The SAT®

Practice Test #6

ANSWER EXPLANATIONS

These answer explanations are for students taking the digital SAT in nondigital format.

Reading and Writing
Module 1
(33 questions)

QUESTION 1

Choice D is the best answer because in context, sharing "similarities with" means having some resemblance to. The text establishes a comparison between two groups of mammals, stating that although they aren't closely related, hedgehog tenrecs and true hedgehogs play similar roles in their habitats, a circumstance that has resulted in the independent development of some of the same physical traits. This context supports the idea that hedgehog tenrecs resemble, or share basic similarities with, true hedgehogs in some respects.

Choice A is incorrect because the text doesn't suggest that hedgehog tenrecs are "examples of," or representative of, true hedgehogs. The text states despite some shared physical traits, the two groups of mammals aren't closely related; therefore, hedgehog tenrecs can't be examples of true hedgehogs. *Choice B* is incorrect because in this context, "concerns about" would mean worries about or interests in. The text focuses on the various physical traits that hedgehog tenrecs and true hedgehogs share. There's nothing in the text to suggest why hedgehog tenrecs would be worried about true hedgehogs, or why they would be interested in them. *Choice C* is incorrect because in this context, "indications of" would mean evidence of. By listing a set of traits that hedgehog tenrecs share with true hedgehogs, the text establishes a comparison between the two groups of mammals, and saying that the traits shared within one group of mammals provide evidence of another group of mammals wouldn't be an effective way to establish the similarities between the two groups.

QUESTION 2

Choice B is the best answer because it most logically completes the text's discussion of Yaszek's introduction to her science fiction anthology. In this context "overtly" means openly or without concealment. The text draws a contrast between the lack of "deliberately signaled" political themes in women-authored science fiction from the 1920s to the 1960s and what Yaszek notes

about women-authored science fiction from the 1970s. This contrast implies that the work from the 1970s did clearly reflect feminist political themes. In other words, the text indicates that unlike women who wrote science fiction in the 1920s to the 1960s, the women who wrote science fiction in the 1970s expressed overtly feminist themes.

Choice A is incorrect. In this context "prudently" would mean cautiously, which might plausibly describe the women who wrote science fiction from the 1920s to the 1960s, in that they tended to avoid revealing their political views; however, the text contrasts these authors with the women writing science fiction in the 1970s, thereby suggesting that the authors writing in the 1970s were not restrained in that way. *Choice C* is incorrect because in this context "cordially" would mean politely, and nothing in the text indicates that politeness was a significant factor for women writing science fiction either from the 1920s to the 1960s or in the 1970s. The text draws a contrast between the lack of "deliberately signaled" political themes in women-authored science fiction from the 1920s to the 1960s and what Yaszek notes about women-authored science fiction from the 1970s. It's unclear how "less deliberately signaled" politics and an increasing sense of politeness toward feminism would constitute a meaningful contrast. *Choice D* is incorrect because in this context, "inadvertently" would mean unintentionally, and nothing in the text suggests that Yaszek thought the feminist elements of the women-authored science fiction from the 1970s arose without deliberate effort.

QUESTION 3

Choice B is the best answer because it most logically completes the text's discussion about research into social media use. In context, "redressing" means remedying or compensating for. The text indicates that there is a long-standing trend of overemphasizing teenagers and young adults in studies of social media use. It goes on to say that scholars have recently broadened the kinds of social media users they study by including senior citizens. This suggests that scholars are redressing the long-standing trend of overemphasis on younger users by studying older users as well.

Choice A is incorrect because "exacerbating" means making worse or aggravating, which would not make logical sense in context. Expanding the focus of studies of social media use to include senior citizens would not make the long-standing trend of overemphasizing teenagers and young adults in studies of social media use worse; instead, it would help to remedy this trend. *Choice C* is incorrect because "epitomizing" means illustrating or providing an example, which would not make logical sense in context. Expanding the groups of social media users that scholars study to include senior citizens would not provide an example of the long-standing trend of overemphasizing teenagers and young people in research on social media use. *Choice D* is incorrect because "precluding" means making impossible in advance or preventing, which would not make logical sense in context. The text indicates that there is a long-standing trend of overemphasizing teenagers and young adults in social media research. Expanding the focus of social media research to include senior citizens, as the text indicates scholars have begun to do, could help to rectify the trend, but it could not prevent the trend or make the trend impossible in advance, since the trend started long before scholars started expanding their focus.

QUESTION 4

Choice D is the best answer because as used in the text, "disputing" most nearly means providing resistance to. The narrator is in a taxi as it drives down a street lined with so many food vendors and shoppers that the narrator describes them as "the multitude of Paris," meaning an immense group of people. The street is essentially a large open-air market, and there are so many people pushing small wagons of goods and carrying shopping baskets that "every inch" of the taxi's progress is impeded. In other words, the people are providing resistance to the taxi's attempt to drive down the street.

Choice A is incorrect. Although in some contexts, "disputing" can mean arguing, the narrator doesn't portray the shoppers and vendors as arguing with the driver of the taxi or, indeed, arguing at all. *Choice B* is incorrect. Although in some contexts, "disputing" can mean expressing disapproval, the narrator doesn't suggest that the shoppers and vendors necessarily disapprove of the taxi's attempt to drive down the street. Instead, their combined presence along the street has the effect of impeding the taxi's progress. *Choice C* is incorrect because, as the narrator explains, both the multitude of people and the taxi are using a public space (a street) at the same time. The narrator doesn't go so far as to suggest that the people feel that they, and not the taxi, possess exclusive access to the street.

QUESTION 5

Choice D is the best answer because it most logically completes the text's discussion of the twelfth-century Islamic philosopher Ibn Rushd. As used in this context, "inconsequential to" means not significant to. According to the text, Ibn Rushd's works were primarily available in Spain, where he lived, far from central areas of the Muslim world, a fact that could support the conclusion that his influence on Muslim contemporaries was limited. The text implies, however, that recent scholarship has shown that his works still had an impact on other Muslim philosophers of his time. This context supports the idea that his works weren't inconsequential to Islamic thought in this period.

Choice A is incorrect because the issue under consideration in the text is whether other Muslim philosophers of Ibn Rushd's time had access to his works, not whether his works were "controversial among," or causing dispute among, other philosophers. *Choice B* is incorrect. The text implies that other Muslim philosophers of Ibn Rushd's era were aware of his works, not that they were "antagonistic toward," or hostile toward, them. There is no suggestion that Ibn Rushd's writings elicited hostility from his contemporaries. *Choice C* is incorrect because in this context, "imitated by" would mean followed as a model by. Although the text implies that Ibn Rushd's works were at least somewhat available in regions that were at the center of Islamic thought during the period, it doesn't specifically address in what ways his works influenced contemporary Muslim philosophers. Thus, the text doesn't support the idea that other philosophers modeled their own works after Ibn Rushd's works.

QUESTION 6

Choice A is the best answer because it most accurately describes the function of the underlined sentence in the text as a whole. The first sentence of the text indicates that Johnson returned to the US in 1938 at which time his painting style suddenly changed. The second sentence is underlined and gives more detail about this stylistic change, noting that his earlier work consisted largely of landscapes in an expressionist style and his new works were highly stylized portraits of Black Americans. In other words, the function of the underlined sentence is to elaborate on a transitional moment in Johnson's painting career.

Choice B is incorrect. Although the text does mention that Johnson spent a decade in Europe, it does not discuss what other travel Johnson might have done. Furthermore, although the text mentions African, American, and Scandinavian artistic elements in Johnson's work, it does not indicate that he traveled to different locations to learn about these practices. *Choice C* is incorrect because the text does not focus on Johnson's personal life nor does it address how successful his career was in general. *Choice D* is incorrect because, rather than call it into question, the underlined sentence continues the discussion of Johnson's career by adding further relevant detail of Johnson's artistic transformation.

QUESTION 7

Choice B is the best answer because it most accurately describes the main purpose of the text, which is to establish that pianist Martha Argerich's performances appear easy because of her work to prepare for them. The text begins by stating that Argerich plays in such a way that it looks like the music is coming to her naturally in the moment, without planning. It goes on to point out that despite her skill and experience, Argerich works tirelessly and treats each piece of music as if it is new each time she performs it, and that it is this preparation that causes her playing to appear relaxed and natural. These details establish that the purpose of the text is to assert that Argerich's performances look effortless because of how she prepares for them.

Choice A is incorrect because the text doesn't address how Argerich selects the music she'll perform; instead, it describes how she approaches a piece of music in preparation for a performance. *Choice C* is incorrect because the text doesn't discuss kinds of music beyond stating that Argerich is a classical pianist, and it doesn't mention Argerich actually encountering any music for the first time; it indicates only that she approaches a piece of music she is going to perform as if she has never played it before. *Choice D* is incorrect because the text doesn't mention music that Argerich is actually performing for the first time, only that Argerich approaches the pieces she performs as if they are new each time; further, the text doesn't characterize this approach as unique, or something only Argerich does.

QUESTION 8

Choice B is the best answer because it best describes the function of the underlined portion in the text as a whole. The text describes the failed attempt of Israel Potter to establish a farm in New England during the late eighteenth century: according to his contract, he was to receive two hundred acres in exchange for three months' work, but his employer then refused to fulfill the bargain and Israel had no recourse to law to obtain the land he was owed. Israel was therefore forced to find another means of supporting himself. To explain why Israel was particularly susceptible to his employer's dishonesty, the underlined portion states that though Israel was "brave-hearted, and even much of a dare-devil upon a pinch," he also possessed "a singular patience and mildness." In other words, Israel could be courageous in certain circumstances, but he was usually meek and disinclined to argument, from which it is reasonable to infer that Israel was often taken advantage of. Thus, the underlined portion suggests that if not for a certain aspect of his character, Israel might not have been as easily thwarted in his ambition to establish a farm.

Choice A is incorrect because although the underlined portion describes aspects of Israel's personality, it does not address how he feels about his own personality. *Choice C* is incorrect because the underlined portion addresses Israel's occasional courage and frequent meekness but does not address whether he would have the skills and resolve necessary to operate a farm if he owned sufficient property. *Choice D* is incorrect. Though the underlined portion does indicate that Israel could be courageous in certain circumstances, it does not say that he undertook acts of courage that others avoided, but rather that he was habitually meek. Even if the underlined portion did say that Israel was more courageous than most, this would not explain why he found himself under the circumstances described in the text—that is, as a consequence of his meek nature, cheated of the property to which he had a right.

QUESTION 9

Choice D is the best answer because it reflects how the author of Text 2 would most likely respond to the underlined claim in Text 1. Text 1 begins by noting the success of *The Nutcracker* but then claims that the ballet is "stuck in the past" and should "no longer be produced." Text 2 begins by conceding that *The Nutcracker* is indeed outdated but argues that it should continue to be performed, states that the show can be updated to include more contemporary dance styles, and provides an example of one such modernized version, *Hot Chocolate Nutcracker*. Hence, the author of Text 2 would most likely respond to the underlined claim in Text 1 by suggesting that dance companies should consider offering revised versions of *The Nutcracker* instead of completely rejecting the show.

Choice A is incorrect because the author of Text 2 advocates for using creative ways to update the ballet discussed in Text 1 and therefore wouldn't respond to the underlined claim by rejecting the suggestion that contemporary audiences would enjoy an updated version. *Choice B* is incorrect because although the authors of both texts claim that a particular ballet is outdated, neither

text suggests that contemporary audiences have largely stopped attending productions of the show. On the contrary, Text 2 states that that ballet is a holiday favorite and generates substantial income for some dance companies. *Choice C* is incorrect because although Text 2 provides an example of a contemporized version of the ballet discussed in Text 1, the text doesn't suggest that offering modernized versions is a way to increase income for most dance companies. Rather, the author of Text 2 suggests that offering modernized versions is a way to make the ballet discussed in Text 1 feel less outdated.

QUESTION 10

Choice D is the best answer because it most accurately states the main idea of the text. The text indicates that archaeologist Mª Ángeles Medina-Alcaide and her team used replicas of Paleolithic light sources to understand how Paleolithic artists moved through dark caves. The researchers learned, for example, that torches were more helpful for moving through caves than animal-fat lamps were. Thus, the main idea of the text is that Medina-Alcaide and her team tested Paleolithic light sources and learned some details about how Paleolithic artists traveled within dark caves.

Choice A is incorrect because the text doesn't address the usefulness of fireplaces for Paleolithic cave artists; it only mentions fireplaces briefly as one of the three lighting methods the researchers tested. *Choice B* is incorrect because the text doesn't discuss how often Paleolithic cave artists used each kind of light source tested. Although the text does compare animal-fat lamps with another lighting method, the point of that comparison is that animal-fat lamps were less useful than torches when walking, not that one method was used more often than another. *Choice C* is incorrect because the text doesn't discuss either how difficult it was for Medina-Alcaide and her team to replicate light sources or how the team felt about drawing conclusions from their study. Instead, the text reveals that the team was able to conclude that each light source likely had a distinct purpose.

QUESTION 11

Choice A is the best answer because it most effectively uses data from the table to complete the statement about the US auto industry in the early twentieth century. The table shows the number of cars produced annually and number of companies producing cars in the United States between 1910 and 1925 in increments of five years. According to the table, the number of cars produced consistently increased from one increment to the next, going from 123,990 cars in 1910 to 3,185,881 cars in 1925. At the same time, the table shows that the number of companies producing cars consistently decreased, going from 320 companies in 1910 to only 80 companies in 1925. Thus, the table shows that the number of cars produced increased from 1910 to 1925, even as the number of companies producing cars decreased.

Choice B is incorrect because the table indicates that the number of companies producing cars consistently decreased from 1910 to 1925, going from 320 companies to only 80 companies. *Choice C* is incorrect because the table

indicates that the number of cars produced consistently increased from 1910 to 1925, going from 123,990 cars to 3,185,881 cars, instead of decreasing; moreover, the table shows that the number of companies producing cars from 1910 to 1925 declined from 320 to 80 instead of remaining unchanged. *Choice D* is incorrect. The table shows that the number of cars produced in the US increased, going from 123,990 in 1910 to 3,185,881 in 1925, instead of remaining unchanged, and the table also shows that the number of companies producing cars decreased from 320 to 80 instead of remaining unchanged.

QUESTION 12

Choice A is the best answer because it best supports the researchers' explanation of the results of rearranging a store's layout. According to the text, Sam K. Hui and colleagues found that rearranging a store's layout can encourage customers to make spontaneous purchases. The text states that the researchers explain that a change in layout causes shoppers to hunt for items' new locations, which exposes the shoppers to more products and increases the likelihood that they'll make an unplanned purchase. This quotation from a surveyed shopper indicates that the shopper spontaneously purchased a notebook while looking for cleaning supplies that weren't in their usual place. The quotation therefore supports the researchers' explanation that rearranging a store's layout can lead shoppers to make unanticipated purchases.

