	13	10	10	15	15	
16	14	14	11	10	15	15	
17	15	15	12	11			
18	15	15	12	12			
19			13	13			
20			13	15			
21			14				
22			15				
23			15				
24			15				

PSAT/NMSQT Practice Test #1 Worksheet: Cross-Test Scores

Conversion Equation 3: Calculate Your Cross-Test Scores

Fill in your question-specific raw scores from page 8 into the table below. Then use Raw Score Conversion Table 3 at the bottom of this page to convert your total raw scores to cross-test scores.

Test	Analysis in History/Social Studies		Analysis in Science	
	Questions	Raw Score	Questions	Raw Score
Reading Test	10-19; 29-37		20-28; 38-47	
Writing and Language Test	25; 27-28; 30; 32-33		15-19; 22	
Math Test – No Calculator	7-8		None	
Math Test – Calculator	1; 13-16		17; 19; 22-24; 30; 31	
	Total		Total	



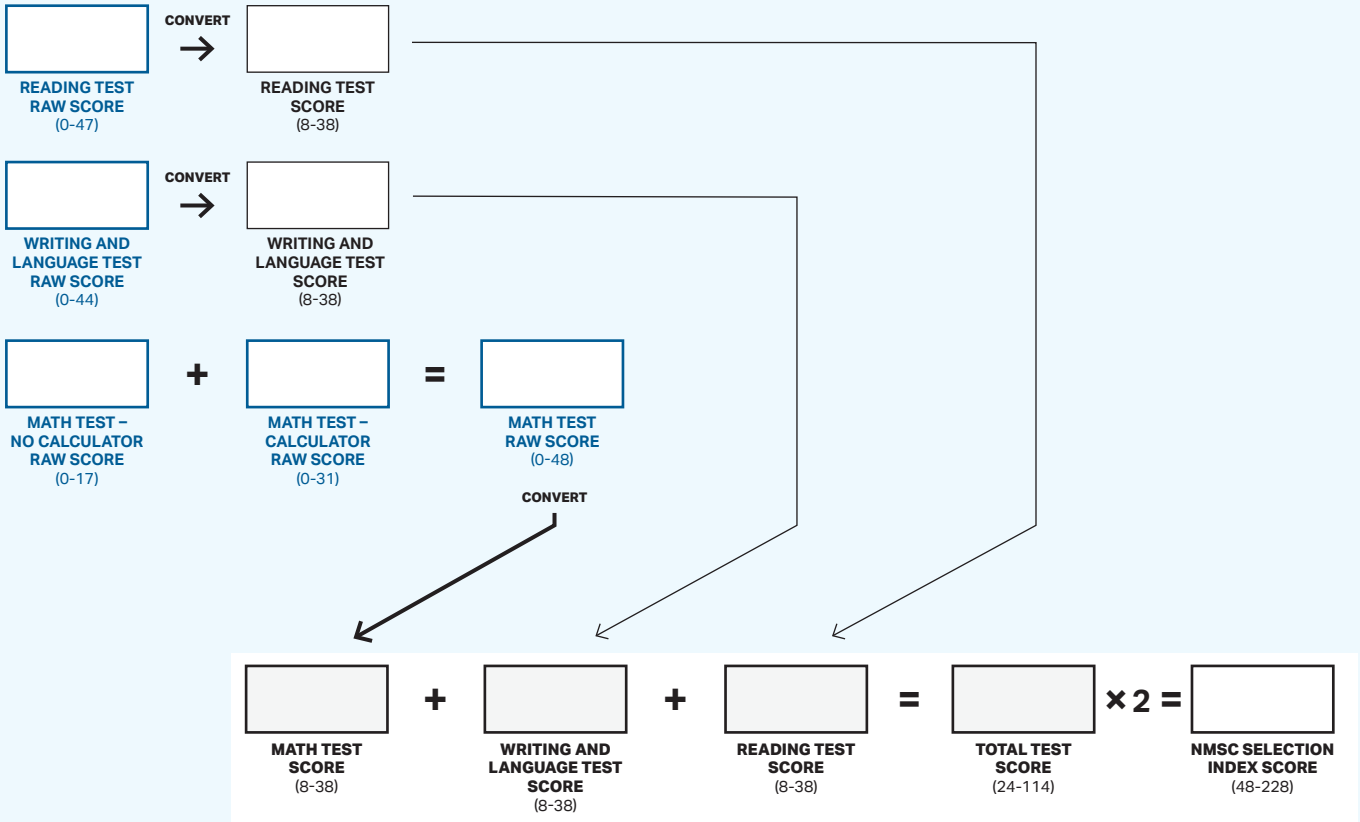
Raw Score Conversion Table 3: Cross-Test Scores

RAW SCORE (# OF CORRECT ANSWERS)	Analysis in History/Social Studies Cross-Test Score	Analysis in Science Cross-Test Score
0	8	8
1	9	12
2	11	15
3	12	16
4	14	17
5	15	18
6	16	18
7	17	19
8	18	20
9	19	21
10	20	22
11	21	23
12	22	24
13	23	25
14	24	26
15	25	26
16	26	27

RAW SCORE (# OF CORRECT ANSWERS)	Analysis in History/Social Studies Cross-Test Score	Analysis in Science Cross-Test Score
17	26	28
18	27	28
19	28	29
20	29	30
21	30	31
22	30	31
23	31	32
24	32	33
25	32	34
26	33	35
27	34	36
28	35	37
29	36	37
30	37	38
31	37	38
32	38	38

PSAT/NMSQT Practice Test #1 Worksheet: Selection Index Score

Conversion Equation 4: Calculate Your Selection Index Score



PSAT/NMSQT®

Practice Test #1

Answer Explanations

Preliminary SAT/National Merit Scholarship Qualifying Test
cosponsored by
CollegeBoard / NATIONAL MERIT SCHOLARSHIP CORPORATION

Table of Contents:

User Notes:
Please have a copy of the PSAT/NMSQT Practice Test #1 to reference for the passages and other information that form the basis for the questions in the Evidence-Based Reading and Writing and the Math sections of the Practice Test.

You can also refer to the test to see the information given to students about math formulas and how to record the student-produced responses.

In this document, we have provided the following for each question:

- difficulty level
- content description
- best or correct answer
- answer explanation

Reading Test Answer Explanations

> Question 1
>
> The main purpose of the passage is to
> (A) describe a main character and a significant change in her life.
> (B) provide an overview of a family and a nearby neighbor.
> (C) discuss some regrettable personality flaws in a main character.
> (D) explain the relationship between a main character and her father.

Item Difficulty: Easy
Content: Rhetoric / Analyzing purpose
Best Answer: A

Choice A is the best answer. Emma Woodhouse's life and family are discussed, including the marriage of her governess Miss Taylor who then moves out of Emma's home. In line 74, Emma wonders how she is to "bear the change" of Miss Taylor's departure, which indicates its significance.

Choices B and D are incorrect because the passage focuses more on Emma than on her family and neighbors, and Emma's relationship with her father is a relatively minor consideration. Choice C is also incorrect because Emma is characterized as handsome and clever with a happy disposition, and her arrogance is only briefly mentioned.

> Question 2
>
> Which choice best summarizes the first two paragraphs of the passage (lines 1-14)?
> (A) Even though a character loses a parent at an early age, she is happily raised in a loving home.
> (B) An affectionate governess helps a character to overcome the loss of her mother, despite the indifference of her father.
> (C) Largely as a result of her father's wealth and affection, a character leads a contented life.
> (D) A character has a generally comfortable and fulfilling life, but then she must recover from losing her mother.

Item Difficulty: Hard
Content: Information and Ideas / Summarizing
Best Answer: A

Choice A is the best answer. The passage indicates that Emma's mother died long ago and that Emma barely remembers her. Emma is raised by an affectionate father and governess and is described as a person with a happy disposition.

Choices B, C, and D are incorrect: Emma's father is not described as indifferent, Emma is not described as contented because of her father's wealth, and Emma does not appear to suffer from the loss of her mother.

> Question 3
>
> The narrator indicates that the particular nature of Emma's upbringing resulted in her being
> (A) despondent.
> (B) self-satisfied.
> (C) friendless.
> (D) inconsiderate.

Item Difficulty: Medium
Content: Information and Ideas / Reading closely
Best Answer: B

Choice B is the best answer. According to the passage, Emma had "a disposition to think a little too well of herself" (line 30). Thinking a "little too well of herself" means that Emma had an elevated opinion of herself, or that she was self-satisfied.

Choices A, C, and D are incorrect because Emma's relationship with her father and Miss Taylor, the two characters who raised her, did not result in her being despondent, friendless, or inconsiderate.

> Question 4
>
> Which choice provides the best evidence for the answer to the previous question?
> (A) Lines 1-5 ("Emma . . . her")
> (B) Lines 9-14 ("Her . . . affection")
> (C) Lines 28-32 ("The real . . . enjoyments")
> (D) Lines 32-34 ("The danger . . . her")

Item Difficulty: Medium
Content: Information and Ideas / Citing textual evidence
Best Answer: C

Choice C is the best answer. Lines 28-32 state that "The real evils indeed of Emma's situation were the power of having rather too much her own way, and a

disposition to think a little too well of herself; these were the disadvantages which threatened alloy to her many enjoyments." Thinking a "little too well of herself" means that Emma had an elevated opinion of herself, or that she was self-satisfied.

Choices A, B, and D are incorrect because they do not provide the best evidence for Emma being self-satisfied. Choice A describes Emma's positive traits, choice B describes Emma's affectionate relationship with Miss Taylor, and choice D discusses only that Emma's problems were negligible.

> Question 5
>
> As used in line 26, "directed" most nearly means
> (A) trained.
> (B) aimed.
> (C) guided.
> (D) addressed.

Item Difficulty: Medium
Content: Information and Ideas / Interpreting words and phrases in context
Best Answer: C

Choice C is the best answer. In lines 25-27, Emma's situation is described as "doing just what she liked; highly esteeming Miss Taylor's judgment, but directed chiefly by her own." In other words, Emma respects Miss Taylor's opinion but makes decisions directed, or guided, primarily by her own opinion.

Choices A, B, and D are incorrect because lines 25-27 emphasize that in "doing what she liked" Emma was directed, or guided, by her own opinion. Emma's opinion is not trained by, aimed at, or addressed by anyone else.

> Question 6
>
> As used in line 54, "want" most nearly means
> (A) desire.
> (B) lack.
> (C) requirement.
> (D) request.

Item Difficulty: Hard
Content: Information and Ideas / Interpreting words and phrases in context
Best Answer: B

Choice B is the best answer. Lines 53-55 describe how Emma felt a loss after Miss Taylor married and moved out of Emma's home: "but it was a black morning's work for her. The want of Miss Taylor would be felt every hour of every day." In this context, "want" means "lack."

Choices A, C, and D are incorrect because in this context "want" does not mean desire, requirement, or request.

> Question 7
>
> It can most reasonably be inferred that after Miss Taylor married, she had
> (A) less patience with Mr. Woodhouse.
> (B) fewer interactions with Emma.
> (C) more close friends than Emma.
> (D) an increased appreciation for Emma.

Item Difficulty: Easy
Content: Information and Ideas / Reading closely
Best Answer: B

Choice B is the best answer. According to lines 76-81, following Miss Taylor's marriage, "Emma was aware that great must be the difference between a Mrs. Weston only half a mile from them, and a Miss Taylor in the house; and with all her advantages, natural and domestic, she was now in great danger of suffering from intellectual solitude." This implies that since Miss Taylor's marriage, the two characters see each other less often.

Choice A is incorrect because the passage does not mention Miss Taylor's relationship with Mr. Woodhouse. Choices C and D are incorrect because the passage describes how Miss Taylor's marriage might affect Emma but not how the marriage might affect Miss Taylor.

> Question 8
>
> Which choice provides the best evidence for the answer to the previous question?
> (A) Line 37 ("Miss . . . married")
> (B) Lines 47-48 ("The event . . . friend")
> (C) Lines 61-66 ("A large . . . recollection")
> (D) Lines 74-81 ("How . . . solitude")

Item Difficulty: Medium
Content: Information and Ideas / Citing textual evidence
Best Answer: D

Choice D is the best answer because lines 74-81 refer to Emma's new reality of "intellectual solitude" after Miss Taylor moved out of the house.

Choices A, B, and C are incorrect because none of these choices support the idea that Miss Taylor and Emma had fewer interactions following Miss Taylor's marriage. Choice A mentions Emma's "sorrow" towards losing Miss Taylor, choice B introduces how Miss Taylor may benefit from the marriage, and choice C describes Emma's and Miss Taylor's close friendship.

> Question 9
>
> Which situation is most similar to the one described in lines 84-92 ("The evil . . . time")?
> (A) A mother and her adult son have distinct tastes in art and music that result in repeated family arguments.
> (B) The differences between an older and a younger friend are magnified because the younger one is more active and athletic.
> (C) An older and a younger scientist remain close friends despite the fact that the older one's work is published more frequently.
> (D) The age difference between a high school student and a college student becomes a problem even though they enjoy the same diversions.

Item Difficulty: Medium
Content: Information and Ideas / Reading closely
Best Answer: B

Choice B is the best answer. Lines 84-92 describe the fact that though Emma and her father have a loving relationship, Mr. Woodhouse is much older than Emma and in poor health. For these reasons, he did not make a good companion for the spirited, young Emma. Their relationship is most similar to a friendship between an older and younger person that is negatively affected by the fact one is more lively and active than the other.

Choice A is incorrect because Emma and her father did not have regular arguments. Choice C is incorrect because the relationship between Emma and Mr. Woodhouse was affected by the difference in their age and activity, not any relative successes one or the other might have had. Choice D is incorrect because there is no indication that Emma and her father enjoyed the same activities.

> Question 10
>
> As used in line 10, "plot" most nearly means
> (A) mark.
> (B) form.
> (C) plan.
> (D) claim.

Item Difficulty: Easy
Content: Information and Ideas / Interpreting words and phrases in context
Best Answer: C

Choice C is the best answer. The first paragraph discusses the "vast informal economy driven by human relationships" (lines 6-7) that existed in the Soviet Union as a result of the gaps in the official economy. Lines 9-10 state that "The Soviet people didn't plot how they would build these [social] networks." In this context, the word "plot" means "plan"; the paragraph is implying that the informal economy grew up spontaneously, without premeditation or planning.

Choices A, B, and D are incorrect because in this context "plot" does not mean mark, form, or claim.

> Question 11
>
> The references to the shoemaker, the programmer, and the apple farmer in lines 37-40 ("We can easily . . . community") primarily serve to
> (A) illustrate the quality of products and services in countries around the world.
> (B) emphasize the broad reach of technologies used to connect people.
> (C) demonstrate that recommendations made online are trustworthy.
> (D) call attention to the limits of the expansion of the global economy.

Item Difficulty: Easy
Content: Rhetoric / Analyzing text structure
Best Answer: B

Choice B is the best answer. The third paragraph of the passage (lines 27-46) describes how new technologies are affecting new economies, as people are using social media to vet people and businesses through eBay, Twitter, Facebook, and YouTube. The author uses broad examples (a business in South America, a person in Asia, and a farmer in the reader's local community) to imply that these technologies have a global reach.

Choice A is incorrect because the passage provides no comment about the quality of products or services. Choice C is incorrect because the passage never alludes to

the trustworthiness of online recommendations. Choice D is incorrect because the idea that the new global economy will have only a limited expansion is oppositional to the passage's main points.

> Question 12
>
> The passage's discussion of life in the Soviet Union in the 1960s and 1970s primarily serves to
>
> (A) introduce the concept of social networking.
> (B) demonstrate that technology has improved social connections.
> (C) list differences between the Soviet Union and other countries.
> (D) emphasize the importance of examining historical trends.

Item Difficulty: Medium
Content: Rhetoric / Analyzing text structure
Best Answer: A

Choice A is the best answer. The Soviet Union of the 1960s and 1970s was most notable for the disparity between its official economy and a second, unofficial one. The author explains how unwanted items sold at state stores were not the "nice furnishings" found in people's homes. These "nice furnishings" were a result of the Soviet Union's unofficial economy driven by social networking, or "relationship-driven economics" (lines 16-17).

Choices B, C, and D are incorrect because the author does not use the discussion of life in the Soviet Union in the 1960s and 1970s to show how technology has changed social conditions, how the Soviet Union was different from other countries, or how important it is to consider historical trends.

> Question 13
>
> As used in line 45, "post" most nearly means
>
> (A) publish.
> (B) transfer.
> (C) assign.
> (D) denounce.

Item Difficulty: Easy
Content: Information and Ideas / Interpreting words and phrases in context
Best Answer: A

Choice A is the best answer. The third paragraph of the passage (lines 27-46) describes how new technology has impacted the economy. The author states that

people can use websites to post descriptions of projects, which means that people can write these descriptions and publish them online.

Choices B, C, and D are incorrect because in this context "post" does not mean transfer, assign, or denounce.

> Question 14
>
> The author indicates that, in comparison to individuals, traditional organizations have tended to be
> (A) more innovative and less influential.
> (B) larger in size and less subject to regulations.
> (C) less reliable and less interconnected.
> (D) less efficient and more expensive.

Item Difficulty: Medium
Content: Information and Ideas / Understanding relationships
Best Answer: D

Choice D is the best answer. The passage explains that socially driven economies create new societies where "amplified individuals—individuals empowered with technologies and the collective intelligence of others in their social network—can take on many functions that previously only large organizations could perform, often more efficiently, at lower cost or no cost at all, and with much greater ease" (lines 66-72). It is clear from these lines that the author views some large organizations as less efficient and more expensive than individuals.

Choices A, B, and C are incorrect because the passage offers no evidence that the author believes traditional organizations are more innovative, less regulated, or less reliable than individuals.

