PSAT™ 8/9

Practice Test #3

ANSWER EXPLANATIONS

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PSAT™ 8/9

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Reading and Writing

Module 1

(33 questions)

QUESTION 1

Choice C is the best answer because it most logically completes the text's discussion of how Camila Rosa's artistic style developed. In this context, "influenced" means shaped or affected by. The text indicates that Rosa's experience with Coletivo Chá and her interest in punk rock and political movements are "inspirations" that are reflected in the "references to identity and social justice" in her artworks. This context supports the idea that Rosa's artistic style has been influenced—that is, shaped—by her experience and interests.

Choice A is incorrect because saying that Rosa's artistic style has been "copied," or reproduced, by her time in Coletivo Chá and her interest in punk rock and political movements wouldn't make sense in context. The text describes how Rosa's artistic style has been inspired by her experience in the art collective and her various interests, which suggests that these things influenced her artistry, not copied it. *Choice B* is incorrect because in this context, "believed" would mean regarded as true, and it wouldn't be logical to say that Rosa's artistic style has been believed by her time in Coletivo Chá and her interest in punk rock and political movements. The text focuses on how Rosa's experiences and various interests have provided inspiration for her artistic style, not on what she, or anybody else, believed. *Choice D* is incorrect because saying that Rosa's artistic style has been "debated," or argued about, by her time in Coletivo Chá and her interest in punk rock and political movements wouldn't make sense in context. The text focuses on how Rosa's experience in the art collective and her interests have provided inspirations for her artistic style, not on any arguments about the style.

QUESTION 2

Choice B is the best answer because it most logically completes the text's discussion about whether humans are able to wiggle their ears. In this context, "capacity" means ability to do something. The text states that a study found that

participants "made small ear movements" as they listened to podcasts. The study's finding provides evidence that humans can make ear movements. This context supports the idea that humans might have some capacity to wiggle their ears.

Choice A is incorrect because saying that humans might have some "kindness," or quality of being friendly or generous, to wiggle their ears wouldn't make sense in context. The focus of the text is on a study suggesting that humans can make ear movements, and kindness has no logical connection to the physical ability to move one's ears. *Choice C* is incorrect because in this context, "weakness" would mean flaw or lack of strength. The text is describing a study that suggests evidence of an ability to do something (wiggle one's ears), rather than describing a flaw or lack of some kind. *Choice D* is incorrect because in this context, "job" would mean task or duty that has to be completed. The text is about whether humans can wiggle their ears, not whether ear wiggling is something that they have to complete or get done.

QUESTION 3

Choice D is the best answer because it most logically completes the text's discussion of Greek mythology's influence on the creation of the artworks mentioned. In this context, "inspired" means stimulated or motivated the creation of something. The text states that Greek mythology has "influenced artists for centuries" and that Hunt and Alechinsky "drew on Greek mythology to spark their creativity." This context supports the idea that Greek mythology has inspired works like Hunt's sculpture and Alechinsky's painting; that is, it served as a creative stimulus for these artworks.

Choice A is incorrect because stating that Greek mythology has "evaluated," or assessed the value of, these artworks wouldn't make sense in context. Mythology cannot judge or assess works of art; rather, the text indicates that mythology served as a source of creative inspiration for artists. *Choice B* is incorrect because "reenacted" would imply a direct re-creation of earlier performances or events. The text doesn't suggest that Hunt and Alechinsky reproduced specific mythological scenes or artworks. Instead, the text states that the artists "drew on Greek mythology" as a source of ideas and inspiration for their work. *Choice C* is incorrect because "satisfied" suggests fulfilling a need, requirement, or expectation. The text doesn't indicate that the artworks required Greek mythology in order to be complete or acceptable. Instead, it describes how the artists used Greek mythology as a source of inspiration.

QUESTION 4

Choice C is the best answer because it most logically completes the text's discussion of the interdisciplinary team studying cicada wings. In this context, "collaboration between" means a joint effort by or partnership between different individuals. The text indicates that rather than conducting independent research, engineers and entomologists worked together on the same study of cicada wings. The text then indicates that separate efforts by experts from either discipline would have been less effective—that is, such efforts would have

produced a less thorough approach. This context supports the idea that the collaboration between experts in two disciplines produced the more comprehensive approach.

Choice A is incorrect because saying that "skepticism toward," or doubt about, experts in two disciplines resulted in a more comprehensive approach wouldn't make sense in context. The text discusses a benefit of experts from different fields working together, not doubt about these experts or what they achieved. *Choice B* is incorrect because saying that "distrust among," or suspicion between, experts in two disciplines resulted in a more comprehensive approach than separate efforts by experts in these disciplines would have wouldn't make sense in context. The text describes a positive outcome (a thorough approach) resulting from the combined efforts of two types of experts, engineers and entomologists, studying cicada wings. This suggests that the collaboration between, not distrust among, experts in two disciplines produced the more comprehensive approach. *Choice D* is incorrect because saying that the "exaggeration of," or overstatement by, experts in two disciplines resulted in a more comprehensive approach wouldn't make sense in context. The text focuses on a benefit of combining expertise from different disciplines, not on any instances of experts overstating something.

QUESTION 5

Choice B is the best answer because it most logically completes the text's discussion of the relationship between the Egyptian plover and the Nile crocodile. In this context, "reciprocal" means mutually beneficial, or beneficial to both parties involved. The text explains that both species benefit from the relationship: the plover receives "a nutritious meal," while the crocodile has "potentially dangerous bacteria" removed from its mouth. This context supports the idea that the relationship is reciprocal; that is, that both parties benefit.

Choice A is incorrect because describing the relationship between the Egyptian plover and the Nile crocodile as "interchangeable," or able to be exchanged or substituted, wouldn't make sense in context. The text describes how each species provides a specific benefit to the other, not that their roles can be exchanged. *Choice C* is incorrect because describing the relationship between the Egyptian plover and the Nile crocodile as "inefficient," or wasteful, would contradict the text. The text presents the two species' relationship positively, showing that both species benefit, which suggests efficiency rather than waste. *Choice D* is incorrect because describing the relationship between the Egyptian plover and the Nile crocodile as "unequal," or not the same, wouldn't align with the text's emphasis on the benefits each species receives in the relationship. The text presents a balanced exchange where both species benefit, suggesting the relationship is mutually advantageous rather than one-sided.

QUESTION 6

Choice C is the best answer because it states the main purpose of the text. The text presents a series of details about the current condition of the old South Boston Aquarium, comparing the site of the building to a snow-covered version of the Sahara, a vast desert in Africa. The building's windows are broken and

boarded over, and its weather vane, which is a likeness of a cod (a type of fish), is falling apart. The aquarium tanks, once filled with water, are now dry. Taken together, these details present the picture of a structure in abandonment and disrepair. Therefore, the main purpose of the text is to describe details of the deteriorated state of a building.

Choice A is incorrect because the text doesn't argue that the building should be rehabilitated; instead, the text describes the building's deterioration and offers no comment on what, if anything, should be done to improve the situation. *Choice B* is incorrect. Although the introduction notes that the aquarium closed in 1954, the text itself offers no reason for the closure and instead only describes the building's current state of deterioration. Furthermore, the text doesn't address the building's popularity. *Choice D* is incorrect. The text mentions that the site of the building is covered in snow, a detail that contributes to the picture of the building's abandonment. Yet the text doesn't cite winter weather as a reason for the building's deterioration. Moreover, the text doesn't mention any weather conditions other than the snow or compare the effects of winter weather with the effects of other kinds of weather.

QUESTION 7

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 two sentences introduce the discovery of an ancient fossilized *Calamophyton* forest and present the conclusion that these kinds of forests contributed important changes to the land. The underlined sentence, starting with "for example," then provides two specific illustrations of how the forests changed the land: the tree roots likely slowed the amount of soil erosion, and twigs that fell from the trees may have resulted in new habitats. Thus, the underlined sentence illustrates how *Calamophyton* forests likely changed conditions on the land.

Choice B is incorrect because the underlined sentence doesn't discuss how quickly the forest spread. Instead, it gives two examples of how *Calamophyton* forests changed the land. *Choice C* is incorrect because neither the underlined sentence nor the text as a whole addresses whether *Calamophyton* forests existed before 390 million years ago. The text only mentions that the fossilized *Calamophyton* forest that was discovered in England was 390 million years old. *Choice D* is incorrect because neither the underlined sentence nor the text as a whole suggests that there are competing views about when the *Calamophyton* forest discussed in the text emerged. The text states that the forest was 390 million years old, and there's no suggestion in the underlined sentence or the rest of the text that this dating is in question.

QUESTION 8

Choice A is the best answer because it most accurately describes the function of the underlined portion in the text as a whole. The text begins by noting that the first souvenir postcards sold in the United States were sold at the 1893 World's Fair in Chicago. The text then states that these postcards were "extremely popular" and "sparked a craze" for postcards in the 1890s and early 1900s. The

underlined portion supports this claim by providing details that illustrate this popularity, indicating that during this period tourists bought postcards from across the US and billions of these postcards were mailed. Thus, the underlined portion serves to illustrate the popularity of souvenir postcards during a specific historical period.

Choice B is incorrect. Though the underlined portion indicates that early souvenir postcards in the US showed "scenery and attractions from across the US," it only describes postcards that were purchased and mailed within the US; it doesn't discuss what postcards from other countries looked like at all. *Choice C* is incorrect because the underlined portion doesn't discuss any changes in tourism during the late 1800s and early 1900s. Indeed, neither the underlined portion nor the text as a whole makes any claims about tourism becoming more widespread during this period. Rather, the text as a whole discusses the popularity of souvenir postcards at this time, and the underlined portion describes evidence indicating that popularity. *Choice D* is incorrect because the underlined portion describes postcards purchased by tourists across the US during the postcard craze that followed the 1893 World's Fair in Chicago, not the various souvenirs available at the Fair itself.

QUESTION 9

Choice D is the best answer because it describes the main purpose of the text. The text begins by stating that the Marsalis family is often referred to as "the first family of jazz," and it then goes on to explain the basis for this nickname. The text indicates that the father, Ellis Marsalis Jr., was a celebrated pianist and that four of his children—Jason, Delfeayo, Branford, and Wynton—became critically acclaimed performers. The text also highlights that Wynton became the first jazz composer to win the Pulitzer Prize for Music. Thus, the text presents the family's collective musical achievements to explain why they received this particular nickname.

Choice A is incorrect because the text doesn't compare the artistic achievements of the musicians mentioned; instead, it presents their achievements collectively to explain why the family received its nickname. *Choice B* is incorrect because the text never discusses why musicians should work together, nor does it suggest that the Marsalis family works together on musical projects. *Choice C* is incorrect. Although the text mentions that Wynton Marsalis won the Pulitzer Prize for Music, it does so in the context of summarizing the achievements of the Marsalis family, and it doesn't provide details about why he won this particular award.

QUESTION 10

Choice A is the best answer because it most accurately describes the narrator's house based on the information in the text. The narrator begins by stating, "I live in a tilted house." The narrator then explains that a bowling ball placed on the living room floor "would roll past the couch, past the dining table, all the way to the kitchen sink," emphasizing the slanted nature of the house by describing its likely effect on the bowling ball. Thus, the text suggests that the house is not level, or slanted.

Choice B is incorrect because the text indicates that the house has multiple rooms, not just one. The narrator mentions a living room, a kitchen, a bathroom, and the narrator's own room "at the end of the house." *Choice C* is incorrect because the text doesn't describe the color or colors of the house. The text focuses on the tilted nature of the house rather than describing other aspects of its appearance. *Choice D* is incorrect because the text doesn't provide any information about when the house was built. The text describes some of the house's physical characteristics but doesn't mention its age.

QUESTION 11

Choice C is the best answer because it most accurately presents the subject of Bellie's research according to information in the text. The text's opening sentence establishes that "Darsan Swaroop Bellie researches gravitational waves." The next sentence of the text provides information about the study of gravitational waves, reinforcing the idea that these waves are the focus of Bellie's research; it then concludes by describing the creative way in which Bellie utilizes and shares insights from this research.

Choice A is incorrect because the text doesn't indicate that Bellie researches music history. Although the text mentions that Bellie is a musician who has created compositions, gravitational waves, not music history, are explicitly said to be the subject of Bellie's research. *Choice B* is incorrect because the text doesn't mention ocean currents. The text discusses gravitational waves that move through space, not ocean waves or currents. *Choice D* is incorrect because the text doesn't discuss space travel. Although the text discusses phenomena that occur in space, such as gravitational waves and black holes, it doesn't mention space travel; further, gravitational waves are specifically identified as the focus of Bellie's research.

QUESTION 12

Choice D is the best answer because it most accurately describes the behavior of the flies in Tombak and her team's experiment as suggested by the text. The text indicates that Tombak and her team released flies into an enclosure containing both uniform (nonstriped) and striped animal pelts. According to the text, "the flies mostly avoided landing on the striped pelts." If the flies avoided the striped pelts, they must have landed more frequently on the uniform pelts instead. In other words, the flies preferred landing on the uniform animal pelts in the enclosure.