Choice B is incorrect because it doesn't support the researchers' explanation that rearranging a store's layout can lead shoppers to make unanticipated purchases. Instead of attributing an unplanned purchase to a change in layout, the quotation notes that the shopper searched for but couldn't find some items, and as a result the shopper purchased less, not more, than what was anticipated. *Choice C* is incorrect because the quotation attributes what was purchased to coupons that the shopper received, not to a new store layout. Thus, the quotation doesn't support the researchers' explanation that rearranging a store's layout can lead shoppers to make unanticipated purchases. *Choice D* is incorrect because the quotation attributes what was purchased to the size and stock of the store, not to a new store layout. The shopper simply purchased products that the shopper wanted in a particular store because other stores didn't carry those products, so the quotation doesn't support the researchers' explanation that rearranging a store's layout can lead shoppers to make spontaneous purchases.

QUESTION 13

Choice A is the best answer because it presents a statement that, if true, would support the claim that the two exhibitions *This Is the Day* and *The Dirty South* showcase the diverse media artists have used to represent the Black experience in the US. The text describes the thematic focus of the two exhibitions: religious and spiritual expressions in the Black community and the connections between visual arts and music in Black culture in the American South between 1920 and 2020. If these exhibits included works created with many different materials and means of artistic expression (such as paint, textiles, sculptural stone, and musical forms), they would display how artists have portrayed and responded to the Black experience in the US as well as the variety of media that these artists have used to do so.

Choice B is incorrect because it focuses on the number of artists whose works were included in the exhibitions, not on the means of expression that these artists have used. Therefore, the statement wouldn't address the claim that the exhibits showcased the different media artists have used to represent the Black experience in the US. *Choice C* is incorrect because it focuses on how the works that were included in the exhibitions were sourced, not on the means of expression the artists whose works were featured have used. Therefore, the statement wouldn't address the claim that the exhibits showcased the different media artists have used to represent the Black experience in the US. *Choice D* is incorrect. Although the statement focuses on similarities in the themes of the two exhibitions—that is, they both concern the Black experience in the US—it doesn't mention the media that artists whose works were featured in the exhibitions have used to portray and respond to this experience.

QUESTION 14

Choice C is the best answer because it describes data from the graph that support Jan Packer and colleagues' conclusion about the effect of leave time on the attentiveness of university employees. According to the text, the researchers' study design included a group of employees who took no leave, a group who took 2–4 days of leave, and a group who took 1–5 weeks of leave. The participants who took leave were tested for attentiveness one week before their leave (the first test administration), one week after their return to work (the second test administration), and two weeks after their return (the third test administration). The participants who took no leave were tested three times at random. The graph shows that at one week after their return to work, participants who took only 2–4 days of leave had an average attentiveness score of between 540 and 600, while participants who took 1–5 weeks of leave had an average score of between 480 and 540. At two weeks after their return to work, those who took only 2–4 days of leave had an average score of between 480 and 540, while those who took 1–5 weeks of leave had an average score of approximately 480. In other words, the graph shows that on both post-leave testing dates, participants with longer leave times had lower average attentiveness scores than those with shorter leave times. Since attentiveness is an indicator of cognitive functioning, these data confirm Packer and colleagues' conclusion that longer leave times might not confer a greater cognitive benefit than shorter leave times do.

Choice A is incorrect. The graph does show that in the second test administration, participants who took 2– 4 days of leave had higher average attentiveness scores than did those who took no leave and also shows that in the third test administration, those who took no leave had higher average scores than those who took 1–5 weeks of leave. But neither of these findings has a direct bearing on the researchers' conclusion, which concerns a comparison of participants who took 2–4 days of leave with those who took 1–5 weeks, rather than a comparison of either group with participants who took no leave. *Choice B* is incorrect. Although the graph does show that in the first test administration, participants who took 2–4 days of leave had lower average attentiveness scores than did those who took 1–5 weeks of leave and those who took no leave, this test administration occurred before any participants went on leave; therefore,

these results have no bearing on the researchers' conclusion about how the amount of leave taken by participants affected their cognitive functioning. *Choice D* is incorrect. Although the graph does show that in the second and third test administrations, participants who took 2–4 days of leave had higher average attentiveness scores than did those who took no leave, the researchers' conclusion is about the effects of short leave compared with the effects of long leave, not the effects of short leave compared with the effects of no leave. These results are therefore irrelevant to the conclusion.

QUESTION 15

Choice B is the best answer because it describes data from the graph that complete the text's discussion of lizard species' use of maximal speed when escaping predators. According to the text, moving at maximal speed (the highest speed possible) requires so much energy that it is not always an effective strategy for animals, even when they are escaping predators. The graph displays data on the average percent of maximal speed used by lizard species while either escaping predators or pursuing prey. The graph categorizes the data for both pursuing and escaping by the number of species using 30%–39% of maximal speed, 40%–49% of maximal speed, 50%–59% of maximal speed, 60%–69% of maximal speed, 70%–79% of maximal speed, 80%–89% of maximal speed, and 90%–100% of maximal speed, respectively. In the graph, there is at least one species in each of the following percent categories for maximal speed while escaping predators: 50%– 59%, 60%–69%, 70%–79%, and 80%–89%. Thus, the data in the graph show that multiple lizard species move at an average of less than 90% of their maximal speed while escaping predation.

Choice A is incorrect because the data in the graph isn't organized in such a way that a comparison of the percentage of maximal speed used when escaping predation with the percentage used when pursuing prey is possible at the level of individual species. *Choice C* is incorrect. It is true that in the graph, the percent category with the largest number of species using maximal speed while escaping predators is 90%–100% (8 species total). However, these data don't complete the text, which is concerned instead with how animals are discouraged from using maximal speed even when escaping predators because of the amount of energy required to use it. *Choice D* is incorrect because these data from the graph pertain to maximal speed while pursuing prey and therefore don't complete the text's discussion of lizard species' use of maximal speed when escaping predators.

QUESTION 16

Choice D is the best answer because it presents a finding that, if true, would support the researchers' hypothesis that TMAO reduces water's compressibility. The text explains that at great depths in the ocean, extreme pressure compresses the molecular structure of water by destabilizing the hydrogen bonds between adjacent molecules, thereby allowing water to penetrate proteins and harm the associated organisms. However, deep-sea organisms called piezophiles have adapted to live at these depths and previous studies show a positive correlation between the depth at which a piezophile species lives and the species' level of the compound TMAO. Because this hypothesis links TMAO levels with reduced compressibility of water's tetrahedral molecular structure, a finding that TMAO helps maintain the hydrogen bonds between water molecules under high pressure would strongly support that hypothesis.

Choice A is incorrect. Although the researchers' hypothesis suggests a relationship between TMAO and water molecules' tetrahedral molecular structure, that relationship involves TMAO helping maintain water's tetrahedral molecular structure under high pressure; as presented in the text, the hypothesis doesn't contend that water molecules are impervious to, or incapable of being penetrated by, TMAO. *Choice B* is incorrect because the text discusses how the molecular structure of water, not TMAO, is compressed under extreme pressure and never addresses how TMAO might be affected by such pressure. *Choice C* is incorrect because the researchers' hypothesis holds that water under extreme pressure is more resistant, not less, to being compressed when TMAO concentrations are higher. Moreover, the positive correlation mentioned in the text is between TMAO concentrations and the depths at which piezophiles live, not between concentrations of TMAO and the rate at which water's molecular structure compresses as pressure increases.

QUESTION 17

Choice D is the best answer because it most logically completes the text's discussion of the Cretaceous pterosaur *Tupandactylus navigans*. The text first describes what paleontologists initially speculated to be true of *T. navigans* based on observing only fossilized skulls of the pterosaur rather than complete skeletons—namely, that *T. navigans* had an oversized head crest and that, like other pterosaurs, its main mode of movement must have been flight. The text goes on to describe what researcher Victor Beccari and his team concluded based on studying a nearly complete fossilized skeleton of *T. navigans*, which provided additional information that fossilized skulls alone could not. Beccari and colleagues determined that *T. navigans* had long hind legs, short wings, and an unusually long neck, in addition to the oversized head crest previously observed by paleontologists. Taken together, these characteristics would have made sustained flight difficult and upright walking comfortable, which would make *T. navigans* different from other pterosaurs that moved mainly through flight. Thus, Beccari and colleagues suggest that previously held speculations of paleontologists are inaccurate: that instead of moving mainly through powered flight, *T. navigans* likely flew for shorter distances and spent more time walking than researchers previously thought.

Choice A is incorrect because Beccari and his team determined, based on their examination of a nearly complete skeleton, that *T. navigans* would have found "sustained flight difficult," which would differentiate it from most other pterosaurs that moved mainly through flight. Therefore, Beccari's team would not suggest that *T. navigans* flew for longer distances than did other pterosaur species with large head crests. *Choice B* is incorrect because the fossilized skeleton studied by Beccari and colleagues was notable for its short wings, and because no indication in the text is made that other pterosaurs were thought by paleontologists to be comfortable walking. Therefore, Beccari's team would not suggest that *T. navigans* had longer wings than other pterosaur species considered to have been comfortable walking. *Choice C* is incorrect because the text indicates that Beccari and his team agree with the paleontologists mentioned earlier in the text that *T. navigans* had a large-crested head. Therefore, Beccari's team would not suggest that *T. navigans* had a smaller head than researchers previously expected.

QUESTION 18

Choice B is the best answer because it most logically completes the text's discussion of a study involving ethical consumers. According to the text, ethical consumers are people who strive to purchase goods and services with positive or neutral effects on society and the environment. The text explains that consumer psychologists believe these consumers are more likely to purchase a product if its effects correspond better to their values. The text then introduces a study of ethical consumers' attitudes toward a specific mobile phone, indicating that participants in their twenties had a less positive attitude toward the phone's effects on society and the environment than participants in other age groups did. The text indicates that readers should assume there are no other differences between the participants in their twenties and those in other age groups. If the consumer psychologists' theory is correct, as the text proposes, then the study's finding suggests that ethical consumers in their twenties are less likely to purchase the phone than ethical consumers in other age groups are.

Choice A is incorrect because the text mentions only the mobile phone used in the study and therefore provides no basis to compare participants' attitudes toward that phone with their attitudes toward any other phone. *Choice C* is incorrect because the study's finding suggests the contrary. The text indicates that study participants in their twenties had a less positive attitude toward the phone's social and environmental effects than study participants in other age groups did. If the consumer psychologists' theory is true, as the text proposes, then the study's finding suggests that ethical consumers in their twenties are meaningfully less likely to purchase the phone than ethical consumers in other age groups are. *Choice D* is incorrect because there's nothing in the text to suggest that ethical consumers in their twenties are more likely than ethical consumers in other age groups to consider a phone's social and ecological effects when deciding whether to purchase it. Rather, the text's discussion of people who identify as ethical consumers suggests that they all consider the social and ecological effects of products, regardless of age.

QUESTION 19

Choice A is the best answer. The convention being tested is the use of verb forms within a sentence. The nonfinite past participle "created" is correctly used to form a supplementary element that modifies the noun phrase "the saloon," identifying who established the Boston Saloon.

Choice B is incorrect because it results in an ungrammatical sentence. The finite present tense verb "creates" can't be used in this way to form a supplementary element to modify the noun phrase "the saloon." *Choice C* is incorrect because it results in an ungrammatical sentence. The nonfinite present participle "creating" can't be used in this way to form a supplementary element to modify the noun phrase "the saloon." *Choice D* is incorrect because it results in an ungrammatical sentence. The finite present tense verb "create" can't be used in this way to form a supplementary element to modify the noun phrase "the saloon."

QUESTION 20

Choice C is the best answer. The convention being tested is punctuation use between a verb and an object. No punctuation is needed between the verb "popularized" and its object "the use of Jamaican Creole." The object helps complete the idea of the verb—in this case, it explains what Louise Bennett popularized—and any punctuation between the two results in an ungrammatical sentence.

Choice A is incorrect because no punctuation is needed between the verb and its object. *Choice B* is incorrect because no punctuation is needed between the verb and its object. *Choice D* is incorrect because no punctuation is needed between the verb and its object.

QUESTION 21

Choice D is the best answer. The convention being tested is subject-verb agreement. The singular verb "creates" agrees in number with the singular subject "technique."

Choice A is incorrect because the plural verb "create" doesn't agree in number with the singular subject "technique." *Choice B* is incorrect because the plural verb "are creating" doesn't agree in number with the singular subject "technique." *Choice C* is incorrect because the plural verb "have created" doesn't agree in number with the singular subject "technique."

QUESTION 22

Choice D is the best answer. The convention being tested is end-of-sentence punctuation. This choice correctly uses a period to punctuate a declarative sentence that asks an indirect question ("Researchers Amit Kumar and Nicholas Epley investigated how people perceive acts of kindness").

Choice A is incorrect. The structure of the sentence requires a declarative clause at the end of the sentence that states what Kumar and Epley did, not an interrogative clause that asks a direct question, such as "how do people perceive

acts of kindness." *Choice B* is incorrect. The structure of the sentence requires a declarative clause at the end of the sentence that states what Kumar and Epley did, not an interrogative clause that asks a direct question, such as "how do people perceive acts of kindness?" *Choice C* is incorrect. It's unconventional to use a question mark in this way to punctuate a declarative sentence that asks an indirect question, such as "Researchers…kindness."

QUESTION 23

Choice D is the best answer. The convention being tested is subject-verb agreement. The plural verb "reveal" agrees in number with the plural subject "objects."

Choice A is incorrect because the singular verb "was revealing" doesn't agree in number with the plural subject "objects." *Choice B* is incorrect because the singular verb "has revealed" doesn't agree in number with the plural subject "objects." *Choice C* is incorrect because the singular verb "reveals" doesn't agree in number with the plural subject "objects."

QUESTION 24

Choice C is the best answer. The convention being tested is punctuation between sentences. In this choice, the period is used to correctly mark the boundary between one sentence ("Jamaican…microsculptures") and another ("Creations… strands"). The noun phrase beginning with "creations" modifies the subject of the next sentence, "Wigan's sculptures."

Choice A is incorrect because it results in a run-on sentence. The sentences ("Jamaican…microsculptures" and "Creations…strands") are fused without punctuation and/or a conjunction. *Choice B* is incorrect because it results in a comma splice. A comma can't be used in this way to mark the boundary between sentences. *Choice D* is incorrect. Without a comma preceding it, the conjunction "and" can't be used in this way to join sentences.

QUESTION 25

Choice B is the best answer. The convention being tested is punctuation use between sentences. In this choice, the period is used to correctly mark the boundary between one sentence ("A ray…works") and another ("Because…image").

Choice A is incorrect because it results in a run-on sentence. The two sentences ("A ray…works" and "Because…image") are fused without punctuation and/or a conjunction. *Choice C* is incorrect because it results in a comma splice. A comma can't be used in this way to mark the boundary between sentences. *Choice D* is incorrect because it results in a comma splice. Since the contraction "it's" creates a main clause, the comma after "single ray" can't be used in this way to mark the boundary between two main clauses ("it's…ray" and "all light…image").

QUESTION 26

Choice D is the best answer. "Instead" logically signals that the idea in this sentence—that researchers should use the word "lyfe"—is an alternative to the idea mentioned in the previous sentence (scientists' use of the word "life").