> Question 15
>
> Which choice provides the best evidence for the answer to the previous question?
> (A) Lines 22-26 ("Empowered . . . connectedness")
> (B) Lines 40-42 ("We no longer . . . ideas")
> (C) Lines 47-50 ("We are moving . . . socialstructing")
> (D) Lines 66-72 ("amplified . . . ease")

Item Difficulty: Medium
Content: Information and Ideas / Citing textual evidence
Best Answer: D

Choice D is the best answer. Lines 66-72 explain how socially driven economies are creating societies where individuals no longer rely on traditional organizations to perform specific tasks. Instead, individuals can use technology and social relationships to more efficiently perform these tasks at a lower cost.

Choices A, B, and C are incorrect because they do not directly compare individuals to traditional organizations.

> Question 16
>
> The author recognizes counterarguments to the position she takes in the passage by
> (A) acknowledging the risks and drawbacks associated with new technologies and social networks.
> (B) admitting that some people spend too much time unproductively on the Internet.
> (C) drawing an analogy between conditions today and conditions in the Soviet Union of the 1960s and 1970s.
> (D) conceding that the drawbacks of socialstructing may prove over time to outweigh the benefits.

Item Difficulty: Medium
Content: Rhetoric / Analyzing arguments
Best Answer: A

Choice A is the best answer. While the author argues throughout the passage that new technologies benefit modern economies, she also recognizes that some people believe this new technology "distances us from the benefits of face-to-face communication and quality social time" (lines 86-87).

Choice B is incorrect because the author provides no evidence of Internet overuse. Choice C is incorrect because the author provides an example of the Soviet Union of the 1960s and 1970s to explain an economic process called "socialstructing." Choice D is incorrect because the author concludes that socialstructing may ultimately be "opening up new opportunities to create, learn, and share" (lines 91-92).

> Question 17
>
> Which choice provides the best evidence for the answer to the previous question?
> (A) Lines 35-37 ("We can look . . . videos")
> (B) Lines 74-76 ("a world . . . hackers")
> (C) Lines 79-84 ("They . . . science")
> (D) Lines 85-87("Much . . . time")

Item Difficulty: Medium
Content: Information and Ideas / Citing textual evidence
Best Answer: D

Choice D is the best answer as it acknowledges that people have identified some risks and drawbacks to using new technology to form social connections. Some people believe that new technology distances users from the advantages of "face-to-face communication and quality social time" (lines 86-87).

Choices A, B, and C are incorrect because they do not show that the author recognized counterarguments to her argument. Choices A and B provide examples of the impact and use of the new technologies, and choice C summarizes the benefits of socialstructing.

> Question 18
>
> Which statement best summarizes the information presented in the graph?
> (A) Far more people around the world own computers and cell phones today than in 2005.
> (B) The number of people sharing digital information has more than tripled since 2005.
> (C) The volume of digital information created and shared has increased tremendously in recent years.
> (D) The amount of digital information created and shared is likely to be almost 8 zettabytes in 2015.

Item Difficulty: Medium
Content: Synthesis / Analyzing quantitative information
Best Answer: C

Choice C is the best answer. The graph shows a steady increase in digital information created and shared in recent years, beginning with less than one zettabyte in 2005 and rising to nearly 8 zettabytes projected for 2015.

Choices A, B, and D are incorrect because they do not summarize the information presented in the graph. Choices A and B provide details that, while likely true, cannot be directly inferred from the information in the graph, and choice D provides a detail from the graph but not a summary of it.

> Question 19
>
> According to the graph, which statement is true about the amount of digital information projected to be created and shared globally in 2012?
> (A) Growth in digital information creation and sharing was projected to be wildly out of proportion to growth in 2011 and 2013E.
> (B) The amount of digital information created and shared was projected to begin a new upward trend.
> (C) The amount of digital information created and shared was projected to peak.
> (D) The amount of digital information created and shared was projected to pass 2 zettabytes for the first time.

Item Difficulty: Medium
Content: Synthesis / Analyzing quantitative information
Best Answer: D

Choice D is the best answer. The graph shows that the amount of digital information projected to be created and shared in 2012 is about 2.5 zettabytes. Since the graph shows a steady increase in the creation and sharing of digital information, and the digital information created and shared in 2011 was approximately 1.75 zettabytes, the graph shows that the 2012 projections passes the 2 zettabyte barrier for the first time.

Choice A is incorrect because the graph shows the projected 2012 numbers to be part of a steady increase consistent with the 2011 and 2013E numbers. Choice B is incorrect because the graph projects the 2012 number to continue the increase started in 2005. Choice C is incorrect because the 2012 numbers are projected to continue increasing through at least 2015.

> Question 20
>
> The passage is written from the perspective of someone who is
> A) actively involved in conducting hibernator research.
> B) a participant in a recent debate in the field of cardiology.
> C) knowledgeable about advances in hibernator research.
> D) an advocate for wildlife preservation.

Item Difficulty: Hard
Content: Rhetoric / Analyzing point of view
Best Answer: C

Choice C is the best answer. The author is someone who knows about advances in hibernator research but isn't necessarily an active participant in that research.

Choice A is incorrect because the passage mentions that "Fröbert and his colleagues" (line 32) are conducting hibernator research. Choice B is incorrect because the passage discusses the heart health of bears but never provides evidence that this research is contested. Choice D is incorrect because the passage focuses on hibernating animals and their health more than wildlife preservation.

> Question 21
>
> It is reasonable to conclude that the main goal of the scientists conducting the research described in the passage is to
> A) learn how the hibernation patterns of bears and squirrels differ.
> B) determine the role that fat plays in hibernation.
> C) illustrate the important health benefits of exercise for humans.
> D) explore possible ways to prevent human diseases.

Item Difficulty: Medium
Content: Information and Ideas / Reading closely
Best Answer: D

Choice D is the best answer. The author begins the passage by suggesting that the bear hibernation research may be beneficial to human health: "Understanding how hibernators, including ground squirrels, marmots and bears, survive their long winter's naps may one day offer solutions for problems such as heart disease, osteoporosis and muscular dystrophy" (lines 1-5). In the last paragraph of the passage, the author suggests that Fröbert hopes to use his research findings to "stave off hardened arteries in humans as well" (lines 76-77).

Choice A is incorrect because the passage briefly mentions ground squirrels and does not specifically compare them to bears. Choice B is incorrect because the passage clearly states that during hibernation fat acts as fuel for a resting animal.

Choice C is incorrect because the passage discusses exercise only within the context of bears.

> Question 22
>
> Which choice provides the best evidence for the answer to the previous question?
> A) Lines 1-5 ("Understanding . . . dystrophy")
> B) Lines 10-13 ("Fat . . . squirrels")
> C) Lines 31-35 ("To . . . bears")
> D) Lines 42-46 ("Once . . . tissues")

Item Difficulty: Medium
Content: Information and Ideas / Citing textual evidence
Best Answer: A

Choice A is the best answer. This sentence supports the idea that one of the goals of the hibernation research discussed in the passage is to try to improve human health: "Understanding how hibernators, including ground squirrels, marmots and bears, survive their long winter's naps may one day offer solutions for problems such as heart disease, osteoporosis and muscular dystrophy" (lines 1-5).

Choices B, C, and D are incorrect because they do not address the main goal of the hibernator research. Choice B is incorrect because lines 10-13 describe only one aspect of hibernation: fat as fuel. Choices C and D are incorrect because lines 31-35 and 42-46 describe the field research, not the goal of this research.

> Question 23
>
> What main effect do the quotations by Andrews in lines 10-18 have on the tone of the passage?
> A) They create a bleak tone, focusing on the difficulties hibernators face during the winter.
> B) They create a conversational tone, relating scientific information in everyday language.
> C) They create an ominous tone, foreshadowing the dire results of Andrews's research.
> D) They create an absurd tone, using images of animals acting as if they were human.

Item Difficulty: Medium
Content: Rhetoric / Analyzing word choice
Best Answer: B

Choice B is the best answer. In lines 10-18 the molecular biologist Matthew Andrews explains how fat is important to hibernating animals, stating "'Fat is where it's at'" and "'You bring your own lunch with you.'" The use of this nonscientific language creates a conversational tone that allows readers to understand what might otherwise be a complex topic.

Choices A, C, and D are incorrect because Andrews's phrases, such as "'Fat is where it's at,'" are relaxed rather than bleak, ominous, or absurd.

> Question 24
>
> As used in line 19, "stores" most nearly means
> A) preservatives.
> B) reserves.
> C) stacks.
> D) shelters.

Item Difficulty: Medium
Content: Information and Ideas / Interpreting words and phrases in context
Best Answer: B

Choice B is the best answer. Lines 19-20 describe how fat is important to hibernating animals, as "[b]igger fat stores mean a greater chance of surviving until spring." In this context, hibernating animals have "stores," or reserves, of fat that they put away for later use.

Choices A, C, and D are incorrect because in this context "stores" does not mean preservatives, stacks, or shelters.

> Question 25
>
> Based on the passage, what is Fröbert's hypothesis regarding why bears' arteries do not harden during hibernation?
> A) The bears' increased plasma cholesterol causes the arteries to be more flexible.
> B) Sluggish circulation pinches off the blood vessels rather than hardening the arteries.
> C) Bears exercise in short, infrequent bursts during hibernation, which staves off hardened arteries.
> D) Bears possess a molecule that protects against hardened arteries.

Item Difficulty: Medium
Content: Information and Ideas / Reading closely
Best Answer: D

Choice D is the best answer. The passage concludes by noting that "Fröbert hopes to find some protective molecule that could stave off hardened arteries in humans as well" (lines 75-77). This makes clear the scientist's belief that even though bears begin hibernation while "'very, very fat'" (lines 62-63) and do not exercise for many months, these animals have some molecule that protects them from hardened arteries.

Choices A and B are incorrect because lines 58-69 explain that the bears' elevated plasma cholesterol levels combined with the sluggish circulation that results from their lack of exercise during hibernation "are a recipe for hardened arteries" (lines 67-68). Choice C is incorrect because lines 63-64 state that hibernating bears "get zero exercise during hibernation."

> Question 26
>
> Which choice provides the best evidence for the answer to the previous question?
> A) Lines 19-20 ("Bigger . . . spring")
> B) Lines 24-27 ("The brown . . . day")
> C) Lines 70-73 ("Even . . . streaks")
> D) Lines 74-77 ("It's . . . well")

Item Difficulty: Medium
Content: Information and Ideas / Citing textual evidence
Best Answer: D

Choice D is the best answer. The passage concludes by noting that "Fröbert hopes to find some protective molecule that could stave off hardened arteries in humans as well" (lines 75-77). This sentence explains Fröbert's hypothesis that the reason bears do not "build up such artery-hardening streaks" (lines 72-73) is because they have some molecule that protects them from hardened arteries.

Choices A, B, and C are incorrect because they do not address Fröbert's hypothesis. Choice A is incorrect because lines 19-20 highlight the importance of fat to hibernators. Choice B is incorrect because lines 24-27 describe the diet of one group of hibernating bears. Choice C is incorrect because lines 70-73 describe the hardening of arteries in inactive humans.

> Question 27
>
> What information discussed in paragraph 10 (lines 58-69) is represented by the graph?
> A) The information in lines 58-62 ("Recent . . . reported")
> B) The information in lines 62-64 ("These . . . hibernation")
> C) The information in lines 64-66 ("Lolling . . . circulation")
> D) The information in lines 67-69 ("It's . . . strokes")

Item Difficulty: Medium
Content: Synthesis / Analyzing quantitative information
Best Answer: A

Choice A is the best answer. The graph compares the total plasma cholesterol found in seven bears during periods of their hibernation and nonhibernation, exemplifying how that cholesterol is generally higher during the hibernating stage. Meanwhile, lines 58-62 describe the very phenomena that the graph depicts: "Recent analyses revealed that Scandinavian brown bears spend the summer with plasma cholesterol levels considered high for humans; those values then increase substantially for hibernation, Fröbert and his colleagues reported."

Choices B, C, and D are incorrect because none of the other lines in paragraph 10 discuss the comparative levels of plasma cholesterol found in bears during their hibernating and nonhibernating phases. Lines 62-64 describe how bears spend their hibernating phase. Lines 64-66 describe the poor circulation those bears experience during hibernation. Lines 67-69 explain the heart risks that may occur in humans who are overweight and inactive.

> Question 28
>
> Which statement about the effect of hibernation on the seven bears is best supported by the graph?
> A) Only one of the bears did not experience an appreciable change in its total plasma cholesterol level.
> B) Only one of the bears experienced a significant increase in its total plasma cholesterol level.
> C) All of the bears achieved the desirable plasma cholesterol level for humans.
> D) The bear with the lowest total plasma cholesterol level in its active state had the highest total plasma cholesterol level during hibernation.

Item Difficulty: Medium
Content: Synthesis / Analyzing quantitative information
Best Answer: A

Choice A is the best answer because the graph shows that six of the seven bears experienced increased plasma cholesterol during hibernation; the seventh bear experienced neither an increase nor a decrease in plasma cholesterol.

Choices B, C, and D are incorrect because they are not supported by the graph.

> Question 29
>
> Which choice best describes the structure of the first paragraph?
> (A) A personal history is narrated, historical examples are given, and a method is recommended.
> (B) A position is stated, historical context is given, and earnest advice is given.
> (C) Certain principles are stated, opposing principles are stated, and a consensus is reached.
> (D) A historical period is described, and its attributes are reviewed.

Item Difficulty: Medium
Content: Rhetoric / Analyzing text structure
Best Answer: B

Choice B is the best answer. In the first paragraph, Andrew Carnegie states his position that the changes in society that are occurring are "not to be deplored, but welcomed as highly beneficial" (lines 12-13). After providing historical context on the interactions between rich and poor, Carnegie concludes the first paragraph by giving earnest advice: "It is a waste of time to criticize the inevitable" (lines 27-28).

Choice A is incorrect because the first paragraph emphasizes the current realities of humanity as a whole—the very "conditions of human life" (lines 4-5)—but not any one personal history. Choice C is incorrect because the first paragraph describes the author's personal opinion and his conclusion, not a conclusion reached by a consensus. Choice D is incorrect because the first paragraph focuses more on "our age" (line 1) than on the past.

> Question 30
>
> The author most strongly implies which of the following about "the ties of brotherhood" (line 2)?
> (A) They were always largely fictitious and are more so at present.
> (B) They are stronger at present than they ever were before.
> (C) They are more seriously strained in the present than in the past.
> (D) They will no longer be able to bring together the rich and the poor.

Item Difficulty: Hard
Content: Information and Ideas / Reading closely
Best Answer: C

Choice C is the best answer. Carnegie states in lines 1-4 that a serious problem of his time was how to distribute wealth so that "the ties of brotherhood may still bind together the rich and poor in harmonious relationship." In other words, he was concerned that the "ties of brotherhood" between rich and poor were not as strong as they used to be.

Choice A is incorrect because Carnegie implies that changes in modern society have negatively impacted the relationship between the rich and poor, but he does not suggest that such a relationship never existed. Choice B is incorrect because the passage implies that "the ties of brotherhood" are weaker than they were previously. Choice D is incorrect because Carnegie states that these ties continue and "may still bind together the rich and poor in harmonious relationship."

> Question 31
>
> The author uses "dwelling, dress, food, and environment" (lines 7-8) as examples of
> (A) things more valued in the present than in the past.
> (B) bare necessities of life.
> (C) things to which all people are entitled.
> (D) possible indications of differences in status.

Item Difficulty: Medium
Content: Rhetoric / Analyzing text structure
Best Answer: D

Choice D is the best answer. Carnegie explains that the contrast between the rich and poor is greater than in the past: "In former days there was little difference between the dwelling, dress, food, and environment of the chief and those of his retainers…" (lines 6-9). Carnegie uses the examples of "dwelling, dress, food, and environment" to show the difference in status between the rich and the poor.

Choice A is incorrect because Carnegie does not suggest that basic necessities, like food and housing, are more valued in the present than they were in the past. Choice B is incorrect because, while these aspects of life are basic necessities, they are used here as examples of areas in which differences in status might be evident. Choice C is incorrect because Carnegie is not using these examples to suggest that "dwelling, dress, food, and environment" are things to which all people are entitled.

> Question 32
>
> The author describes the people who live in the "houses of some" (line 15) as interested in the
> (A) materials from which their houses are constructed.
> (B) size of their homes.
> (C) advantages of culture.
> (D) pedigree of their guests.

Item Difficulty: Medium
Content: Information and Ideas / Reading closely
Best Answer: C

Choice C is the best answer. In lines 14-18 Carnegie states that it is "essential, for the progress of the race that the houses of some should be homes for all that is highest and best in literature and the arts, and for all the refinements of civilization, rather than that none should be so." Carnegie is suggesting that "houses of some" should be filled with people who care a great deal about culture, or the "highest and best in literature and the arts."

Choices A, B, and D are incorrect because lines 14-18 explicitly state that the people who live in the "houses of some" care a great deal about culture, not that they care about what materials their homes are made of, the size of those homes, or the pedigree of their guests.

> Question 33
>
> Which choice provides the best evidence for the answer to the previous question?
> (A) Lines 9-10 ("the palace . . . laborer")
> (B) Lines 15-16 ("all . . . arts")
> (C) Lines 18-19 ("Much . . . squalor")
> (D) Lines 19-20("Without . . . Maecenas")

Item Difficulty: Hard
Content: Information and Ideas / Citing textual evidence
Best Answer: B

Choice B is the best answer. In lines 15-16 Carnegie advocates that the "houses of some" should be filled with people who care a great deal about culture, such as "all that is highest and best in literature and the arts."