Choice A is incorrect because the text doesn't indicate that the flies were difficult to observe. The text describes what the flies did (avoided the striped pelts), which suggests that Tombak and her team were able to observe the flies' behavior. *Choice B* is incorrect because the text indicates the opposite: the flies' behavior was "as expected" and therefore not surprising. The text states that the hypothesis about stripes keeping away flies is supported by findings from several experiments and that Tombak and her team's experiment produced results consistent with expectations. *Choice C* is incorrect because the text indicates that the flies did not land on all pelts equally. The text states that "the flies mostly avoided landing on the striped pelts," which means the flies landed on the striped pelts less than they landed on the uniform pelts, not the same number of times.

QUESTION 13

Choice C is the best answer because it most accurately states the main idea of the text. The text describes an experiment by Shachar Givon and colleagues in which goldfish were taught to drive a motorized fish tank on land to reach a target. According to the text, the goldfish were often successful at navigating. The text then states that because the goldfish could move the tank toward the target, "Givon [concluded] that their navigational skills aren't specific to an aquatic environment"; in other words, the experiment showed that the goldfish were able to demonstrate navigational skills on land as well as in the water. Thus, the main idea of the text is that research shows fish can navigate on land with mechanical assistance (e.g., from the motorized tank), even though they naturally live in water.

Choice A is incorrect. Although the text mentions that the goldfish received treats when they succeeded in moving the tank to the target, the text focuses on the finding that goldfish can navigate outside of their natural aquatic environment, not on the idea that researchers can train animals to complete many different tasks using treats. The text doesn't mention any animals besides fish, and only the navigational task is discussed. *Choice B* is incorrect because it directly contradicts the text. Givon specifically concludes that the goldfish's "navigational skills aren't specific to an aquatic environment," indicating that the fish can navigate outside their natural aquatic environment as well as within it. *Choice D* is incorrect because the text suggests the opposite: Givon's experiment demonstrated that the navigational skills of goldfish are not dependent on a particular environment. In the experiment, the goldfish successfully demonstrated navigational skills on land using a vehicle even though this environment differed from their usual aquatic habitat.

QUESTION 14

Choice D is the best answer because it provides a quotation that would most directly support the student's argument that the use of stylized masks in commedia dell'arte affected how actors portrayed their characters. The text states that actors in commedia dell'arte typically wore stylized masks. The quotation establishes a causal relationship between wearing masks and performance technique: because actors' faces were hidden by masks, they couldn't rely on facial expressions to portray their characters' emotions. Instead, they had to use other means—hand gestures and body movements—to display emotions. By explaining how masks required commedia dell'arte actors to adapt their performance method, the quotation would directly illustrate how the use of masks affected the way actors portrayed their characters.

Choice A is incorrect because this quotation doesn't address the use of masks in commedia dell'arte at all, much less how masks affected the actors' performances. Rather, it discusses the history of commedia dell'arte's popularity over time, describing its near disappearance in the 1800s and its revival in the 1960s and 1970s. *Choice B* is incorrect because this quotation traces the historical origins of mask use in commedia dell'arte to ancient Roman theater but doesn't indicate how wearing masks affected actors' portrayal of their characters. The origin of the practice of theatrical mask wearing isn't relevant to how masks

influenced actors' performances. *Choice C* is incorrect because this quotation describes the use of masks in theatrical traditions around the world but doesn't address commedia dell'arte specifically, nor does it illustrate how wearing masks within that tradition affected how the actors portrayed their characters.

QUESTION 15

Choice C is the best answer because it presents a finding that, if true, would most directly support Khudadad's conclusion that evidence from the Cairo site is inconsistent with the partition hypothesis. The partition hypothesis explains that during the Devonian period, there were two distinct biome types—a tropical deltaic forest biome (associated with plants like *Eospermatopteris*) and an arid floodplain forest biome (associated with plants like *Archaeopteris*). In other words, under the partition hypothesis, *Eospermatopteris* and *Archaeopteris*, which are associated with different biomes, wouldn't be expected to coexist. If the Cairo site was an arid floodplain forest during the Devonian period and contains fossil evidence of both *Eospermatopteris* and *Archaeopteris* existing at the same time, that would directly contradict the partition hypothesis by showing that these plants, supposedly confined to different biomes, actually coexisted.

Choice A is incorrect because a finding that the site transitioned from one biome type to another after the end of the Devonian period wouldn't be inconsistent with the partition hypothesis, which specifically addresses the Devonian period. Changes occurring after the Devonian period are irrelevant to a hypothesis about biome distinctions during that period. Moreover, even if the fossil evidence indicated that the Cairo site was a single biome throughout the Devonian, this wouldn't undermine the validity of the partition hypothesis. Evidence from one site wouldn't indicate that only one biome type—not two, as the hypothesis proposes—existed globally, since it wouldn't preclude the existence of other biome types elsewhere during the Devonian. *Choice B* is incorrect because a finding that *Eospermatopteris* was present in what appears to have been a tropical deltaic forest would actually be consistent with the partition hypothesis, not inconsistent with it, since the text states that, according to the partition hypothesis, *Eospermatopteris* was found in tropical deltaic forest biomes in the Devonian. *Choice D* is incorrect because a finding that other plant species besides *Eospermatopteris* and *Archaeopteris* lived at the site isn't relevant to whether there were two distinctly different biomes as described by the partition hypothesis. In the text, *Eospermatopteris* and *Archaeopteris* are merely given as examples of the kinds of plants found in the types of biomes posited by the partition hypothesis and aren't a complete list; the presence of additional plants at the Cairo site would have no bearing on whether *Eospermatopteris* and *Archaeopteris* were confined to separate biomes.

QUESTION 16

Choice A is the best answer because it most logically completes the text's discussion of the land that ancient Mesopotamian cities sat on. The text indicates that archaeologists "traditionally thought" the cities of ancient Mesopotamia "lay on the extremely dry banks of the Tigris and Euphrates rivers." However, the text

states that evidence gathered by Jennifer Pournelle and her team suggests that the cities sat on "marshy wetlands" instead of dry land. Therefore, the team's finding suggests that the land many ancient Mesopotamian cities sat on wasn't as dry as previously believed.

Choice B is incorrect because the text doesn't mention trade among ancient Mesopotamian people or cities. It therefore wouldn't be logical to conclude from the team's findings that people from Ur engaged in trade with people from many parts of ancient Mesopotamia. *Choice C* is incorrect because fish aren't mentioned in the text. It therefore wouldn't be logical to conclude that the team's finding suggests that fewer fish species are found in rivers today than in ancient times. *Choice D* is incorrect because the text doesn't address when the ancient Mesopotamian cities of Uruk and Ur were founded. It therefore wouldn't be logical to conclude that the researchers' finding suggests that Uruk was founded at an earlier time than Ur was.

QUESTION 17

Choice D is the best answer because it most logically completes the text's discussion of early human habitation at the Shinfa-Metema 1 site. The text indicates that the eruption of a supervolcano nearly 74,000 years ago made the environment at the Shinfa-Metema 1 site significantly harsher. The text also indicates that although some researchers "believe these conditions forced humans to relocate," analysis by paleontologist John Kappelman and his team showed that human habitation at the site continued after the eruption. The text then states that the "fossil record indeed shows a decline in the ratio of terrestrial mammals to fish in humans' diets in this period," indicating a shift in diet toward greater fish consumption consistent with Kappelman and team's hypothesis. Taken together, the information in the text suggests that early humans living around the Shinfa-Metema 1 site adapted to environmental challenges by changing the way they acquired food.

Choice A is incorrect. Although the text indicates that evidence from Kappelman and his team shows that "humans were living" at Shinfa-Metema 1 "after the eruption," there is nothing to suggest that the population was substantially larger after the eruption than it was before. In fact, given that conditions after the eruption of Toba were "even harsher," there's some suggestion that populations would be constrained by the harshness of the local environment. *Choice B* is incorrect. Although the text indicates that "the Toba supervolcano eruption nearly 74,000 years ago" made conditions at Shinfa-Metema 1 harsher and that some researchers "believe these conditions forced humans to relocate," the text then makes clear that evidence from Kappelman and his team shows that "humans were living there after the eruption." It therefore wouldn't be logical to conclude from the information in the fossil record that humans were forced to move away from the site. *Choice C* is incorrect. The text doesn't mention feeding habits of terrestrial mammals or how they might have changed after the eruption of Toba. It therefore wouldn't be logical to conclude that the fossil record suggests that terrestrial mammals fed at rivers around the site more frequently after the Toba eruption than before the eruption.

QUESTION 18

Choice A is the best answer because it most logically completes the text's discussion of the method outlined by Baumard and colleagues. The method involves "analyzing popular cultural artifacts (literature, paintings, sculptures, etc.) for their psychological content (sadness, joy, love, etc.)" with the goal of discerning "relationships between psychological shifts in a population and concurrent historical events." In the method the team has outlined, the analysis would be performed by an algorithm "trained specifically to identify psychological features." This algorithm would be trained using contemporary human subjects and could be verified to reflect their thought, but not the thought of past populations, which cannot be retrieved. And given that the algorithm is designed to evaluate shifts in a population's psychology in relation to historical events, there is a reasonable concern that contemporary people might differ psychologically in some ways from people during earlier historical periods. Therefore, it would be logical for the team to caution that such an algorithm should be used prudently because it might not reflect aspects of the psychology of past populations.

Choice B is incorrect. Although the information in the text about studying trends in the historical record may seem logically consistent with the idea that algorithms reflective of contemporary psychology should be preserved, the text's framing focuses on what "the team cautions" about the proposed algorithm, not on a recommendation that the team is making to preserve the algorithm in the future. *Choice C* is incorrect. Although the text mentions several types of artifacts, it does not address analyzing artifacts singularly or simultaneously. It therefore would be illogical to infer that the team cautions that the algorithm should not be used to make judgments about more than one artifact at a time. *Choice D* is incorrect because the text does not distinguish between traditional and nontraditional research practices. The text mentions research that would span historical periods, but it only discusses the nontraditional research method that the team proposes.

QUESTION 19

Choice B is the best answer. The convention being tested is the use of verb forms within a sentence. The nonfinite to-infinitive verb "to communicate" is correctly used to form a subordinate clause that indicates how the codes were used.

Choice A is incorrect because it results in an ungrammatical sentence. The finite present tense verb "communicates" can't be used in this way to form a subordinate clause that indicates how the codes were used. *Choice C* is incorrect because it results in an ungrammatical sentence. The finite present perfect tense verb "have communicated" can't be used in this way to form a subordinate clause that indicates how the codes were used. *Choice D* is incorrect because it results in an ungrammatical sentence. The finite present tense/nonfinite base form verb "communicate" can't be used in this way to form a subordinate clause that indicates how the codes were used.

QUESTION 20

Choice B is the best answer. The convention being tested is punctuation use between sentences. In this choice, the period is used correctly to mark the boundary between one sentence ("Observational drawing…art") and another ("The observational approach…see it").

Choice A 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 C* is incorrect because an opening parenthesis can't be used in this way to mark the boundary between sentences. *Choice D* is incorrect because it results in a run-on sentence. The sentences ("Observational drawing...art" and "the observational approach... see it") are fused without punctuation and/or a conjunction.

QUESTION 21

Choice C is the best answer. The convention being tested is the use of verbs to express tense in a sentence. In this choice, the past tense verb "determined" is consistent with the other past tense verbs ("identified," "developed," "received," "didn't create") used to describe what the companies did during the period when the data were collected (2002–2018).

Choice A is incorrect because the future tense verb "will determine" isn't consistent with the other past tense verbs used to describe what the companies did. *Choice B* is incorrect because the present progressive tense verb "are determining" isn't consistent with the other past tense verbs used to describe what the companies did. *Choice D* is incorrect because the present tense verb "determine" isn't consistent with the other past tense verbs used to describe what the companies did.

QUESTION 22

Choice A is the best answer. The convention being tested is the use of verb forms within a sentence. A main clause requires a finite (tensed) verb to perform the action of the subject (in this case, "the photo"), and this choice supplies the finite present tense verb "shows" to indicate what the photo depicts.

Choice B is incorrect because it results in an ungrammatical sentence. The nonfinite participle "having shown" doesn't supply the main clause with a finite verb. *Choice C* is incorrect because it results in an ungrammatical sentence. The nonfinite participle "showing" doesn't supply the main clause with a finite verb. *Choice D* is incorrect because it results in an ungrammatical sentence. The nonfinite to-infinitive "to show" doesn't supply the main clause with a finite verb.

QUESTION 23

Choice D is the best answer. The convention being tested is the use of verbs to express tense in a sentence. It's conventional to use the present tense when describing a situation that is habitually or generally true. In this choice, the present tense verb "is" correctly indicates that the sentence is presenting a definition of the Purkinje effect and that the eye generally perceives objects in this way.