Choice A is incorrect because "previously" illogically signals that the idea in this sentence occurs before the action in the first sentence. Instead, the use of "lyfe" is an alternative to the previously mentioned use of "life." *Choice B* is incorrect because "regardless" illogically signals that the idea in this sentence is true despite the information in the first sentence. Instead, the use of "lyfe" is an alternative to the previously mentioned use of "life." *Choice C* is incorrect because "there" illogically signals that the idea in this sentence occurs in a place mentioned in the previous sentence. Instead, the use of "lyfe" is an alternative to the previously mentioned use of "life."

QUESTION 27

Choice D is the best answer. "Today" logically signals that the information in the sentence—that the museum is able to display close to 30% of its collection—is true of the Art Institute of Chicago as it exists in the present day after the previously mentioned unveiling of the massive new gallery in 2009.

Choice A is incorrect because "additionally" illogically signals that the information in the sentence is merely an additional fact related to the information about the museum before the new gallery opened. Instead, the sentence is about the museum in the present day after the new gallery opened. *Choice B* is incorrect because "for example" illogically signals that the information in the sentence exemplifies the previous information about the museum before the new gallery opened. Instead, the sentence is about the museum in the present day after the new gallery opened. *Choice C* is incorrect because "nevertheless" illogically signals that the information in the sentence is true despite the previous information about the museum before the new gallery opened. Instead, the sentence is about the museum in the present day after the new gallery opened.

QUESTION 28

Choice C is the best answer. "On the other hand" logically signals that the information in the sentence—that the snowpack at higher elevations in the Chuska Mountains was deepest in mid-March—contrasts with the previous information about the snowpack at lower elevations being deepest in early March.

Choice A is incorrect because "in other words" illogically signals that information in the sentence is merely a paraphrase or restatement of the previous information about the snowpack at lower elevations. Instead, the information about the snowpack at higher elevations contrasts with that information. *Choice B* is incorrect because "for instance" illogically signals that the information in the sentence exemplifies the previous information about the snowpack at lower elevations. Instead, the information about the snowpack at higher elevations contrasts with that information. *Choice D* is incorrect because "in summary" illogically signals that the information in the sentence summarizes the previous information about the snowpack at lower elevations. Instead, the information about the snowpack at higher elevations contrasts with that information.

QUESTION 29

Choice C is the best answer. "In addition" logically signals that the claim in this sentence—that the Inca of South America may have used quipus to record more complex information—is an additional point related to the previous statement about the Inca using quipus to record countable information.

Choice A is incorrect because "as a result" illogically signals that the claim in the sentence is a consequence or result of the previous statement about the Incas using quipus to record countable information. Instead, the possibility that the Inca used quipus to record more complex information is an additional point about how the quipus were used. *Choice B* is incorrect because "in other words" illogically signals that the claim in the sentence is merely a paraphrase or restatement of the previous statement about the Incas using quipus to record countable information. Instead, the possibility that the Inca used quipus to record more complex information is an additional point about how the quipus were used. *Choice D* is incorrect because "for example" illogically signals that the claim in the sentence exemplifies the previous statement about the Incas using quipus to record countable information. Instead, the possibility that the Inca used quipus to record more complex information is an additional point about how the quipus were used.

QUESTION 30

Choice B is the best answer. "Then" signals that this sentence's claim about Darwin and Wallace follows logically from the previous information. In other words, both scientists independently arriving at the theory of natural selection was, arguably, an expected outcome of the circumstances mentioned in the previous sentence.

Choice A is incorrect because "however" illogically signals that the claim in this sentence contrasts with the previous information about the ideas circulating among British scientists in the 1800s. Instead, this claim follows logically from that information. *Choice C* is incorrect because "moreover" illogically signals that the claim in this sentence merely adds to the previous information about the ideas circulating among British scientists in the 1800s. Instead, this claim follows logically from that information. *Choice D* is incorrect because "for example" illogically signals that this sentence provides an example supporting the previous information about the ideas circulating among British scientists in the 1800s. Instead, it presents a claim that follows logically from that information.

QUESTION 31

Choice A is the best answer. The sentence emphasizes Janaki Ammal's achievement, explaining that she successfully created sugarcane hybrids that are well suited to India's climate by crossbreeding an imported sugarcane species with grasses native to India.

Choice B is incorrect. The sentence emphasizes the goal of the Imperial Sugar Cane Institute in the 1930s; it doesn't emphasize Janaki Ammal's achievement. *Choice C* is incorrect. While the sentence mentions Ammal, it doesn't emphasize her achievement of successfully creating sugarcane hybrids. *Choice D* is

incorrect. While the sentence mentions the achievement of crossbreeding imported sugarcane species with grasses native to India, it doesn't emphasize the achievement as belonging to Janaki Ammal.

QUESTION 32

Choice B is the best answer. The sentence emphasizes a similarity between the sculptures *Recognition* and *Students Aspire*, noting that both sculptures show African American figures in poses that symbolize supportive relationships.

Choice A is incorrect. The sentence describes one of the sculptures; it doesn't emphasize a similarity between the two sculptures. *Choice C* is incorrect. The sentence specifies the different years the sculptures were completed in; it doesn't emphasize a similarity between the two sculptures. *Choice D* is incorrect. The sentence emphasizes a difference between the two sculptures, noting that the figures in the sculptures have different feature definition; it doesn't emphasize a similarity between the two sculptures.

QUESTION 33

Choice C is the best answer. The sentence makes a generalization about the materials used in dhow replicas, noting that while some modern materials are used, most of the materials are traditional.

Choice A is incorrect. The sentence provides an example of a traditional material used in ancient dhows; it doesn't indicate that the material is used in dhow replicas or make any other generalization about materials used in those replicas. *Choice B* is incorrect. The sentence explains what an ancient dhow was; it doesn't make a generalization about materials used to make dhow replicas. *Choice D* is incorrect. The sentence introduces the construction of dhow replicas to an audience unfamiliar with the vessel; it doesn't make a generalization about the materials used in those replicas.

Reading and Writing

Module 2
(33 questions)

QUESTION 1

Choice C is the best answer because it most logically completes the text's discussion of Ester Hernandez's art. In this context, "featured" means shown prominently. The text focuses on where Hernandez's works have been and continue to be displayed, explaining that her early works, which consisted of murals, could be viewed in outdoor spaces in San Francisco. The central contrast developed in the text is between where her early works could be viewed and where her works can be viewed now, which is in museums across the United States and around the world. The context therefore supports the idea that Hernandez's works are now shown, or featured, in museums globally.

Choice A is incorrect because in this context "invented" would mean created something for the first time, which isn't supported since the text doesn't discuss where Hernandez creates her works or whether they're original or innovative. *Choice B* is incorrect because "adjusted" in this context would mean adapted. Although the text mentions that many of Hernandez's early works were outdoor murals and thus it may be reasonable to infer that Hernandez altered her approach to creating art so that her works could be displayed in indoor venues instead, the text makes no mention of how Hernandez's works might have been adapted for such venues. The text focuses on where Hernandez's works have been and continue to be displayed, not on how she or anyone else may have adapted, or adjusted, her works. *Choice D* is incorrect because "recommended" in this context would mean endorsed or put forth as a suggestion for something that is worth seeing. Although it may be reasonable to say that in choosing to display certain works, museum curators believe such works are worth seeing, the text doesn't discuss the reasons why museums display Hernandez's works. Instead, the text mainly develops a contrast between where Hernandez's early works could once be viewed and where her work can be viewed now.

QUESTION 2

Choice D is the best answer because it most logically completes the text's discussion of Carmen Lomas Garza's artistic process. In this context, "inspired by" means influenced by or motivated by. The text refers to how, regardless of the scale of the work, Garza uses her memories of Texas and details from California to create her art. If Garza is basing her work on her direct experiences, then they play a part in her artistic process. This context thus suggests that Garza's art is inspired by the experiences of her childhood in Texas and her current life in California.

Choice A is incorrect because it wouldn't make logical sense to indicate that Garza is "complimented by"—or praised by—something inanimate such as direct experience. *Choice B* is incorrect because describing Garza as "uncertain about"—or unsure or doubtful of—direct experience would suggest that she had misgivings about it. If Garza were unsure of her experiences, that would suggest that she couldn't recall them, and Garza wouldn't be able to represent direct experience in her art if she were uncertain of the memories or details. *Choice C* is incorrect because describing Garza as "unbothered by"—or uninterested in—her experience would imply the opposite of what the text suggests about Garza's artistic process. The text indicates that Garza's art comes from memories of her childhood in Texas and details of her surroundings in California.

QUESTION 3

Choice C is the best answer because it most logically completes the text's discussion of Bastos's study of a wild kea parrot. In this context, "accidental" means unplanned or unintentional. The text first describes Bastos's study, which concerns a kea that is observed using small stones to preen its feathers. The text then mentions colleagues who are skeptical (that is, they have doubt) about Bastos's findings, and finally describes how Bastos and her team responded to the skepticism of those colleagues. Given that the colleagues mentioned in the text expressed skepticism regarding Bastos's findings, the best answer choice must be one that completes the text in a manner such that the skeptics' opinion regarding the kea's use of stones disagrees with that held by Bastos and her team. Since Bastos and her team showed that the kea's use of stones was deliberate (that is, intentional), the skeptics' opinion in this context must be that the kea's use of stones was unintentional, or accidental.

Choice A is incorrect because the best answer choice is one that portrays skepticism, or doubt, of Bastos's claim that the kea's usage of stones was deliberate, or intentional. If the skeptics found the kea's usage of stones "intriguing," or fascinating, this would not be at odds with the position of Bastos and her team; in fact, it is reasonable to believe that someone who agreed that the kea's stone usage was deliberate would also find it intriguing. *Choice B* is incorrect because if the skeptics believed that the kea's usage of small stones was "obvious," or evident, this would not be contrary to the observation of Bastos and her team that the kea's usage of stones was deliberate: in fact, these opinions would be consistent with each other. *Choice D* is incorrect because if the skeptics believed that the kea's usage of small stones was "observable," or visible, this would not conflict with the claim of Bastos and her team that the kea's usage of stones was deliberate: instead, these positions would agree.

QUESTION 4

Choice B is the best answer because it most logically completes the text's discussion of the Kelmscott Press's books. In this context, "manifest in" means evident or apparent from. The text states that the Kelmscott Press, which was cofounded by William Morris, produced its books using preindustrial methods. The text notes the similarity between those methods, which include the use of handmade materials and intricate ornamentation, and methods used in the creation of medieval manuscripts. This context suggests that Morris's repudiation of industrialization is apparent from, or manifest in, the methods and materials his company employed.

Choice A is incorrect because there is nothing in the text to suggest that Morris's repudiation of industrialization is "insensible to," or unaware of or lacking perception of, the use of handmade materials and intricate ornamentation in the production of the Kelmscott editions. Instead, the text suggests that the methods and materials used to produce the Kelmscott editions are evidence of Morris's repudiation of industrialization. *Choice C* is incorrect because it would not make sense to say that Morris's repudiation of industrialization was "scrutinized by," or examined closely by, the Kelmscott editions' use of handmade materials and intricate ornamentation. Although creating the Kelmscott editions may have involved examining the books closely, the text does not mention this aspect of Morris's work, and in any case, the action of using certain materials to create those editions cannot scrutinize Morris's attitude toward industrialization. *Choice D* is incorrect because the text gives no indication that Morris's repudiation of industrialization is "complicated by," or made more complex or difficult by, the Kelmscott Press's use of preindustrial methods and handcrafted elements to produce books. Instead, the text presents those methods as exemplifying Morris's repudiation of industrialization.

QUESTION 5

Choice B is the best answer because it most logically completes the text's discussion of Mary Engle Pennington and Stephanie Kwolek. In this context, "tentative" means unsettled or not definite. The text indicates a contrast between Pennington and Kwolek in terms of their memorability ("place in our historical memory") and states that Kwolek "will long be remembered" for her invention of Kevlar material. This context suggests that although Pennington had an impact on society, she may be less likely than Kwolek to be remembered for a very long time—in other words, that her memorability may be more tentative, or less definite, than Kwolek's.

Choice A is incorrect because the text establishes a contrast between Pennington and Kwolek in terms of their "place in our historical memory" for their achievements, and the statement that Kwolek "will be long remembered" while Pennington's memorability may be more "permanent," or enduring, wouldn't supply a contrast; it would instead suggest that both people will remain memorable. *Choice C* is incorrect because the text establishes a contrast between Pennington and Kwolek in terms of their memorability, suggesting that Pennington is less likely than Kwolek to be "long remembered," but doesn't

address how "warranted," or based on good reason, each person's "place in our historical memory" is. In fact, the text suggests that both Pennington and Kwolek had significant achievements, even if one may be more memorable. *Choice D* is incorrect because the text establishes a contrast between Pennington and Kwolek in terms of their "place in our historical memory" for their achievements, and the statement that Kwolek "will be long remembered" while Pennington's memorability may be more "prominent," or widely known, wouldn't supply a contrast; it would instead suggest that both people are very memorable.

QUESTION 6

Choice C is the best answer because it most accurately describes the main purpose of the text, which is to portray Francie's determination to reach her goal of reading all the books in the world. The text indicates that to achieve this aim, Francie works systematically and persistently: she reads all the books in the library in alphabetical order and devotes much time and effort to the project, finishing one book per day over a long period of time. The text then suggests that even though she progresses slowly ("she was still in the B's") and that she struggled with some books ("some of the B's had been hard going"), she doesn't give up because she thinks of herself as "a reader." These details show Francie's resolve.

Choice A is incorrect. Although the text mentions several topics (bees and buffaloes, Bermuda vacations, and Byzantine architecture) that Francie has read about, it doesn't indicate that any of these topics are unusual or that she especially enjoyed reading about one of these topics in particular. If anything, the text suggests that she may have found some of these topics to be dull, saying that she even read the "dry ones"— that is, the boring books—and that some of the books were "hard going," meaning they were difficult to get through. *Choice B* is incorrect because the text doesn't discuss Francie's involvement in other activities, only her dedication to reading. Although it's possible that Francie dedicates herself to reading because she prefers it to other activities, the text doesn't indicate whether this is the case. *Choice D* is incorrect. Although the text mentions one author (Abbott) whose book Francie has read as well as several topics (bees and buffaloes, Bermuda vacations, and Byzantine architecture) she has encountered, the text doesn't say whether Francie admires any of the books she's read so far. Instead, the text focuses on the time and effort she devotes to reaching her goal of reading all the books in the world—even ones she doesn't enjoy.

QUESTION 7

Choice D is the best answer because it most accurately states the main purpose of the text, which is to describe an experiment whose results cast doubt on an established hypothesis. The text begins by noting that researchers have long believed that woolly mammoths were hunted to extinction in North America by humans using spears with Clovis points. The text then describes an experiment conducted by an anthropologist to test this hypothesis. According to the text, the results of the experiment led the anthropologist to conclude that hunters using spears with Clovis points likely weren't the primary cause of the extinction. The anthropologist's results cast doubt on the long-held hypothesis presented at the beginning of the text and suggest that woolly mammoths may have become extinct in North America due to some other cause.