Choices A and C are incorrect because lines 9-10 and 18-19 highlight a disparity in wealth between the rich and poor but do not specifically mention people who live in the "houses of some." Choice D is incorrect because in lines 19-20 Carnegie is suggesting that patrons of the arts exist because of wealth.

> Question 34
>
> The author uses the phrase "good old times" (line 20) as an example of
> (A) a cliché that still has life and usefulness left in it.
> (B) a bit of folk wisdom from his childhood.
> (C) something said by those who have acquired great riches.
> (D) something said by people who do not share his viewpoint.

Item Difficulty: Hard
Content: Rhetoric / Analyzing word choice
Best Answer: D

Choice D is the best answer. Carnegie uses quotation marks around the phrase the "good old times" to suggest that others refer to the past as the "good old times." However, Carnegie states that these "'good old times' were not good old times. Neither master nor servant was as well situated then as to-day" (lines 20-22), which suggests that Carnegie does not believe that things were better in the past.

Choice A is incorrect because Carnegie immediately refutes the usefulness of the cliché by saying that the "'good old times" were not good old times." Choice B is incorrect because the passage provides no evidence that the saying comes from Carnegie's childhood. Choice C is incorrect because there is no evidence that the phrase the "good old times" is a cliché used by the wealthy.

> Question 35
>
> What is the author's main point about the disadvantages of the modern economic system?
> (A) It provides only a few people with the advantages of culture.
> (B) It replicates many of the problems experienced in the past.
> (C) It creates divisions between different categories of people.
> (D) It gives certain people great material advantages over others.

Item Difficulty: Medium
Content: Information and Ideas / Determining central ideas and themes
Best Answer: C

Choice C is the best answer. Lines 47-60 explain that by Carnegie's time standards of living had raised significantly, and that the cost of this increase is that "All intercourse between [rich and poor] is at an end. Rigid castes are formed . . ." (lines 65-66). A disadvantage of the modern economic system, in other words, is that divisions exist between classes and types of people.

Choice A is incorrect because Carnegie says it is "essential" that some people have access to high culture (line 14). Choice B is incorrect because Carnegie argues that the "conditions of human life have not only been changed, but revolutionized, within the past few hundred years" (lines 4-6) and does not suggest that the modern economic system replicates past problems. Choice D is incorrect because Carnegie writes "Much better this great irregularity than universal squalor" (lines 18-19).

> Question 36
>
> Which choice provides the best evidence for the answer to the previous question?
> (A) Lines 37-39 ("The master . . . conditions")
> (B) Lines 43-45 ("There was . . . State")
> (C) Lines 46-47 ("The inevitable . . . prices")
> (D) Lines 65-66 ("All intercourse . . . end")

Item Difficulty: Hard
Content: Information and Ideas / Citing textual evidence
Best Answer: D

Choice D is the best answer. Lines 47-60 explain that by Carnegie's time standards of living had raised significantly, with lines 61-62 then explaining that those increases came at a cost: "The price we pay for this salutary change is, no doubt, great." Lines 65-66 explains what that cost, or disadvantage, is: "All intercourse between [rich and poor] is at an end." A disadvantage of the modern economic system, in other words, is that it creates divisions between classes and types of people.

Choice A, B, and C are incorrect because they do not provide evidence that Carnegie believes there are disadvantages to the modern economic system. Choices A and B are incorrect because lines 37-39 and 43-45 explain what life was like "Formerly," in the time of master and apprentice, before the modern economic system came to exist. Choice C is incorrect because lines 46-47 also describes a condition of a time before the modern economic system.

> Question 37
>
> As used in line 82, "in its train" is closest in meaning to
> (A) before it.
> (B) with it.
> (C) anticipating it.
> (D) advancing it.

Item Difficulty: Medium
Content: Information and Ideas / Interpreting words and phrases in context
Best Answer: B

Choice B is the best answer. In the final paragraph of the passage, Carnegie writes of the "law of competition" (lines 76-77), explaining that the law has some costs but also provides improved living conditions for everyone "in its train." Saying these conditions come "in the train" of the law means they accompany the law or come with it.

Choices A, C, and D are incorrect because in this context "in its train" does not mean precede the law, predict the arrival of the law, or help advance the law.

> Question 38
>
> The author of Passage 1 suggests that the usefulness of de-extinction technology may be limited by the
> (A) amount of time scientists are able to devote to genetic research.
> (B) relationship of an extinct species to contemporary ecosystems.
> (C) complexity of the DNA of an extinct species.
> (D) length of time that a species has been extinct.

Item Difficulty: Medium
Content: Information and Ideas / Reading closely
Best Answer: D

Choice D is the best answer. Lines 9-11 explain that, although some extinct species can be brought back to life, "Only species whose DNA is too old to be recovered, such as dinosaurs, are the ones to consider totally extinct, bodily and genetically." The determining factor is the length of time that species has been extinct.

Choices A, B, and C are incorrect because lines 9-11 explicitly state that only DNA that is "too old to be recovered" determines whether a species can be brought back to life, not the amount of time scientists devote to genetic research, the relationship between an extinct species and contemporary ecosystems, or how complex a species' DNA might be.

> Question 39
>
> Which choice provides the best evidence for the answer to the previous question?
>
> (A) Lines 7-9 ("Thanks . . . life")
> (B) Lines 9-11 ("Only . . . genetically")
> (C) Line 13 ("It will be . . . difficult")
> (D) Lines 13-14 ("It will take . . . succeed")

Item Difficulty: Medium
Content: Information and Ideas / Citing textual evidence
Best Answer: B
Choice B is the best answer. Lines 9-11 state that species that have DNA that is "too old to be recovered" cannot be brought back to life.

Choices A, C, and D are incorrect because they do not indicate any limits to de-extinction technology. Choice A is incorrect because lines 7-9 explain only that the use of DNA can lead to certain species being brought back to life. Choices C and D are incorrect because line 13 and lines 13-14 explain some challenges to bringing back certain species but do not explain the limits to de-extinction technology.

> Question 40
>
> As used in line 27, "deepest" most nearly means
> (A) most engrossing.
> (B) most challenging.
> (C) most extensive.
> (D) most fundamental.

Item Difficulty: Hard
Content: Information and Ideas / Interpreting words and phrases in context
Best Answer: D

Choice D is the best answer. Lines 24-27 explain that "Just the thought of mammoths and passenger pigeons alive again invokes the awe and wonder that drives all conservation at its deepest level." The author of Passage 1 is suggesting that the "prospect of de-extinction" (line 21) evokes the same emotions of "awe and wonder" that propel conservation efforts at its deepest, or most fundamental, level.

Choices A, B, and C are incorrect because in this context the "deepest" level of conservation does not mean the most engrossing level, most challenging level, or most extensive level.

> Question 41
>
> The authors of Passage 2 indicate that the matter of shrinking biodiversity should primarily be considered a
> (A) historical anomaly.
> (B) global catastrophe.
> (C) scientific curiosity.
> (D) political problem.

Item Difficulty: Medium
Content: Information and Ideas / Reading closely
Best Answer: B

Choice B is the best answer. "Shrinking biodiversity" means the loss of species, and the authors of Passage 2 clearly state that shrinking biodiversity is a global issue: "Species today are vanishing in such great numbers—many from hunting and habitat destruction—that the trend has been called a sixth mass extinction, an event on par with such die-offs as the one that befell the dinosaurs 65 million years ago" (37-41). Labeling this loss of diversity a "mass extinction," shows that the authors believe this situation is serious and widespread.

Choice A is incorrect because the passage states the current loss of biodiversity would be a "sixth" mass extinction, indicating that the occurrence is far from an anomaly (or abnormality). Choices C and D are incorrect because the authors of Passage 2 do not primarily present the shrinking biodiversity as a scientific curiosity or a political problem.

> Question 42
>
> Which choice provides the best evidence for the answer to the previous question?
> (A) Lines 37-41 ("Species . . . ago")
> (B) Lines 42-45 ("A program . . . woes")
> (C) Lines 53-56 ("Against . . . irresponsible")
> (D) Lines 65-67 ("Such . . . grave")

Item Difficulty: Medium
Content: Information and Ideas / Citing textual evidence
Best Answer: A

Choice A is the best answer. Lines 37-41 label the shrinking biodiversity as a global catastrophe, as it is "a sixth mass extinction, an event on par with such die-offs as the one that befell the dinosaurs 65 million years ago." Labeling this loss of

diversity a "mass extinction" implies the authors' belief that this shrinking biodiversity is serious and widespread.

Choices B, C, and D do not explain the authors' opinions on shrinking biodiversity. Choices B and C are incorrect because lines 42-45 and 53-56 describe what the authors view as possible problems with de-extinction. Choice D is incorrect because lines 65-67 provide one reason to continue with de-extinction programs.

> Question 43
>
> As used in line 37, "great" most nearly means
> (A) lofty.
> (B) wonderful.
> (C) large.
> (D) intense.

Item Difficulty: Easy
Content: Information and Ideas / Interpreting words and phrases in context
Best Answer: C

Choice C is the best answer. Lines 37-40 state that "species today are vanishing at such great numbers" that the loss of these species is considered a "sixth mass extinction." In this context, there is a "great," or large, number of species at risk of extinction.

Choice A, B, and D are incorrect because in this context, "great," does not mean lofty, wonderful, or intense.

> Question 44
>
> The reference to the "black-footed ferret and the northern white rhino" (line 64) serves mainly to
> (A) emphasize a key distinction between extinct and living species.
> (B) account for types of animals whose numbers are dwindling.
> (C) provide examples of species whose gene pools are compromised.
> (D) highlight instances of animals that have failed to adapt to new habitats.

Item Difficulty: Medium
Content: Rhetoric / Analyzing text structure
Best Answer: C

Choice C is the best answer. The authors of Passage 2 suggest that de-extinction may "help save endangered species." (line 60). Lines 61-64 provide an example of how de-extinction could be beneficial: "For example, extinct versions of genes

could be reintroduced into species and subspecies that have lost a dangerous amount of genetic diversity, such as the black-footed ferret and the northern white rhino." In this context, the black-footed ferret and northern white rhino are used as examples of species that have lost genetic diversity; in other words, they are species whose gene pools have been compromised.

Choices A, B, and D are incorrect because lines 61-64 clearly identify the black-footed ferret and the northern white rhino as species whose gene pools have been compromised. They are not highlighted to emphasize any difference between extinct and living species, to explain why the numbers of some animals are dwindling, or to describe species that failed to adapt to new environments.

> Question 45
>
> Which choice best states the relationship between the two passages?
> (A) Passage 2 attacks a political decision that Passage 1 strongly advocates.
> (B) Passage 2 urges caution regarding a technology that Passage 1 describes in favorable terms.
> (C) Passage 2 expands on the results of a research study mentioned in Passage 1.
> (D) Passage 2 considers practical applications that could arise from a theory discussed in Passage 1.

Item Difficulty: Medium
Content: Synthesis / Analyzing multiple texts
Best Answer: B

Choice B is the best answer. Passage 1 enthusiastically supports the idea of de-extinction, saying it is "profound news. That something as irreversible and final as extinction might be reversed is a stunning realization" (lines 22-24). Passage 2, on the other hand, recognizes the "gee-whiz appeal" (line 29) of de-extinction but is less certain about its implementation: "Yet with limited intellectual bandwidth and financial resources to go around, de-extinction threatens to divert attention from the modern biodiversity crisis" (lines 30-33). Therefore, Passage 2 urges restraint for an idea that Passage 1 enthusiastically supports.

Choice A is incorrect because neither passage focuses on a political decision.
Choice C is incorrect because Passage 1 does not mention a research study.
Choice D is incorrect because Passage 2 does not consider practical uses (or "applications") of de-extinction as much as the practical problems that result from its use.

> Question 46
>
> How would the authors of Passage 2 most likely respond to the "prospect" referred to in line 21, Passage 1?
> (A) With approval, because it illustrates how useful de-extinction could be in addressing widespread environmental concerns.
> (B) With resignation, because the gradual extinction of many living species is inevitable.
> (C) With concern, because it implies an easy solution to a difficult problem.
> (D) With disdain, because it shows that people have little understanding of the importance of genetic diversity.

Item Difficulty: Hard
Content: Synthesis / Analyzing multiple texts
Best Answer: C

Choice C is the best answer. The author of passage is amazed by the idea of de-extinction, while the authors of passage 2 warn that a "program to restore extinct species poses a risk of selling the public on a false promise that technology alone can solve our ongoing environmental woes" (lines 42-45). This statement shows that the authors of Passage 2 view de-extinction as a "false promise" that may make the problem of shrinking biodiversity appear easier to solve than it actually will be.

Choice A is incorrect because the authors of Passage 2 are less enthusiastic about the "prospect" of de-extinction than the author of Passage 1, as they state that de-extinction "threatens to divert attention from the modern biodiversity crisis" (lines 32-33). Choice B is incorrect because, while the authors of Passage 2 acknowledge that some extinctions may be inevitable, they are not resigned to de-extinction. Choice D is incorrect because the authors of Passage 2 do not suggest that people have little understanding of the biodiversity crisis.

> Question 47
>
> Which choice would best support the claim that the authors of Passage 2 recognize that the "imagination soars" (line 24, Passage 1) in response to de-extinction technology?
> (A) Lines 28-30 ("The . . . news")
> (B) Lines 30-33 ("Yet . . . crisis")
> (C) Lines 58-59 ("That . . . altogether")
> (D) Lines 61-63 ("For . . . diversity")

Item Difficulty: Medium
Content: Synthesis / Analyzing multiple texts
Best Answer: A

Choice A is the best answer. In lines 22-24, the author of Passage 1 writes: "That something as irreversible and final as extinction might be reversed is a stunning realization. The imagination soars." This enthusiasm for such an exciting possibility is also recognized in Passage 2, which states in lines 28-30 that "The idea of bringing back extinct species holds obvious gee-whiz appeal and a respite from a steady stream of grim news." By conceding that there is "gee-whiz appeal" to de-extinction, the authors of Passage 2 recognize that it is an idea that makes the "imagination [soar]."

Choice B is incorrect because lines 30-33 explain why de-extinction is a threat. Choice C is incorrect because lines 58-59 concede only that the idea of de-extinction is not entirely without merit, a characterization which is far less enthusiastic than the statement "the imagination soars." Choice D is incorrect because lines 61-63 provide a single example of when de-extinction might be appropriate.

Writing and Language Test Answer Explanations

> Question 1
>
> (A) NO CHANGE
> (B) see an annual loss of $63.2 billion each year
> (C) lose $63.2 billion annually
> (D) have a yearly loss of $63.2 billion annually

Item Difficulty: Medium
Content: Effective Language Use / Concision
Best Answer: C
Choice C is the best answer because it states the situation succinctly and is free of redundancies.

Choices A, B, and D are incorrect because all three contain a redundancy in which a reference to the annual nature of the loss is stated twice; for example, Choice A states "yearly" and "annually."

> Question 2
>
> (A) NO CHANGE
> (B) main things leading up to
> (C) huge things about
> (D) primary causes of

Item Difficulty: Medium
Content: Effective Language Use / Style and tone
Best Answer: D
Choice D is the best answer because the use of language is correct for standard written English and matches the formal tone of the passage.

Choices A and C are incorrect because both rely on colloquial language, specifically "big" and "huge," which strays from the formal tone of the article. Additionally, "things" in Choice C is vague and informal. Choice B is incorrect for the same reason.

Question 3

(A) NO CHANGE
(B) have spent
(C) spends
(D) are spent

Item Difficulty: Medium
Content: Conventions of Usage / Agreement / Subject-verb agreement
Best Answer: C

Choice C is the best answer because the verb "spends" grammatically corresponds with the singular noun "American."

Choices A, B, and D are incorrect because, in each instance, the noun and verb do not grammatically correspond. The verbs "spend," "have spent" and "are spent" would correspond with a plural noun, but not with the singular noun "American."

Question 4

(A) NO CHANGE
(B) workers; managers
(C) workers, managers,
(D) workers, managers

Item Difficulty: Medium
Content: Conventions of Punctuation / Within-sentence punctuation
Best Answer: D

Choice D is the best answer because it provides punctuation that creates a complete sentence with clauses whose relationship to one another is clear.

Choice A is incorrect because it results in a sentence fragment. Choice B is incorrect because the first clause is dependent, signaled by the conditional phrase "As long as," so a semicolon cannot be used. Choice C is incorrect because the comma following "managers" inappropriately separates the noun from the verb "should champion."

Question 5

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

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

Item Difficulty: Hard
Content: Organization / Logical sequence
Best Answer: C

Choice C is the best answer. Sentence 3 logically follows the statement in sentence 1 where readers learn that part of the problem is the work itself. Sentence 3 then tells readers what about the work has caused the decrease in sleep: "The hours the average American spend[s] working have increased dramatically…."

Choices A, B, and D are incorrect because they do not order the information in the paragraph logically.

Question 6

At this point, the writer is considering adding the following sentence.
"Even fifteen-minute power naps improve alertness, creativity, and concentration."
Should the writer make this addition here?

(A) Yes, because it demonstrates that the benefits of napping can be gained without sacrificing large amounts of work time.
(B) Yes, because it explains the methodology of the studies mentioned in the previous sentence.
(C) No, because a discussion of the type of nap workers take is not important to the writer's main point in the paragraph.
(D) No, because it contradicts the writer's discussion of napping in the previous sentences.

Item Difficulty: Medium
Content: Development / Focus
Best Answer: A

Choice A is the best answer because it adds relevant information in support of the claim that companies should allow their employees to take naps.

Choice B is incorrect because the prospective sentence does not explain methodology. Choice C is incorrect because the example in the sentence provides additional information in support of napping. Choice D is incorrect because there is no contradiction.

> Question 7
>
> Which choice provides a supporting example that reinforces the main point of the sentence?
>
> (A) NO CHANGE
> (B) including a lower risk of cardiovascular problems such as heart attack and stroke.
> (C) which are essential in an era of rising health care costs.
> (D) in addition to making employees more efficient.