Choice A is incorrect because the future perfect tense verb "will have been" doesn't indicate that the clause is presenting a situation that is habitually or generally true. Instead, this choice illogically suggests that the Purkinje effect will describe this tendency at some point in the future. *Choice B* is incorrect because the past tense verb "was" doesn't indicate that the clause is presenting a situation that is habitually or generally true. Instead, this choice illogically suggests that the definition of the Purkinje effect applied only in the past. *Choice C* is incorrect because the present perfect tense verb "has been" doesn't indicate that the clause is presenting a situation that is habitually or generally true. Instead, this choice illogically suggests that the definition of the Purkinje effect may have changed.

QUESTION 24

Choice C is the best answer. The conventions being tested are the use of possessive and plural nouns. The singular possessive noun "island's" and the plural noun "residents" correctly indicate that multiple residents of a single island (La Gomera) adapted their whistling skills.

Choice A is incorrect because the context requires the singular possessive noun "island's" and the plural noun "residents," not the plural noun "islands" and the plural possessive noun "residents'." *Choice B* is incorrect because the context requires the plural noun "residents," not the singular possessive noun "resident's." *Choice D* is incorrect because the context requires the singular possessive noun "island's" and the plural noun "residents," not the plural noun "islands" and the singular possessive noun "resident's."

QUESTION 25

Choice D is the best answer. The convention being tested is punctuation use between sentences. In this choice, the period is used correctly to mark the boundary between one sentence ("Kizomba...phenomenon") and another ("In 2022...winners"). The prepositional phrase "in 2022" functions as an introductory element that establishes the time frame for the events described in the second sentence.

Choice A is incorrect because without a comma preceding it, the conjunction "and" can't be used in this way to join two sentences. *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 C* is incorrect because it results in a run-on sentence. The sentences ("Kizomba...phenomenon" and "in 2022... winners") are fused without punctuation and/or a conjunction.

QUESTION 26

Choice A is the best answer. The convention being tested is subject-modifier placement. This choice makes the noun phrase "Chiliza's vignette" the subject of the sentence and places it immediately after the modifying phrase "unlike most paintings in the florilegium." In doing so, this choice clearly establishes that Chiliza's vignette—and not another noun in the sentence—is being contrasted with most paintings in the florilegium.

Choice B is incorrect because it results in a dangling modifier. The placement of the noun "Chiliza" immediately after the modifying phrase illogically suggests that Chiliza (a person) is unlike most paintings in the florilegium. *Choice C* is incorrect because it results in a dangling modifier. The placement of the noun phrase "the contextualization" immediately after the modifying phrase illogically suggests that the contextualization is unlike most paintings in the florilegium. *Choice D* is incorrect because it results in a dangling modifier. The placement of the noun phrase "a plant's ecosystem" immediately after the modifying phrase illogically suggests that the ecosystem is unlike most paintings in the florilegium.

QUESTION 27

Choice B is the best answer. "For instance" logically signals that the information in this sentence about coin-flip probabilities provides a specific example illustrating Talagrand's research findings, which show that random variables cluster around an average over large numbers of trials.

Choice A is incorrect because "however" illogically signals that the information about coin-flip probabilities contrasts with the previous information about Talagrand's research findings. Instead, the sentence provides an example that illustrates those findings. *Choice C* is incorrect because "in addition" illogically signals that the information about coin-flip probabilities merely adds to the previous information about Talagrand's research findings. Instead, the sentence provides an example that illustrates those findings. *Choice D* is incorrect because "in comparison" illogically signals that the information about coin-flip probabilities is being compared to the previous information about Talagrand's research findings. Instead, the sentence provides an example that illustrates those findings.

QUESTION 28

Choice D is the best answer. "Previously" logically signals that the information in this sentence—that Massey *had* served as the first president of the National Society of Black Physicists—occurred earlier in time than his 1990 appointment (mentioned in the previous sentence).

Choice A is incorrect because "thus" illogically signals that Massey's service as president of the National Society of Black Physicists is a result or consequence of his 1990 appointment. Instead, the sentence describes an event that occurred earlier in Massey's career. *Choice B* is incorrect because "in conclusion" illogically signals that the information about Massey's service as president of the National Society of Black Physicists summarizes or concludes the previous information about his career. Instead, the sentence describes an event that occurred earlier in Massey's career. *Choice C* is incorrect because "for example" illogically signals that Massey's service as president of the National Society of Black Physicists exemplifies his 1990 appointment as director of the National Science Foundation. Instead, the sentence describes a separate event that occurred earlier in Massey's career.

QUESTION 29

Choice C is the best answer. "As such" logically signals that the information in this sentence—that the Eloi were prime candidates for inclusion in *The Book of Imaginary Beings*—follows directly from the previous information about the Eloi: as fictional creatures, the Eloi were prime candidates for inclusion in a book about fictional creatures.

Choice A is incorrect because "in reality" illogically signals that the claim in this sentence about the Eloi is true despite the previous information about them being fictional creatures. Instead, the Eloi being prime candidates for inclusion in *The Book of Imaginary Beings* follows directly from that information. *Choice B* is incorrect because "for example" illogically signals that the claim about the Eloi in this sentence exemplifies the previous information about the Eloi being fictional creatures. Instead, the Eloi being prime candidates for inclusion in *The Book of Imaginary Beings* follows directly from that information. *Choice D* is incorrect because "granted" illogically signals that the claim about the Eloi in this sentence is true despite it being in opposition to the previous information about them being fictional creatures. Instead, the Eloi being prime candidates for inclusion in *The Book of Imaginary Beings* follows directly from that information.

QUESTION 30

Choice B is the best answer. The sentence emphasizes how popular the novel became when it was first published, noting that it drove the magazine's sales to a record-breaking 100,000 copies per issue.

Choice A is incorrect. The sentence describes a feature of the novel's installments and how readers responded; it doesn't emphasize how popular the novel became overall. *Choice C* is incorrect. The sentence indicates where the novel first appeared; it doesn't emphasize how popular the novel became. *Choice D* is incorrect. The sentence describes when and how the novel was published; it doesn't emphasize how popular the novel became.

QUESTION 31

Choice B is the best answer. The sentence contrasts how the igneous rock at the two national parks formed, noting that Acadia's rock formed from molten rock that cooled deep within Earth's crust while Crater Lake's rock formed from molten rock that cooled after exiting Earth's crust.

Choice A is incorrect. While the sentence mentions Acadia and intrusive igneous rock, it doesn't mention Crater Lake or contrast how the rock at the two parks formed. *Choice C* is incorrect. The sentence emphasizes a similarity between the two parks (both contain igneous rock); it doesn't contrast how the igneous rock at the two parks formed. *Choice D* is incorrect. The sentence makes a general statement about the two types of igneous rock; it doesn't contrast how the igneous rock at the two specific national parks formed.

QUESTION 32

Choice B is the best answer. The sentence quotes Alagappan to emphasize the biological importance of capillary action, noting that capillary action is "crucial to the sound functioning of our bodies and our environment."

Choice A is incorrect. While the sentence mentions the biological relevance of capillary action (noting that it occurs in trees and human bodies), it doesn't quote Alagappan. *Choice C* is incorrect. While the sentence quotes Alagappan, the quoted portion expresses general admiration for an unspecified process; it doesn't emphasize the biological importance of capillary action specifically. *Choice D* is incorrect. While the sentence quotes Alagappan and mentions capillary action, it explains how capillary action occurs rather than emphasizing its biological importance.

QUESTION 33

Choice C is the best answer. The sentence emphasizes a difference between the two scrolls, noting that one features a painting and the other features a poem.

Choice A is incorrect. While the sentence does contrast the two scrolls, it misrepresents information from the notes: scroll 2 features a poem by Li Bai, not a portrait. *Choice B* is incorrect because the sentence presents a similarity between the scrolls (both depict nature) rather than emphasizing a difference between them. Additionally, the sentence misrepresents information from the notes: the artwork was created by Ike Taiga, not Li Bai. *Choice D* is incorrect. The sentence emphasizes a similarity between the two scrolls (both depict nature); it doesn't emphasize a difference between them.

Reading and Writing

Module 2

(33 questions)

QUESTION 1

Choice A is the best answer because it most logically completes the text's discussion of young Indigenous artists in Peru and their music. In this context, "developing" means bringing into existence. The text states that these artists are creating a "new sound," which suggests that the music they're producing didn't previously exist. The text then provides an example of the new sound: artists Cay Sur and Renata Flores mix the rhythms of hip-hop with "traditional Andean instruments and themes." This context supports the idea that young Indigenous artists in Peru are developing a new music genre.

Choice B is incorrect because in this context, "repeating" would mean making, saying, or doing again. The text indicates that young Indigenous artists in Peru are creating music that has a "new sound." Something new didn't previously exist, so it can't be made again. Therefore, the artists are developing, not repeating, a new music genre. *Choice C* is incorrect because in this context, "correcting," would mean fixing errors in something. The text describes the music the young Indigenous artists in Peru are creating as a "new sound." This indicates that this genre of music didn't exist before, and it wouldn't be logical to say that artists are fixing errors in a genre that didn't previously exist. *Choice D* is incorrect because in this context, "remembering" would mean recalling from memory. The text describes the music the young Indigenous artists in Peru are creating as a "new sound." This indicates that this genre of music didn't exist before, and it wouldn't be logical to say that artists are recalling from memory a genre that didn't previously exist.

QUESTION 2

Choice C is the best answer because it most logically completes the text's discussion of increasing road capacity as a solution to traffic congestion. In this context, "efficacy" means the ability to produce a desired result or outcome. The text states that research studies have indicated that one approach to reducing traffic congestion, adding road capacity, doesn't produce the desired outcome

and can in fact "make traffic worse." This supports the idea that studies have cast doubt on the efficacy of the approach of building additional road capacity to reduce congestion.

Choice A is incorrect because saying that studies have cast doubt on the "aesthetics," or visual appearance, of the approach of building additional road capacity to reduce traffic congestion wouldn't make sense in context. The text focuses on whether the approach effectively solves traffic congestion, not on how appealing the additional or modified roads look. *Choice B* is incorrect because in this context, "popularity" would mean how well-liked something is. The text focuses on what research studies have indicated about how well an approach (adding road capacity) works to solve a problem (traffic congestion). The studies have indicated that added road capacity doesn't reduce congestion. This suggests that research studies have cast doubt on the efficacy, not the popularity, of the approach. *Choice D* is incorrect because saying that studies have cast doubt on the "originality," or novelty, of building additional road capacity to reduce traffic congestion wouldn't make sense in context. The text doesn't address whether the approach is new; instead, it focuses on whether the approach effectively reduces traffic congestion.

QUESTION 3

Choice D is the best answer because it most logically completes the text's discussion of Allan Houser's sculptures. In this context, "identify" means to recognize or distinguish. The text contrasts Houser's abstract works (for instance, *Embrace)*, which show their subjects as "abstract geometric shapes," with some of his other works, which portray subjects "in realistic detail" (meaning the works' subjects are depicted as they would appear in real life). This context supports the idea that in Houser's realistic pieces, the viewer can easily identify—that is, recognize—familiar objects.

Choice A is incorrect because saying that the viewer can easily "reveal," or make known, familiar objects in Houser's nonabstract pieces wouldn't make sense in context. The text states that Houser's nonabstract sculptures portray their subjects "in realistic detail" (that is, as they would appear in real life), which suggests that familiar objects depicted in those sculptures are already apparent to the viewer. Therefore, the viewer can easily identify, or recognize, the objects. *Choice B* is incorrect because saying that the viewer can easily "remember," or recall from the past, familiar objects in Houser's nonabstract pieces wouldn't make sense in context. The text contrasts Houser's abstract works, which consist of geometric shapes, with his nonabstract works, which depict subjects as they would appear in real life. This suggests that in the latter works, viewers can easily identify, not remember, familiar objects. *Choice C* is incorrect because saying that the viewer can easily "ignore," or disregard, familiar objects in Houser's nonabstract sculptures wouldn't make sense in context. The text contrasts Houser's abstract works with his nonabstract (that is, realistic) ones, noting that in the latter works, subjects are depicted as they would appear in real life. This suggests that in the realistic works, viewers can easily recognize, not disregard, familiar objects.

QUESTION 4

Choice A is the best answer because it most logically completes the text's discussion of Marques Hanalei Marzan's artistic process. In this context, "intention for" means a plan or purpose regarding something. The text indicates that Marzan "makes up his designs as he weaves" and allows "inspiration to take him in unexpected directions," which suggests he doesn't plan what his final product will look like before he begins. This supports the idea that Marzan often doesn't have a specific intention for—that is, a predetermined plan for—what the final product will look like.

Choice B is incorrect because stating that Marzan doesn't have a specific "acceptance of" what the final product will look like wouldn't make sense in context. "Acceptance" means approval or willingness to receive something, but the text is discussing whether Marzan has a plan for his work from the start, not whether he approves of the outcome. *Choice C* is incorrect because stating that Marzan doesn't have a specific "admiration for" what the final product will look like wouldn't make sense in context. "Admiration" means respect or approval, but the text is discussing Marzan's creative process, not how he feels about his finished work. *Choice D* is incorrect because stating that Marzan doesn't have a specific "imitation of" what the final product will look like wouldn't make sense in context. "Imitation" means a copy or reproduction of something, but the text is discussing Marzan's creative process, not whether he copies existing artwork.