Choice A is incorrect because there's nothing in the text to suggest that researchers have been involved in an ongoing debate. On the contrary, the text suggests that most researchers agree on the cause of the woolly mammoth's extinction in North America. *Choice B* is incorrect because the text never mentions any advantages or disadvantages of the method used in the experiment, focusing instead on the results achieved using that method. *Choice C* is incorrect because the text addresses only one hypothesis, that mammoths were hunted to extinction in North America by humans using spears with Clovis points. Rather than present a competing hypothesis, the text explains how one anthropologist designed an experiment to test this long-held hypothesis.

QUESTION 8

Choice C is the best answer because it most effectively describes the function of the underlined portion. The text discusses the long-standing misconception that people in medieval Europe were uninterested in cleanliness and hygiene. As evidence that this idea is false, the text cites historian Eleanor Janega's assertion that in medieval Europe, towns usually had at least one bathhouse, where people could take immersion baths or steam baths for a fee. The underlined portion then notes that mainly town dwellers had access to these bathhouses. The remainder of the text explains that those who lacked such access were nonetheless able to bathe in outdoor waterways or take sponge baths at home. Therefore, the underlined portion concedes that some people in medieval Europe lacked access to public bathhouses.

Choice A is incorrect. The underlined portion establishes that amenities such as steam baths were mainly available to town dwellers, which suggests in turn that steam baths were largely unavailable to people in rural areas. Thus, the distinction made by the underlined portion is not between the popularity of steam baths in towns versus their lack of popularity in rural areas but instead between their presence in towns and absence in rural areas. *Choice B* is incorrect. Although the text does explain that recent historians have disproved the idea that medieval Europeans rarely bathed, it doesn't attribute that misconception to earlier historians of medieval Europe or suggest that their research was subject to limitations. Moreover, the underlined portion addresses a limitation of life in medieval Europe, not of historical research. *Choice D* is incorrect because the

underlined portion doesn't address why historian Eleanor Janega decided to study the popularity of public bathhouses in medieval Europe—nor does any portion of the text. The text mentions Janega in passing, but it doesn't go into detail about why she decided to study the popularity of public bathhouses in medieval Europe.

QUESTION 9

Choice C is the best answer because it most accurately describes how the underlined portion functions in the text as a whole. The text begins by mentioning scholarly accounts of the Chicano movement, which the underlined portion describes as tending "to focus on the most militant, outspoken figures in the movement," making the movement as a whole seem uniformly radical. The text then indicates that the work of geographer Juan Herrera shows that focusing less on such militant figures and instead paying more attention to manifestations of the Chicano movement in less widely known neighborhood institutions and projects would reveal that the movement's participants embraced a range of political orientations and approaches. Thus, the underlined portion describes a common approach to studying the Chicano movement that, according to the text, obscures the ideological diversity of the movement's participants.

Choice A is incorrect. Though the underlined portion does present a trend in scholarship on the Chicano movement, the text does not indicate that other scholars have reevaluated their methods in light of Herrera's work. It only indicates that Herrera's work suggests that the work of those other scholars does not provide a complete picture of the Chicano movement. *Choice B* is incorrect. Though the underlined portion does identify an aspect of the Chicano movement that the text indicates has been overemphasized, the text does not discuss the political orientations of the scholars whose work is mentioned in the text. *Choice D* is incorrect. Though the underlined portion does summarize the conventional method for analyzing the Chicano movement, the rest of the text does not address the effectiveness of "comparatively low-profile neighborhood institutions and projects." Instead, the text suggests that those projects were led by people with a variety of approaches to community activism.

QUESTION 10

Choice C is the best answer because it accurately states the main idea of the text. According to the text, contrary to what some might expect, foreign investment is typically lower in developing countries whose economies are more dependent on natural-resource extraction. The text explains that high reliance on natural-resource extraction can subject a developing country to economic shocks that can destabilize the local currency and introduce economic uncertainty that tends to keep investors away. In other words, although we may think otherwise, foreign investors are less willing to invest in projects in developing countries whose economies are heavily dependent on natural-resource extraction because those economies tend to exhibit instability that investors want to avoid.

Choice A is incorrect. The text does indicate that foreign investment is typically lower in developing countries whose economies are more dependent on

natural-resource extraction; the text further indicates that natural-resource extraction requires substantial initial investments (to acquire things like required technologies) for which there are fewer investors willing to participate at this stage than one might think. But the text does not implicate the cost of these initial investments as a reason why foreign investment is less widely available than some might think. *Choice B* is incorrect. The text indicates that greater dependence on natural-resource extraction makes a developing country less appealing to foreign investors because of associated economic instability. Rather than arguing that the goal of developing countries is to become less dependent on foreign investment, as the phrasing of choice B suggests, the text focuses only on why foreign investors become less involved with such countries, which suggests that more investment would be preferable. *Choice D* is incorrect. Although the text indicates that natural-resource extraction requires substantial initial investments (to acquire things like required technologies) and that there are fewer likely investors willing to participate at this stage than one might think, the text does not address what investors are likely to do over time as the industry stabilizes itself.

QUESTION 11

Choice C is the best answer because it accurately describes why the finding about the microorganism community composition was important. The text describes an experiment by Eva Kaštovská and her team in which they collected plant-soil cores at one elevation and transplanted them to sites at a lower elevation, where the mean air temperature was warmer. Kaštovská and her team observed that microorganism-mediated nutrient cycling was accelerated in the transplanted cores and that "crucially, microorganism community composition was unchanged," which allowed the team to attribute the acceleration to changes in microorganism activity brought about by the difference in temperature. This strongly implies that the team wouldn't have been able to make that attribution otherwise, meaning that a change in microorganism composition represented another possible explanation for the acceleration that had to be ruled out.

Choice A is incorrect. Although the text says microorganism-mediated cycling of soil nutrients increased in the transplanted cores, this is unrelated to what's important about the finding that the microorganism composition didn't change— that it allowed the team to attribute the change in activity solely to the change in temperature. *Choice B* is incorrect. Although the text compares activity in one core at two different elevations, the text doesn't address changes in activity at various elevations over time. *Choice D* is incorrect. Although different microorganisms likely exhibit different levels of activity, the text indicates that there was no change in microorganism composition, and there is nothing in the text about different microorganisms having different activity levels.

QUESTION 12

Choice C is the best answer because it states a conclusion the researchers likely agree with, given the details in the text. The text explains that a biosignature gas is a gas that can be used as an indicator that a planet harbors some form of life and some astronomers have proposed that NH_3 could serve as a biosignature gas. The researchers evaluating this claim found that the atmosphere of rocky planets would be unlikely to reach "detectably high levels" of NH_3 without biological activity, which would support the proposal of NH_3 serving as a biosignature gas. However, the text also states that mini-Neptune planets can produce NH_3 in the absence of biological activity. Thus, the text is structured to lead to the conclusion that detectable levels of NH_3 in the atmospheres of rocky planets could constitute a biosignature, but that is not the case for detectable levels of the gas in the atmospheres of mini-Neptune planets.

Choice A is incorrect because the text indicates that biological activity likely accounts for detectable levels of NH_3 in the atmospheres of rocky planets but mini-Neptune planets can have detectable levels of NH_3 in their atmospheres in the absence of biological activity. Therefore, both rocky planets and mini-Neptune planets can have detectable levels of atmospheric NH_3. *Choice B* is incorrect because the text states that for NH_3 to reach detectable levels in the atmospheres of rocky planets likely means they harbor biological activity, meaning that rocky planets with detectable NH_3 usually harbor biological activity. However, that does not entail that every rocky planet with biological activity will have detectable levels of NH_3 in their atmospheres. *Choice D* is incorrect because the text claims only that some astronomers have proposed using NH_3 as a biosignature gas without mentioning a minimum concentration of atmospheric NH_3 that must be met for it to function as a biosignature gas.

QUESTION 13

Choice C is the best answer because it most effectively uses data from the graph to complete the statement about the US national park with the highest number of recreation visits during a three-month period. The line graph shows the number of recreation visits to four US national parks for the months of June, July, and August 2021. According to the graph, the number of recreation visits to Yellowstone National Park in June was approximately 940,000; in July, the number of visits was approximately 1,080,000; and in August, the number of visits was approximately 920,000. In all three months, the number of visits to Yellowstone was higher than the number of visits to any other park in each month.

Choice A is incorrect. According to the graph, the number of recreation visits to Zion National Park was approximately 680,000 in June, about 580,000 in July, and about 470,000 in August, each of which is lower than the number of visits to Yellowstone in the same months. *Choice B* is incorrect. According to the graph, the number of recreation visits to Rocky Mountain National Park was approximately 670,000 in June, about 900,000 in July, and about 750,000 in August, each of which is lower than the number of visits to Yellowstone in the same months. *Choice D* is incorrect. According to the graph, the number of recreation visits to Grand Canyon National Park was approximately 540,000 in June, about 560,000 in July, and about 430,000 in August, each of which is lower than the total visits to Yellowstone in the same months.

QUESTION 14

Choice D is the best answer because it most effectively illustrates the claim that the speaker has contradictory feelings while experiencing the sights and sounds of spring. This quotation indicates that the speaker is reclined in a grove listening to a thousand sounds. Even though the speaker is in a "sweet mood" and thinking "pleasant thoughts," those pleasant thoughts also bring to mind "sad thoughts." In other words, these lines illustrate the claim that the speaker is having contradictory thoughts while immersed in the sights and sounds of spring.

Choice A is incorrect. Although this quotation refers to several flowers (primroses and periwinkles) and indicates that the speaker is in a "bower," or shady spot among the trees—details which suggest that the speaker is experiencing the sights of spring—it doesn't suggest that the speaker is having contradictory feelings, only that the speaker believes that the flowers are experiencing enjoyment. *Choice B* is incorrect. Although this quotation focuses on the sights of spring—namely, new leaves on nearby trees appear to be opening up ("The budding twigs spread out their fan") to feel the breeze—the quotation doesn't suggest that the speaker feels conflicted about this: the statement "And I must think, do all I can" suggests the speaker's determination to attribute feelings of pleasure to the trees, not that the speaker is experiencing contradictory feelings. *Choice C* is incorrect. Although this quotation indicates that the speaker isn't certain what the birds are thinking ("Their thoughts I cannot measure"), there's nothing to suggest that the speaker is experiencing contradictory feelings. Rather, the quotation suggests that although the speaker is uncertain about the birds' feelings, the speaker believes that the birds' movements likely suggest their pleasure.

QUESTION 15

Choice D is the best answer because it most effectively uses data from the table to complete the statement comparing the mean ratings for two different groups of participants in a study. The text explains that a research team evaluated the study's participants using various measures in order to learn whether there might be a medical benefit to telling patients they're receiving a placebo. The table shows the team's mean ratings for participants after 21 days for three of the measures: global improvement, symptom severity reduction, and quality of life improvement. According to the table, the mean ratings were higher for all three measures for participants aware of taking a placebo than for participants in the control group. Given that higher ratings indicate greater well-being, as the text states, the mean ratings in the table indicate greater overall well-being for participants aware of taking a placebo than for participants in the control group.

Choice A is incorrect because the table doesn't include data about individual participants; rather, it presents means, or mathematical averages, of ratings. For this reason, no conclusions can be drawn from data in the table about the extent to which well-being may have varied from participant to participant. *Choice B* is incorrect because according to the table, the mean ratings for participants aware of taking a placebo were higher for all three measures than for participants in the control group, not lower for two of the measures. *Choice C* is incorrect because

it cites data from the table related to participants in the control group, not to participants aware of taking a placebo. Additionally, the mean ratings in the table for participants aware of taking a placebo are higher for all three measures than for participants in the control group. Given that higher ratings indicate greater well-being, as the text states, the ratings in the table for participants aware of taking a placebo indicate greater well-being for these participants in all three measures.

QUESTION 16

Choice B is the best answer because it presents a finding that, if true, would most directly support the idea advanced by Homero Gil de Zúñiga and Trevor Diehl that NFM ("news finds me") attitude may reduce voting probability through an indirect effect. The text describes NFM as an attitude that has lowered people's interest in actively acquiring news and introduces Gil de Zúñiga and Diehl's study on the effects of NFM on people in the United States' political knowledge and interest. The text goes on to say that despite the fact that the study didn't occur near a major election, Gil de Zúñiga and Diehl still conclude that NFA may reduce voting probability. If the likelihood, or probability, that a person will vote is linked to that person's level of political knowledge and interest, that would suggest that negatively affecting a person's level of political knowledge and interest would also negatively affect how likely that person is to vote. Thus, if NFM attitude has a negative effect on political knowledge and interest, then it would also likely reduce voting probability.

Choice A is incorrect because the finding that NFM attitude increases as major elections approach wouldn't address the effect of NFM on the likelihood of voting, which is the idea advanced by Gil de Zúñiga and Diehl. Moreover, although the text mentions that there were no major elections that occurred near the time of the study, it doesn't discern between major and minor elections when discussing voting probability. *Choice C* is incorrect because finding that NFM attitude shows little correlation with either political knowledge or political interest would undermine, not support, Gil de Zúñiga and Diehl's idea that NFM may reduce voting probability because it suggests that NFM has no effect on political knowledge or political interest. *Choice D* is incorrect. Although Gil de Zúñiga and Diehl's idea would be supported by the finding that the likelihood of voting increases as political knowledge increases, nothing in the text suggests that the researchers' idea hinges on the size of people's social networks.

QUESTION 17

Choice A is the best answer because it most logically completes the text's discussion of the potential effects of logging on forest conservation. The text begins by stating that logging practices are often thought of as being contrary to forest conservation efforts. Then, the text presents the results of a research study examining the effect of limited logging practices on specific forest plots, finding that the plots with limited logging may be "more robust" (healthier) than the plots that hadn't been logged at all. Given these results, it follows that logging may be a useful practice for maintaining healthy forests if it is practiced in a limited way.

Choice B is incorrect because the study referenced in the text only provides information on limited logging as a potential forest management strategy. There is no information in the text about how other forest management strategies support forest conservation efforts. Therefore, the text does not support the assertion that other forest management strategies are more successful than limited logging. *Choice C* is incorrect because the text presents a research study with findings that specific plots of forest with limited logging may be more robust than the forest plots that were not logged. Rather than suggesting that it is hard to know whether limited logging might be beneficial, the text suggests that the practice could be useful in forest conservation efforts. *Choice D* is incorrect. The text discusses the results of a research study that compares the health of forest plots with limited logging to forest plots that were not logged. It does not take a position on the best way to support forest health but rather presents a research study with findings that question conventionally held thoughts regarding the practice of logging.

QUESTION 18

Choice D is the best answer because it presents the conclusion that most logically follows from the text's discussion of the means authors use to write and revise their novels. After stating that many authors still choose to draft novels by hand even though computers are now widely used, the text acknowledges the speculation that the opposite choice—using only a computer—would have had an effect on such novels. However, the text then points out that every novel is the singular result of a combination of the particular conditions surrounding its creation. This suggests that it isn't possible to determine the effect of any single condition (such as the means of writing) on its own; thus, there would be no way to reasonably evaluate how a novel would have turned out differently if it had been written by other means.