Item Difficulty: Hard
Content: Development / Support
Best answer: B

Choice B is the best answer because it offers a specific example of a long-term health benefit that could lead to "reduced health care costs."

Choices A, C, and D are incorrect because they offer no supporting examples of long-term health benefits that could reduce health care costs.

> Question 8
>
> (A) NO CHANGE
> (B) gently wake
> (C) gently to wake
> (D) gentle waking of

Item Difficulty: Medium
Content: Sentence Structure / Sentence formation / Parallel structure
Best Answer: B

Choice B is the best answer because the verb "wake" is consistent with the preceding verbs in the series, "block" and "play." Furthermore, choice B provides a verb that creates a grammatically complete and standard sentence.

Choices A, C, and D are incorrect because, in each instance, the verb is not consistent with the preceding verbs in the series, "block" and "play."

> Question 9
>
> (A) NO CHANGE
> (B) among
> (C) between
> (D) into

Item Difficulty: Easy
Content: Conventions of Usage / Conventional expression
Best Answer: B

Choice B is the best answer because, in this context, the preposition "among" is the only idiomatic choice: napping can be promoted "among" people but not "throughout," "between," or "into" them.

Choices A, C, and D are incorrect because the prepositions "throughout," "between," and "into" are unidiomatic in this context.

> Question 10
>
> (A) NO CHANGE
> (B) but it benefits
> (C) as also to
> (D) but also to

Item Difficulty: Medium
Content: Sentence Structure / Sentence formation / Subordination and coordination
Best Answer: D

Choice D is the best answer because it completes a parallel construction in which two elements are compared. In this construction "but also to" is parallel to "not only to" and thus is the only choice that creates a grammatically complete and standard sentence. The "not only…but also" construction is also known as a correlative conjunction, meaning that these two phrases should always travel in pairs.

Choices A and C are incorrect because they fail to complete the comparison that the preposition "not only to" signals. Choice B is incorrect because it results in a run-on and incomplete sentence.

> Question 11
>
> The writer wants a concluding sentence that restates the main argument of the passage. Which choice best accomplishes this goal?
>
> (A) NO CHANGE
> (B) Clearly, employers should consider reducing employees' hours when they are overworked.
> (C) Companies should consider employee schedules carefully when implementing a napping policy.
> (D) More businesses should follow their lead and embrace napping on the job.

Item Difficulty: Medium
Content: Organization / Introductions, conclusions, and transitions
Best Answer: D

Choice D is the best answer because it logically concludes the essay, the main argument of which is that napping during the workday boosts employee productivity and morale and reduces costs associated with poor health and absences.

Choices A, B, and C are incorrect because none of these choices restates the main argument of the passage.

> Question 12
>
> (A) NO CHANGE
> (B) pollination: this is
> (C) pollination,
> (D) pollination;

Item Difficulty: Medium
Content: Conventions of Punctuation / Nonrestrictive and parenthetical elements
Best Answer: C

Choice C is the best answer because it provides the appropriate punctuation for the nonrestrictive modifying clause "including honeybee pollination." Because the clause is not essential to the sentence, it should be offset with commas (or other matching punctuation). Since a comma is used before the clause, a comma must be used after it as well.

Choices A and D are incorrect because the punctuation does not match the comma that sets off the nonrestrictive modifying clause "including honeybee pollination."

Choice B is incorrect because "this is" is unnecessarily wordy.

> Question 13
>
> (A) NO CHANGE
> (B) highlights the potentially disastrous effects
> (C) highlight the potentially disastrous effects
> (D) highlight the potentially disastrous affects

Item Difficulty: Medium
Content: Conventions of Usage / Frequently confused words
Best Answer: B

Choice B is the best answer because the verb "highlights" grammatically corresponds with the singular noun "the importance of bees." Additionally, "effects" is the correct noun to describe outcomes.

Choices A and D are incorrect because "affects" is the incorrect word in this context. Choice C is incorrect because there is no subject-verb agreement between the singular noun "the importance of bees" and the verb "highlight."

> Question 14
>
> (A) NO CHANGE
> (B) Known as colony
> (C) It is known as colony
> (D) Colony

Item Difficulty: Medium
Content: Sentence Structure / Sentence formation / Modifier placement
Best Answer: B

Choice B is the best answer because it provides a dependent clause that adequately introduces the main subject, colony collapse disorder, which corresponds directly to the subject in the second clause: "this phenomenon."

Choice A is incorrect because "They" has no clear antecedent and creates a comma splice. Choice C is incorrect because it also results in a comma splice. Choice D is incorrect because it creates redundancy with the following noun phrase "this phenomenon."

> Question 15
>
> Which choice offers the most accurate interpretation of the data in the chart?
>
> (A) NO CHANGE
> (B) been above the acceptable range.
> (C) not changed noticeably from year to year.
> (D) greatly increased every year.

Item Difficulty: Medium
Content: Development / Quantitative information
Best Answer: B

Choice B is the best answer because it accurately represents the information in the chart.

Choice A is incorrect because in the 2011-2012 winter season, bee mortality rates fell below 25% of the bee colony. Choice C is incorrect because, according to the chart, bee mortality rates have varied noticeably year to year. Choice D is incorrect for a similar reason. The chart shows that, year to year, bee mortality rates have both increased and decreased.

> Question 16
>
> Which choice offers an accurate interpretation of the data in the chart?
>
> (A) NO CHANGE
> (B) portion of bees lost was double what it had been the previous year, rising to
> (C) number of losses, which had fallen within the acceptable range the previous year, rose to
> (D) portion of total colonies lost rose almost 10 percentage points, with a loss of

Item Difficulty: Medium
Content: Development / Quantitative information
Best Answer: D

Choice D is the best answer because it accurately represents the comparison in bee population loss between the 2010–2012 and 2012–2013 periods. Compared to the 2011–2012 winter season, bee loss was almost 10 percentage points higher the following year.

Choice A is incorrect because it states that compared to the preceding years, bee losses fell in 2012–2013 when, according to the data, the opposite was true. Choice B is incorrect because the bee loss in 2012–2013 did not double from 2011–2012. Given that bee loss in 2011–2012 hovered around 22%, double would be around 44%, while the chart says bee loss in 2012–2013 was just over 30%. Choice C is incorrect because it makes a false statement: the number of losses had *not* "fallen within the acceptable range the previous year."

> Question 17
>
> Which choice most smoothly and effectively introduces the writer's discussion of studies of CCD in this paragraph?
>
> (A) NO CHANGE
> (B) Bees are vanishing, and according to studies there are several possible reasons for this trend.
> (C) Several possible reasons, offered by studies, may explain why bees are vanishing.
> (D) DELETE the underlined sentence.

Item Difficulty: Medium
Content: Effective Language Use / Syntax
Best Answer: A

Choice A is the best answer. It adequately introduces the paragraph's main topic in a grammatically complete and standard manner. In addition, its use of the passive voice ("Studies have offered") establishes a pattern that the next sentence maintains ("One reason that is often cited").

Choices B and C are incorrect because each is redundant. In B, there is no need to refer to bees vanishing and "this trend" in the same sentence. In C, there is no need to specify that "reasons . . . may explain." Choice D is incorrect because if the paragraph were to begin with the sentence "One reason that is often cited…," the writer's discussion of studies of CCD would not be introduced smoothly and effectively.

> Question 18
>
> At this point, the writer is considering adding the following sentence.
> "Prolonged exposure to neonicotinoids has been shown to increase bees' vulnerability to disease and parasitic mites."
> Should the writer make this addition here?
> (A) Yes, because it provides support for the claim made in the previous sentence.
> (B) Yes, because it introduces a new idea that will become important later in the passage.
> (C) No, because it would be better placed elsewhere in the passage.
> (D) No, because it contradicts the main idea of the passage.

Item Difficulty: Medium
Content: Development / Focus
Best Answer: A

Choice A is the best answer because the information supports the preceding claim by showing how lingering neonicotinoids impact bees in particular. The previous sentence notes "one reason" why bees are vanishing (the use of neonicotinoids), and this proposed sentence usefully elaborates on how neonicotinoids harm bees.

Choices B, C, and D are incorrect because the information doesn't introduce a new idea that will become important later in the passage, belong elsewhere in the passage, or contradict the main idea.

> Question 19
>
> (A) NO CHANGE
> (B) is a pretty big deal.
> (C) can't be put on the back burner.
> (D) cannot be ignored.

Item Difficulty: Easy
Content: Effective Language Use / Style and tone
Best Answer: D

Choice D is the best answer because the diction is consistent with the article's tone and style.

Choices A, B, and C are incorrect because the casual tone and style of the phrases "is not to be scoffed at," "is a pretty big deal," and "can't be put on the back burner" deviate from the more formal tone and style established in the rest of the article.

> Question 20
>
> (A) NO CHANGE
> (B) crops, this is an expensive proposition when there is a shortage of bees.
> (C) crops, an expensive proposition when there is a shortage of bees.
> (D) crops; an expensive proposition when there is a shortage of bees.

Item Difficulty: Hard
Content: Sentence Structure / Sentence formation / Sentence boundaries
Best Answer: C

Choice C is the best answer because it creates a grammatically correct relationship between an independent clause and a dependent one.

Choices A and D are incorrect because a semicolon should link two independent clauses in order to be grammatically correct; in each instance the second clause is dependent. Choice B is incorrect because it creates a comma splice.

> Question 21
>
> (A) NO CHANGE
> (B) there
> (C) their
> (D) its

Item Difficulty: Easy
Content: Conventions of Usage / Possessive determiners
Best Answer: C

Choice C is the best answer because it provides the correct possessive form of a plural noun, the farmers who are the main subject of the sentence.

Choices A and B are incorrect because neither is the correct possessive form of "they." Choice A is a contraction of the subject "they" and the verb "are," while Choice B is an adverb that refers to a place or a particular point in time. Choice D is incorrect because it is the possessive form of a singular, not a plural, noun.

> Question 22
>
> The writer wants a conclusion that addresses the future of efforts to combat CCD. Which choice results in the passage having the most appropriate concluding sentence?
>
> (A) NO CHANGE
> (B) Still, bee colonies have experienced such devastating losses that the consequences of the issue have been felt worldwide.
> (C) Although CCD is a relatively new phenomenon, scientists have been studying other aspects of honeybees for over a century.
> (D) Genetic variation in bee colonies generally improves bees' productivity, disease resistance, and ability to regulate body temperature.

Item Difficulty: Hard
Content: Organization / Introductions, conclusions, and transitions
Best Answer: A

Choice A is the best answer because the passage already has an appropriate concluding sentence that addresses "the future of efforts to combat CCD." This sentence supports the last paragraph's focus on "commonsense measures" by outlining potential CCD-prevention efforts such as "[a] decrease in the use of certain pesticides, herbicides, and fungicides" and stating that these efforts "could begin a shift in a favorable direction."

Choices B, C, and D are incorrect because they don't address "the future of efforts to combat CCD" that the question demands. Choice B describes the current impact of diminishing bee populations instead of discussing the future. Choice C introduces a new topic that departs from the paragraph's main topic. Choice D introduces a related topic that needs further elaboration.

> Question 23
>
> (A) NO CHANGE
> (B) stood;
> (C) stood—
> (D) stood

Item Difficulty: Easy
Content: Conventions of Punctuation / Unnecessary punctuation
Best Answer: D

Choice D is the best answer because it creates a grammatically complete and standard sentence.

Choices A, B, and C are incorrect because each inserts unnecessary punctuation that disrupts the meaning of the sentence, which is to state where Giuseppe Ferrua stood.

> Question 24
>
> (A) NO CHANGE
> (B) inside
> (C) for
> (D) on

Item Difficulty: Easy
Content: Conventions of Usage / Conventional expression
Best Answer: A

Choice A is the best answer because the preposition "with" correctly reflects the relationship between the subject, verb, and object: "landscape," "dotted," and "vineyards," respectively.

Choices B, C, and D are incorrect because each provides a preposition that does not appropriately represent the relationship between the subject, verb, and object. A landscape can be dotted "with" vineyards; it cannot be dotted "inside," "for," or "on" vineyards.

> Question 25
>
> (A) NO CHANGE
> (B) however,
> (C) by contrast,
> (D) thereafter,

Item Difficulty: Medium
Content: Organization / Introductions, conclusions, and transitions
Best Answer: A
Choice A is the best answer because the information in the sentence elaborates on and supports the claim in the previous sentence: that lunar farming "is driven by the belief that the Moon influences levels of moisture in the soil."

Choices B, C, and D are incorrect because they do not appropriately signal the information in the sentence, which elaborates on and supports the claim in the previous sentence. Rather, Choices B and C suggest that the writer is drawing a contrast, and Choice D introduces a time sequence that is not present in the paragraph.

> Question 26
>
> (A) NO CHANGE
> (B) Given that
> (C) So
> (D) DELETE the underlined portion and begin the sentence with a capital letter.

Item Difficulty: Medium
Content: Sentence Structure / Sentence formation / Subordination and coordination
Best Answer: B

Choice B is the best answer because it creates a grammatically complete and standard sentence. It also correctly reflects the relationship specified in the passage between moisture and the lunar calendar.

Choice A is incorrect because "Although" suggests that the second clause will say something contrary to the first. Choices C and D are incorrect because each results in a grammatically incomplete sentence.

> Question 27
>
> Which choice most effectively sets up the paragraph?
> (A) NO CHANGE
> (B) People all over the world farm by the Moon.
> (C) Farming by the Moon is not new.
> (D) Talk of the Moon's influence is far-reaching.

Item Difficulty: Medium
Content: Development / Proposition
Best Answer: C

Choice C is the best answer because it acts effectively as a transition between the previous paragraph and this one.

Choices A, B, and D are incorrect because none of the three introduces the paragraph's main topic, the long history of lunar farming.

> Question 28
>
> Which choice provides the most specific information on the type of advice a lunar calendar offers?
> (A) NO CHANGE
> (B) actions relevant to farming.
> (C) points in time at which to undertake certain tasks.
> (D) optimal times to plant, weed, prune, and harvest.

Item Difficulty: Medium
Content: Effective Language Use / Precision
Best Answer: D

Choice D is the best answer because it provides "the most specific information on the type of advice a lunar calendar offers."

Choices A, B, and C are incorrect because each is vague; specifically, "farm chores," "actions," and "certain tasks" are all nebulous terms, and the question asks for the "most specific information."

> Question 29
>
> (A) NO CHANGE
> (B) almanacs's
> (C) almanac's
> (D) almanacs'

Item Difficulty: Medium
Content: Conventions of Punctuation / Possessive nouns and pronouns
Best Answer: C

Choice C is the best answer because it provides the grammatically correct option for a possessive singular noun. The editor belongs to, or is affiliated with, the almanac.

Choices A, B, and D are incorrect because each fails to provide a grammatically correct possessive noun. There is only one almanac, the "*Old Farmer's Almanac*," to which the editor belongs.

Question 30

(A) NO CHANGE
(B) skeptics, who have yet to be convinced.
(C) skeptics—those who doubt the method.
(D) skeptics.

Item Difficulty: Hard
Content: Effective Language Use / Concision
Best Answer: D

Choice D is the best answer because it introduces the paragraph's topic succinctly without repeating information. By definition, skeptics are people who are unsure, have yet to be convinced, doubt the method, etc.

Choices A, B, and C are incorrect because all three include redundant information about skeptics.

Question 31

(A) NO CHANGE
(B) those
(C) it's
(D) its

Item Difficulty: Medium
Content: Conventions of Usage / Possessive determiners
Best Answer: D

Choice D is the best answer because it provides the possessive pronoun that grammatically corresponds to a singular noun, "agriculture."

Choices A, B, and C are incorrect because each fails to provide a grammatically correct or appropriate possessive pronoun. Choice A presents a possessive pronoun for a plural antecedent rather than a singular one. Choice B's "those" is vague, leaving the reader unsure of the relationship between the practices and agriculture. Choice C presents a grammatically incorrect construction of the possessive pronoun for it.

> Question 32
>
> The writer wants to conclude the paragraph effectively while also reinforcing the point that skepticism toward lunar farming still exists. Which choice best accomplishes this goal?
>
> (A) NO CHANGE
> (B) and therefore no sound scientific data on the subject exist to date.
> (C) yet many continue to practice lunar farming.
> (D) leading many to conclude that the practice is based in folklore, not fact.

Item Difficulty: Hard
Content: Organization / Introductions, conclusions, and transitions
Best Answer: D

Choice D is the best answer because it satisfies the directions of the question by "reinforcing the point that skepticism toward lunar farming still exists." Only Choice D refers back to the skeptics mentioned at the beginning of the paragraph, acknowledging that "many...conclude that the practice" of lunar farming is "based in folklore, not fact."

Choices A, B, and C are incorrect because, while each makes a logical connection with the preceding part of the sentence, none of the three refers back to the skeptics mentioned at the beginning of the paragraph.

> Question 33
>
> Which choice gives an additional supporting example that emphasizes the importance of the senses in judging the success of the lunar farming method?
>
> (A) NO CHANGE
> (B) She has taken photographs of the grapevines and landscape.
> (C) She takes careful notes about Ferrua's farming methods, asking Ferrua to clarify how he prepares the soil.
> (D) She dips bread into Ferrua's olive oil as he explains a soil preparation he does in the fall.

Item Difficulty: Medium
Content: Development / Support
Best Answer: A

Choice A is the best answer because it corresponds with the question's instructions to choose "an additional supporting example that emphasizes the importance of the senses." Professor Coffman's statement about the fragrant rosemary logically follows the English farmer's statement about his potatoes, as both use sensory impressions to attest to the success of lunar farming.