QUESTION 5

Choice C is the best answer because it most logically completes the text's discussion of how geomagnetic storms affect the performance of GPS. In this context, "reliability" means the quality of being accurate and dependable. The text indicates that geomagnetic storms can cause GPS models to "produce inaccurate calculations," which means the system cannot be depended on to work correctly during such events. This information supports the idea that space weather events can affect the reliability of GPS—that is, its ability to consistently produce accurate results.

Choice A is incorrect because saying that space weather affects the "extent," or range, of GPS wouldn't capture the main point of the text. The text focuses on GPS producing inaccurate calculations, which is a problem of dependability rather than range. *Choice B* is incorrect because saying that space weather affects the "complexity," or complicated nature, of GPS wouldn't make sense in context. The text indicates that geomagnetic storms cause inaccurate calculations, not that they make the system more or less involved or complicated. *Choice D* is incorrect because saying that space weather affects the "significance," or importance, of GPS wouldn't make sense in context. The text focuses on GPS producing inaccurate results during geomagnetic storms and does not discuss any corresponding change in the status or importance of the system.

QUESTION 6

Choice B is the best answer because it most accurately describes the main purpose of the text, which is to note a new finding about the number of Saturn's moons. The text starts by stating that Saturn is the first planet in our solar system that astronomers have found over 100 moons orbiting. It then explains how this discovery occurred: astronomers used the Canada-France-Hawaii Telescope (CFHT) to observe 62 previously undetected moons. The text goes on to elaborate that this finding means that Saturn has now taken Jupiter's place as the planet in our solar system with the most observed moons.

Choice A is incorrect because the text doesn't explain how the CFHT works; the CFHT is mentioned only as the instrument used to detect moons orbiting Saturn that had been previously unobserved. *Choice C* is incorrect because the text doesn't discuss the history of Hawaii; Hawaii is mentioned only as the location of the telescope used to make the discovery about Saturn's previously unobserved moons. *Choice D* is incorrect because the text doesn't describe Jupiter's atmospheric conditions; Jupiter is mentioned only in comparison to Saturn regarding the number of their observed moons.

QUESTION 7

Choice A is the best answer because it most accurately states the function of the underlined portion in the text as a whole. When the woman excitedly mentions "those wonderful words," Oscar rises and asks, "Which wonderful words?" His action and his question both indicate his increased interest and suggest his hope that the woman might be referring to his own writing. However, when the woman specifies the words "about moving toward the beautiful distances," Oscar says, "Those are Mr. Wills' wonderful words." Since they are not his own, he loses interest. Therefore, the underlined portion portrays his brief hope that the woman is fond of his writing (a hope that ends when the woman clarifies her meaning).

Choice B is incorrect because nothing in the text suggests Oscar was expecting the woman; his initial, distracted "um-hum" and his rising with interest only after she mentions "wonderful words" both indicate that he had no prior knowledge of her visit. *Choice C* is incorrect because the underlined portion shows Oscar rising with interest, not annoyance; his initial engagement with the woman's comment suggests curiosity and hope rather than irritation. *Choice D* is incorrect because the underlined portion primarily reveals Oscar's personal interest in whether the woman might be praising his writing, rather than depicting polite, professional behavior.

QUESTION 8

Choice C is the best answer because it most accurately describes the function of the underlined sentence in the text as a whole. The text presents evidence that the crater on Pluto observed by the New Horizons space probe was formed by an ice volcano—namely, the presence of water ice and ammonia near the crater, both of which are associated with ice volcano eruptions. The underlined sentence then adds that the crater's shape and appearance indicate that it wasn't formed by an impact, which implies that an alternative explanation for the crater's

formation—that the crater was an impact crater—was considered and ruled out. The text then concludes by stating that the evidence summarized earlier pointed Cruikshank and his team to the hypothesis that the crater had likely been an ice volcano at one time. Thus, the underlined sentence implies that in arriving at the hypothesis stated in the last sentence, the research team had eliminated an alternative explanation based on the available evidence.

Choice A is incorrect because the underlined sentence doesn't identify a misconception the researchers had; rather, it presents evidence that helped them rule out the impact explanation. *Choice B* is incorrect because the underlined sentence presents an observation about the crater based on data gathered in 2015 by the New Horizons space probe. Neither the text as a whole nor the underlined sentence discusses previous findings that informed a research method used by Cruikshank and his team. *Choice D* is incorrect because the underlined sentence focuses on the implications of the crater's shape and appearance, not on the importance of the New Horizons space probe.

QUESTION 9

Choice C is the best answer because it accurately describes a difference in how the author of Text 1 and the author of Text 2 each view consumer inertia. The author of Text 1 presents consumer inertia as positive from a business perspective, stating that it "can be advantageous to companies" and characterizing pricing strategies that exploit consumer inertia, including using low introductory offers to attract customers and then raising prices, as successful for increasing revenue. By contrast, the author of Text 2 presents research that suggests that the specific method of capitalizing on consumer inertia discussed in Text 1 can backfire. According to Text 2, the research team found that using introductory offers to lock subscribers into automatic renewals at higher prices may attract fewer subscribers than using introductory offers that end with a cancellation of the service. In other words, using introductory offers was associated with greater success when the strategy didn't take advantage of consumer inertia than when it did. Thus, while the author of Text 1 emphasizes the potential benefits of exploiting consumer inertia, the author of Text 2 warns that a particular approach to doing so may not produce the intended results.

Choice A is incorrect because the author of Text 1 doesn't assert that introductory offers are most effective at eliciting consumer inertia; rather, Text 1 presents introductory offers as one example of a strategy that can exploit consumer inertia but doesn't imply that it's the most effective strategy for doing so. Additionally, the author of Text 2 doesn't conclude that automatic renewal services are more likely to cultivate consumer inertia than other strategies are. In fact, Text 2 suggests that automatic renewals may actually be counterproductive, resulting in fewer subscribers. *Choice B* is incorrect because neither author makes claims about which types of consumers exhibit consumer inertia or which product markets are affected by it. Text 1 describes consumer inertia in general terms but doesn't make any claims about consumer types, and Text 2 focuses on subscription-based services as an example without claiming consumer inertia is absent in other markets. *Choice D* is incorrect because the author of Text 1 doesn't argue that brand loyalty is the primary source of consumer inertia. Text 1

mentions both brand loyalty and convenience as possible reasons customers may not search for less expensive options, but it doesn't identify either as the primary cause. Furthermore, the author of Text 2 doesn't address the causes of consumer inertia at all, focusing instead on the outcomes of certain pricing strategies.

QUESTION 10

Choice C is the best answer because it most accurately states the main idea of the text. The narrator reflects on having experienced many "unexpected moments" and "unforeseen twists and turns" throughout her life. However, the narrator emphasizes that she was never "so aware of entering a new stage" as when she crossed the threshold into her new apartment. The narrator describes leaving behind a complicated past and seeing the empty space of her new apartment "that time would take care of filling up." This portrayal of leaving the past behind and facing an open future reinforces the narrator's recognition that this particular moment—entering the new apartment—marks a major shift in her life.

Choice A is incorrect because the text doesn't mention a new business. Rather, the narrator describes entering a new apartment and reflecting on a new stage of life, not a new business venture. *Choice B* is incorrect because the text suggests the opposite: the narrator indicates that often she has been unprepared for life's unexpected moments. This suggests that the narrator has not always had a plan for handling big moments in her life. *Choice D* is incorrect because the text doesn't mention other people in the narrator's life or indicate that the narrator wishes to express gratitude for anyone's help. Instead, the narrator's reflection focuses on her own experience of entering a new stage of life.

QUESTION 11

Choice A is the best answer because it most effectively uses data from the graph to complete the example about employment trends from 1995 to 2007. The graph presents the number of employees (in thousands) working in agriculture, hunting, and forestry in the Czech Republic and Austria from 1995 to 2013. According to the graph, employment in these sectors in the Czech Republic decreased from approximately 225 thousand in 1995 to approximately 125 thousand in 2007. During the same period, employment in Austria remained relatively steady at just under 25 thousand.

Choice B is incorrect because the graph indicates that the number of employees working in these sectors in the Czech Republic decreased, not increased, from 1995 to 2007. *Choice C* is incorrect because the graph shows only the number of employees in these specific sectors, not the total number of employees in Austria; therefore, it does not provide information about what proportion of Austrian workers were employed in these sectors and whether they represented a majority. *Choice D* is incorrect because the graph indicates that employment in these sectors did not remain stable in the Czech Republic; rather, it decreased substantially from approximately 225 thousand to approximately 125 thousand between 1995 and 2007.

QUESTION 12

Choice D is the best answer because it most effectively presents a quotation that illustrates the claim that Liebes's use of bold colors, textured fabrics, and metallic threads resulted in some of the most influential designs of the time. The text introduces Liebes as "an influential designer" in the mid-twentieth century. The text then explains that Liebes used "bold colors, textured fabrics, and metallic threads" to create "some of the most influential designs" of that period. This quotation indicates that Liebes was known to use colors and fabrics in "unexpected" ways to create "sought-after" designs that formed an identifiable style referred to as "the 'Liebes Look.'" This quotation therefore illustrates both Liebes's design approach and its influential results as described in the underlined portion of text.

Choice A is incorrect because instead of focusing on her artistic approach and influence, this quotation describes Liebes's production methods, including her transition from handwoven textiles to mass production using power looms. Although being able to reach a wider audience at lower costs could suggest influence, this quotation doesn't address the idea that her designs were some of the most influential of the time. *Choice B* is incorrect because this quotation describes Liebes's career path—from working as an art teacher to opening studios—but doesn't address her use of bold colors, textured fabrics, or metallic threads. Although this quotation does suggest that Liebes was successful professionally, which could suggest influence, opening design studios in California and New York doesn't directly illustrate that her designs were influential. *Choice C* is incorrect because instead of illustrating the specific design elements Liebes used or the influence of her designs, this quotation indicates that she collaborated professionally with architects, fashion designers, and film producers. This fact could suggest influence but doesn't indicate it directly.

QUESTION 13

Choice B is the best answer because it most effectively illustrates the claim that the children appreciate the garden because it allows them to experience nature. The quotation depicts the children in the garden engaging with nature—specifically, stopping their games to listen to birds "[singing] so sweetly" in the trees—and expressing their happiness by exclaiming "How happy we are here!" This directly shows both the children's experience of nature in the garden and their appreciation of it.

Choice A is incorrect because this quotation focuses on the Giant's possessiveness and his actions to exclude others from the garden, not on the children's appreciation of experiencing nature there. The quotation doesn't describe the children at all. *Choice C* is incorrect because this quotation describes the children's dislike of playing on the dusty road; it doesn't illustrate their appreciation of the garden or their experience of nature within it. *Choice D* is incorrect because this quotation describes the arrival of spring and contrasts the vibrant landscape elsewhere with the ongoing winter of the Giant's garden, but it doesn't depict the children experiencing or appreciating nature in the garden.

QUESTION 14

Choice D is the best answer because it presents a finding that, if true, would most directly support Adlhart's claim that the sponge developed by Guoqing Wang to reduce microplastic pollution would be difficult to mass-produce. The text explains that the sponge is composed mainly of starch and gelatin. If the worldwide supply of these substances is in high demand from the food industry and therefore difficult to source in significant quantities, that would present a major obstacle to mass-producing the sponge, since the necessary raw materials would be hard to obtain in the amounts needed for large-scale production.

Choice A is incorrect because a finding that textiles are a major source of microplastic pollution would pertain to the environmental problem the sponge is designed to help solve, not the question of whether the sponge would be difficult to mass-produce. The source of microplastic pollution is irrelevant to the sponge's production challenges. *Choice B* is incorrect because a finding that the sponge is light and easy to ship would suggest that distributing the product wouldn't be difficult, which has no bearing on—and would arguably counter—the claim that the sponge would be difficult to mass-produce. *Choice C* is incorrect because a finding that the sponge's absorption capabilities varied depending on the liquid solution would address the sponge's effectiveness in different conditions, not the challenges related to the sponge's mass production. The effectiveness of the sponge in different conditions is a separate issue from the difficulty of producing the sponge.

QUESTION 15

Choice D is the best answer because it accurately describes data from the table that strengthen both parts of Pereira and colleagues' conclusion. At 12 weeks, the two groups had similar productivity loss (268 and 282 Australian dollars), meaning there was no clear sign yet that one program was working better than the other. This supports the part of the conclusion stating that the results "took time to become apparent." But at 12 months, productivity loss had significantly decreased for the EET group (to 171 Australian dollars) and significantly increased for the EHP group (to 436). This pattern supports the other part of the conclusion: that EET was more effective at restraining productivity loss than EHP was.