Choice A is incorrect because the text doesn't suggest that it's more efficient to write a novel on a computer than to write it by hand; it doesn't address efficiency at all. Therefore, it isn't logical to conclude that authors who currently choose to write novels largely by hand should instead work only on a computer to increase their efficiency. *Choice B* is incorrect because the text doesn't suggest anything about how successful authors are, regardless of the means by which they choose to write; therefore, it isn't logical to conclude that authors who write largely by hand are likely to be more successful than those who work only on a computer. *Choice C* is incorrect because the text makes no mention of the time it takes to produce a novel, regardless of the means by which it's written; therefore, it isn't logical to conclude that novels written by hand take less time on average to produce than those written on a computer do.

QUESTION 19

Choice C is the best answer. The convention being tested is end-of-sentence punctuation. This choice correctly uses a question mark to punctuate the coordinated interrogative clauses "What are atmospheric rivers" and "how do they affect our weather," both of which ask direct questions.

Choice A is incorrect because a period can't be used in this way to punctuate an interrogative clause, such as "how do they affect our weather," at the end of a sentence. *Choice B* is incorrect because the structure requires an interrogative clause and a question mark at the end of the sentence. *Choice D* is incorrect because the structure requires an interrogative clause at the end of the sentence.

QUESTION 20

Choice A is the best answer. The convention being tested is subject-modifier placement. This choice makes the proper noun "Matthew Henson" the subject of the sentence and places it immediately after the modifying phrase "one… century." In doing so, this choice clearly establishes that Matthew Henson—and not another noun in the sentence—is being described as one of the few African American global explorers during the turn of the 20th century.

Choice B is incorrect because it results in a dangling modifier. The placement of the noun phrase "1891 and 1909" immediately after the modifying phrase illogically suggests that those years were one of the few African American global explorers during the turn of the 20th century. *Choice C* is incorrect because it results in a dangling modifier. The placement of the proper noun "Greenland" immediately after the modifying phrase illogically suggests that Greenland was one of the few African American global explorers during the turn of the 20th century. *Choice D* is incorrect because it results in a dangling modifier. The placement of the noun phrase "several treks across Greenland" immediately after the modifying phrase illogically suggests that the treks were one of the few African American global explorers during the turn of the 20th century.

QUESTION 21

Choice A is the best answer. The convention being tested is subject-modifier placement. This choice makes the noun phrase "topological tapestries" the subject of the sentence and places it immediately after the modifying phrase "woven…grandmother." In doing so, this choice clearly establishes that the topological tapestries—and not another noun in the sentence—are being described as woven from recycled yarn and hand tufted.

Choice B is incorrect because it results in a dangling modifier. The placement of the noun phrase "Argentine textile artist Alexandra Kehayoglou" immediately after the modifying phrase illogically suggests that Kehayoglou is woven from recycled yarn and hand tufted. *Choice C* is incorrect because it results in a dangling modifier. The placement of the pronoun "she" and the noun phrase "Argentine textile artist Alexandra Kehayoglou" after the modifying phrase illogically suggests that Kehayoglou is woven from recycled yarn and hand tufted. *Choice D* is incorrect because it results in a dangling modifier. The placement of the noun "Alexandra Kehayoglou" immediately after the modifying phrase illogically suggests that Kehayoglou is woven from recycled yarn and hand tufted.

QUESTION 22

Choice C is the best answer. The convention being tested is the coordination of main clauses within a sentence. This choice uses a semicolon in a conventional way to join the first main clause ("Clear… through") and the second main clause ("wax…through").

Choice A is incorrect because it results in a comma splice. Without a conjunction following it, a comma can't be used in this way to join two main clauses. *Choice B* is incorrect because it results in a run-on sentence. The two main clauses ("Clear…through" and "wax…through") are fused without punctuation and/or a conjunction. Furthermore, it results in a confusing and illogical sentence that suggests clear glass allows light to pass through wax paper, which doesn't make sense in this context. *Choice D* is incorrect because when coordinating two longer main clauses such as these, it's conventional to use a comma before the coordinating conjunction.

QUESTION 23

Choice B is the best answer. The convention being tested is the punctuation of elements in a complex series. It's conventional to use a semicolon to separate items in a complex series with internal punctuation, and in this choice, the semicolon after "leaves" is conventionally used to separate the first item ("natural debris, such as dried leaves") and the second item ("man-made trash, such as plastic bags") in the series of materials used by Gavua. Further, the comma after "trash" correctly separates the noun phrase "man-made trash" from the supplementary phrase ("such as plastic bags") that describes it.

Choice A is incorrect because a comma after "leaves" doesn't match the semicolon used later to separate the second and third items in the series ("man-made…bags" and "and…glue"). Additionally, it's not conventional to use a colon in this way to separate a supplementary phrase ("such as plastic bags") from the noun phrase it modifies ("man-made trash"). *Choice C* is incorrect because a comma after "leaves" doesn't match the semicolon used later to separate the second and third items in the series ("man-made…bags" and "and…glue"). *Choice D* is incorrect because it's not conventional to use a semicolon in this way to separate a supplementary phrase ("such as plastic bags") from the noun phrase it modifies ("man-made trash").

QUESTION 24

Choice A is the best answer. The convention being tested is the punctuation of supplementary elements within a sentence. This choice correctly uses a comma to separate the supplementary adverb "however" from the preceding main clause ("only…competitions"), and it uses a colon to introduce the list of dances that follows ("rumba…jive"). Further, placing the colon after "however" rather than before indicates that the information in the preceding main clause (only…competitions) is contrary to what might be assumed from the information in the previous sentence (Latin America has many more dance forms).

Choice B is incorrect. The comma after "however" can't be used in this way to introduce a series ("rumba…jive"). *Choice C* is incorrect because it isn't

conventional to use a semicolon in this way to introduce a series of items, such as the list of dances. *Choice D* is incorrect because placing the semicolon after "competitions" illogically indicates that the following list of five Latin American dances ("rumba…jive") is contrary to the information in the previous clause (only five Latin American dances are included in international ballroom dance competitions).

QUESTION 25

Choice D is the best answer. The convention being tested is punctuation use between two main clauses. In this choice, a colon is correctly used to mark the boundary between one main clause ("goats are notoriously indiscriminate") and another main clause ("they will devour all kinds of shrubs and weeds") and to introduce the following explanation of goats' nondiscriminatory behavior when it comes to what they eat.

Choice A is incorrect because when coordinating two longer main clauses such as these, it's conventional to use a comma before the coordinating conjunction. Furthermore, the conjunction "and" fails to indicate that what follows is an explanation of goats' nondiscriminatory behavior when it comes to their diets. *Choice B* is incorrect because it results in a comma splice. A comma can't be used in this way to join two main clauses ("goats…indiscriminate" and "they… weeds"). *Choice C* is incorrect because it results in a run-on sentence. The two main clauses ("goats…indiscriminate" and "they…weeds") are fused without punctuation and/or a conjunction.

QUESTION 26

Choice B is the best answer. The convention being tested is subject-verb agreement. The plural verb "increase" agrees in number with the plural subject "toxins."

Choice A is incorrect because the singular verb "is increasing" doesn't agree in number with the plural subject "toxins." *Choice C* is incorrect because the singular verb "increases" doesn't agree in number with the plural subject "toxins." *Choice D* is incorrect because the singular verb "has increased" doesn't agree in number with the plural subject "toxins."

QUESTION 27

Choice D is the best answer. "Finally" logically signals that the actions in this sentence—the removal, cataloging, and analysis of artifacts—are the next and final steps in a process, following the previous actions of surveying, digging, recording, and mapping.

Choice A is incorrect because "for instance" illogically signals that the actions in this sentence are an example of the actions in the previous sentence. Instead, the removal, cataloging, and analysis of artifacts are the next and final steps in a process. *Choice B* is incorrect because "on the contrary" illogically signals that the actions in this sentence are directly opposed to the actions in the previous sentence. Instead, the removal, cataloging, and analysis of artifacts are the next and final steps in a process. *Choice C* is incorrect because "earlier" illogically

signals that the actions in this sentence occur before the actions in the previous sentence. Instead, the removal, cataloging, and analysis of artifacts are the next and final steps in a process.

QUESTION 28

Choice A is the best answer. "In turn" logically signals that the information in the sentence—that the electrical currents create a protective barrier around Earth—is a result or consequence of the previous information about the circulation of liquid metals generating electrical currents that flow between Earth's magnetic poles.

Choice B is incorrect because "likewise" illogically signals that the information in the sentence is similar to the previous information about the circulation of liquid metals generating electrical currents that flow between Earth's magnetic poles. Instead, the new information about the electrical currents is a direct result or consequence of the previous information. *Choice C* is incorrect because "nevertheless" illogically signals that the information in the sentence is true despite the previous information about the circulation of liquid metals generating electrical currents that flow between Earth's magnetic poles. Instead, the new information about the electrical currents is a direct result or consequence of the previous information. *Choice D* is incorrect because "in reality" illogically signals that the information in the sentence contradicts the previous information about the circulation of liquid metals generating electrical currents that flow between Earth's magnetic poles. Instead, the new information about the electrical currents is a direct result or consequence of the previous information.

QUESTION 29

Choice B is the best answer. "In fact" logically signals that the critics' claim at the end of this sentence—that the two editions are essentially two different novels altogether—offers additional emphasis in support of the previous claim that the differences between the editions are extreme.

Choice A is incorrect because "by contrast" illogically signals that the claim at the end of this sentence contrasts with the previous claim about the differences between the editions. Instead, the critics' opinion offers additional emphasis in support of that claim. *Choice C* is incorrect because "nevertheless" illogically signals that the claim at the end of this sentence is true despite the previous claim about the differences between the two editions. Instead, the critics' opinion offers additional emphasis in support of that claim. *Choice D* is incorrect because "in other words" illogically signals that the claim at the end of this sentence is merely paraphrasing the previous claim about the differences between the two editions. The critics' opinion adds new information to the previous claim rather than simply paraphrasing it.

QUESTION 30

Choice C is the best answer. The sentence emphasizes a similarity between the Choctaw Code Talkers and the Navajo Code Talkers by explaining that both groups used their native languages to transmit coded messages for the military.

Choice A is incorrect. The sentence describes the Choctaw Code Talkers; it doesn't emphasize a similarity between the Choctaw Code Talkers and the Navajo Code Talkers. *Choice B* is incorrect. The sentence introduces the Navajo Code Talkers; it doesn't emphasize a similarity between the Choctaw Code Talkers and the Navajo Code Talkers. *Choice D* is incorrect. The sentence emphasizes a difference between the Choctaw Code Talkers and the Navajo Code Talkers; it doesn't emphasize a similarity.

QUESTION 31

Choice D is the best answer. The sentence contrasts the number of meteorite falls with the number of meteorite finds, noting that there have been over 60,000 meteorite finds but only about 1,200 recorded meteorite falls.

Choice A is incorrect. While the sentence explains the difference between meteorite falls and meteorite finds, it doesn't contrast the number of meteorite falls and meteorite finds. *Choice B* is incorrect. The sentence indicates the two categories of meteorites found on Earth; it doesn't contrast the number of meteorite falls and meteorite finds. *Choice C* is incorrect. While the sentence notes the number of recorded meteorite falls, it doesn't contrast this with the number of meteorite finds.

QUESTION 32

Choice B is the best answer. The sentence emphasizes the sample collected from Serra de Itatiaia, noting that Bandeira collected a *Polytrichum juniperinum* sample there in 1925.

Choice A is incorrect. The sentence introduces Bandeira to an audience unfamiliar with her work; it doesn't emphasize the sample she collected from Serra de Itatiaia. *Choice C* is incorrect. While the sentence mentions the sample Bandeira collected from Serra de Itatiaia, it doesn't emphasize this sample over the sample from Ponte do Inferno. *Choice D* is incorrect. The sentence provides examples of the botanical samples Bandeira collected; it doesn't emphasize the sample collected from Serra de Itatiaia.

QUESTION 33

Choice C is the best answer. The sentence indicates which classification category most routine diplomatic correspondence belongs in, explaining that it is classified as Confidential because it has the potential to damage national security if disclosed.

Choice A is incorrect. While the sentence makes a claim about information classified as Confidential, it doesn't indicate which category routine diplomatic correspondence belongs in. *Choice B* is incorrect. The sentence makes a generalization about how routine diplomatic correspondence is classified; it doesn't indicate which classification category the correspondence belongs in. *Choice D* is incorrect. This sentence explains that routine diplomatic correspondence could affect national security if disclosed; it doesn't indicate which category of sensitive information this correspondence belongs in.

Math

Module 1
(27 questions)

QUESTION 1

Choice A is correct. Subtracting 8 from both sides of the given equation yields $p+3=2$. Subtracting 3 from both sides of this equation yields $p=-1$.

Choice B is incorrect and may result from conceptual or calculation errors.
Choice C is incorrect and may result from conceptual or calculation errors.
Choice D is incorrect and may result from conceptual or calculation errors.

QUESTION 2

Choice D is correct. An appropriate model should follow the trend of the data points and should have data points both above and below the model. The scatterplot shows that the data points have an increasing trend that is curved. Therefore, an appropriate model should be an increasing curve with data points both above and below the model. Of the given choices, only the model in choice D is an increasing curve with data points both above and below the model.

Choice A is incorrect. Since the trend of the data points isn't linear, a line isn't the most appropriate model for the data. *Choice B* is incorrect. Since the trend of the data points is increasing and isn't linear, a decreasing line isn't the most appropriate model for the data. *Choice C* is incorrect. All the data points are below the model shown in this graph.

QUESTION 3

Choice D is correct. Adding 53 to each side of the given equation yields $k^2=144$. Taking the square root of each side of this equation yields $k=\pm 12$. Therefore, the positive solution to the given equation is 12.

Choice A is incorrect. This is the positive solution to the equation $k^2-53=20{,}683$, not $k^2-53=91$. *Choice B* is incorrect. This is the positive solution to the equation $k^2-53=5{,}131$, not $k^2-53=91$. *Choice C* is incorrect. This is the positive solution to the equation $k^2-53=1{,}391$, not $k^2-53=91$.

QUESTION 4

Choice D is correct. It's given that during a portion of a flight, a small airplane's cruising speed varied between 150 miles per hour and 170 miles per hour. It's also given that s represents the cruising speed, in miles per hour, during this portion of the flight. It follows that the airplane's cruising speed, in miles per hour, was at least 150, which means $s \geq 150$, and was at most 170, which means $s \leq 170$. Therefore, the inequality that best represents this situation is $150 \leq s \leq 170$.

Choice A is incorrect and may result from conceptual or calculation errors.
Choice B is incorrect and may result from conceptual or calculation errors.
Choice C is incorrect and may result from conceptual or calculation errors.