Choices B, C, and D are incorrect because each fails to provide an additional supporting example that demonstrates that Professor Coffman "has a similar response" to that of the English farmer. Choices B and D both involve the senses, but neither uses sensory impressions to judge the success of lunar farming. Choice C doesn't involve a sensory experience; it recounts an experience of information gathering.

> Question 34
>
> The writer is considering deleting the underlined portion (ending the sentence with a period). Should the writer make this deletion?
>
> A) Yes, because the underlined portion detracts from the paragraph's focus on the Szathmary collection.
> B) Yes, because the information in the underlined portion is provided in the previous sentence.
> C) No, because the underlined portion defines a term that is important to the passage.
> D) No, because the underlined portion gives an example of a particular culinary artifact.

Item Difficulty: Hard
Content: Development / Focus
Best Answer: C

Choice C is the best answer because the term "manuscript recipe books" is unclear without the underlined portion to define it.

Choice A is incorrect because the underlined portion is consistent with the paragraph's focus; it does not detract from it. Choice B is incorrect because the underlined information does not appear in the previous sentence. Choice D is incorrect because, while it asserts correctly that the underlined portion should not be deleted, it does not offer a persuasive reason for keeping the definition of "manuscript recipe books."

> Question 35
>
> A) NO CHANGE
> B) Regardless of
> C) In contrast to
> D) In addition to

Item Difficulty: Hard
Content: Organization / Introductions, conclusions, and transitions
Best Answer: A

Choice A is the best answer. "Because of" supports the cause-effect relationship between the two clauses in the sentence, which state that as result of the 20,000-item donation's size and range, figuring out how to make the information available to the public was "a challenge."

Choices B, C, and D are incorrect because they do not support the cause-effect relationship between the two clauses.

> Question 36
>
> A) NO CHANGE
> B) donation of so many culinary artifacts,
> C) massive donation of cookbooks,
> D) donation,

Item Difficulty: Hard
Content: Effective Language Use / Concision
Best Answer: D

Choice D is the best answer because it does not contain information that has already been established in the preceding sentences of the passage.

Choices A, B, and C are incorrect because they repeat information already established in the preceding sentences of the passage.

> Question 37
>
> A) NO CHANGE
> B) for
> C) and
> D) but

Item Difficulty: Medium
Content: Sentence Structure / Sentence formation / Subordination and coordination
Best Answer: D

Choice D is the best answer because it provides a conjunction, "but," that accurately reflects the relationship between the two clauses. This relationship contrasts the librarians' desire to share all the objects in the collection with the problem of presenting the delicate manuscripts.

Choices A, B, and C are incorrect because each provides a conjunction that does not reflect the relationship between the two clauses.

> Question 38
>
> A) NO CHANGE
> B) his or her
> C) their
> D) one's

Item Difficulty: Medium
Content: Conventions of Usage / Agreement / Pronoun-antecedent agreement
Best Answer: C

Choice C is the best answer because the possessive pronoun "their" grammatically corresponds to the plural "volunteers."

Choice A is incorrect because it provides a possessive pronoun that would correspond with "we," which would only be valid if the writer were part of the group of volunteers. Choices B and D are incorrect because each provides a possessive pronoun for a singular noun, yet the subject of the clause is the plural noun "volunteers."

> Question 39
>
> A) NO CHANGE
> B) simple directions
> C) bare-bones how-tos
> D) facile protocols

Item Difficulty: Medium
Content: Effective Language Use / Style and tone
Best Answer: B

Choice B is the best answer because it offers wording that is clear and consistent with the style of the passage.

Choices A and D are incorrect because both use jargon, or unnecessarily esoteric language, which is inconsistent with the passage's formal yet accessible style. Choice C is incorrect because the wording is clunky and too colloquial for the passage's style.

> Question 40
>
> A) NO CHANGE
> B) therefore,
> C) however,
> D) in short,

Item Difficulty: Medium
Content: Organization / Introductions, conclusions, and transitions
Best Answer: C

Choice C is the best answer. It provides a conjunction, "however," which captures the contrast between transcribing the recipes, described as "easy," and recognizing some of the ingredients and measurements in the recipes, described as "puzzling."

Choices A, B, and D are incorrect because each fails to capture the relationship between the sentence in which the conjunction appears and the sentence preceding it. Choice A is incorrect because it proposes a conjunction that suggests the sentence is building upon information in the previous sentence. Choice B is incorrect because "therefore" suggests a cause-effect relationship between the two sentences. Choice D is incorrect because it suggests that the second sentence is providing a shortened version of information introduced in the first sentence. Instead, the difference between "easy" in the first sentence of the sequence and "puzzling" in the second denotes a contrast.

> Question 41
>
> A) NO CHANGE
> B) access to
> C) excess of
> D) excess to

Item Difficulty: Easy
Content: Conventions of Usage / Frequently confused words
Best Answer: B

Choice B is the best answer because it provides the correct noun, "access," to indicate the ability to utilize something, and the correct preposition, "to," to link the noun to the prepositional phrase that follows it.

Choice A is incorrect because it provides a noun and preposition combination that does not correspond to standard English. Choices C and D are incorrect because both present the noun "excess," which is a close homonym of "access," but means a surfeit or overabundance.

> Question 42
>
> A) NO CHANGE
> B) work
> C) worked
> D) could have worked

Item Difficulty: Hard
Content: Sentence Structure / Inappropriate shifts in construction / Verb tense, mood, and voice
Best Answer: B

Choice B is the best answer because it provides a verb in the present tense ("work"), which is consistent with the present tense verb "don't fare" that opens the sentence.

Choices A and C are incorrect because both use verbs in the past tense. Choice D is incorrect because the compound verb "could have worked" presents a possibility that is not consistent with the tone or purpose of the sentence, in which the writer is making a comparison between archival recipes that don't hold up well in the present day and those that do.

> Question 43
>
> A) NO CHANGE
> B) almond, cheesecake summer, mince,
> C) almond cheesecake summer, mince
> D) almond, cheesecake, summer, mince,

Item Difficulty: Easy
Content: Conventions of Punctuation / Items in a series
Best Answer: A

Choice A is the best answer because it provides items in a series that are whole discrete items, each one an example of a dessert from the Szathmary collection. Each item in the series is presented in standard English with the adjective preceding the main noun, for example, "summer mince pie."

Choices B, C, and D are incorrect because each one scrambles the names of the dessert items by separating the parts of their names by commas.

> Question 44
>
> The writer plans to add the following sentence to this paragraph.
>
> "The judges reported that the entries were delicious."
>
> To make this paragraph most logical, the sentence should be placed
>
> A) after sentence 1.
> B) after sentence 2.
> C) after sentence 3.
> D) after sentence 4.

Item Difficulty: Medium
Content: Organization / Logical sequence
Best Answer: D

Choice D is the best answer because the proposed sentence logically follows information about a contest at the Iowa State Fair. At no other point in the paragraph does the writer mention a contest.

Choices A, B, and C are incorrect because the writer has yet to state that there was a contest or other situation that involved an official judge, so placement of the proposed sentence after any of the first three sentences would be illogical.

Math Test – No Calculator Answer Explanations

Question 1
A babysitter earns $8 an hour for babysitting 2 children and an additional $3 tip when both children are put to bed on time. If the babysitter gets the children to bed on time, what expression could be used to determine how much the babysitter earned?
A) $8x + 3$, where x is the number of hours
B) $3x + 8$, where x is the number of hours
C) $x(8 + 2) + 3$, where x is the number of children
D) $3x + (8 + 2)$, where x is the number of children

Item Difficulty: Easy
Content: Heart of Algebra
Correct Answer: A

Choice A is the correct answer. Let x be the number of hours that the babysitter worked. Since the babysitter earns money at a rate of $8 per hour, she earned $8x$ dollars for the x hours worked. If the babysitter gets both children to bed on time, the babysitter earns an additional $3 tip. Therefore, the babysitter earned a total amount of $8x + 3$ dollars.

Choice B is incorrect since the tip and the rate per hour have been interchanged in the expression. Choices C and D are incorrect since the number of children is not part of how the babysitter's earnings are calculated.

Question 2

$$3(x + y) = y$$

If (x, y) is a solution to the equation above and $y \neq 0$, what is the ratio $\frac{x}{y}$?

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

B) $-\frac{2}{3}$

C) $\frac{1}{3}$

D) $\frac{2}{3}$

Item Difficulty: Medium
Content: Passport to Advanced Math
Correct Answer: B

Choice B is the correct answer. We can find the ratio $\frac{x}{y}$ by rearranging the equation. Multiplying out the expression on the left side of the equation yields $3x + 3y = y$. Then, subtracting $3y$ from both sides of the equation gives $3x = -2y$. Finally, dividing both sides of this equation by $3y$ (note that $y \neq 0$) gives $\frac{x}{y} = -\frac{2}{3}$

Choices A, C, and D are incorrect; they could result from errors during algebraic transformations of the equation $3(x + y) = y$.

Question 3

$$\frac{1}{2}x - \frac{1}{4}y = 10$$
$$\frac{1}{8}x - \frac{1}{8}y = 19$$

Which ordered pair (x, y) satisfies the system of equations above?

A) $(-112, -264)$

B) $(64, 88)$

C) $\left(\frac{232}{3}, \frac{224}{3}\right)$

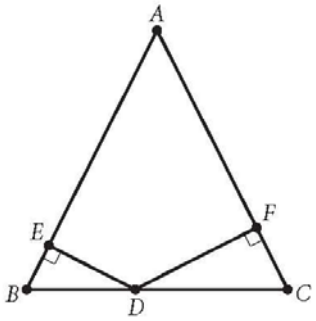
D) $(288, 536)$

Item Difficulty: Medium
Content: Heart of Algebra
Correct Answer: A

Choice A is the correct answer. First, we clear the fractions from the two given equations by multiplying both sides of the first equation by 4 and then both sides of the second equation by 8 (note that the new equations are equivalent to the original ones). Thus the system becomes $\begin{cases} 2x - y = 40 \\ x - y = 152 \end{cases}$. Subtracting side by side the second equation from the first eliminates the variable y, $(2x - y) - (x - y) = 40 - 152$, leaving an equation with just one variable, x. Solving this equation gives $x = -112$. Substituting -112 for x into the equation $x - y = 152$ gives $y = -264$. Therefore, $(-112, -264)$ is the ordered pair that satisfies the system of equations given.

Choices B, C, and D are incorrect since the ordered pair in each choice does not satisfy both equations in the system. For example, the ordered pair of choice B, $(64, 88)$, does not satisfy equation $\frac{1}{8}x - \frac{1}{8}y = 19$ because $\frac{1}{8}(64) - \frac{1}{8}(88) \neq 19$.

Question 4



Note: Figure not drawn to scale.

Triangle ABC above is isosceles with $AB = AC$ and $BC = 48$. The ratio of DE to DF is $5 : 7$. What is the length of $\overline{DC}$?

A) 12
B) 20
C) 24
D) 28

Item Difficulty: Medium
Content: Additional Topic in Math
Correct Answer: D

Choice D is the correct answer. The base angles, $\angle B$ and $\angle C$, of isosceles triangle ABC are congruent. Additionally, $\angle BED$ and $\angle CFD$ are both right angles and therefore are congruent. Because ΔBED and ΔCFD have two corresponding pairs of angles that are congruent, they are similar. Consequently, the corresponding sides of the similar triangles are proportional. So $\frac{BD}{DC} = \frac{DE}{DF}$, and since $\frac{DE}{DF} = \frac{5}{7}$, it follows that $\frac{BD}{DC} = \frac{5}{7}$. If we let $BD = 5x$, then $DC = 7x$. Since $BD + DC = BC$ and $BC = 48$, it follows that $5x + 7x = 48$. Solving this equation for x gives $x = 4$, and so DC is $7(4) = 28$.

Alternatively: Due to the similarity of ΔBED and ΔCFD, one can conclude that $\frac{BD}{DC} = \frac{5}{7}$, and so DC must be greater than half of BC, which is 24. Of the choices given, only one satisfies this condition, namely 28. If $DC = 28$, then $BD = 48 - 28 = 20$, confirming that $\frac{BD}{DC} = \frac{20}{28} = \frac{5}{7}$. Therefore, the length of $\overline{DC}$ must be 28.

Choices A, B, and C are incorrect because each of the values for DC would result in BC being less than 48 units long.

> Question 5
>
> In a certain game, a player can solve easy or hard puzzles. A player earns 30 points for solving an easy puzzle and 60 points for solving a hard puzzle. Tina solved a total of 50 puzzles playing this game, earning 1,950 points in all. How many hard puzzles did Tina solve?
> A) 10
> B) 15
> C) 25
> D) 35

Item Difficulty: Medium
Content: Heart of Algebra
Correct Answer: B

Choice B is the correct answer. Let x and y be the number of easy and hard puzzles, respectively, that Tina solved. Since she solved a total of 50 puzzles, it follows that $x + y = 50$. She earned a total of $1{,}950$ points, so it must also be true that $30x + 60y = 1{,}950$. Dividing both sides of this equation by 30 gives $x + 2y = 65$. Subtracting the first equation, $x + y = 50$, from the second equation, $x + 2y = 65$, gives $y = 15$. Therefore, Tina solved 15 hard puzzles.

Alternatively: Let x be the number of easy puzzles Tina solved. Then, $50 - x$ is the number of hard puzzles she solved. And since she earned a total of $1{,}950$ points, it must be true that $30x + 60(50 - x) = 1{,}950$. Solving this equation for x gives $x = 35$, and so $50 - x = 15$. Therefore, Tina solved 15 hard puzzles.

Choices A and C are incorrect because if the number of hard puzzles Tina solved were as they indicate, the total number of points she would earn will not be $1{,}950$. The incorrect answer in choice D could be the result of interchanging the number of hard puzzles and easy puzzles.

Question 6

$$2x^2 + 7x - 15 = 0$$

If r and s are two solutions of the equation above and $r > s$, which of the following is the value of $r - s$?

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

B) $\frac{13}{2}$

C) $\frac{11}{2}$

D) $\frac{3}{2}$

Item Difficulty: Medium
Content: Passport to Advanced Math
Correct Answer: B

Choice B is correct. This equation can be solved using the quadratic formula or factoring. The quadratic formula approach is left as an exercise for students. We will show first how to solve this equation using simple factoring and then will show how to solve it using both the structure of the equation and factoring.

Since $7x = 10x - 3x$, the given equation can be rewritten as $2x^2 + (10x - 3x) - 15 = 0$. Regrouping the terms so that the left side of the equation is in the factored form gives $(2x - 3)(x + 5) = 0$, from which it follows that $2x - 3 = 0$ or $x + 5 = 0$. Thus, the quadratic equation has solutions $\frac{3}{2}$ and -5. Since r and s are solutions to the quadratic equation and $r > s$, we can conclude that $r = \frac{3}{2}$ and $s = -5$; therefore, $r - s = \frac{3}{2} - (-5) = \frac{13}{2}$.

Alternatively: Multiplying the original equation by 2, we can rewrite it in terms of $2x$ as follows: $(2x)^2 + 7(2x) - 30 = 0$. Since the two numbers whose sum is -7 and whose product is -30 are -10 and 3, the equation will be factored as $(2x - 3)(2x + 10) = 0$, generating $\frac{3}{2}$ and -5 as solutions. Since r and s are solutions to the quadratic equation and $r > s$, we can conclude that $r = \frac{3}{2}$ and $s = -5$; therefore, $r - s = \frac{3}{2} - (-5) = \frac{13}{2}$.

Choices A, C, and D are incorrect and could result from calculating the value of expressions given in terms of the solutions r and s, but are not equivalent to the

difference $r - s$ of these solutions. For example, $\frac{15}{2}$ is the value of $-rs$, not the value of $r - s$.

> Question 7
>
> To cut a lawn, Allan charges a fee of $15 for his equipment and $8.50 per hour spent cutting a lawn. Taylor charges a fee of $12 for his equipment and $9.25 per hour spent cutting a lawn. If x represents the number of hours spent cutting a lawn, what are all the values of x for which Taylor's total charge is greater than Allan's total charge?
> A) $x > 4$
> B) $3 \le x \le 4$
> C) $4 \le x \le 5$
> D) $x < 3$

Item Difficulty: Medium
Content: Heart of Algebra
Correct Answer: A

Choice A is the correct answer. If x represents the number of hours spent cutting the lawn, the total fee that Allan charges is $8.5x + 15$ dollars and the total fee that Taylor charges is $9.25x + 12$ dollars. To find all of the values of x for which Taylor's total fee is greater than Allan's total fee, we solve the inequality $9.25x + 12 > 8.5x + 15$, which simplifies to $0.75x > 3$, and so $x > 4$.

Alternatively: Since Taylor's hourly rate charge is higher than Allan's, it can be concluded that after a certain amount of hours, Taylor's total charge will always be greater than Allan's total charge. Thus the inequality that represents all possible values of x for which this occurs will be of the form $x > a$ for some value a. Of the choices given, only $x > 4$ is in this form. Lastly, one can confirm that Taylor and Allan charge the same amount when $x = 4$. Therefore, choice A is correct.

Choice B is incorrect because Allan's total charge is greater than Taylor's total charge when $x < 4$. Choice C is incorrect because Allan's total charge and Taylor's total charge at $x = 4$ are exactly the same, and Taylor's total charge is greater than Allan's total charge also for values of x greater than 5. Choice D is incorrect because Allan's total charge is greater than Taylor's charge when x is less than 3.

Question 8

$$n = 456 - 3T$$

The equation above is used to model the relationship between the number of cups, n, of hot chocolate sold per day in a coffee shop and the average daily temperature, T, in degrees Fahrenheit. According to the model, what is the meaning of the 3 in the equation?