Choice A is incorrect because the table provides data on total productivity loss for each group but does not provide any information about what proportion of productivity loss was due to absenteeism versus presenteeism. *Choice B* is incorrect because the table shows that the difference between the two groups actually increased over time, not decreased: at 12 weeks, the productivity loss was 268 Australian dollars for the EET group and 282 Australian dollars for the EHP group; at 12 months, the gap between the two groups had widened (171 versus 436 Australian dollars). *Choice C* is incorrect because according to the table, productivity loss for the EET group decreased from 268 to 171 Australian dollars, a reduction of 97 Australian dollars, which is not accurately characterized by the phrase "barely decreased."

QUESTION 16

Choice C is the best answer because it uses data from the table to effectively complete the text's explanation of why both alkanes and dimethyl sulfides must have been present in the sample before the methanol-only extraction (extraction 3). The table shows that dimethyl sulfides were detected in the third extract (methanol only), which means that these compounds must have been present in the sample when the methanol extraction began. The table also shows that alkanes were detected in the fourth extract (dichloromethane and methanol), indicating that alkanes remained in the sample after the methanol-only extraction and therefore must have been present before it. Together, these observations confirm that both compounds were present in the sample before the methanol-only extraction.

Choice A is incorrect because while the table does show that the second extract contains alkanes but no dimethyl sulfides, this observation alone does not explain why both alkane and dimethyl sulfide compounds must have been present in the sample before the methanol-only extraction (extraction 3). The observation provides evidence about the presence of alkanes but provides no evidence that dimethyl sulfides were present before the methanol-only extraction. *Choice B* is incorrect because while the table shows that the fourth extract contains alkanes but no dimethyl sulfides, this observation does not address whether both compounds were present in the sample before the methanol-only extraction (extraction 3). It indicates only what remained in the sample after that extraction. *Choice D* is incorrect because it simply summarizes how often alkanes and dimethyl sulfides appear across the extracts but does not use the extract sequencing information to explain why both compounds must have been present in the sample before the methanol-only extraction.

QUESTION 17

Choice B is the best answer because it most effectively uses data from the table to complete the assertion about the nonuniform upward trend in Indonesia's renewable energy capacity. The text establishes that although the overall trend from 2017 to 2020 was upward, the growth was not uniform. In other words, capacity didn't rise steadily every year—it could drop or stay the same, as shown by solar's decline from 2017 to 2018. The table shows that geothermal capacity remained at 2,131 megawatts in both 2019 and 2020, and wind capacity remained at 154.3 megawatts in both 2019 and 2020. By illustrating that some technologies experienced periods of no growth, these data provide another example supporting the nonuniform trend in Indonesia's use of renewable energy.

Choice A is incorrect because while the data in the table support this claim, noting that wind and solar capacities were lower than renewable hydropower across the four-year period does not show that the trend was not uniform. This choice compares technologies rather than describing year-to-year change. Even if wind and solar remained consistently lower than hydropower, their capacities could still have increased uniformly from 2017 to 2020. *Choice C* is incorrect because while the table supports this comparison, it does not complete the sentence in a way that demonstrates the nonuniform trend; instead, it simply compares the relative

electrical capacities of two renewable technologies. *Choice D* is incorrect because while it uses accurate data from the table, it does not complete the sentence in a way that illustrates the nonuniform upward trend described in the text. The table does show that wind capacity was 1.5 megawatts in 2017 and much higher in 2018, 2019, and 2020, but this mainly provides evidence of an increase overall. It does not point to a year-to-year interruption—such as a decrease or a period of no growth—that would support the text's claim that the trend was not uniform.

QUESTION 18

Choice B is the best answer because it most logically completes the text's discussion of differences between shaded and full-sun coffee farms. The text indicates that full-sun coffee farms lack trees, which results in a lack of spaces for many species of birds to roost. The logical implication is that shaded farms, which do have trees, would provide roosting spaces for these bird species. Therefore, shaded farms would tend to be home to a more diverse range of birds than full-sun farms, which lack the trees that birds need to roost.

Choice A is incorrect because the text doesn't discuss soil quality on coffee farms. The text focuses on the presence or absence of trees and its effect on bird populations, not on soil conditions. *Choice C* is incorrect because the text makes no mention of insects or other pests on coffee farms. The text's discussion of trees and birds doesn't provide any basis for conclusions about pest problems. *Choice D* is incorrect. Although the text does discuss sun and shade, it doesn't address weather conditions on coffee farms. The text focuses specifically on the relationship between trees and roosting spaces for birds, not on weather.

QUESTION 19

Choice B is the best answer. The convention being tested is punctuation use within a sentence. No punctuation is needed between "three times" and "in a row" because the prepositional phrase "in a row" provides essential information about how the three victories occurred.

Choice A is incorrect because no punctuation is needed between "three times" and "in a row." *Choice C* is incorrect because no punctuation is needed between "three times" and "in a row." *Choice D* is incorrect because no punctuation is needed between "three times" and "in a row."

QUESTION 20

Choice A is the best answer. The convention being tested is punctuation in a sentence. No punctuation is needed between the verb "grow" and its object "healthier gardens." The object completes the sentence by explaining what Joseph helps people grow. In this case, any punctuation between the two results in an ungrammatical sentence.

Choice B is incorrect because no punctuation is needed between the verb and its object. *Choice C* 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 B 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 makes a statement ("Most...language").

Choice A is incorrect. It's unconventional to use a question mark in this way to punctuate a declarative sentence that makes a statement. *Choice C* is incorrect because the context requires a declarative clause at the end of the sentence that states that "Happy Birthday" is the most frequently sung song in the English language, not an interrogative clause that asks a direct question about whether "Happy Birthday" is the most frequently sung song in the English language. *Choice D* is incorrect because the context requires a declarative clause at the end of the sentence that states that "Happy Birthday" is the most frequently sung song in the English language, not an interrogative clause that asks a direct question about whether "Happy Birthday" is the most frequently sung song in the English language.

QUESTION 22

Choice D is the best answer. The convention being tested is end-of-sentence punctuation. This choice correctly uses a question mark to punctuate the interrogative clause "why is it considered controversial," which asks a direct question at the end of the sentence.

Choice A is incorrect because the context requires an interrogative clause, not a declarative one, to ask a direct question. Following a question word like "why," it is conventional to invert the order of the subject and verb ("is it") to form an interrogative clause. *Choice B* is incorrect because a period can't be used in this way to punctuate an interrogative clause, such as "why is it considered controversial," at the end of a sentence. *Choice C* is incorrect because the context requires an interrogative clause, not a declarative one, to ask a direct question. Following a question word like "why," it is conventional to invert the order of the subject and verb ("is it") to form an interrogative clause.

QUESTION 23

Choice D is the best answer. The convention being tested is the use of determiners. The singular demonstrative determiner "this" agrees in number with the singular noun "place" and clearly indicates that Mookodi wants to educate the public about the Okavango Delta.

Choice A is incorrect because the plural demonstrative determiner "those" doesn't agree in number with the singular noun "place." *Choice B* is incorrect because the plural determiner "both" doesn't agree in number with the singular noun "place." *Choice C* is incorrect because the plural demonstrative determiner "these" doesn't agree in number with the singular noun "place."

QUESTION 24

Choice C is the best answer. The convention being tested is the use of verbs to express tense in a sentence. In this choice, the past tense verb "featured" correctly indicates that the gallery displayed Moon's work in an exhibition that occurred in the past (early 2022).

Choice A is incorrect because the future tense verb "will feature" doesn't indicate that the exhibition occurred in the past. *Choice B* is incorrect because the present tense verb "features" doesn't indicate that the exhibition occurred in the past. *Choice D* is incorrect because the present perfect tense verb "has been featured" is ungrammatical in this context. The passive construction incorrectly treats "New York's Derek Eller Gallery" as the entity being featured, even though "her work" appears as an object.

QUESTION 25

Choice C is the best answer. The convention being tested is pronoun-antecedent agreement. The singular pronoun "it" agrees in number with the singular antecedent "the small town of Elkader, Iowa" and clearly indicates that the town was founded in 1846.

Choice A is incorrect because the singular pronoun "he" doesn't agree with the antecedent "the small town of Elkader, Iowa." Using "he" would illogically suggest that a person, not the town, was founded. *Choice B* is incorrect because the plural pronoun "they" doesn't agree in number with the singular antecedent "the small town of Elkader, Iowa." *Choice D* is incorrect because the plural pronoun "these" doesn't agree in number with the singular antecedent "the small town of Elkader, Iowa."

QUESTION 26

Choice A is the best answer. The convention being tested is subject-verb agreement. The plural verb "use" agrees in number with the plural subject "coaches."

Choice B is incorrect because the singular verb "uses" doesn't agree in number with the plural subject "coaches." *Choice C* is incorrect because the singular verb "is using" doesn't agree in number with the plural subject "coaches." *Choice D* is incorrect because the singular verb "has used" doesn't agree in number with the plural subject "coaches."

QUESTION 27

Choice C is the best answer. "For example" logically signals that the information in this sentence—that the Umbrian language went extinct around the first century BCE—provides a specific example of the general concept of language extinction.

Choice A is incorrect because "admittedly" illogically signals that the information about the Umbrian language going extinct is a concession or acknowledgment that qualifies the previous definition of language extinction. Instead, the Umbrian language is an example of the concept. *Choice B* is incorrect because "therefore"

illogically signals that the information about the Umbrian language going extinct is a result or consequence of the previous definition of language extinction. Instead, the Umbrian language is an example of the concept. *Choice D* is incorrect because "in conclusion" illogically signals that the information about the Umbrian language going extinct summarizes or concludes the previous information about language extinction. Instead, the Umbrian language is an example of the concept.

QUESTION 28

Choice D is the best answer. "Hence" logically signals that the information in this sentence—that LiDAR's penetrating light waves were the only way to reveal some aspects of the city—is a result or consequence of the previous information about parts of Tikal being physically inaccessible to researchers.

Choice A is incorrect because "afterward" illogically signals that the information about LiDAR being the only way to reveal aspects of the city is an event that occurred later in a chronological sequence than the site's inaccessibility. However, that inaccessibility is a current, ongoing state, and needing to use LiDAR is a consequence of it. *Choice B* is incorrect because "similarly" illogically signals that the information about LiDAR being the only way to reveal aspects of the city is similar to the previous information about the site's inaccessibility. Instead, needing to use LiDAR is a consequence of that inaccessibility. *Choice C* is incorrect because "specifically" illogically signals that the information about LiDAR being the only way to reveal aspects of the city provides specific details elaborating on the previous information about the site's inaccessibility. Instead, needing to use LiDAR is a consequence of that inaccessibility.

QUESTION 29

Choice C is the best answer. "Rather" logically signals that the information in this sentence contrasts with the information in the previous sentence: instead of maintaining bonds by sharing and exchanging electrons, metals are held together by freely traveling valence electrons.

Choice A is incorrect because "likewise" illogically signals that the information about freely traveling valence electrons is similar to the previous information about metals not sharing electrons. Instead, the sentence provides contrasting information, describing the means by which metals are actually held together. *Choice B* is incorrect because "accordingly" illogically signals that the information about freely traveling valence electrons is a result or consequence of the previous information about metals not sharing electrons. Instead, the sentence provides contrasting information, describing the means by which metals are actually held together. *Choice D* is incorrect because "for example" illogically signals that the information about freely traveling valence electrons illustrates the previous information about metals not sharing electrons. Instead, the sentence provides contrasting information, describing the means by which metals are actually held together.

QUESTION 30

Choice D is the best answer. "To this end" logically signals that the information in this sentence—that Whitney offered to donate works to a museum and eventually opened her own—describes actions taken to achieve the previously mentioned goal of helping avant-garde artists gain exposure.

Choice A is incorrect because "in other words" illogically signals that the information about Whitney's donation offer and museum founding is a paraphrase or restatement of the previously mentioned goal of helping avant-garde artists gain exposure. Instead, the sentence describes specific actions taken to achieve that goal. *Choice B* is incorrect because "in contrast" illogically signals that the information about Whitney's donation offer and museum founding contrasts with the previously mentioned goal of helping avant-garde artists gain exposure. Instead, the sentence describes specific actions taken to achieve that goal. *Choice C* is incorrect because "granted" illogically signals that the information about Whitney's donation offer and museum founding qualifies or contrasts with the previously mentioned goal of helping avant-garde artists gain exposure. Instead, the sentence describes specific actions taken to achieve that goal.

QUESTION 31

Choice B is the best answer. The sentence contrasts the two estimates of Perucetus's weight, noting that Pyenson's estimate of 60 to 70 tons was much less than Urbina's team's original estimate of 200 tons.

Choice A is incorrect. The sentence presents Pyenson's claim about the Urbina's team's estimate (which it mischaracterizes); it doesn't contrast the two estimates of Perucetus's weight. *Choice C* is incorrect. While the sentence mentions when the two estimates were made, it doesn't provide or contrast the two estimates. *Choice D* is incorrect. The sentence indicates when and where Perucetus was found and provides one of the estimates of the whale's weight; it doesn't contrast the two estimates of Perucetus's weight.