QUESTION 5

Choice A is correct. It's given that the variable y represents the height, in meters, of the object above the ground. The graph shows that the height of the object was increasing from $x = 0$ to $x = 2$, and decreasing from $x = 2$ to $x = 4$. Therefore, the height of the object was increasing for the entire interval of time from $x = 0$ to $x = 2$.

Choice B is incorrect. The height of the object wasn't increasing for this entire interval of time, as it was decreasing from $x = 2$ to $x = 4$. *Choice C* is incorrect. The height of the object was decreasing, not increasing, for this entire interval of time. *Choice D* is incorrect. The height of the object was decreasing, not increasing, for this entire interval of time.

QUESTION 6

The correct answer is 31. It's given that 1 yard is equal to 36 inches. Therefore, 1,116 inches is equivalent to $\left(1{,}116 \text{ inches}\right)\left(\frac{1 \text{ yard}}{36 \text{ inches}}\right)$, or 31 yards.

QUESTION 7

The correct answer is 11. It's given that the function $f(x) = 14 + 4x$ represents the total cost, in dollars, of attending an arcade when x games are played. Substituting 58 for $f(x)$ in the given equation yields $58 = 14 + 4x$. Subtracting 14 from each side of this equation yields $44 = 4x$. Dividing each side of this equation by 4 yields $11 = x$. Therefore, 11 games can be played for a total cost of $58.

QUESTION 8

Choice D is correct. It's given that when $x = 0$, $f(x) = 30$. Substituting 0 for x and 30 for $f(x)$ in the given function yields $30 = 0 + b$, or $30 = b$. Therefore, the value of b is 30.

Choice A is incorrect and may result from conceptual or calculation errors.
Choice B is incorrect and may result from conceptual or calculation errors.
Choice C is incorrect and may result from conceptual or calculation errors.

QUESTION 9

Choice B is correct. The function P gives the estimated number of marine mammals in a certain area, where t is the number of years since a study began. Since the value of $P(0)$ is the value of $P(t)$ when $t=0$, it follows that $P(0)=1,800$ means that the value of $P(t)$ is 1,800 when $t=0$. Since t is the number of years since the study began, it follows that $t=0$ is 0 years since the study began, or when the study began. Therefore, the best interpretation of $P(0)=1,800$ in this context is the estimated number of marine mammals in the area was 1,800 when the study began.

Choice A is incorrect and may result from conceptual or calculation errors.
Choice C is incorrect and may result from conceptual or calculation errors.
Choice D is incorrect and may result from conceptual or calculation errors.

QUESTION 10

Choice B is correct. It's given that the shop's inventory starts with 4,500 paper cups and that the manager estimates that 70 of these paper cups are used each day. Let x represent the number of days in which the estimated supply of paper cups will reach 1,700. The equation $4,500-70x=1,700$ represents this situation. Subtracting 4,500 from both sides of this equation yields $-70x=-2,800$. Dividing both sides of this equation by -70 yields $x=40$. Therefore, based on this estimate, the supply of paper cups will reach 1,700 in 40 days.

Choice A is incorrect. After 20 days, the estimated supply of paper cups would be $4,500-70(20)$, or 3,100 cups, not 1,700 cups. Choice C is incorrect. After 60 days, the estimated supply of paper cups would be $4,500-70(60)$, or 300 cups, not 1,700 cups. Choice D is incorrect. After 80 days, the estimated supply of paper cups would be $4,500-70(80)$, or $-1,100$ cups, which isn't possible.

QUESTION 11

Choice A is correct. In each choice, the values of x are 2, 4, and 6. Substituting the first value of x, 2, for x in the given inequality yields $y>4(2)+8$, or $y>16$. Therefore, when $x=2$, the corresponding value of y must be greater than 16. Of the given choices, only choice A is a table where the value of y corresponding to $x=2$ is greater than 16. To confirm that the other values of x in this table and their corresponding values of y are also solutions to the given inequality, the values of x and y in the table can be substituted for x and y in the given inequality. Substituting 4 for x and 30 for y in the given inequality yields $30>4(4)+8$, or $30>24$, which is true. Substituting 6 for x and 41 for y in the given inequality yields $41>4(6)+8$, or $41>32$, which is true. It follows that for choice A, all the values of x and their corresponding values of y are solutions to the given inequality.

Choice B is incorrect. Substituting 2 for x and 8 for y in the given inequality yields $8>4(2)+8$, or $8>16$, which is false. Choice C is incorrect. Substituting 2 for x and 13 for y in the given inequality yields $13>4(2)+8$, or $13>16$, which is false. Choice D is incorrect. Substituting 2 for x and 13 for y in the given inequality yields $13>4(2)+8$, or $13>16$, which is false.

QUESTION 12

Choice B is correct. The expression $(x^2+11)^2$ can be written as $(x^2+11)(x^2+11)$, which is equivalent to $x^2(x^2+11)+11(x^2+11)$. Distributing x^2 and 11 to (x^2+11) yields $x^4+11x^2+11x^2+121$, or x^4+22x^2+121. The expression $(x-5)(x+5)$ is equivalent to $(x-5)x+(x-5)5$. Distributing x and 5 to $(x-5)$ yields $x^2-5x+5x-25$, or x^2-25. Therefore, the expression $(x^2+11)^2+(x-5)(x+5)$ is equivalent to $(x^4+22x^2+121)+(x^2-25)$, or $x^4+22x^2+121+x^2-25$. Combining like terms in this expression yields x^4+23x^2+96.

Choice A is incorrect. Equivalent expressions must be equivalent for any value of x. Substituting 0 for x in this expression yields -14, whereas substituting 0 for x in the given expression yields 96. *Choice C* is incorrect. Equivalent expressions must be equivalent for any value of x. Substituting 0 for x in this expression yields 121, whereas substituting 0 for x in the given expression yields 96. *Choice D* is incorrect. Equivalent expressions must be equivalent for any value of x. Substituting 0 for x in this expression yields 146, whereas substituting 0 for x in the given expression yields 96.

QUESTION 13

The correct answer is $\frac{1}{2}$. The value of $h(2)$ is the value of $h(x)$ when $x=2$. Substituting 2 for x in the given equation yields $h(2)=\frac{8}{5(2)+6}$, which is equivalent to $h(2)=\frac{8}{16}$, or $h(2)=\frac{1}{2}$. Therefore, the value of $h(2)$ is $\frac{1}{2}$. Note that 1/2 and .5 are examples of ways to enter a correct answer.

QUESTION 14

The correct answer is $\frac{15}{2}$. The area, A, of a triangle is given by the formula $A=\frac{1}{2}bh$, where b is the length of the base of the triangle and h is the height of the triangle. In the right triangle shown, the length of the base of the triangle is 5 inches, and the height is 3 inches. It follows that $b=5$ and $h=3$. Substituting 5 for b and 3 for h in the formula $A=\frac{1}{2}bh$ yields $A=\frac{1}{2}(5)(3)$, which is equivalent to $A=\frac{1}{2}(15)$, or $A=\frac{15}{2}$. Therefore, the area of the triangle, in square inches, is $\frac{15}{2}$. Note that 15/2 and 7.5 are examples of ways to enter a correct answer.

QUESTION 15

Choice B is correct. It's given that the graph models the number of active projects a company was working on x months after the end of November 2012. Therefore, the value of x that corresponds to the end of November 2012 is 0. The point at which $x=0$ is the y-intercept of the graph. It follows that the y-intercept of the graph shown is the point $(0, 5)$. Therefore, according to the model, the predicted number of active projects the company was working on at the end of November 2012 is 5.

Choice A is incorrect. This is the value of x that corresponds to the end of November 2012, not the predicted number of active projects the company was working on at the end of November 2012. *Choice C* is incorrect. This is the predicted number of active projects the company was working on 2 months after the end of November 2012. *Choice D* is incorrect. This is the predicted number of active projects the company was working on 4 months after the end of November 2012.

QUESTION 16

Choice C is correct. It's given that the relationship between x and y is linear. An equation representing a linear relationship can be written in the form $y = mx + b$, where m is the slope and b is the y-coordinate of the y-intercept of the graph of the relationship in the xy-plane. It's given that for every increase in the value of x by 1, the value of y increases by 8. The slope of a line can be expressed as the change in y over the change in x. Thus, the slope, m, of the line representing this relationship can be expressed as $\frac{8}{1}$, or 8. Substituting 8 for m in the equation $y = mx + b$ yields $y = 8x + b$. It's also given that when the value of x is 2, the value of y is 18. Substituting 2 for x and 18 for y in the equation $y = 8x + b$ yields $18 = 8(2) + b$, or $18 = 16 + b$. Subtracting 16 from each side of this equation yields $2 = b$. Substituting 2 for b in the equation $y = 8x + b$ yields $y = 8x + 2$. Therefore, the equation $y = 8x + 2$ represents this relationship.

Choice A is incorrect. This equation represents a relationship where for every increase in the value of x by 1, the value of y increases by 2, not 8, and when the value of x is 2, the value of y is 22, not 18. *Choice B* is incorrect. This equation represents a relationship where for every increase in the value of x by 1, the value of y increases by 2, not 8, and when the value of x is 2, the value of y is 12, not 18. *Choice D* is incorrect. This equation represents a relationship where for every increase in the value of x by 1, the value of y increases by 3, not 8, and when the value of x is 2, the value of y is 32, not 18.

QUESTION 17

Choice D is correct. It's given that the values of P, N, and C are positive. Therefore, dividing each side of the given equation by N yields $\frac{P}{N} = 19 - C$. Subtracting 19 from each side of this equation yields $\frac{P}{N} - 19 = -C$. Dividing each side of this equation by -1 yields $19 - \frac{P}{N} = C$, or $C = 19 - \frac{P}{N}$.

Choice A is incorrect. This equation is equivalent to $P = NC - 19$, not $P = N(19 - C)$. *Choice B* is incorrect. This equation is equivalent to $P = 19 - NC$, not $P = N(19 - C)$. *Choice C* is incorrect. This equation is equivalent to $P = N(C - 19)$, not $P = N(19 - C)$.

QUESTION 18

Choice D is correct. Adding 40 to both sides of the given equation yields $w^2 + 12w = 40$. To complete the square, adding $\left(\frac{12}{2}\right)^2$, or 6^2, to both sides of this equation yields $w^2 + 12w + 6^2 = 40 + 6^2$, or $(w+6)^2 = 76$. Taking the square root of both sides of this equation yields $w + 6 = \pm\sqrt{76}$, or $w + 6 = \pm 2\sqrt{19}$. Subtracting 6 from both sides of this equation yields $w = -6 \pm 2\sqrt{19}$. Therefore, the solutions to the given equation are $-6 + 2\sqrt{19}$ and $-6 - 2\sqrt{19}$. Of these two solutions, only $-6 + 2\sqrt{19}$ is given as a choice.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice B* is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect and may result from conceptual or calculation errors.

QUESTION 19

Choice D is correct. If a data set contains an odd number of data values, the median is represented by the middle data value in the list when the data values are listed in ascending or descending order. Since the numbers of employees are given as ranges of values rather than specific values, it's only possible to determine the range in which the median falls, rather than the exact median. Since there are 17 restaurants included in the data set and the numbers of employees are listed in ascending order, it follows that the median number of employees will be represented by the ninth restaurant in the list. Since the first 2 restaurants each have 2 to 7 employees, numbers of employees in the 2 to 7 range would be represented by the first and second restaurants in the list. The next 4 restaurants each have 8 to 13 employees. Therefore, numbers of employees in the 8 to 13 range will be represented by the third through sixth restaurants in the list. The next 2 restaurants each have 14 to 19 employees. Therefore, numbers of employees in the 14 to 19 range will be represented by the seventh and eighth restaurants in the list. Since the next 7 restaurants each have 20 to 25 employees, numbers of employees in the 20 to 25 range will be represented by the ninth through fifteenth restaurants in the list. This means that the ninth restaurant in the list, which has the median number of employees for the restaurants in this town, has a number of employees in the 20 to 25 range. Of the given choices, the only number of employees in the 20 to 25 range is 21.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice B* is incorrect. This is the position of the median in the list, not the value of the median. *Choice C* is incorrect and may result from conceptual or calculation errors.

QUESTION 20

The correct answer is $\frac{189}{5}$. A y-intercept of a graph in the xy-plane is a point where the graph intersects the y-axis, which is a point with an x-coordinate of 0. Substituting 0 for x in the given equation yields $\frac{3(0)}{7} = -\frac{5y}{9} + 21$, or $0 = -\frac{5y}{9} + 21$. Subtracting 21 from both sides of this equation yields $-21 = -\frac{5y}{9}$. Multiplying both sides of this equation by -9 yields $189 = 5y$. Dividing both sides of this equation by 5 yields $\frac{189}{5} = y$. Therefore, the y-coordinate of the y-intercept of the graph of the given equation in the xy-plane is $\frac{189}{5}$. Note that 189/5 and 37.8 are examples of ways to enter a correct answer.

QUESTION 21

The correct answer is -24. Since the graph passes through the point $(0, -6)$, it follows that when the value of x is 0, the value of y is -6. Substituting 0 for x and -6 for y in the given equation yields $-6 = 2(0)^2 + b(0) + c$, or $-6 = c$. Therefore, the value of c is -6. Substituting -6 for c in the given equation yields $y = 2x^2 + bx - 6$. Since the graph passes through the point $(-1, -8)$, it follows that when the value of x is -1, the value of y is -8. Substituting -1 for x and -8 for y in the equation $y = 2x^2 + bx - 6$ yields $-8 = 2(-1)^2 + b(-1) - 6$, or $-8 = 2 - b - 6$, which is equivalent to $-8 = -4 - b$. Adding 4 to each side of this equation yields $-4 = -b$. Dividing each side of this equation by -1 yields $4 = b$. Since the value of b is 4 and the value of c is -6, it follows that the value of bc is $(4)(-6)$, or -24.

Alternate approach: The given equation represents a parabola in the xy-plane with a vertex at $(-1, -8)$. Therefore, the given equation, $y = 2x^2 + bx + c$, which is written in standard form, can be written in vertex form, $y = a(x - h)^2 + k$, where (h, k) is the vertex of the parabola and a is the value of the coefficient on the x^2 term when the equation is written in standard form. It follows that $a = 2$. Substituting 2 for a, -1 for h, and -8 for k in this equation yields $y = 2(x - (-1))^2 + (-8)$, or $y = 2(x + 1)^2 - 8$. Squaring the binomial on the right-hand side of this equation yields $y = 2(x^2 + 2x + 1) - 8$. Multiplying each term inside the parentheses on the right-hand side of this equation by 2 yields $y = 2x^2 + 4x + 2 - 8$, which is equivalent to $y = 2x^2 + 4x - 6$. From the given equation $y = 2x^2 + bx + c$, it follows that the value of b is 4 and the value of c is -6. Therefore, the value of bc is $(4)(-6)$, or -24.