A) For every increase of 3°F, one more cup of hot chocolate will be sold.
B) For every decrease of 3°F, one more cup of hot chocolate will be sold.
C) For every increase of 1°F, three more cups of hot chocolate will be sold.
D) For every decrease of 1°F, three more cups of hot chocolate will be sold.

Item Difficulty: Medium
Content: Heart of Algebra
Correct Answer: D

Choice D is the correct answer. According to the model, if the average daily temperature is T degrees Fahrenheit, then the number of cups of hot chocolate sold per day in the coffee shop would be $456 - 3T$. If the temperature decreases by 1°F, then the number of cups of hot chocolate sold per day in the coffee shop would be $456 - 3(T - 1)$, which can be rewritten as $(456 - 3T) + 3$. Therefore, for every 1°F drop in the average daily temperature, the coffee shop sells three more cups of hot chocolate.

Choices A and B are incorrect because the change in the average daily temperature and the change in the number of cups of hot chocolate have been interchanged. Choice C is incorrect because, according to the model, the higher value of daily temperature corresponds to a lower, not higher, number of cups of hot chocolate sold.

Question 9

A truck enters a stretch of road that drops 4 meters in elevation for every 100 meters along the length of the road. The road is at 1,300 meters elevation where the truck entered, and the truck is traveling at 16 meters per second along the road. What is the elevation of the road, in meters, at the point where the truck passes t seconds after entering the road?

A) $1{,}300 - 0.04t$

B) $1{,}300 - 0.64t$

C) $1{,}300 - 4t$

D) $1{,}300 - 16t$

Item Difficulty: Medium
Content: Heart of Algebra
Best Answer: B

Choice B is the correct answer. Since the truck is traveling at 16 meters per second along the road, the distance it has traveled t seconds after entering the road is $16t$ meters. Since the elevation of the road drops 4 meters for every 100 meters along the length of the road, it follows that for $16t$ meters along the road, the elevation drops $\frac{4}{100}$ x $16t$ or $0.64t$. Therefore, the elevation of the road at the point where the truck passes t seconds after entering the road is $1{,}300 - 0.64t$ meters.

Choice A is incorrect because $\frac{4}{100}t$ would be the number of meters that the elevation drops t seconds after the truck enters the road if its speed were 1 meter per second. Choice C is incorrect because $4t$ meters does not give the number of meters the elevation of the road drops. Choice D is incorrect because the drop rate of 4 meters for every 100 meters along the road is not used.

Question 10

If $f(x-1)=2x+3$ for all values of x, what is the value of $f(-3)$?

A) -7
B) -5
C) -3
D) -1

Item Difficulty: Medium
Content: Passport to Advanced Math
Correct Answer: D

Choice D is correct. Since $f(x-1)=2x+3$ for all values of x, $f(-3)=f(-2-1)=2(-2)+3$, and so the value of $f(-3)$ is -1.

Alternatively: $2x+3$ can be rewritten as $2(x-1)+5$, and since $f(x-1)=2(x-1)+5$ for all values of x, it follows that $f(x)=2x+5$ for all values of x. Substituting -3 for x in this equation gives $f(-3)=2(-3)+5=-1$.

Choices A, B, and C are incorrect because f is a function, and there is one and only one value for $f(-3)$, which as shown above is -1. Therefore, neither of the choices, -7, -5, or -3 can be the value of $f(-3)$.

Question 11

Which of the following is equivalent to $(s-t)\left(\frac{s}{t}\right)$?

A) $\frac{s}{t}-s$
B) $\frac{s}{t}-st$
C) $\frac{s^2}{t}-s$
D) $\frac{s^2}{t}-\frac{s}{t^2}$

Item Difficulty: Medium
Content: Passport to Advanced Math
Correct Answer: C

Choice C is the correct answer. Using the distributive property to expand the given expression gives $s\left(\frac{s}{t}\right) - t\left(\frac{s}{t}\right) = \frac{s^2}{t} - s$.

Choices A, B, and D are incorrect. In each of these choices, at least one of the products in the expansion is not correct. For example $s\left(\frac{s}{t}\right) = \frac{s^2}{t}$, not $\frac{s}{t}$, and $t\left(\frac{s}{t}\right) = s$, not st or $\frac{s}{t}$.

Question 12

$$p(x) = 3(x^2 + 10x + 5) - 5(x - k)$$

In the polynomial $p(x)$ defined above, k is a constant. If $p(x)$ is divisible by x, what is the value of k?

A) −3
B) −2
C) 0
D) 3

Item Difficulty: Medium
Content: Passport to Advanced Math
Correct Answer: A

Choice A is the correct answer. If polynomial $p(x)$ is divisible by x, then x must be a factor of the polynomial, or equivalently, the constant term of the polynomial must be zero. Multiplying out on the right side of the equation gives $p(x) = 3x^2 + 30x + 15 - 5x + 5k$, which can be rewritten as $p(x) = 3x^2 + 25x + (5k + 15)$. Hence, $5k + 15 = 0$, and so $k = -3$.

Choices B, C, and D are the not correct answers because if the value of k were as indicated in those choices, then x would not be a factor of the polynomial $p(x)$, and so $p(x)$ would not be divisible by x.

Question 13

In the xy-plane, if the parabola with equation $y = ax^2 + bx + c$, where a, b, and c are constants, passes through the point $(-1, 1)$, which of the following must be true?

A) $a - b = 1$
B) $-b + c = 1$
C) $a + b + c = 1$
D) $a - b + c = 1$

Item Difficulty: Hard
Content: Passport to Advanced Math
Correct Answer: D

Choice D is the correct answer. If the graph of a parabola passes through the point $(-1, 1)$, then the ordered pair $(-1, 1)$ must satisfy the equation of the parabola. Thus, $1 = a(-1)^2 + b(-1) + c$, which is equivalent to $a - b + c = 1$.

Choices A, B, and C are incorrect and could result from misinterpreting what it means for the point (–1, 1) to be on the parabola or from common calculation errors while expressing this fact algebraically.

Question 14

For what value of h is $24 = \frac{h}{10} - 6$?

Item Difficulty: Easy
Content: Heart of Algebra
Correct Answer: 300

The correct answer is 300. To solve the given equation for h, first add 6 to both sides of the equation to get $30 = \frac{h}{10}$. Then multiply both sides of this equation by 10 to yield $h = 300$.

Question 15

What is the value of a if $(2a + 3) - (4a - 8) = 7$?

Item Difficulty: Medium
Content: Heart of Algebra
Correct Answer: 2

The correct answer is 2. The equation given can be rewritten as $2a + 3 - 4a + 8 = 7$, which is equivalent to $-2a + 11 = 7$, and so $a = 2$.

Question 16

If x is not equal to zero, what is the value of $\frac{4(3x)^2}{(2x)^2}$?

Item Difficulty: Medium
Content: Passport to Advanced Math
Correct Answer: 9

The correct answer is 9. Multiplying out the given expression gives $\frac{4(9x^2)}{4x^2}$. Since $x \neq 0$, dividing both the numerator and the denominator of the fraction by $4x^2$ simplifies the expression to 9.

Question 17

If $x - 2$ is a factor of $x^2 - bx + b$, where b is a constant, what is the value of b ?

Item Difficulty: Hard
Content: Passport to Advanced Math
Correct Answer: 4

The correct answer is 4. If $x - 2$ is a factor of $x^2 - bx + b$, where b is a constant, then $x^2 - bx + b$ can be written as the product $(x - 2)(x - a)$ for some real number a. Expanding $(x - 2)(x - a)$ gives $x^2 - 2x - ax + 2a$, which can be rewritten as $x^2 - (2 + a)x + 2a$. Hence, $x^2 - (2 + a)x + 2a = x^2 - bx + b$ is true for all values of x. Consequently, the coefficients of like terms on each side of the equation must be the same: $2 + a = b$ and $2a = b$. Solving this system gives $b = 4$.

Alternatively: Since $x - 2$ is a factor of $x^2 - bx + b$ and $(x - 2)^2 = x^2 - 4x + 4$,one can correctly conclude that the value of b is 4.

Math Test – Calculator Answer Explanations

Question 1

Tyra subscribes to an online gaming service that charges a monthly fee of $5.00 and $0.25 per hour for time spent playing premium games. Which of the following functions gives Tyra's cost, in dollars, for a month in which she spends x hours playing premium games?

A) $C(x) = 5.25x$
B) $C(x) = 5x + 0.25$
C) $C(x) = 5 + 0.25x$
D) $C(x) = 5 + 25x$

Item Difficulty: Easy
Content: Heart of Algebra
Correct Answer: C

Choice C is the correct answer. Tyra pays $\$0.25$ per hour for time spent playing premium games, so for the month in which she spends x hours playing premium games, she pays $0.25x$ dollars for playing the premium games. She also pays an additional $\$5$ monthly fee. Therefore, Tyra's cost, in dollars, for the month in which she spends x hours playing premium games is given by the function $C(x) = 5 + 0.25x$.

Choice A is incorrect because Tyra is not charged $\$5.25$ per hour for time playing premium games. Choice B is incorrect because the charge per hour has been interchanged with the monthly fee. Choice D is incorrect because $25x$ is the charge for playing premium games in cents, not in dollars.

Question 2

A grocery store sells a brand of juice in individual bottles and in packs of 6 bottles. On a certain day, the store sold a total of 281 bottles of the brand of juice, of which 29 were sold as individual bottles. Which equation shows the number of packs of bottles, p, sold that day?

A) $p = \frac{281 - 29}{6}$

B) $p = \frac{281 + 29}{6}$

C) $p = \frac{281}{6} - 29$

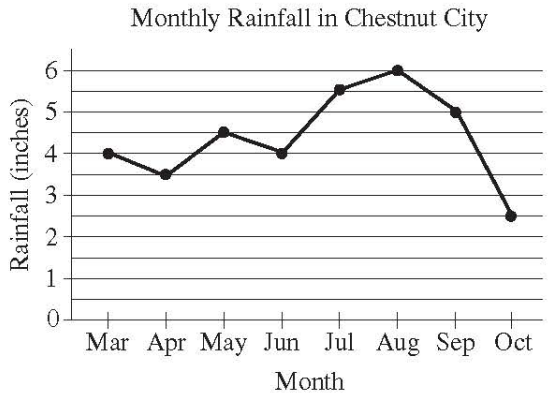
D) $p = \frac{281}{6} + 29$

Item Difficulty: Easy
Content: Heart of Algebra
Correct Answer: A

Choice A is the correct answer. Since the store sold a total of 281 bottles, 29 of which were sold individually, it follows that 281 – 29 bottles were sold in packs of 6 bottles. Therefore, the number of packs of bottles, p, sold that day in the store is $p = \frac{281-29}{6}$.

Choice B is incorrect. Adding the number of bottles sold individually, 29, to the total number of bottles sold, 281, does not give the number of bottles that were sold in packs of 6. Choices C and D are incorrect and could result from dividing all of the bottles into groups of 6 (incorrectly assuming that all 281 bottles of juice were sold in packs of 6), and either subtracting the 29 bottles sold individually from that result, as in choice C, or adding the 29 bottles to that result, as in choice D.

Question 3



The line graph above shows the monthly rainfall from March to October last year in Chestnut City. According to the graph, what was the greatest change (in absolute value) in the monthly rainfall between two consecutive months?

A) 1.5 inches
B) 2.0 inches
C) 2.5 inches
D) 3.5 inches

Item Difficulty: Medium
Content: Probability and Data Analysis
Correct Answer: C

Choice C is the correct answer. The greatest change (in absolute value) in monthly rainfall could be an increase or a decrease in monthly rainfall. The table below shows the approximate changes in monthly rainfall in Chestnut City last year between each of the two consecutive months.

Consecutive months	Change in monthly rainfall (inches)
March to April	0.5
April to May	1
May to June	0.5
June to July	1.5
July to August	0.5
August to September	1
September to October	2.5

Of the values on the right column, the greatest is from September to October, which is a change of 2.5 inches.

Choices A, B, and D are incorrect because they contain values that either do not represent any of the changes in monthly rainfall between two consecutive months or that are not the greatest change.

Question 4

A rectangle has perimeter P, length ℓ and width w. Which of the following represents ℓ in terms of P and w ?

A) $\ell = P - w$

B) $\ell = \frac{2P - w}{2}$

C) $\ell = \frac{P - 2w}{2}$

D) $\ell = 2P - 2w$

Item Difficulty: Medium
Content: Passport to Advanced Math
Correct Answer: C

Choice C is the correct answer. The perimeter of a rectangle is the sum of the four sides and can be calculated using the formula $P = 2\ell + 2w$, where ℓ is the length and w is the width of the rectangle. Subtracting 2w from both sides of the equation gives

$P - 2w = 2\ell$, and then dividing by 2 yields $\ell = \frac{P - 2w}{2}$.

Choice A is incorrect. This choice does not use the fact that the perimeter of a rectangle is the sum of two length and two widths. Choice B and D are incorrect. In each of these choices, the equation incorrectly doubles the perimeter.

Question 5

Which ordered pair (x, y) satisfies the system of equations shown below?

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

A) $(-6, 2)$
B) $(-2, 2)$
C) $(2, -2)$
D) $(4, 2)$

Item Difficulty: Medium
Content: Heart of Algebra
Correct Answer: C

Choice C is the correct answer. To eliminate y, the first equation in the system can be multiplied by 2 and then the equations can be added as shown below.

$$\begin{array}{r} 4x - 2y = 12 \\ x + 2y = -2 \\ \hline 5x + 0 = 10 \end{array}$$

Since the result is $5x = 10$, it follows that $x = 2$. Substituting 2 for x into the equation $x + 2y = -2$ gives $2 + 2y = -2$ and so $y = -2$. Therefore, $(2, -2)$ is the solution to the system given.

Alternatively: Use the substitution method to solve the system. For example, the first equation can be rewritten as $y = 2x - 6$. Substituting $2x - 6$ for y in the second equation gives $x + 2(2x - 6) = -2$, and so $x = 2$. Finally, substituting 2 for x in $y = 2x - 6$ gives $y = -2$, leading to the same solution of the system, namely $(2, -2)$.

Choice B is incorrect. The value for x and the value for y have been reversed in the ordered pair. Choices A and D are incorrect. The ordered pair in each of these choices does not satisfy at least one of the equations in the system. For example, the ordered pair $(4, 2)$ does not satisfy the equation $x + 2 = -2$, since $4 + 2(2) \neq -2$.

Question 6

A soda company is filling bottles of soda from a tank that contains 500 gallons of soda. At most, how many 20-ounce bottles can be filled from the tank? (1 gallon = 128 ounces)
A) 25
B) 78
C) 2,560
D) 3,200

Item Difficulty: Easy
Content: Probability and Data Analysis
Correct Answer: D

Choice D is the correct answer. Since 1 gallon equals 128 ounces, 500 gallons equal $(500)(128) = 64{,}000$ ounces. Therefore, the maximum number of 20-ounce bottles that can be filled with the soda from the tank is $\frac{64,000}{20} = 3,200$.

Choice A is incorrect and could result from dividing 500 (the number of gallons contained in the tank) by 20 (the capacity of one bottle, in ounces). The gallons need to be converted into ounces first, and then the result can be divided by 20. Choices B and C are incorrect because they do not give the maximum number of 20-ounce bottles that can be filled from the soda in the tank.

Question 7

A car traveled at an average speed of 80 miles per hour for 3 hours and consumed fuel at a rate of 34 miles per gallon. Approximately how many gallons of fuel did the car use for the entire 3-hour trip?
A) 2
B) 3
C) 6
D) 7

Item Difficulty: Medium
Content: Probability and Data Analysis
Correct Answer: D

Choice D is the correct answer. Since the car traveled at an average speed of 80 miles per hour, the distance the car traveled during 3 hours is $(80)(3) = 240$ miles.

The car consumed fuel at a rate of 34 miles per gallon, so the car used $\frac{240}{34}$ gallons of fuel, which is approximately 7 gallons of fuel.

Choices A, B, and C are incorrect. For each of these choices, the amount of fuel is not enough to travel the entire 240 miles.

Question 8

What is the slope of the line in the xy-plane that passes through the points $\left(-\frac{5}{2}, 1\right)$ and $\left(-\frac{1}{2}, 4\right)$?

A) -1

B) $-\frac{2}{3}$

C) 1

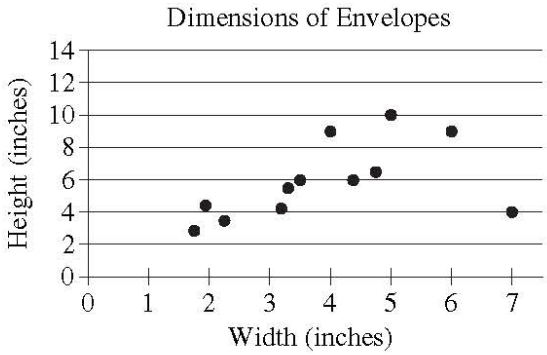
D) $\frac{3}{2}$

Item Difficulty: Medium
Content: Heart of Algebra
Correct Answer: D

Choice D is the correct answer. In the xy-plane, the slope m of a line that passes through the points (x_1, y_1) and (x_2, y_2) is the change in y over the change in x (rise over run), which is expressed by the formula $m = \frac{y_2 - y_1}{x_2 - x_1}$. Thus, the slope of the line through the points $\left(-\frac{5}{2}, 1\right)$ and $\left(-\frac{1}{2}, 4\right)$ is $\frac{4 - 1}{-\frac{1}{2} - \left(-\frac{5}{2}\right)}$, which simplifies to $\frac{3}{2}$.

Choices A and C are incorrect because the change in y and the change in x do not have the same magnitude. Choice B is incorrect; the fraction $-\frac{2}{3}$ is the negative reciprocal of the slope of the line through the points $\left(-\frac{5}{2}, 1\right)$ and $\left(-\frac{1}{2}, 4\right)$.