QUESTION 32

Choice C is the best answer. The sentence explains how soap removes a surface contaminant (dirt), noting that soap molecules form a micelle around the dirt and then encase the micelle in water, lifting it and the dirt off the surface.

Choice A is incorrect. While the sentence mentions that soap can remove surface contaminants like dirt, it describes how soap forms rather than explaining how soap removes contaminants. *Choice B* is incorrect. The sentence explains what micelles are; it doesn't explain how soap removes a surface contaminant. *Choice D* is incorrect. The sentence explains what hydrophobic surface contaminants are; it doesn't explain how soap removes them.

QUESTION 33

Choice B is the best answer. The sentence makes and supports a claim about the inspiration for kumiko patterns, claiming that many patterns are inspired by nature and citing the seigaiha pattern's resemblance to ocean waves as support.

Choice A is incorrect. While the sentence mentions that kumiko patterns resemble elements from nature, it primarily focuses on how the patterns are formed; it doesn't effectively support a claim about the patterns' inspiration. *Choice C* is incorrect. While the sentence mentions that the kikko pattern resembles a tortoise's shell, it misrepresents information from the notes; the pattern is inspired by the shape of a tortoise's shell, not by "wooden strips from nature." *Choice D* is incorrect. The sentence describes the kumiko woodworking technique; it doesn't make and support a claim about the inspiration for kumiko patterns.

Math

Module 1
(27 questions)

QUESTION 1

Choice D is correct. It's given that the vehicle travels 9 feet per second for 7 seconds. The distance traveled can be found by multiplying the rate, 9 feet per second, by the time, 7 seconds. This yields $\left(\frac{9 \text{ feet}}{1 \text{ second}}\right)(7 \text{ seconds})$, or 63 feet. Therefore, the vehicle travels 63 feet in 7 seconds.

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 2

Choice A is correct. The perimeter, P, of a square can be found using the formula $P = 4s$, where s is the length of each side of the square. It's given that square X has a side length of 24 centimeters. Substituting 24 for s in the formula for the perimeter of a square yields $P = 4(24)$, or $P = 96$. Therefore, the perimeter of square X is 96 centimeters. It's also given that the perimeter of square Y is 2 times the perimeter of square X. Therefore, the perimeter of square Y is $2(96)$, or 192, centimeters. Substituting 192 for P in the formula $P = 4s$ gives $192 = 4s$. Dividing both sides of this equation by 4 gives $48 = s$. Therefore, the length, in centimeters, of one side of square Y is 48.

Alternate approach: It's given that the perimeter of square Y is 2 times the perimeter of square X. The scale factor of the perimeters of two squares is equal to the scale factor of the lengths of the sides of the two squares. It follows that the length of each side of square Y is 2 times the length of each side of square X. It's given that square X has a side length of 24 centimeters. It follows that the length, in centimeters, of one side of square Y is $2(24)$, or 48.

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 is the length, in centimeters, of one side of a square whose perimeter is $\frac{1}{2}$ times, not 2 times, the perimeter of square X.

QUESTION 3

Choice B is correct. It's given that 100% of the business owners attended the meeting, which means all the business owners attended the meeting. Since there are 45 business owners and 100% of them attended the meeting, 45 business owners attended the meeting.

Choice A is incorrect. This represents 0%, not 100%, of 45. *Choice C* is incorrect. This represents 1,000%, not 100%, of 45. *Choice D* is incorrect. This represents 10,000%, not 100%, of 45.

QUESTION 4

Choice D is correct. In the given expression, $10x$ and $2x$ are like terms, and $10y$ and $7y$ are like terms. By combining like terms in the given expression, it can be rewritten as $12x + 17y + 3$.

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 B is correct. It's given that the triangle has one side with a length of x inches and two sides each with a length of y inches. The perimeter of a triangle is the sum of the lengths of its three sides. Therefore, the perimeter, in inches, of this triangle is $x + y + y$, or $x + 2y$. It's also given that the perimeter of this triangle is 23 inches. Therefore, the equation $x + 2y = 23$ represents this situation.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect. This equation represents a triangle with a perimeter of 23 inches that has two sides with a length of x inches and one side with a length of y inches, not one side with a length of x inches and two sides with a length of y inches. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 6

The correct answer is 1,000. It's given that $1.3x = 1{,}300$. Dividing both sides of this equation by 1.3 yields $x = 1{,}000$. Therefore, 1,000 is the solution to the given equation.

QUESTION 7

The correct answer is 20. The graph shows the relationship between x and y. The point on the graph with an x-coordinate of 1 is $(1, 20)$. Therefore, if the value of x is 1, the value of y, to the nearest integer, is 20.

QUESTION 8

Choice A is correct. It's given that function f is defined by $f(x)=\frac{1}{7}x-7$. Substituting 70 for x in the given function yields $f(70)=\frac{1}{7}(70)-7$, or $f(70)=3$. Therefore, the value of $f(70)$ is 3.

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 9

Choice C is correct. The median of a data set with an odd number of values is the middle value of the data set when the values are in ascending or descending order. It's given that there are 11 values in each data set, so the middle value of each data set is the sixth value. Since the values in each data set are given in ascending order, the median of each data set is the sixth value. In data set A the sixth value is 10, so the median of data set A is 10. In data set B the sixth value is also 10, so the median of data set B is 10. Therefore, the medians of data sets A and B are equal.

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 10

Choice C is correct. A linear function can be defined by the equation $f(x)=mx+b$, where m is the slope and $(0, b)$ is the y-intercept of the graph of $y=f(x)$ in the xy-plane. The slope of a line that passes through the points (x_1, y_1) and (x_2, y_2) can be calculated using the equation $m=\frac{(y_2-y_1)}{(x_2-x_1)}$. The line shown passes through the points $(0, -1)$ and $(5, -4)$. Substituting $(0, -1)$ for (x_1, y_1) and $(5, -4)$ for (x_2, y_2) in the equation $m=\frac{(y_2-y_1)}{(x_2-x_1)}$ yields $m=\frac{-4-(-1)}{5-0}$, or $m=\frac{-3}{5}$. Since the line shown passes through the point $(0, -1)$, it follows that $b=-1$. Substituting $-\frac{3}{5}$ for m and -1 for b in the equation $f(x)=mx+b$ yields $f(x)=-\frac{3}{5}x-1$. Therefore, the equation $f(x)=-\frac{3}{5}x-1$ defines function f.

Choice A is incorrect. The graph of this equation has a positive slope, which means it defines a function that's increasing, not decreasing. *Choice B* is incorrect. The graph of this equation has a positive slope, which means it defines a function that's increasing, not decreasing. *Choice D* is incorrect. This equation defines a linear function whose graph has a slope of $-\frac{5}{3}$, not $-\frac{3}{5}$.

QUESTION 11

Choice B is correct. In the given expression, $2t^2$ is a common factor of each term. Factoring out $2t^2$ from each term in the given expression $114t^3 - 26t^2u$ yields $2t^2(57t - 13u)$. Therefore, the expression $2t^2(57t - 13u)$ is equivalent to $114t^3 - 26t^2u$.

Choice A is incorrect. This expression is equivalent to $114t^3 - 26tu$, not $114t^3 - 26t^2u$. *Choice C* is incorrect. This expression is equivalent to $114t^3u - 26tu$, not $114t^3 - 26t^2u$. *Choice D* is incorrect. This expression is equivalent to $114t^3u - 26t^2u$, not $114t^3 - 26t^2u$.

QUESTION 12

Choice B is correct. It's given that a competitor needs to score at least 90 total points from two rounds. It's also given that each completed task in the first round is worth 5 points and each completed task in the second round is worth 6 points, where x represents the number of completed tasks in the first round and y represents the number of completed tasks in the second round. It follows that the expression $5x$ represents the total points earned in the first round and $6y$ represents the total points earned in the second round. Therefore, $5x + 6y$ represents the competitor's total score from both rounds. Since the competitor must score at least 90 total points, the total score must be greater than or equal to 90. Therefore, the inequality $5x + 6y \geq 90$ models this situation.

Choice A is incorrect. This inequality models a situation in which the total number of tasks completed, not the total points earned, is at most, not at least, 90. *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 13

The correct answer is 4. The second equation in the given system is $y = 7$. Substituting 7 for y in the first equation in the given system yields $3x + 8(7) = 68$, or $3x + 56 = 68$. Subtracting 56 from both sides of this equation yields $3x = 12$. Dividing both sides of this equation by 3 yields $x = 4$. Therefore, the value of x is 4.

QUESTION 14

The correct answer is $\frac{9}{50}$. If one of these people is selected at random, the probability of selecting a person who chose a green T-shirt is equal to the number of people who chose a green T-shirt divided by the total number of people. The table shows that 9 people chose a green T-shirt. It's given that the total number of people is 50. Therefore, the probability of selecting a person who chose a green T-shirt is $\frac{9}{50}$. Note that 9/50 and .18 are examples of ways to enter a correct answer.

QUESTION 15

Choice A is correct. The sum of the measures of the angles of a triangle is 180°. Therefore, in $\triangle DEF$, the sum of the measures of $\angle D$, $\angle E$, and $\angle F$ is 180°. It's given that the measure of $\angle D$ is 163°. It follows that the sum of the measures of $\angle E$ and $\angle F$ is $(180 - 163)°$, or 17°. Therefore, the measure, in degrees, of $\angle E$ must be less than 17. Of the given choices, only 16 is less than 17. Thus, the measure, in degrees, of $\angle E$ could be 16.

Choice B is incorrect. If the measure, in degrees, of $\angle E$ is 18, then the sum of the measures of the angles of $\triangle DEF$ is greater than, not equal to, 180°. *Choice C* is incorrect. If the measure, in degrees, of $\angle E$ is 90, then the sum of the measures of the angles of $\triangle DEF$ is greater than, not equal to, 180°. *Choice D* is incorrect. If the measure, in degrees, of $\angle E$ is 164, then the sum of the measures of the angles of $\triangle DEF$ is greater than, not equal to, 180°.

QUESTION 16

Choice B is correct. It's given that the equation $0.6t + 3 = 7$ describes the situation in which a plant's stem will grow at a constant rate from 3 inches to 7 inches in t weeks. Thus, the coefficient 0.6 represents the constant rate at which the stem's length increases with respect to time t, in weeks. This means the stem's length increases by 0.6 inches each week. Therefore, the best interpretation of 0.6 in this context is the length, in inches, that the plant's stem will grow each week.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect. This is the best interpretation of t, not 0.6. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 17

Choice C is correct. The volume, V, of a right square pyramid is given by the formula $V = \left(\frac{1}{3}\right)Bh$, where B represents the area of the square base and h represents the height of the pyramid. The area of a square is given by s^2, where s is the side length of the square. It's given that the side length of the square base is 13 centimeters. It follows that the area of the base is $(13)^2$, or 169 square centimeters. It's given that the height of the pyramid is 15 centimeters. Substituting 169 for B and 15 for h into the formula $V = \left(\frac{1}{3}\right)Bh$ yields $V = \left(\frac{1}{3}\right)(169)(15)$, or $V = 845$. Therefore, the volume, in cubic centimeters, of the pyramid is 845.

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. This is the value of Bh, not $\frac{1}{3}Bh$.

QUESTION 18

Choice A is correct. It's given that the function $f(x) = 53{,}000(1.02)^{x-1}$ gives the balance of the loan $f(x)$, in dollars, x years after the loan is taken out, where $x \geq 1$, if no payments are made to the loan. It follows that $f(x)$ represents the balance of the loan, in dollars, x years after it is taken out. The constant 53,000 is the value of $f(x)$ when $x = 1$, since substituting 1 for x in the expression $(1.02)^{x-1}$ yields $(1.02)^0$, or 1. Therefore, $f(1) = 53{,}000(1)$, or $f(1) = 53{,}000$; thus, the best interpretation of 53,000 is the balance of the loan, in dollars, 1 year after the loan is taken out.

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 19

Choice B is correct. The y-intercept of the graph of $y = g(x)$ in the xy-plane occurs at the point where $x = 0$. This means that when $x = 0$, the corresponding value of $g(x)$ is the y-coordinate of the y-intercept of the graph. Substituting 0 for x in the given function yields $g(0) = \left(\frac{1}{8}\right)(3)^0$, which is equivalent to $g(0) = \left(\frac{1}{8}\right)(1)$, or $g(0) = \frac{1}{8}$. Thus, when $x = 0$, the corresponding value of $g(x)$ is $\frac{1}{8}$. Therefore, if the given function g is graphed in the xy-plane, where $y = g(x)$, the y-intercept of the graph is $\left(0, \frac{1}{8}\right)$.

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 20

The correct answer is 598.2. It's given that a polar bear weighs 94 stones, and to use 1 stone = 14 pounds and 1 kilogram = 2.2 pounds. It follows that a weight of 94 stones is equivalent to $(94 \text{ stones})\left(\frac{14 \text{ pounds}}{1 \text{ stone}}\right)\left(\frac{1 \text{ kilogram}}{2.2 \text{ pounds}}\right)$, or approximately 598.18 kilograms. Therefore, the weight of the polar bear is approximately 598.2 kilograms. Note that 598.2 and 598.1 are examples of ways to enter a correct answer.