QUESTION 22

Choice D is correct. It's given that in 2008 Zinah earned 14% more than in 2007. Let h represent the amount Zinah earned in 2007 and let j represent the amount that Zinah earned in 2008. This situation can be represented by the equation $j = \left(1 + \frac{14}{100}\right)h$, or $j = 1.14h$. It's also given that in 2009 Zinah earned 4% more than in 2008. Let k represent the amount Zinah earned in 2009. This situation can be represented by the equation $k = \left(1 + \frac{4}{100}\right)j$, or $k = 1.04j$. Substituting $1.14h$ for j in the equation $k = 1.04j$ yields $k = (1.04)(1.14h)$, or $k = 1.1856h$. If Zinah earned y times as much in 2009 as in 2007, then the value of y is 1.1856.

Choice A is incorrect and may result from conceptual or calculation errors.
Choice B is incorrect and may result from conceptual or calculation errors.
Choice C is incorrect and may result from conceptual or calculation errors.

QUESTION 23

Choice A is correct. According to the graph, the center of circle *A* has coordinates $(-2, 0)$, and the radius of circle *A* is 3. It's given that circle *B* is the result of shifting circle *A* down 6 units and increasing the radius so that the radius of circle *B* is 2 times the radius of circle *A*. It follows that the center of circle *B* is 6 units below the center of circle *A*. The point that's 6 units below $(-2, 0)$ has the same *x*-coordinate as $(-2, 0)$ and has a *y*-coordinate that is 6 less than the *y*-coordinate of $(-2, 0)$. Therefore, the coordinates of the center of circle *B* are $(-2, 0-6)$, or $(-2, -6)$. Since the radius of circle *B* is 2 times the radius of circle *A*, the radius of circle *B* is $(2)(3)$. A circle in the *xy*-plane can be defined by an equation of the form $(x-h)^2 + (y-k)^2 = r^2$, where the coordinates of the center of the circle are (h, k) and the radius of the circle is *r*. Substituting -2 for *h*, -6 for *k*, and $(2)(3)$ for *r* in this equation yields $(x-(-2))^2 + (y-(-6))^2 = ((2)(3))^2$, which is equivalent to $(x+2)^2 + (y+6)^2 = (2)^2(3)^2$, or $(x+2)^2 + (y+6)^2 = (4)(9)$. Therefore, the equation $(x+2)^2 + (y+6)^2 = (4)(9)$ defines circle *B*.

Choice B is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect. This equation defines a circle that's the result of shifting circle *A* up, not down, by 6 units and increasing the radius. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 24

Choice C is correct. In the triangle shown, the measure of angle *B* is 30° and angle *C* is a right angle, which means that it has a measure of 90°. Since the sum of the angles in a triangle is equal to 180°, the measure of angle *A* is equal to $180° - (30+90)°$, or 60°. In a right triangle whose acute angles have measures 30° and 60°, the lengths of the legs can be represented by the expressions *x*, $x\sqrt{3}$, and $2x$, where *x* is the length of the leg opposite the angle with measure 30°, $x\sqrt{3}$ is the length of the leg opposite the angle with measure 60°, and $2x$ is the length of the hypotenuse. In the triangle shown, the hypotenuse has a length of 54. It follows that $2x = 54$, or $x = 27$. Therefore, the length of the leg opposite angle *B* is 27 and the length of the leg opposite angle *A* is $27\sqrt{3}$. The tangent of an acute angle in a right triangle is defined as the ratio of the length of the leg opposite the angle to the length of the leg adjacent to the angle. The length of the leg opposite angle *A* is $27\sqrt{3}$ and the length of the leg adjacent to angle *A* is 27. Therefore, the value of $\tan A$ is $\frac{27\sqrt{3}}{27}$, or $\sqrt{3}$.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice B* is incorrect. This is the value of $\frac{1}{\tan A}$, not the value of $\tan A$. *Choice D* is incorrect. This is the length of the leg opposite angle *A*, not the value of $\tan A$.

QUESTION 25

Choice D is correct. It's given that an exponential model estimates that the number of comments on an article increased by a fixed percentage at the end of each hour. Therefore, the model can be represented by an exponential equation of the form $C = Ka^t$, where C is the estimated number of comments on the article t hours after the article was first featured on the home page and K and a are constants. It's also given that when the article was first featured on the home page of the news website, there were 40 comments on the article. This means that when $t = 0$, $C = 40$. Substituting 0 for t and 40 for C in the equation $C = Ka^t$ yields $40 = Ka^0$, or $40 = K$. It's also given that the number of comments on the article at the end of an hour had increased by 190% of the number of comments on the article at the end of the previous hour. Multiplying the percent increase by the number of comments on the article at the end of the previous hour yields the number of estimated additional comments the article has on its home page: $(40)\left(\frac{190}{100}\right)$, or 76 comments. Thus, the estimated number of comments for the following hour is the sum of the comments from the end of the previous hour and the number of additional comments, which is $40 + 76$, or 116. This means that when $t = 1$, $C = 116$. Substituting 1 for t, 116 for C, and 40 for K in the equation $C = Ka^t$ yields $116 = 40a^1$, or $116 = 40a$. Dividing both sides of this equation by 40 yields $2.9 = a$. Substituting 40 for K and 2.9 for a in the equation $C = Ka^t$ yields $C = 40(2.9)^t$. Thus, the equation that best represents this model is $C = 40(2.9)^t$.

Choice A is incorrect. This model represents a situation where the number of comments at the end of each hour increased by 19% of the number of comments at the end of the previous hour, rather than 190%. *Choice B* is incorrect. This model represents a situation where the number of comments at the end of each hour increased by 90% of the number of comments at the end of the previous hour, rather than 190%. *Choice C* is incorrect. This model represents a situation where the number of comments at the end of each hour was 19 times the number of comments at the end of the previous hour, rather than increasing by 190% of the number of comments at the end of the previous hour.

QUESTION 26

Choice A is correct. It's given that the table shows values of x and their corresponding values of $g(x)$, where $g(x) = \frac{f(x)}{x+3}$. It's also given that f is a linear function. It follows that an equation that defines f can be written in the form $f(x) = mx + b$, where m represents the slope and b represents the y-coordinate of the y-intercept $(0, b)$ of the graph of $y = f(x)$ in the xy-plane. The slope of the graph of $y = f(x)$ can be found using two points, (x_1, y_1) and (x_2, y_2), that are on the graph of $y = f(x)$, and the formula $m = \frac{y_2 - y_1}{x_2 - x_1}$. Since the table shows values of x and their corresponding values of $g(x)$, substituting values of x and $g(x)$ in the equation $g(x) = \frac{f(x)}{x+3}$ can be used to define function f. Using the first pair of values from the table, $x = -27$ and $g(x) = 3$, yields $3 = \frac{f(-27)}{-27+3}$, or $3 = \frac{f(-27)}{-24}$. Multiplying each side of this equation by -24 yields $-72 = f(-27)$, so the point $(-27, -72)$

is on the graph of $y=f(x)$. Using the second pair of values from the table, $x=-9$ and $g(x)=0$, yields $0=\frac{f(-9)}{-9+3}$, or $0=\frac{f(-9)}{-6}$. Multiplying each side of this equation by -6 yields $0=f(-9)$, so the point $(-9, 0)$ is on the graph of $y=f(x)$. Substituting $(-27, -72)$ and $(-9, 0)$ for (x_1, y_1) and (x_2, y_2), respectively, in the formula $m=\frac{y_2-y_1}{x_2-x_1}$ yields $m=\frac{0-(-72)}{-9-(-27)}$, or $m=4$. Substituting 4 for m in the equation $f(x)=mx+b$ yields $f(x)=4x+b$. Since $0=f(-9)$, substituting -9 for x and 0 for $f(x)$ in the equation $f(x)=4x+b$ yields $0=4(-9)+b$, or $0=-36+b$. Adding 36 to both sides of this equation yields $36=b$. It follows that 36 is the y-coordinate of the y-intercept $(0, b)$ of the graph of $y=f(x)$. Therefore, the y-intercept of the graph of $y=f(x)$ is $(0, 36)$.

Choice B is incorrect. 12 is the y-coordinate of the y-intercept of the graph of $y=g(x)$. *Choice C* is incorrect. 4 is the slope of the graph of $y=f(x)$. *Choice D* is incorrect. -9 is the x-coordinate of the x-intercept of the graph of $y=f(x)$.

QUESTION 27

The correct answer is 54. It's given that in triangle ABC, point D on side AB is connected by a line segment with point E on side AC such that line segment DE is parallel to side BC. It follows that parallel segments DE and BC are intersected by sides AB and AC. If two parallel segments are intersected by a third segment, corresponding angles are congruent. Thus, corresponding angles C and AED are congruent and corresponding angles B and ADE are congruent. Since triangle ADE has two angles that are each congruent to an angle in triangle ABC, triangle ADE is similar to triangle ABC by the angle-angle similarity postulate, where side DE corresponds to side BC, and side AE corresponds to side AC. Since the lengths of corresponding sides in similar triangles are proportional, it follows that $\frac{DE}{BC}=\frac{AE}{AC}$. Since point E lies on side AC, $AE+CE=AC$. It's given that $CE=2AE$. Substituting $2AE$ for CE in the equation $AE+CE=AC$ yields $AE+2AE=AC$, or $3AE=AC$. It's given that $BC=162$. Substituting 162 for BC and $3AE$ for AC in the equation $\frac{DE}{BC}=\frac{AE}{AC}$ yields $\frac{DE}{162}=\frac{AE}{3AE}$, or $\frac{DE}{162}=\frac{1}{3}$. Multiplying both sides of this equation by 162 yields $DE=54$. Thus, the length of line segment DE is 54.

Math
Module 2
(27 questions)

QUESTION 1

Choice B is correct. Substituting 72 for $f(x)$ in the given function yields $72 = 8x$. Dividing each side of this equation by 8 yields $9 = x$. Therefore, $f(x) = 72$ when the value of x is 9.

Choice A is incorrect. This is the value of x for which $f(x) = 64$, not $f(x) = 72$. *Choice C* is incorrect. This is the value of x for which $f(x) = 512$, not $f(x) = 72$. *Choice D* is incorrect. This is the value of x for which $f(x) = 640$, not $f(x) = 72$.

QUESTION 2

Choice A is correct. It's given that angle 1 and angle 2 are vertical angles, and the measure of angle 1 is 72°. Vertical angles have equal measures. Therefore, the measure of angle 2 is 72°.

Choice B is incorrect. This is the measure of an angle that is supplementary, not congruent, to angle 1. *Choice C* is incorrect. This is the sum of the measures of angle 1 and angle 2. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 3

Choice B is correct. If a house from the street is selected at random, the probability of selecting a house that is blue is equal to the number of houses on the street that are blue divided by the total number of houses on the street. Since there are 2 blue houses on a street with 7 total houses, the probability of selecting a house that is blue from this street is $\frac{2}{7}$.

Choice A is incorrect. This is the probability of selecting a house that is blue from a street on which 1 of the 7 houses is blue. *Choice C* is incorrect. This is the probability of selecting a house that is not blue from this street. *Choice D* is incorrect. This is the probability of selecting a house that is blue from a street on which all the houses are blue.

QUESTION 4

Choice A is correct. The graph of function f shows that as x increases, $f(x)$ also increases, which means $f(x)$ is an increasing function. The graph of f is a line, which indicates a constant rate of change. A function that has a constant rate of change is a linear function. Therefore, function f can be described as increasing linear.

Choice B is incorrect. For a decreasing function, as x increases, $f(x)$ decreases, rather than increases. *Choice C* is incorrect. For a decreasing function, as x increases, $f(x)$ decreases, rather than increases, and the graph of an exponential function isn't a line. *Choice D* is incorrect. The graph of an exponential function isn't a line.

QUESTION 5

Choice B is correct. The y-intercept of a graph is the point where the graph intersects the y-axis. The graph of function f shown intersects the y-axis at the point $(0, -4)$. Therefore, the y-intercept of the graph is $(0, -4)$.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect and may result from conceptual or calculation errors. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 6

The correct answer is 6. The first equation in the given system is $x = 8$. Substituting 8 for x in the second equation in the given system yields $8 + 3y = 26$. Subtracting 8 from both sides of this equation yields $3y = 18$. Dividing both sides of this equation by 3 yields $y = 6$. Therefore, the value of y is 6.

QUESTION 7

The correct answer is 10. It's given that the amount of Hanna's food order was $50 and that Hanna gave a tip of 20% of the amount of the bill. 20% of 50 can be calculated as $\left(\frac{20}{100}\right)(50)$, which yields $\frac{1000}{100}$, or 10. Therefore, the amount, in dollars, of the tip Hanna gave is 10.

QUESTION 8

Choice B is correct. Since x^3 is a common factor of each term in the given expression, the expression can be rewritten as $x^3(5x^2 - 6x + 8)$.

Choice A is incorrect. This expression is equivalent to $5x^5 - 6x^4$. *Choice C* is incorrect. This expression is equivalent to $40x^5 - 48x^4 + 8x^3$. *Choice D* is incorrect. This expression is equivalent to $-36x^9 + 48x^8 + 6x^5$.

QUESTION 9

Choice A is correct. It's given that the ratio of the length of line segment XY to the length of line segment ZV is 6 to 1, which means $\frac{XY}{ZV} = \frac{6}{1}$. It's given that the length of line segment XY is 102 inches. If the length, in inches, of line segment ZV is represented by ℓ, the value of ℓ can be calculated by solving the equation $\frac{102}{\ell} = \frac{6}{1}$, or $\frac{102}{\ell} = 6$. Multiplying each side of this equation by ℓ yields $102 = 6\ell$. Dividing each side of this equation by 6 yields $17 = \ell$. Therefore, the length of line segment ZV is 17 inches.

Choice B is incorrect. This is the length, in inches, of line segment ZV if the length of line segment XY is 576, not 102, inches. *Choice C* is incorrect. This is the length, in inches, of line segment XY, not line segment ZV. *Choice D* is incorrect. This is the length, in inches, of line segment ZV if the ratio of the length of line segment XY to the length of line segment ZV is 1 to 6, not 6 to 1.

QUESTION 10

Choice A is correct. Dividing each side of the given equation by 7 yields $\frac{7(2x-3)}{7} = \frac{63}{7}$, or $2x - 3 = 9$. Therefore, the equation $2x - 3 = 9$ is equivalent to the given equation and has the same solution.

Choice B is incorrect. This equation is equivalent to $7(2x-3) = 392$, not $7(2x-3) = 63$. *Choice C* is incorrect. Distributing 7 on the left-hand side of the given equation yields $14x - 21 = 63$, not $2x - 21 = 63$. *Choice D* is incorrect. Distributing 7 on the left-hand side of the given equation yields $14x - 21 = 63$, not $2x - 21 = 70$.

QUESTION 11

Choice D is correct. It's given that the function f defined by $f(t) = 14t + 9$ gives the estimated length, in inches, of a vine plant t months after Tavon purchased it. For a function defined by an equation of the form $f(t) = mt + b$, where m and b are constants, b represents the value of $f(0)$, or the value of $f(t)$ when the value of t is 0. Therefore, for the function defined by $f(t) = 14t + 9$, 9 represents the value of $f(t)$ when the value of t is 0. This means that 0 months after the vine plant was purchased, the estimated length of the vine plant was 9 inches. Therefore, the best interpretation of 9 in this context is the estimated length of the vine plant was 9 inches when Tavon purchased it.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice B* is incorrect. The vine plant is expected to grow 14 inches, not 9 inches, each month. *Choice C* is incorrect and may result from conceptual or calculation errors.