Question 9



The scatterplot above shows the widths and the heights of 12 types of rectangular envelopes. What is the width, in inches, of the envelope represented by the data point that is farthest from the line of best fit (not shown)?

A) 2
B) 5
C) 7
D) 12

Item Difficulty: Medium
Content: Probability and Data Analysis
Correct Answer: C

Choice C is the correct answer. The data point that is farthest from the line of best fit is located at (7, 4), which means that this point represents a type of envelope that is 7 inches wide and 4 inches high.

Choices A and B are incorrect because none of the data points with width 2 or width 5 is the farthest from the line of best fit. Choice D is incorrect because the scatterplot does not contain any points with width 12 inches.

Question 10

A high school basketball team won exactly 65 percent of the games it played during last season. Which of the following could be the total number of games the team played last season?
A) 22
B) 20
C) 18
D) 14

Item Difficulty: Medium
Content: Probability and Data Analysis
Correct Answer: B

Choice B is the correct answer. The number of games won by the basketball team must be a whole number. Since 65% is equivalent to $\frac{13}{20}$, it follows that, of the choices given, the total number of games the team played last season can only be 20. Multiplying $\frac{13}{20}$ by each of the other answer choices does not result in a whole number.

Choices A, C, and D are incorrect because 65% of each of the numbers in the choices results in non-whole numbers.

Question 11

$$110x + y = 1{,}210$$

A coffee shop is running a promotion where a number of free coffee samples are given away each day. The equation above can be used to model the number of free coffee samples, y, that remain to be given away x days after the promotion began. What does it mean that (11, 0) is a solution to this equation?
A) During the promotion, 11 samples are given away each day.
B) It takes 11 days during the promotion to see 1,210 customers.
C) It takes 11 days during the promotion until none of the samples are remaining.
D) There are 11 samples available at the start of the promotion.

Item Difficulty: Medium
Content: Heart of Algebra
Correct Answer: C

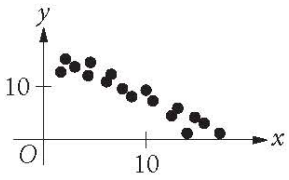
Choice C is the correct answer. Since x represents the number of days after the promotion began and y represents the remaining number of coffee samples, the fact that the ordered pair $(11, 0)$ is a solution to the given equation means that it takes 11 days during the promotion until none of the samples are remaining.

Choice A is incorrect; if 11 samples were given away each day, then the coefficient of x in the equation would be 11. Therefore, this is not the correct interpretation of $(11, 0)$ as a solution to the equation. Choice B is incorrect; the total number of free coffee samples given away during 11 days of the promotion was $1{,}210$. But the number of customers who were in the store during those days need not be $1{,}210$. Choice D is incorrect; according to the given equation, there were $1{,}210$, not 11, samples available at the start of the promotion.

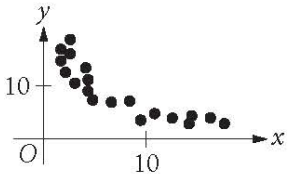
Question 12

Which scatterplot shows a negative association that is not linear? (Note: A negative association between two variables is one in which higher values of one variable correspond to lower values of the other variable, and vice versa.)

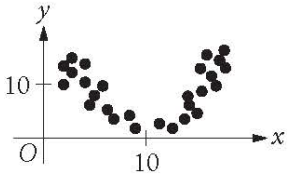
A)



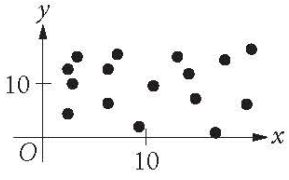
B)



C)



D)

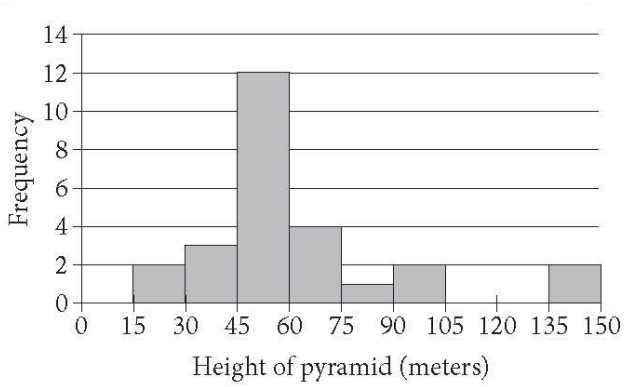


Item Difficulty: Medium
Content: Probability and Data Analysis
Correct Answer: B

Choice B is the correct answer. Of the choices given, only the scatterplots in A and B show a negative association between variables x and y, and of these two associations, the one depicted in choice B is not linear.

Choice A is incorrect. The association depicted in this scatterplot is negative, but it can also be linear. Choice C is incorrect. The association depicted in this scatterplot is not linear. However, for x greater than 10, the association between x and y is positive. Choice D is incorrect. There is no clear association between x and y in this scatterplot.

Question 13



The histogram above shows the distribution of the heights, in meters, of 26 pyramids in Egypt. Which of the following could be the median height of the 26 pyramids represented in the histogram?

A) 44 meters
B) 48 meters
C) 63 meters
D) 77 meters

Item Difficulty: Medium
Content: Probability and Data Analysis
Correct Answer: B

Choice B is the correct answer. The median of a data set is the middle value when the data points are sorted in either ascending or descending order. When the number of the data points is even, then the median is the mean of the two middle values of the sorted data. Hence, the median height of the 26 pyramids is the mean

of the 13th and 14th tallest pyramids. Since the number of pyramids that are less than 30 meters high is 5 and the number of pyramids that are less than 60 meters high is 17, the median height of the 26 pyramids must be between 45 and 60 meters. Therefore, of the choices given, only 48 meters could be the median height of the 26 pyramids.

Choices A, C, and D are incorrect because the median height of the 26 pyramids cannot be less than 45 meters or greater than 60 meters.

Questions 14-16 refer to the following information.
A survey of 170 randomly selected teenagers aged 14 through 17 in the United States was conducted to gather data on summer employment of teenagers. The data are shown in the table below.

	Have a summer job	Do not have a summer job	Total
Ages 14–15	20	69	89
Ages 16–17	39	42	81
Total	59	111	170

Question 14
Which of the following is closest to the percent of those surveyed who had a summer job?
A) 22%
B) 35%
C) 47%
D) 53%

Item Difficulty: Medium
Content: Probability and Data Analysis
Correct Answer: B

Choice B is the correct answer. The number of teenagers surveyed in the data is 170. Of those surveyed, a total of 59 teenagers had a summer job; thus, the percent of those teenager surveyed who had a summer job is $\frac{59}{170} = 0.347$, which rounds to 35%.

Choice A is incorrect. This choice, 22%, is the approximate percent $\left(\frac{20}{89} \approx 0.22\right)$ of teenagers aged 14 to 15 who had summer jobs. But that is not precisely what is

asked in this question. Choices C and D are incorrect and may be the result of calculating relative frequencies that are different from what the problem asks.

> Question 15
> In 2012 the total population of individuals in the United States who were between 14 and 17 years old (inclusive) was about 17 million. If the survey results are used to estimate information about summer employment of teenagers across the country, which of the following is the best estimate of the total number of individuals between 16 and 17 years old in the United States who had a summer job in 2012?
> A) 8,200,000
> B) 3,900,000
> C) 2,000,000
> D) 390,000

Item Difficulty: Hard
Content: Probability and Data Analysis
Correct Answer: B

Choice B is the correct answer. In 2012, the total population of individuals in the United States who were between 14 and 17 years old (inclusive) was about 17 million, which is 10^5 times the size of the survey sample, 170. Since of those surveyed, 39 teenagers aged 16 to 17 had a summer job, it follows that the best estimate of the total number of individuals aged 16 to 17 in the United States who had a summer job in 2012 was $39 \times 10^5 = 3{,}900{,}000$.

Choices A, C, and D are incorrect and are likely the result of either conceptual or calculation errors made.

> Question 16
> Based on the data, how many times more likely is it for a 14 year old or a 15 year old to NOT have a summer job than it is for a 16 year old or a 17 year old to NOT have a summer job? (Round the answer to the nearest hundredth.)
> A) 0.52 times as likely
> B) 0.65 times as likely
> C) 1.50 times as likely
> D) 1.64 times as likely

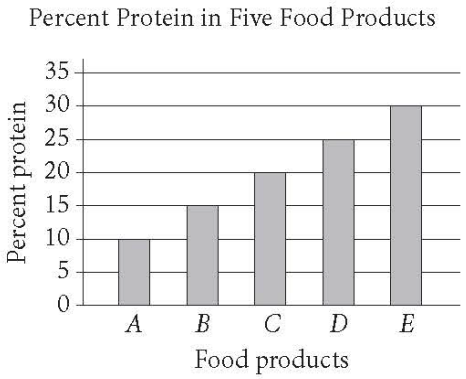
Item Difficulty: Hard
Content: Probability and Data Analysis
Correct Answer: C

Choice C is the correct answer. According to the data shown in the table, 69 out of 89 teenagers aged 14 to 15 did not have summer jobs. So for a 14- or 15-year-old, the likelihood of not having a summer job is $\frac{69}{89}$. And since 42 out of 81 teenagers aged 16 to 17 did not have a summer job, the likelihood that a 15- or 16-year-old not having a summer job is $\frac{42}{81}$. Therefore, a 14- or 15-year-old is $\frac{69}{89} \div \frac{42}{81} = \frac{1{,}863}{1{,}246} = 1.49518$, or about 1.50, times more likely to not have a summer job.

Choice A is incorrect. This choice could result from calculating the likelihood that a teenager aged 16 to 17 will not have a summer job $\left(\frac{42}{81}\right)$. Choice B is incorrect. This choice could result from calculating the likelihood that a teenager aged 14 through 17 will not have a summer job is $\left(\frac{111}{170}\right)$. Choice D is incorrect. This choice could result from calculating the ratio of the number of teenagers aged 14 to 15 who do not have a summer job (69) to the number of teenagers aged 16 to 17 who do not have a summer job (42). If the total number of those surveyed in the two different groups were the same, this result would be correct. But the sizes of the two groups are different; therefore, the result obtained is incorrect.

▲

Question 17



The graph above shows the amount of protein supplied by five different food products, A, B, C, D, and E, as a percentage of their total weights. The costs of 10 grams of products A, B, C, D, and E are \$2.00, \$2.20, \$2.50, \$4.00, and \$5.00, respectively. Which of the five food products supplies the most protein per dollar?

A) A
B) B
C) C
D) E

Item Difficulty: Medium
Content: Probability and Data Analysis
Correct Answer: C

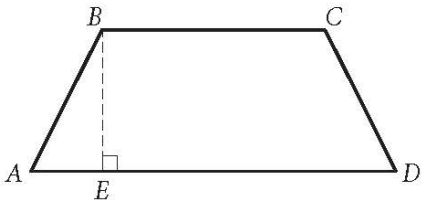
Choice C is the correct answer. The table below organizes the information in the graph and the additional data needed to answer the question.

Food product	Cost of 10 grams of product	Amount of product (in grams)	Percent protein	Amount of protein (in grams)	Protein per dollar (in grams/dollar)
A	\$2.00	10	10%	0.1(10) = 1	$\frac{10(0.1)}{2} = 0.5$
B	\$2.20	10	15%	0.15(10) = 1.5	$\frac{10(0.15)}{2.2} = 0.68$
C	\$2.50	10	20%	0.2(10) = 2	$\frac{10(0.2)}{2.5} = 0.8$
D	\$4.00	10	25%	0.25(10) = 2.5	$\frac{10(0.25)}{4} = 0.625$
E	\$5.00	10	30%	0.3(10) = 3	$\frac{10(0.3)}{5} = 0.6$

According to the table, food product C provides the most protein per dollar (0.8).

Choices A, B, and D are incorrect. For each choice, the protein per dollar for each of the food products is less than 0.8 grams of protein per dollar.

Question 18



In quadrilateral $ABCD$ above, $\overline{BC}$ is parallel to $\overline{AD}$, and $AB = CD$. If BC and AD were each doubled and BE was reduced by 50 percent, how would the area of ABCD change?

A) The area of ABCD would be decreased by 50 percent.
B) The area of ABCD would be increased by 50 percent.
C) The area of ABCD would not change.
D) The area of ABCD would be multiplied by 2.

Item Difficulty: Medium
Content: Passport to Advanced Math
Correct Answer: C

Choice C is the correct answer. Quadrilateral $ABCD$ is a trapezoid, and the formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$, where b_1 and b_2 are the bases of the trapezoid (BC and AD) and h is the height (BE). If the bases (BC and AD) are each doubled and the height (BE) is reduced by 50%, then the area of the new trapezoid $ABCD$ would be $\frac{1}{2}\left(\frac{h}{2}\right)(2b_1 + 2b_2)$, which after multiplying out becomes $\frac{1}{2}h(b_1 + b_2)$, the same as the area of the original trapezoid. Therefore, the area of the trapezoid would not change.

Choice A is incorrect. This choice does not take into account the changes to the bases, BC and AD. Choice B is incorrect. This choice could result from incorrectly interpreting the impact of doubling the bases on the area of $ABCD$ as a 100% increase and the impact of reducing the height by 50% as a 50% decrease, resulting

in a combined $100\% - 50\% = 50\%$ increase of the area. Choice D is incorrect. This choice does not take into account the change to height, BE.

> Question 19
> Boyd grows only tomatoes and raspberries in his garden. Last year, he grew 140 pounds of tomatoes and 60 pounds of raspberries. This year, the production, by weight, of tomatoes declined by 20 percent, and the production, by weight, of raspberries declined by 50 percent. By what percentage did the total yield, by weight, of Boyd's garden decline?
> A) 29 percent
> B) 30 percent
> C) 35 percent
> D) 70 percent

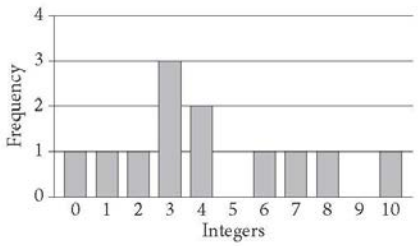
Item Difficulty: Hard
Content: Probability and Data Analysis
Correct Answer: A

Choice A is the correct answer. Since Boyd's production of tomatoes declined by 20% and the production of raspberries declined by 50% from the previous year, this year, his tomato production was $140 - 0.2(140) = 112$ pounds and his raspberry production was $60 - 0.5(60) = 30$ pounds. The percent decline in the total yield is the decline in the number of pounds of tomatoes and raspberries divided by the original number of pounds of tomatoes and raspberries, which is

$$\frac{28 + 30}{140 + 60} = 0.29 = 29\%.$$

Choice B is incorrect. This choice is close to the answer, but rounding may have erroneously led to this answer. Choice C is incorrect. This choice, 35%, may be a result of calculating the mean of 20% and 50%. Choice D is incorrect. This choice is the approximate percent weight of the tomatoes and raspberries produced this year compared to the last year, but that's not what the problem asks for.

Question 20



The graph above shows the frequency distribution of a list of randomly generated integers between 0 and 10. What is the mean of the list of numbers?

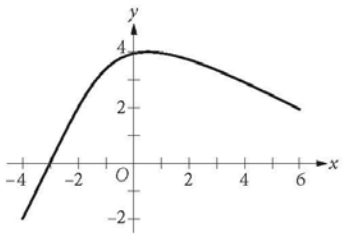
A) 3.0
B) 3.5
C) 4.25
D) 12.0

Item Difficulty: Medium
Content: Probability and Data Analysis
Correct Answer: C

Choice C is the correct answer. There are 12 integers in the list, and some of them are repeated at the frequencies shown in the graph. So the mean of the list of numbers is the sum of the numbers (repeats included) divided by 12. That is $\frac{0+1+2+3(3)+2(4)+6+7+8+10}{12} = 4.25$.

Choice A is incorrect; 3 is the mode, not the mean, of the list of numbers. Choice B is incorrect; 3.5 is the median, not the mean, of the list of numbers. Choice D is incorrect; 12 is the total number of the integers in the list.

Question 21



What is the minimum value of the function graphed on the xy-plane above, for $-4 \le x \le 6$?

A) $-\infty$

B) -4

C) -2

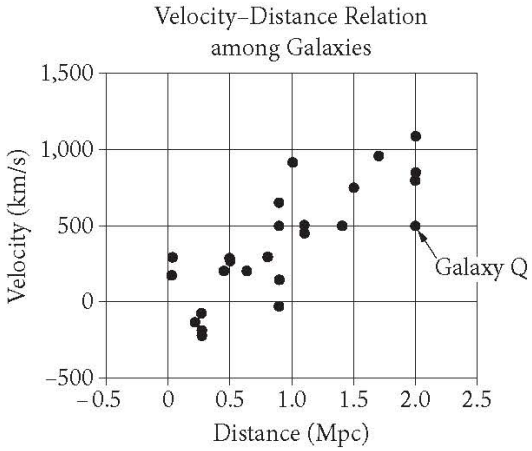
D) 1

Item Difficulty: Hard
Content: Passport to Advanced Math
Correct Answer: C

Choice C is the correct answer. The minimum value of a graphed function is the minimum y-value of all the points on the graph. For the graph shown, the minimum is at the left endpoint of the graph, the y-value of which is -2.

Choice A is incorrect. If the graph would continue indefinitely downward, then the minimum value of the function would be negative infinity. However, the domain of the function is restricted $(-4 \le x \le 6)$ and the minimum value of the graph occurs at point $(-4, -2)$. Choice B is incorrect; -4 is the x-value of the point on the graph where the minimum value of the function occurs. Choice D is incorrect because there are points of the graph below the x-axis; therefore, the minimum value of the function cannot be positive.