QUESTION 21

The correct answer is 122. The mean of a data set is calculated by dividing the sum of the data values by the number of values. It's given that the mean boiling point of the 175 chemical compounds the researcher is investigating is 184 degrees Celsius. This can be represented by the equation $\frac{x}{175} = 184$, where x represents the sum of the boiling points, in degrees Celsius, of all 175 compounds. Multiplying both sides of this equation by 175 yields $x = 175(184)$, or $x = 32{,}200$ degrees Celsius. It's also given that 50 of these compounds were classified as Type A, and that the mean boiling point of the 50 Type A compounds is 339 degrees Celsius. It follows that the sum of the

boiling points, in degrees Celsius, of the Type A compounds is $(50)(339)$, or 16,950. Therefore, the sum of the boiling points, in degrees Celsius, of the 125 Type B compounds is $32{,}200 - 16{,}950$, or 15,250. Since there are 125 compounds classified as Type B, the mean boiling point, in degrees Celsius, of the 125 Type B compounds is $\frac{15{,}250}{125}$, or 122. Therefore, the mean boiling point, in degrees Celsius, of the 125 chemical compounds classified as Type B is 122.

QUESTION 22

Choice C is correct. It's given that the gas mileage of the car is 25 miles per gallon. If the car begins with 15 gallons of gas in the tank, the amount of gas remaining after driving d miles is equal to the initial 15 gallons minus the number of gallons used. The number of gallons used can be expressed as the number of miles driven, d, divided by the gas mileage, 25 miles per gallon, or $\frac{d}{25}$. Therefore, the function that predicts the amount of gas remaining in the tank after the car is driven d miles is $f(d) = 15 - \frac{d}{25}$.

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 23

Choice A is correct. It's given that point P has coordinates $(4, -5)$. To determine which of the given inequalities are satisfied by the coordinates of P, the values $x = 4$ and $y = -5$ can be substituted into each inequality. Substituting $x = 4$ and $y = -5$ into $y < -2x + 7$ yields $-5 < -2(4) + 7$, which gives $-5 < -8 + 7$, or $-5 < -1$. Since $-5 < -1$ is true, this means the inequality in statement I is satisfied by the coordinates of P. Substituting $x = 4$ and $y = -5$ into $y > x - 5$ yields $-5 > 4 - 5$, or $-5 > -1$. Since $-5 > -1$ is false, this means the inequality in statement II is not satisfied by the coordinates of P. Therefore, only the inequality in statement I is satisfied by the coordinates 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 A is correct. It's given that line k passes through the points $(5, 0)$ and $(0, 7)$. The slope of a line that passes through two points (x_1, y_1) and (x_2, y_2) can be found using the slope formula, $m = \frac{y_2 - y_1}{x_2 - x_1}$. Thus, the slope of line k is $\frac{7 - 0}{0 - 5}$, or $-\frac{7}{5}$. An equation for a line in the xy-plane with slope m and y-intercept $(0, b)$ can be written in the form $y = mx + b$. Since line k passes through $(0, 7)$, the y-intercept of line k is $(0, 7)$. Substituting $-\frac{7}{5}$ for m and 7 for b in $y = mx + b$ yields $y = -\frac{7}{5}x + 7$. Multiplying both sides of this equation by 5 yields $5y = -7x + 35$. Adding $7x$ to both sides of this equation yields $7x + 5y = 35$.

Choice B is incorrect. This is an equation for the line that passes through the points $(7, 0)$ and $(0, 5)$, not $(5, 0)$ and $(0, 7)$. *Choice C* is incorrect. This is an equation for the line that passes through the points $(5, 0)$ and $(0, -7)$, not $(5, 0)$ and $(0, 7)$. *Choice D* is incorrect. This is an equation for the line that passes through the points $(7, 0)$ and $(0, -5)$, not $(5, 0)$ and $(0, 7)$.

QUESTION 25

Choice D is correct. It's given that the graph shows the total amount of snowfall y, in centimeters, x hours after the start of a 10-hour period. Because the graph is horizontal between $x = 4$ and $x = 6$, it follows that the total snowfall did not increase during that interval. Therefore, the rate of snowfall was 0 centimeters per hour between $x = 4$ and $x = 6$.

Choice A is incorrect. The value 6 represents the total snowfall, in centimeters, between $x = 4$ and $x = 6$, not the rate of snowfall, in centimeters per hour, during that interval. *Choice B* is incorrect. The steeper slope indicates that the rate of snowfall was the greatest between $x = 0$ and $x = 4$, not between $x = 6$ and $x = 10$. *Choice C* is incorrect. The total snowfall, not the rate of snowfall, increased between $x = 0$ and $x = 4$.

QUESTION 26

Choice D is correct. It's given that 1 inch on the square drawing represents an actual measurement of 13 feet. It's also given that a smaller version of the same drawing is printed as a square with the side length 85% shorter than the side length of the previous drawing. It follows that an actual 13-foot measurement represented by 1 inch on the previous drawing is represented by a length that is 85% shorter than 1 inch on the smaller drawing. Therefore, on the smaller drawing, each 13-foot actual measurement is represented by $1 - \frac{85}{100}$ inches, or 0.15 inches. Thus, on the smaller drawing, if an actual measurement of 13 feet is represented by 0.15 inches, then let x feet be the actual measurement represented by 1 inch. A proportion can be used to solve for x: $\frac{13}{0.15} = \frac{x}{1}$, or x is equal to approximately 86.67. It follows that a length of 1 inch on the smaller drawing represents an actual length of about 86.67 feet.

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 27

The correct answer is 56. The volume of a right rectangular prism can be found using the formula $V = \ell wh$, where V is the volume, in cubic units; ℓ is the length of the base of the prism, in units; w is the width of the prism, in units; and h is the height of the prism, in units. It's given that the height of the prism is 29 units and the volume is 5,568 cubic units. Substituting 5,568 for V and 29 for h in the formula $V = \ell wh$ yields $5{,}568 = \ell w(29)$. It's also given that the length of the base of the prism is 75% of the width of the base, which can be represented by $0.75w$. Substituting $0.75w$ for ℓ in the equation $5{,}568 = \ell w(29)$ yields

$5{,}568 = (0.75w)(w)(29)$, or $5{,}568 = 21.75w^2$. Dividing both sides of this equation by 21.75 yields $256 = w^2$. Taking the positive square root of both sides of this equation yields $16 = w$. Substituting 16 for w in the expression for the length yields $0.75(16)$, or 12. Therefore, the perimeter of the base of the prism is equal to $16 + 12 + 16 + 12$, or 56 units.

Math

Module 2
(27 questions)

QUESTION 1

Choice D is correct. It's given that $8x = 320$. Dividing both sides of this equation by 2 yields $4x = 160$. Therefore, the value of $4x$ is 160.

Choice A is incorrect. This is the value of $16x$, not $4x$. *Choice B* is incorrect. This is the value of $8x$, not $4x$. *Choice C* is incorrect and may result from conceptual or calculation errors.

QUESTION 2

Choice B is correct. It's given that a participant must complete at least 120 training hours to earn the certificate of completion. Let x represent the number of additional training hours a participant must complete to earn the certificate if the participant has completed 44 training hours. After completing x more training hours, the participant will have completed a total of $44 + x$ training hours. It's given that this total must be at least 120, so $44 + x \geq 120$. Subtracting 44 from both sides of this inequality yields $x \geq 76$. Therefore, the minimum number of additional training hours the participant must complete to earn the certificate of completion is 76.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect. This represents the total number of training hours required to earn the certificate, not the minimum number of additional training hours required. *Choice D* is incorrect. This represents the total number of training hours if the participant completes 120 more hours, not the minimum number of additional training hours required.

QUESTION 3

Choice B is correct. Since 10 decimeters is equivalent to 1 meter, 130 decimeters is equivalent to $130 \text{ decimeters}\left(\frac{1 \text{ meter}}{10 \text{ decimeters}}\right)$, or 13 meters.

Choice A is incorrect. This is the length, in meters, that is equivalent to 13, not 130, decimeters. *Choice C* is incorrect. This is the length, in meters, that is equivalent to 1,300, not 130, decimeters. *Choice D* is incorrect. This is the length, in meters, that is equivalent to 13,000, not 130, decimeters.

QUESTION 4

Choice D is correct. It's given that the lab technician combines 30 grams of compound A, 40 grams of compound B, and x grams of compound C and that the resulting mixture has a mass of 130 grams. The mass, in grams, of the mixture is equal to the sum of the masses, in grams, of the combined compounds, or $130 = 30 + 40 + x$. Combining like terms in the equation $130 = 30 + 40 + x$ yields $130 = 70 + x$. Subtracting 70 from both sides of this equation yields $60 = x$. Therefore, the value of x is 60.

Choice A is incorrect. This is the difference between the masses of compound B and compound A, not the mass of compound C. *Choice B* is incorrect. This is the mass of compound A, not the mass of compound C. *Choice C* is incorrect. This is the mass of compound B, not the mass of compound C.

QUESTION 5

Choice D is correct. The expression $0.24x$ represents the result of multiplying a positive integer x by 0.24. Since 0.24 is equivalent to $\frac{24}{100}$, it follows that 0.24 is equivalent to 24%. Therefore, multiplying a positive integer by 0.24 represents 24% of that integer. Thus, the expression $0.24x$ represents 24% of x.

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 6

The correct answer is 97. The perimeter of a square is the sum of the lengths of all four of its sides. Since all sides of a square have equal length, the perimeter of a square with side length s can be expressed as $s + s + s + s$, or $4s$. Since it's given that the perimeter of a square is 388 centimeters, it follows that $4s = 388$. Dividing both sides of this equation by 4 yields $s = 97$. Therefore, the side length, in centimeters, of this square is 97.

QUESTION 7

The correct answer is 2. It's given that the function g is defined by $g(x) = \sqrt{(3x - 9)(3x + 9) + 4}$. Substituting 3 for x in function g gives $g(3) = \sqrt{(3 \cdot 3 - 9)(3 \cdot 3 + 9) + 4}$. This can be rewritten as $g(3) = \sqrt{(9 - 9)(9 + 9) + 4}$, or $g(3) = \sqrt{(0)(18) + 4}$. It follows that $g(3) = \sqrt{0 + 4}$, or $g(3) = \sqrt{4}$, which is equivalent to $g(3) = 2$. Therefore, the value of $g(3)$ is 2.

QUESTION 8

Choice C is correct. It's given that the equation $x + y = 50$ represents the possible combinations of the number of members who use field A, x, and the number of members who use field B, y, for a 50-member sports team at a practice. It's also given that at this practice, 24 members use field A. Substituting 24 for x in the equation $x + y = 50$ yields $24 + y = 50$. Subtracting 24 from both sides of this equation yields $y = 26$. Therefore, at this practice, 26 members use field B.

Choice A is incorrect. This is the number of members who use field A at this practice. *Choice B* is incorrect and may result from conceptual or calculation errors. *Choice D* is incorrect. This is the total number of members on the sports team.

QUESTION 9

Choice C is correct. For the graph shown, the vertical axis represents the number of bacteria in a population, and the horizontal axis represents time, in hours, after an initial observation. Based on the graph, 2 hours after the initial observation, the estimated number of bacteria in the population is between 100 and 110. Of the given choices, only 104 is between 100 and 110. Therefore, the estimated number of bacteria in the population 2 hours after the initial observation is 104.

Choice A is incorrect. This represents the estimated number of bacteria in the population at the time of the initial observation. *Choice B* is incorrect. This represents the estimated number of bacteria in the population approximately 1 hour after the initial observation. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 10

Choice D is correct. The area, A, of a rectangle is given by the formula $A = \ell w$, where ℓ is the length of the rectangle and w is the width of the rectangle. The figure shows the rectangle has a length of 20 centimeters and a width of 5 centimeters. Substituting 20 for ℓ and 5 for w in the formula $A = \ell w$ yields $A = (20)(5)$, or $A = 100$. Therefore, the area, in square centimeters, of the rectangle is 100.

Choice A is incorrect. This is the width, in centimeters, not the area, in square centimeters, of the rectangle. *Choice B* is incorrect. This is the difference between the length and the width, in centimeters, not the area, in square centimeters, of the rectangle. *Choice C* is incorrect. This is the sum of the length and the width, in centimeters, not the area, in square centimeters, of the rectangle.

QUESTION 11

Choice C is correct. It's given that hexagon G and hexagon H are similar and that the length of each side of hexagon G is 2.8 times the length of its corresponding side in hexagon H. If the length of one side of hexagon H is h, it follows that its corresponding side in hexagon G is 2.8 times h, or $2.8h$.