QUESTION 12

Choice C is correct. Applying the zero product property to the given equation yields three equations: $x+2=0$, $x-5=0$, and $x+9=0$. Subtracting 2 from both sides of the equation $x+2=0$ yields $x=-2$. Adding 5 to both sides of the equation $x-5=0$ yields $x=5$. Subtracting 9 from both sides of the equation $x+9=0$ yields $x=-9$. Therefore, the solutions to the given equation are -2, 5, and -9. It follows that a positive solution to the given equation is 5.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice B* is incorrect and may result from conceptual or calculation errors. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 13

The correct answer is 774. It's given that Brian saves $\frac{2}{5}$ of the $215 he earns each week from his job. Therefore, Brian saves $\left(\frac{2}{5}\right)(\$215)$, or $86, per week. If Brian continues to save at this rate of $86 per week for 9 weeks, then he will save a total of $(9)(86)$, or 774, dollars.

QUESTION 14

The correct answer is 5. Let x represent the width, in inches, of the rectangle. It's given that the length of the rectangle is 4 inches less than 7 times its width, or $7x-4$ inches. The area of a rectangle is equal to its width multiplied by its length. Multiplying the width, x inches, by the length, $7x-4$ inches, yields $x(7x-4)$ square inches. It's given that the rectangle has an area of 155 square inches, so it follows that $x(7x-4)=155$, or $7x^2-4x=155$. Subtracting 155 from both sides of this equation yields $7x^2-4x-155=0$. Factoring the left-hand side of this equation yields $(7x+31)(x-5)=0$. Applying the zero product property to this equation yields two solutions: $x=-\frac{31}{7}$ and $x=5$. Since x is the rectangle's width, in inches, which must be positive, the value of x is 5. Therefore, the width of the rectangle, in inches, is 5.

QUESTION 15

Choice B is correct. If a data set contains an even number of data values, when the data values are listed in ascending or descending order, the median is between the two middle values. The given data set contains 8 values. When listed in ascending order, the data set is 4, 4, 4, 5, 5, 6, 10, 18 and the two middle values are 5 and 5. Since the two middle values are the same, the median must be 5.

Choice A is incorrect. This value is between the two middle values in the list shown, not the two middle values when the data values are listed in ascending or descending order. *Choice C* is incorrect. This is the mean, not the median, of the data set. *Choice D* is incorrect. This is the range, not the median, of the data set.

QUESTION 16

Choice A is correct. The volume, V, of a right circular cylinder is given by the formula $V = \pi r^2 h$, where πr^2 is the area of the base of the cylinder and h is the height. It's given that a right circular cylinder has a volume of 432 cubic centimeters and the area of the base is 24 square centimeters. Substituting 432 for V and 24 for πr^2 in the formula $V = \pi r^2 h$ yields $432 = 24h$. Dividing both sides of this equation by 24 yields $18 = h$. Therefore, the height of the cylinder, in centimeters, is 18.

Choice B is incorrect. This is the area of the base, in square centimeters, not the height, in centimeters, of the cylinder. *Choice C* is incorrect. This is the height, in centimeters, of a cylinder if its volume is 432 cubic centimeters and the area of its base is 2, not 24, cubic centimeters. *Choice D* is incorrect. This is the height, in centimeters, of a cylinder if its volume is 432 cubic centimeters and the area of its base is $\frac{1}{24}$, not 24, cubic centimeters.

QUESTION 17

Choice D is correct. Since the square of a real number is never negative, the given equation isn't true for any real value of x. Therefore, the given equation has zero distinct real solutions.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice B* is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect and may result from conceptual or calculation errors.

QUESTION 18

Choice B is correct. It's given that line k is defined by $y = 7x + \frac{1}{8}$. For an equation in slope-intercept form $y = mx + b$, m represents the slope of the line defined by this equation in the xy-plane and b represents the y-coordinate of the y-intercept of this line. Therefore, the slope of line k is 7. It's also given that line j is perpendicular to line k in the xy-plane. Therefore, the slope of line j is the opposite reciprocal of the slope of line k. The opposite reciprocal of 7 is $-\frac{1}{7}$. Therefore, the slope of line j is $-\frac{1}{7}$.

Choice A is incorrect. This is the opposite reciprocal of the y-coordinate of the y-intercept, not the slope, of line k. *Choice C* is incorrect. This is the y-coordinate of the y-intercept of line k, not the slope of line j. *Choice D* is incorrect. This is the slope of a line that is parallel, not perpendicular, to line k.

QUESTION 19

Choice A is correct. It's given that there is a linear relationship between the number of cars, c, on a commuter train and the maximum number of passengers and crew, p, that the train can carry. It follows that this relationship can be represented by an equation of the form $p = mc + b$, where m is the rate of change of p in this relationship and b is a constant. The rate of change of p in this relationship can be calculated by dividing the difference in any two values of p by the difference in the corresponding values of c. Using two pairs of values given in the table, the rate of change of p in this relationship is $\frac{284-174}{5-3}$, or 55. Substituting 55 for m in the equation $p = mc + b$ yields $p = 55c + b$. The value of b can be found by substituting any value of c and its corresponding value of p for c and p, respectively, in this equation. Substituting 10 for c and 559 for p yields $559 = 55(10) + b$, or $559 = 550 + b$. Subtracting 550 from both sides of this equation yields $9 = b$. Substituting 9 for b in the equation $p = 55c + b$ yields $p = 55c + 9$. Subtracting 9 from both sides of this equation yields $p - 9 = 55c$. Subtracting p from both sides of this equation yields $-9 = 55c - p$, or $55c - p = -9$.

Choice B is incorrect and may result from conceptual or calculation errors.
Choice C is incorrect and may result from conceptual or calculation errors.
Choice D is incorrect and may result from conceptual or calculation errors.

QUESTION 20

The correct answer is $\frac{7}{24}$. An expression of the form $\sqrt[n]{a^m}$, where m and n are integers greater than 1 and $a \geq 0$, is equivalent to $a^{\frac{m}{n}}$. Therefore, the expression on the right-hand side of the given equation, $\sqrt[3]{4^7}$, is equivalent to $4^{\frac{7}{3}}$. Thus, $4^{8c} = 4^{\frac{7}{3}}$. It follows that $8c = \frac{7}{3}$. Dividing both sides of this equation by 8 yields $c = \frac{7}{24}$. Note that 7/24, .2916, .2917, 0.219, and 0.292 are examples of ways to enter a correct answer.

QUESTION 21

The correct answer is 1,677. Adding the first equation to the second equation in the given system yields $(x-2) + (x-2) + (-4)(y+7) + 4(y+7) = 117 + 442$, or $2(x-2) = 559$. Multiplying both sides of this equation by 3 yields $6(x-2) = 1,677$. Therefore, the value of $6(x-2)$ is 1,677.

QUESTION 22

Choice B is correct. The Pythagorean theorem states that for a right triangle, $c^2 = a^2 + b^2$, where c represents the length of the hypotenuse and a and b represent the lengths of the legs. It's given that in triangle ABC, angle B is a right angle. Therefore, triangle ABC is a right triangle, where the hypotenuse is side AC and the legs are sides AB and BC. It's given that the lengths of sides AB and BC are $10\sqrt{37}$ and $24\sqrt{37}$, respectively. Substituting these values for a and b in the formula $c^2 = a^2 + b^2$ yields $c^2 = (10\sqrt{37})^2 + (24\sqrt{37})^2$, which is equivalent

to $c^2 = 100(37) + 576(37)$, or $c^2 = 676(37)$. Taking the square root of both sides of this equation yields $c = \pm 26\sqrt{37}$. Since c represents the length of the hypotenuse, side AC, c must be positive. Therefore, the length of side AC is $26\sqrt{37}$.

Choice A is incorrect. This is the result of solving the equation $c = 24\sqrt{37} - 10\sqrt{37}$, not $c^2 = (10\sqrt{37})^2 + (24\sqrt{37})^2$. *Choice C* is incorrect. This is the result of solving the equation $c = 10\sqrt{37} + 24\sqrt{37}$, not $c^2 = (10\sqrt{37})^2 + (24\sqrt{37})^2$. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 23

Choice A is correct. The equation $f(x) = (1.84)^{\frac{x}{4}}$ can be rewritten as $f(x) = (1.84)^{\left(\frac{1}{4}\right)(x)}$, which is equivalent to $f(x) = \left(1.84^{\frac{1}{4}}\right)^x$, or approximately $f(x) = (1.16467)^x$. Since it's given that $f(x) = (1.84)^{\frac{x}{4}}$ can be rewritten as $f(x) = \left(1 + \frac{p}{100}\right)^x$, where p is a constant, it follows that $1 + \frac{p}{100}$ is approximately equal to 1.16467. Therefore, $\frac{p}{100}$ is approximately equal to 0.16467. It follows that the value of p is approximately equal to 16.467. Of the given choices, 16 is closest to the value of p.

Choice B is incorrect and may result from conceptual or calculation errors.
Choice C is incorrect and may result from conceptual or calculation errors.
Choice D is incorrect and may result from conceptual or calculation errors.

QUESTION 24

Choice D is correct. It's given that $f(24) < 0$. Substituting 24 for $f(x)$ in the equation $f(x) = a\sqrt{x + b}$ yields $f(24) = a\sqrt{24 + b}$. Therefore, $a\sqrt{24 + b} < 0$. Since $\sqrt{24 + b}$ can't be negative, it follows that $a < 0$. It's also given that the graph of $y = f(x)$ passes through the point $(-24, 0)$. It follows that when $x = -24$, $f(x) = 0$. Substituting -24 for x and 0 for $f(x)$ in the equation $f(x) = a\sqrt{x + b}$ yields $0 = a\sqrt{-24 + b}$. By the zero product property, either $a = 0$ or $\sqrt{-24 + b} = 0$. Since $a < 0$, it follows that $\sqrt{24 + b} = 0$. Squaring both sides of this equation yields $-24 + b = 0$. Adding 24 to both sides of this equation yields $b = 24$. Since $a < 0$ and b is 24, it follows that $a < b$ must be true.

Choice A is incorrect. The value of $f(0)$ is $a\sqrt{b}$, which must be negative. *Choice B* is incorrect. The value of $f(0)$ is $a\sqrt{b}$, which could be -24, but doesn't have to be. *Choice C* is incorrect and may result from conceptual or calculation errors.

QUESTION 25

Choice A is correct. It's given that points A and B lie on the circle with center C. Therefore, $\overline{AC}$ and $\overline{BC}$ are both radii of the circle. Since all radii of a circle are congruent, $\overline{AC}$ is congruent to $\overline{BC}$. The length of $\overline{AC}$, or the distance from point A to point C, can be found using the distance formula, which gives the distance between two points, (x_1, y_1) and (x_2, y_2), as $\sqrt{(x_1-x_2)^2+(y_1-y_2)^2}$. Substituting the given coordinates of point A, $(h+1, k+\sqrt{102})$, for (x_1, y_1) and the given coordinates of point C, (h, k), for (x_2, y_2) in the distance formula yields $\sqrt{(h+1-h)^2+(k+\sqrt{102}-k)^2}$, or $\sqrt{1^2+(\sqrt{102})^2}$, which is equivalent to $\sqrt{1+102}$, or $\sqrt{103}$. Therefore, the length of $\overline{AC}$ is $\sqrt{103}$ and the length of $\overline{BC}$ is $\sqrt{103}$. It's given that angle ACB is a right angle. Therefore, triangle ACB is a right triangle with legs $\overline{AC}$ and $\overline{BC}$ and hypotenuse $\overline{AB}$. By the Pythagorean theorem, if a right triangle has a hypotenuse with length c and legs with lengths a and b, then $a^2+b^2=c^2$. Substituting $\sqrt{103}$ for a and b in this equation yields $(\sqrt{103})^2+(\sqrt{103})^2=c^2$, or $103+103=c^2$, which is equivalent to $206=c^2$. Taking the positive square root of both sides of this equation yields $\sqrt{206}=c$. Therefore, the length of $\overline{AB}$ is $\sqrt{206}$.

Choice B is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect. This would be the length of $\overline{AB}$ if the length of $\overline{AC}$ were 103, not $\sqrt{103}$. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 26

Choice A is correct. An equation of a line of best fit for data set F can be written in the form $y=a+bx$, where a is the y-coordinate of the y-intercept of the line of best fit and b is the slope. The line of best fit shown for data set E has a y-intercept at approximately $(0, 12)$. It's given that data set F is created by multiplying the y-coordinate of each data point from data set E by 3.9. It follows that a line of best fit for data set F has a y-intercept at approximately $(0, 12(3.9))$, or $(0, 46.8)$. Therefore, the value of a is approximately 46.8. The slope of a line that passes through points (x_1, y_1) and (x_2, y_2) can be calculated as $\frac{y_2-y_1}{x_2-x_1}$. Since the line of best fit shown for data set E passes approximately through the point $(12, 30)$, it follows that a line of best fit for data set F passes approximately through the point $(12, 30(3.9))$, or $(12, 117)$. Substituting $(0, 46.8)$ and $(12, 117)$ for (x_1, y_1) and (x_2, y_2), respectively, in $\frac{y_2-y_1}{x_2-x_1}$ yields $\frac{117-46.8}{12-0}$, which is equivalent to $\frac{70.2}{12}$, or 5.85. Therefore, the value of b is approximately 5.85, or approximately 5.9. Thus, $y=46.8+5.9x$ could be an equation of a line of best fit for data set F.

Choice B is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect and may result from conceptual or calculation errors. *Choice D* is incorrect. This could be an equation of a line of best fit for data set E, not data set F.

QUESTION 27

The correct answer is -28. A system of two linear equations in two variables, x and y, has no solution if the lines represented by the equations in the xy-plane are distinct and parallel. The graphs of two lines in the xy-plane represented by equations in the form $Ax + By = C$, where A, B, and C are constants, are parallel if the coefficients for x and y in one equation are proportional to the corresponding coefficients for x and y in the other equation. The first equation in the given system, $48x - 64y = 48y + 24$, can be written in the form $Ax + By = C$ by subtracting $48y$ from both sides of the equation to yield $48x - 112y = 24$. The second equation in the given system, $ry = \frac{1}{8} - 12x$, can be written in the form $Ax + By = C$ by adding $12x$ to both sides of the equation to yield $12x + ry = \frac{1}{8}$. The coefficient of x in the second equation is $\frac{1}{4}$ times the coefficient of x in the first equation. That is, $48\left(\frac{1}{4}\right) = 12$. For the lines to be parallel, the coefficient of y in the second equation must also be $\frac{1}{4}$ times the coefficient of y in the first equation. Therefore, $-112\left(\frac{1}{4}\right) = r$, or $-28 = r$. Thus, if the given system has no solution, the value of r is -28.