Questions 22-24 refer to the following information.
In 1929, the astronomer Edwin Hubble published the data shown. The graph plots the velocity of galaxies relative to Earth against the distances of galaxies from Earth.



Hubble's data can be modeled by the equation $v = 500d$, where v is the velocity, in kilometers per second, at which the galaxy is moving away from Earth and d is the distance, in megaparsecs, of the galaxy from Earth. Assume that the relationship is valid for larger distances than are shown in the graph. (A megaparsec (Mpc) is 3.1×10^{19} kilometers.)

Question 22
According to Hubble's data, how fast, in meters per second, is Galaxy Q moving away from Earth?
A) 2×10^6 m/s
B) 5×10^5 m/s
C) 5×10^2 m/s
D) 2.5×10^2 m/s

Item Difficulty: Hard
Content: Probability and Data Analysis
Correct Answer: B

Choice B is the correct answer. The coordinates of the data point that represent Galaxy Q on the scatterplot are (2.0, 500), which means that Galaxy Q is at a distance of about 2.0 Mpc from Earth and moves away from Earth at a velocity of approximately 500 km/s. The question asks for the velocity in meters per second; therefore, kilometers (km) need to be converted into meters (m). Since 1 km is

equal to $1{,}000\ m$, it follows that Galaxy Q is moving away from Earth at a velocity of $500 \times 1{,}000$ m/s, or 5×10^5 m/s.

Choices A, C, and D are incorrect and may result from an incorrect interpretation of the coordinates of the point that represents Galaxy Q on the scatterplot or an incorrect conversion of the units.

> Question 23
> There are four galaxies shown in the graph at approximately 0.9 Mpc from Earth. Which of the following is closest to the range of velocities of these four galaxies, in kilometers per second?
> A) 100
> B) 200
> C) 450
> D) 700

Item Difficulty: Hard
Content: Probability and Data Analysis
Correct Answer: D

Choice D is the correct answer. The velocities, in km/s, of the four galaxies shown in the graph at approximately 0.9 Mpc from Earth are about -50, $+200$, $+500$, and $+650$. Thus, the range of the four velocities is approximately $650 - (-50) = 700$ km/s.

Choices A, B, and C are incorrect. The range of velocities is the difference between the largest and smallest velocity. Each of the answer choices A, B, and C are too small compared to the real value of the range.

> Question 24
> Based on the model, what is the velocity, in kilometers per second, of a galaxy that is 15 Mpc from Earth?
> A) 7,500 km/s
> B) 5,000 km/s
> C) 1,100 km/s
> D) 750 km/s

Item Difficulty: Medium
Content: Heart of Algebra
Correct Answer: A

Choice A is the correct answer. The model indicates that the relationship between the velocities of the galaxies, in km/s, and their distance from Earth, in Mpc, is $v = 500d$. Therefore, the velocity of a galaxy that is 15 Mpc from Earth is $v = 500(15)$ km/s, or $7{,}500$ km/s.

Based on the model, the other choices are incorrect: Choice B is the speed of a galaxy that is 10 Mpc from Earth. Choice C is the speed of a galaxy that is 2.2 Mpc from Earth. Choice D is the speed of a galaxy that is 1.5 Mpc from Earth.

▲

Question 25
Janice puts a fence around her rectangular garden. The garden has a length that is 9 feet less than 3 times its width. What is the perimeter of Janice's fence if the area of her garden is 5,670 square feet?
A) 342 feet
B) 318 feet
C) 300 feet
D) 270 feet

Item Difficulty: Hard
Content: Passport to Advanced Math
Correct Answer: A

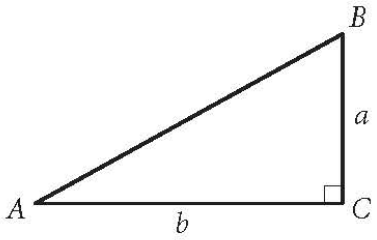
Choice A is the correct answer. Let w represent the width of Janice's garden and $3w - 9$ represent the length of Janice's garden. Since the area of Janice's garden is 5,670 square feet, it follows that $w(3w - 9) = 5{,}670$, which after dividing by 3 on both sides simplifies to $w(w - 3) = 1{,}890$.

From this point on, different ways could be used to solve this equation. One could rewrite this quadratic equation in the standard form and use the quadratic formula to solve it. Another approach would be to look among integer factors of 1,890 and try to find two that differ from each other by 3 and whose product is 1,890. The prime factorization of 1,890 $(2 \cdot 3^3 \cdot 5 \cdot 7)$ can help with this. Two factors that satisfy the conditions above are 42 and 45 (note that $42 = 2 \cdot 3 \cdot 7$ and $45 = 3^2 \cdot 5$). The numbers -45 and -42 also satisfy the above conditions $(w = -42)$, but since w represents the width of Janice's garden, the negative values of w can be rejected. Thus $w = 45$ feet, and so the length of the garden must be $3(45) - 9 = 126$ feet. Therefore, the perimeter of Janice's garden is $2(45 + 126) = 2(171) = 342$ feet.

Choice B is incorrect. This answer choice could result from incorrectly identifying the width of the garden as 42 feet instead of 45 feet. Choices C and D are incorrect; both answers would result in an area of the garden that is significantly smaller than 5,670 square feet. For example, if the perimeter of the garden were 270 feet, as in choice D, then $w + l = 135$ feet, where w represents the width and l represents the length of the garden. So $l = 135 - w$. It is also given that $l = 3w - 9$, which

implies that $135 - w = 3w - 9$. Solving this for w gives $w = 36$, and so $l = 99$. The area of the garden would then be 36×99 square feet, which is clearly less than $5{,}600$ square feet.

Question 26



Given the right triangle ABC above, which of the following is equal to $\frac{b}{a}$?

A) $\sin A$
B) $\sin B$
C) $\tan A$
D) $\tan B$

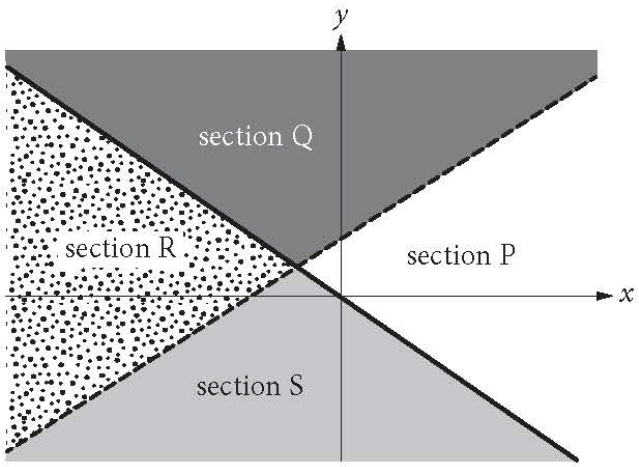
Item Difficulty: Hard
Content: Additional Topic in Math
Correct Answer: D

Choice D is the correct answer. Since the ratio $\frac{b}{a}$ involves only the legs of the right triangle, it follows that, of the given choices, the ratio can be equal to the tangent of one of the angles. In a right triangle, the tangent of an acute angle is defined as the ratio of the opposite side to the adjacent side of the angle. Side b is opposite to angle B and side a is adjacent to angle B. Therefore, $\tan B = \frac{b}{a}$.

Choices A and B cannot be correct; the sine of an acute angle in a right triangle is defined as the ratio of the opposite side to the hypotenuse, and the ratio shown involves only the legs of the triangle. Choice C is incorrect. In the triangle ABC shown, $\tan A = \frac{a}{b}$, not $\frac{b}{a}$.

Question 27

$$\begin{cases} y \le -x \\ 2y > 3x + 2 \end{cases}$$



A system of inequalities and a graph are shown above. Which section or sections of the graph could represent all of the solutions to the system?

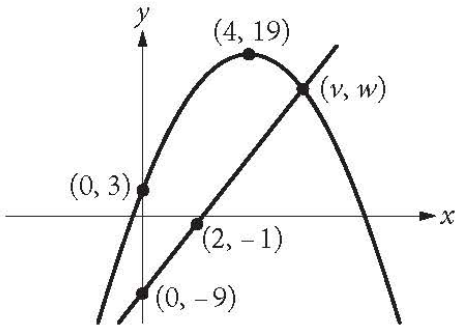
A) Section R
B) Sections Q and S
C) Sections Q and P
D) Sections Q, R, and S

Item Difficulty: Hard
Content: Heart of Algebra
Correct Answer: A

Choice A is the correct answer. The solution set of the inequality $y \le -x$ is the union of sections R and S of the graph. The solution set of the inequality $2y > 3x + 2$ is the union of sections R and Q of the graph. The solutions of the system consist of the coordinates of all the points that satisfy both inequalities, and therefore, section R represents all the solutions to the system since it is common to the solutions of both inequalities.

Choices B, C, and D are incorrect because they contain ordered pairs that do not satisfy both of the inequalities.

Question 28



The xy-plane above shows one of the two points of intersection of the graphs of a linear function and a quadratic function. The shown point of intersection has coordinates (v,w). If the vertex of the graph of the quadratic function is at $(4, 19)$, what is the value of v ?

Item Difficulty: Medium
Content: Passport to Advanced Math
The correct answer is 6.

Since the vertex of the graph of the quadratic function is at $(4, 19)$, the equation of the parabola is of the form $y = a(x - 4)^2 + 19$. It is also given that the parabola passes through point $(0, 3)$. This means that $3 = a(0 - 4)^2 + 19$, and so $a = -1$. So the graph of the parabola is $y = -(x - 4)^2 + 19$.

Since the line passes through the points $(0, -9)$ and $(2, -1)$, one can calculate the slope of the line $\left(\frac{-1-(-9)}{2-0} = 4\right)$ that passes through these points and write the equation of the line in the slope-intercept form as $y = 4x - 9$.

The coordinates of the intersection points of the line and the parabola satisfy both the equation of the parabola and the equation of the line. Therefore, these coordinates are the solutions to the system of equations below:

$$y = 4x - 9$$
$$y = -(x - 4)^2 + 19$$

Substituting $4x - 9$ for y into the second equation gives $4x - 9 = -(x - 4)^2 + 19$, which is equivalent to $x^2 - 4x - 12 = 0$. After factoring, this equation can be rewritten as

$(x - 6)(x + 2) = 0$, and so $x = 6$ or $x = -2$. Since point (v, w) is on the right side of the y-axis, it follows that v cannot be -2. Therefore, $v = 6$.

> Question 29
> In a college archaeology class, 78 students are going to a dig site to find and study artifacts. The dig site has been divided into 24 sections, and each section will be studied by a group of either 2 or 4 students. How many of the sections will be studied by a group of 2 students?

Item Difficulty: Hard
Content: Heart of Algebra
The correct answer is 9.

Let x be the number of sections that will be studied by 2 students and y be the number of sections that will be studied by 4 students. Since there are 24 sections that will be studied by 78 students, it follows that $x + y = 24$ and $2x + 4y = 78$. Solving this system gives $x = 9$ and $y = 15$. Therefore, 9 of the sections will be studied by a group of 2 students.

Alternatively, if all 24 sections were studied by a group of 4 students, then the total number of students required would be $24 \times 4 = 96$. Since the actual number of students is 78, the difference $96 - 78 = 18$ represents the number of "missing" students, and each pair of these "missing" students represents one of the sections that will be studied by 2 students. Hence, the number of sections that will be studied by 2 students is equal to the number of pairs that 18 students can form, which is $\frac{18}{2} = 9$.

Questions 30 and 31 refer to the following information.

$v = v_0 - gt$ (speed-time)

$h = v_0 t - \frac{1}{2} g t^2$ (position-time)

$v^2 = {v_0}^2 - 2gh$ (position-speed)

An arrow is launched upward with an initial speed of 100 meters per second (m/s). The equations above describe the constant-acceleration motion of the arrow, where v_0 is the initial speed of the arrow, v is the speed of the arrow as it is moving up in the air, h is the height of the arrow above the ground, t is the time elapsed since the arrow was projected upward, and g is the acceleration due to gravity (9.8 m/s^2).

> Question 30
> What is the maximum height from the ground the arrow will rise to the nearest meter?

Item Difficulty: Hard
Content: Passport to Advanced Math
The correct answer is 510.

As the arrow moves upward, its speed decreases continuously and it becomes 0 when the arrow reaches its maximum height. Using the position-speed equation and the fact that $v = 0$ when h is maximum gives $0 = 100^2 - 2gh$. Solving for h gives $h = \frac{100^2}{2(9.8)}$ meters, which to the nearest meter is 510.

Alternatively, the maximum height can be found using the position-time equation. Substituting 100 for v_0 and 9.8 for g into this equation gives $h = 100t - \frac{1}{2}(9.8)t^2$. Completing the square gives the equivalent equation $h = -4.9\left(t - \frac{100}{9.8}\right)^2 + 4.9\left(\frac{100}{9.8}\right)^2$. Therefore, the maximum height from the ground the arrow will rise is $4.9\left(\frac{100}{9.8}\right)^2$ meters, which to the nearest meter is 510.

> Question 31
>
> How long will it take for the arrow to reach its maximum height to the nearest tenth of a second?

Item Difficulty: Hard
Content: Passport to Advanced Math
The correct answer is 10.2 seconds (or 51/5 seconds).

As the arrow moves upward, its speed decreases continuously, and it becomes 0 when the arrow reaches its maximum height. Using the speed-time equation and the fact that $v = 0$ when h is maximum, we get $0 = 100 - 9.8t$.

Solving this equation for t gives $t = \frac{100}{9.8} = 10.2041$ seconds, which to the nearest tenth of a second is 10.2.

Answer Key

Reading		Writing & Language		Math Test – No Calculator		Math Test – Calculator	
Q 1	A	Q 1	C	Q 1	A	Q 1	C
Q 2	A	Q 2	D	Q 2	B	Q 2	A
Q 3	B	Q 3	C	Q 3	A	Q 3	C
Q 4	C	Q 4	D	Q 4	D	Q 4	C
Q 5	C	Q 5	C	Q 5	B	Q 5	C
Q 6	B	Q 6	A	Q 6	B	Q 6	D
Q 7	B	Q 7	B	Q 7	A	Q 7	D
Q 8	D	Q 8	B	Q 8	D	Q 8	D
Q 9	B	Q 9	B	Q 9	B	Q 9	C
Q 10	C	Q 10	D	Q 10	D	Q 10	B
Q 11	B	Q 11	D	Q 11	C	Q 11	C
Q 12	A	Q 12	C	Q 12	A	Q 12	B
Q 13	A	Q 13	B	Q 13	D	Q 13	B
Q 14	D	Q 14	B	Q 14	300	Q 14	B
Q 15	D	Q 15	B	Q 15	2	Q 15	B
Q 16	A	Q 16	D	Q 16	9	Q 16	C
Q 17	D	Q 17	A	Q 17	4	Q 17	C
Q 18	C	Q 18	A			Q 18	C
Q 19	D	Q 19	D			Q 19	A
Q 20	C	Q 20	C			Q 20	C
Q 21	D	Q 21	C			Q 21	C
Q 22	A	Q 22	A			Q 22	B
Q 23	B	Q 23	D			Q 23	D
Q 24	B	Q 24	A			Q 24	A
Q 25	D	Q 25	A			Q 25	A
Q 26	D	Q 26	B			Q 26	D
Q 27	A	Q 27	C			Q 27	A
Q 28	A	Q 28	D			Q 28	6
Q 29	B	Q 29	C			Q 29	9
Q 30	C	Q 30	D			Q 30	510
Q 31	D	Q 31	D			Q 31	10.2, 51/5
Q 32	C	Q 32	D				
Q 33	B	Q 33	A				
Q 34	D	Q 34	C				
Q 35	C	Q 35	A				
Q 36	D	Q 36	D				
Q 37	B	Q 37	D				
Q 38	D	Q 38	C				
Q 39	B	Q 39	B				
Q 40	D	Q 40	C				
Q 41	B	Q 41	B				
Q 42	A	Q 42	B				
Q 43	C	Q 43	A				
Q 44	C	Q 44	D				
Q 45	B						
Q 46	C						
Q 47	A						

Answer Sheet—Multiple-Choice Questions and Student-Produced Responses

You must use a No. 2 pencil. It's important that marks are dark and complete. Do not use a mechanical pencil. If you need to change a response, erase as completely as possible. Incomplete marks or erasures may affect your score.

Complete Mark: ●

Incomplete Marks: Ⓐ Ⓑ Ⓒ Ⓓ

Section 1

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

Section 2

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

Section 3

1 Ⓐ Ⓑ Ⓒ Ⓓ	8 Ⓐ Ⓑ Ⓒ Ⓓ	14	15	16	17
2 Ⓐ Ⓑ Ⓒ Ⓓ	9 Ⓐ Ⓑ Ⓒ Ⓓ				
3 Ⓐ Ⓑ Ⓒ Ⓓ	10 Ⓐ Ⓑ Ⓒ Ⓓ				
4 Ⓐ Ⓑ Ⓒ Ⓓ	11 Ⓐ Ⓑ Ⓒ Ⓓ				
5 Ⓐ Ⓑ Ⓒ Ⓓ	12 Ⓐ Ⓑ Ⓒ Ⓓ				
6 Ⓐ Ⓑ Ⓒ Ⓓ	13 Ⓐ Ⓑ Ⓒ Ⓓ				
7 Ⓐ Ⓑ Ⓒ Ⓓ					

Student-Produced Responses Enter answers as directed in your test book. Answers must be bubbled to be scored. You will not receive credit for anything written in the boxes.

Section 4

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

Student-Produced Responses Enter answers as directed in your test book. Answers must be bubbled to be scored. You will not receive credit for anything written in the boxes.