Choice A is incorrect. This expression represents the length of the corresponding side in hexagon G when the length of each side of hexagon H is 2.8 times the length of its corresponding side in hexagon G rather than when the length of each side of hexagon G is 2.8 times the length of its corresponding side in hexagon H. *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 12

Choice B is correct. In the given equation, $d = 29w + 100$, d represents the total amount of money, in dollars, that Lorie has in a piggy bank w weeks after she starts to save. Therefore, the total amount of money, in dollars, that Lorie has in the piggy bank 10 weeks after she starts to save can be found by substituting 10 for w in the equation, which yields $d = 29(10) + 100$, which is equivalent to $d = 290 + 100$, or $d = 390$. Thus, the total amount of money Lorie has in the piggy bank 10 weeks after she starts to save is 390 dollars.

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 13

The correct answer is -9. It's given that the graph of $9x + y = 14$ in the xy-plane is a line. A linear equation can be written in the form $y = mx + b$, where m represents the slope of the line and $(0, b)$ is the y-intercept in the xy-plane. Subtracting $9x$ from both sides of the equation $9x + y = 14$ yields $y = -9x + 14$. Since the value of m in this equation is -9, it follows that the slope of the line is -9.

QUESTION 14

The correct answer is 10.75. It's given that the sand and landscaping pebbles the contractor ordered for a project cost a total of $154. It's also given that the equation $18.5x + 29.25y = 154$ represents the relationship between the number of cubic yards of sand, x, and the number of tons of landscaping pebbles, y, the contractor ordered. Since x represents the number of cubic yards of sand ordered, $18.5x$ represents the total cost, in dollars, of the sand, and the cost per cubic yard of sand is $18.50. Similarly, since y represents the number of tons of landscaping pebbles ordered, $29.25y$ represents the total cost, in dollars, of the landscaping pebbles, and the cost per ton of landscaping pebbles is $29.25. Therefore, a ton of landscaping pebbles cost the contractor $29.25 - 18.50$, or 10.75, more dollars than a cubic yard of sand. Note that 10.75 and 43/4 are examples of ways to enter a correct answer.

QUESTION 15

Choice B is correct. It's given that Laura bought t tarts for $4 each and m muffins for $2 each and spent $58. Therefore, the amount Laura spent on the tarts is $4t$, and the amount Laura spent on the muffins is $2m$. Since Laura spent $58, it follows that this relationship can be represented by the equation $4t + 2m = 58$. It's also given that Laura bought a total of 21 baked goods consisting of t tarts and m muffins. This relationship can be represented by the equation $t + m = 21$. Therefore, the system consisting of the equations $t + m = 21$ and $4t + 2m = 58$ represents this situation.

Choice A is incorrect. The second equation in this system represents a situation where each tart costs $2, not $4, and each muffin costs $4, not $2. *Choice C* is incorrect and may result from conceptual errors. *Choice D* is incorrect and may result from conceptual errors.

QUESTION 16

Choice C is correct. It's given that the length of a crystal formation was estimated to be 270 centimeters at the beginning of a study and that the length of this crystal formation was estimated to increase at a rate of 9 centimeters per year. Therefore, the estimated length, in centimeters, of this crystal formation 10 years after the study began is $270 + 10(9)$, or 360.

Choice A is incorrect. This is the increase in length, not the total length, in centimeters, of the crystal formation 10 years after the study began. *Choice B* is incorrect. This is the length, in centimeters, of the crystal formation after 1 year, not after 10 years. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 17

Choice B is correct. It's given that each side of the pentagon has a length of n feet. The perimeter of a polygon is the sum of all its side lengths, so the perimeter can be written as $n + n + n + n + n$, or $5n$. It's also given that the perimeter of the pentagon is 80 feet. Therefore, the equation $80 = 5n$ gives the perimeter in terms of n.

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

QUESTION 18

Choice A is correct. The Pythagorean theorem states that in a right triangle with legs of length a and b and a hypotenuse with length c, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs; that is, $c^2 = a^2 + b^2$. It's given that the length of the hypotenuse of a right triangle is c and the lengths of its legs are 6 and 9. Substituting these values into the equation $c^2 = a^2 + b^2$ yields $c^2 = 6^2 + 9^2$. Therefore, the expression that represents the value of c^2 is $6^2 + 9^2$.

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 19

Choice C is correct. An equation defining the linear function g can be written in the form $g(x) = mx + b$, where m is the slope and $(0, b)$ is the y-intercept of the graph of $y = g(x)$ in the xy-plane. It's given that the graph of $y = g(x)$ has a slope of 37. Therefore, $m = 37$. It's also given that the graph of $y = g(x)$ passes through the point $(0, 6)$. Therefore, $b = 6$. Substituting 37 for m and 6 for b in the equation $g(x) = mx + b$ yields $g(x) = 37x + 6$. Thus, the equation that defines g is $g(x) = 37x + 6$.

Choice A is incorrect. For this function, the graph of $y = g(x)$ in the xy-plane has a slope of $\frac{37}{6}$, not 37, and passes through the point $(0, 0)$, not $(0, 6)$. *Choice B* is incorrect. For this function, the graph of $y = g(x)$ in the xy-plane has a slope of 6, not 37, and passes through the point $\left(0, \frac{37}{6}\right)$, not $(0, 6)$. *Choice D* is incorrect. For this function, the graph of $y = g(x)$ in the xy-plane passes through the point $(0, 37)$, not $(0, 6)$.

QUESTION 20

The correct answer is 1,008. Adding the first equation to the second equation in the given system yields $\left(\frac{x}{2} + \frac{x}{7}\right) + (9(y - 11) - 9(y - 11)) = 25 + 47$, which gives $\left(\frac{x}{2} + \frac{x}{7}\right) + 0 = 72$, or $\frac{x}{2} + \frac{x}{7} = 72$. Multiplying both sides of this equation by 14 yields $14\left(\frac{x}{2} + \frac{x}{7}\right) = 14(72)$, which gives $7x + 2x = 1{,}008$, or $9x = 1{,}008$. Therefore, the value of $9x$ is 1,008.

QUESTION 21

The correct answer is either 25, 26, 27, 28, 29, 30, 31, 32, 33, or 34. It's given that the frequency table summarizes the daily low temperature for each of 31 days, where the daily low temperature was recorded to the nearest integer. If a data set contains an odd number of values, the median is the middle value in the list when the data values are listed in ascending order. There are 31 data values in the data set, so the median of the recorded daily low temperatures is the 16th value when the values are listed in numerical order. Since the temperatures in the table are given as ranges rather than specific values, it's not possible to know the exact value of the median, only a range of possible values. The table shows the ranges of recorded daily low temperatures in ascending order. It follows that a list of the data values, in ascending order, would be such that the 1st value is between -5 and 4, the next 4 values are between 5 and 14, the next 4 values are between 15 and 24, the next 7 values are between 25 and 34, and so on. Thus, the 16th value of the ordered list is an integer between 25 and 34. Therefore, the median of the recorded daily low temperatures, in degrees Fahrenheit, could be any integer between 25 and 34. Note that 25, 26, 27, 28, 29, 30, 31, 32, 33, or 34 may be entered as the correct answer.

QUESTION 22

Choice A is correct. If the equations $-10x + y = 19$ and $10x + y = 19$ are graphed in the *xy*-plane, the point (x, y) at which the graphs intersect can be found by solving the system of the two given equations. Adding the two given equations yields $(-10x + y) + (10x + y) = 19 + 19$, or $2y = 38$. Dividing both sides of this equation by 2 yields $y = 19$. Substituting 19 for y in the equation $10x + y = 19$ yields $10x + 19 = 19$. Subtracting 19 from both sides of this equation yields $10x = 0$. Dividing both sides of this equation by 10 yields $x = 0$. Therefore, the graphs intersect at the point $(0, 19)$.

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 23

Choice A is correct. Subtracting $12r$ from both sides of the given equation yields $13s = t - 12r$. Dividing both sides of this equation by 13 yields $s = \frac{t - 12r}{13}$.

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 B is correct. To complete the square, adding $\left(\frac{2}{2}\right)^2$, or 1, to each side of this equation yields $x^2 - 2x + 1 = 38 + 1$, or $(x - 1)^2 = 39$. Taking the square root of both sides of this equation yields $x - 1 = \pm\sqrt{39}$. Adding 1 to both sides of this equation yields $x = 1 \pm \sqrt{39}$. Therefore, the solutions to the given equation are $x = 1 + \sqrt{39}$ and $x = 1 - \sqrt{39}$. Of these two solutions, only $1 + \sqrt{39}$ is given as a choice.

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 25

Choice D is correct. It's given that a sphere has a density of 76 ounces per cubic inch. Since the density is given in ounces per cubic inch, the mass, in ounces, can be found by multiplying the density by the volume, in cubic inches. It's also given that the sphere has a radius of 3 inches. The volume of a sphere is given by the formula $V = \frac{4}{3}\pi r^3$, where r represents the radius. Substituting 3 for r in this formula yields $V = \frac{4}{3}\pi(3)^3$, or $V = 36\pi$. Therefore, the volume of this sphere is 36π cubic inches. It follows that the mass of the sphere is equivalent to $\left(\frac{76 \text{ ounces}}{\text{cubic inch}}\right)(36\pi \text{ cubic inches})$, or $2{,}736\pi$ ounces.

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 26

Choice B is correct. It's given that the scatterplot shows the data points in data set W and that the line of best fit for data set W can be represented by the equation $y = a + cx$, where a and c are constants. An equation in the form $y = b + mx$ represents a line with a slope of m and a y-intercept of $(0, b)$. Therefore, in the equation $y = a + cx$, c represents the slope of the line of best fit for data set W and a represents the y-coordinate of the y-intercept. A line of best fit represents the general trend of the data points in a data set, so that the distance between the line and the data points is minimized. The 7 data points in data set W have an upward trend, and the line of best fit for data set W has a positive slope and a positive y-coordinate of the y-intercept. It follows that a and c are positive constants. It's given that data set V consists of every point from data set W as well as the point $(14, 8)$ and that the line of best fit for data set V can be represented by the equation $y = j + kx$, where j and k are constants. In this equation, k represents the slope of the line of best fit for data set V and j represents the y-coordinate of the y-intercept. Data set V also generally has an upward trend. However, the rightmost data point in data set V, $(14, 8)$, has a y-value that is much lower than the y-values of other data points near it. Because $(14, 8)$ is the rightmost data point and lies well below the upward trend, minimizing the distance between $(14, 8)$ and the line of best fit for data set V requires the line of best fit for data set V to pass through a point at $x = 14$ that has a corresponding y-value between $y = 8$ and the y-value predicted by the line of best fit for data set W at $x = 14$. In other words, the right end of the line of best fit for data set V must be lower in the xy-plane than the right end of the line of best fit for data set W. In order to also minimize the distance between the line of best fit for data set V and the other 7 points in data set V, the left end of the line of best fit for data set V must be higher in the xy-plane than the left end of the line of best fit for data set W. It follows that the y-coordinate of the y-intercept of the line of best fit for data set V must be greater than the y-coordinate of the y-intercept of the line for data set W. In terms of a and j, it must be true that $j > a$, or $a < j$. Therefore, statement I is false. Because, in the xy-plane, the line of best fit for data set V is higher on the left and lower on the right than the line of best fit for data set W, the line of best fit for data set V must have a slope that is less than the slope of the line of best fit for data set W. Therefore, in terms of c and k, it must be true that $k < c$, or $c > k$. It follows that only statement II must be true.

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

QUESTION 27

The correct answer is $\frac{9}{7}$. The left-hand side of the given equation is the expression $\frac{7}{9}x^2-\left(\frac{7}{9}r+s\right)x+rs$. Applying the distributive property to this expression yields $\frac{7}{9}x^2-\frac{7}{9}rx-sx+rs$. Since the first two terms of this expression have a common factor of $\frac{7}{9}x$ and the last two terms of this expression have a common factor of s, the expression $\frac{7}{9}x^2-\frac{7}{9}rx-sx+rs$ can be rewritten as $\frac{7}{9}x(x-r)-s(x-r)$. Since the two terms in this expression have a common factor of $(x-r)$, the expression $\frac{7}{9}x(x-r)-s(x-r)$ can be rewritten as $(x-r)\left(\frac{7}{9}x-s\right)$. Therefore, the given equation can be rewritten as $(x-r)\left(\frac{7}{9}x-s\right)=0$. By the zero product property, it follows that $x-r=0$ or $\frac{7}{9}x-s=0$. Adding r to both sides of the equation $x-r=0$ yields $x=r$. Adding s to both sides of the equation $\frac{7}{9}x-s=0$ yields $\frac{7}{9}x=s$. Dividing both sides of this equation by $\frac{7}{9}$ yields $x=\frac{9s}{7}$. Therefore, the solutions to the given equation are r and $\frac{9s}{7}$. It follows that the product of the solutions to the given equation is $r\left(\frac{9s}{7}\right)$, or $\frac{9}{7}rs$. It's given that the product of the solutions to the given equation is rst; therefore, $\frac{9}{7}rs=rst$. Since it's also given that r and s are positive constants, dividing both sides of the equation $\frac{9}{7}rs=rst$ by rs yields $\frac{9}{7}=t$. Thus, the value of t is $\frac{9}{7}$. Note that 9/7, 1.285, and 1.286 are examples of ways to enter a correct answer.