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Cambridge Navigator Plus:

The Complete Explanation Guide to the Retired Test

5 Ways to Increase Score Gains Using Cambridge's *Navigator Plus*

Navigator Plus is Cambridge's complete explanation guide to a previously administered test. It includes explanations for each item on the test, categorization for each item, an answer key, and more.

The following list provides suggestions for implementing the Navigator into your program to increase score gains.

1. **Simulate test day as much as possible when proctoring tests.** Students will benefit from a testing experience that closely simulates what they will experience on test day. They will feel more confident if they know what to expect.

2. **Follow up when you receive your data.** Use the reports you receive from Cambridge to cover the items your class struggled as a group to answer (see the Error Analysis report). Taking this step within two weeks of administering the test will ensure that your students haven't forgotten the items you cover and will be able to learn from their testing experiences.

3. **Use the Pre-Assessment Item references in the *Victory* lesson to illustrate key points.** Your teacher's guide includes references to items on your pre-assessment that you can use as additional examples. Keep a copy of your pre-assessment test booklet handy so that you can cover these items with your students. Using pre-assessment items as additional examples helps students connect the concepts you are teaching with their test-day experiences.

   If you are teaching another Cambridge program that does not include explicit pre-assessment item references, such as the *Non-Negotiable Skills* program, keep the pre-assessment items in mind as you teach. You can refer back to the pre-assessment items periodically throughout your course and incorporate the skills and strategies you have been teaching using the pre-assessment items as examples.

4. **Don't forget to review the wrong answers.** Many explanations in this Navigator packet include references to each wrong answer choice. Students will benefit from reviewing why each wrong answer is wrong so that they can recognize what makes the right answer correct and use the process of elimination to eliminate similar wrong answers in the future.

5. **Pay attention to item categories and connect them to the *Victory* text.** Each item in this Navigator packet includes a category path that corresponds to the course concept outline in the *Victory* text as well as the categories listed in the Item Index of your *Victory* text. Use the Item Index to identify items students can use for further practice. You can also use the online index on the Teacher Resource Center (the URL is found in the introduction of your *Victory* teacher's guide) to look up items in the *Victory* text in a specific category.

TEST 1: ENGLISH

1. **(C)** *English/Usage and Mechanics/Sentence Structure/Fragments.* The underlined portion is wrong because the participle "being" cannot function as the main verb of a sentence. An important principle of writing is that every sentence must have a main, or conjugated, verb. A conjugated verb exhibits tense (e.g., "was," "will speak," "ran," "had hoped," "could collapse"), while a non-conjugated verb (e.g., "being," "speaking," "to run," "to hope," "collapsing") does not exhibit tense and therefore cannot function as a main verb. As written, the resulting construction is a sentence fragment because the participle "being" is a non-conjugated verb. So, (C) is the correct answer choice because it provides a main verb ("was"). As for (B), "having" is also a participle and cannot function as a main verb. As for (D), the resulting construction lacks any verb whatsoever.

2. **(F)** *English/Usage and Mechanics/No Change.* The underlined portion is correct. The comma is required to separate the introductory phrase ("Like many middle children") from the independent clause that makes up the remainder of the sentence ("he claimed…"). Each of the remaining answer choices introduces an error in punctuation. (G) fails to provide the necessary comma that is found in the original, and it disrupts the logical flow of the sentence by inserting an unnecessary comma between "many" and "middle." As a result, the introductory phrase of the related sentence ("Like many") distorts the writer's intended meaning. (H) and (J) also introduce unnecessary commas that disrupt the logical flow of the sentence by separating the main verb ("claimed") from the remainder of the sentence. (J) fails to provide the comma that is needed to signal the end of the introductory phrase ("Like many middle children").

    🅣🅟 Note that correct comma usage can usually be verified by reading the material aloud and pausing at each instance of punctuation (exaggerate the pause(s), if necessary). Use this strategy to test each of the answer choices:

    F. Like many middle children [pause] he claimed that…. ✓
    G. Like many [pause] middle children he claimed that…. ✗
    H. Like many middle children [pause] he claimed [pause] that…. ✗
    J. Like many middle children he claimed [pause] that…. ✗

3. **(D)** *English/Rhetorical Skills/Style/Conciseness* and *Usage and Mechanics/Sentence Structure/Faulty Parallelism.* The underlined portion is wrong because it creates a sentence that suffers from a lack of conciseness as well as faulty parallelism. Parallelism is required when a writer wants to express logically similar or related ideas in the same sentence. The principal requirement of parallelism is that the writer expresses these logically similar or related ideas in parallel language (e.g., two noun phrases, two participle phrases, etc.). This parallel language underscores and signals to the reader that the ideas being expressed are logically related. In this particular sentence, the conjunction "nor" should join two parallel elements since it is part of the "neither/nor" structure (*neither* this *nor* that). As written, however, the first element is a noun phrase ("the privileges…"), and the second element is a verb phrase ("was pampering…"). The ideas are related, but they are not expressed in parallel form. Notice also that the phrase "him as it was on" disrupts the parallelism by illogically implying that Roy did not enjoy those same privileges that he himself received. So, (D) is the correct answer choice because it eliminates both the verb "was" and the phrase "him as it was on"; as a result, ideas are expressed in parallel form. As for (B) and (C), they fail to eliminate the verb "was," thereby creating sentences that join two unparallel elements.

4. **(G)** *English/Usage and Mechanics/Sentence Structure/Misplaced Modifiers.* The underlined portion is wrong because the placement of the adverb "seriously" makes the sentence ambiguous. In general, a modifier should be placed as close as possible to what it modifies to avoid ambiguity. As written, the adverb "seriously" seems to modify the verb "ignored"; however, the writer intends for "seriously" to modify the verb "took." So, (G) is the correct answer choice because it places the adverb ("seriously") closer to the verb that it is intended to modify ("took"). As for (F) and (J), they too create sentences that contain misplaced modifiers. In each case, the adverb "seriously" is not placed close enough to the verb "took."

5. **(D)** *English/Rhetorical Skills/Strategy/Effective Transitional Sentence.* The underlined portion is wrong because it creates a very abrupt and ineffective transition between the first and second paragraphs. The first paragraph describes Roy's status in the family in general terms, while the second paragraph relates a specific anecdote that illustrates Roy's status in vivid detail. The underlined portion, however, fails to signal this relationship between the two paragraphs. (D) is the correct answer choice because it expresses most clearly the connection: the second paragraph will provide a specific anecdote that illustrates the general idea expressed in the first paragraph. As for (B), it attempts to signal an effective transition between the two paragraphs; however, it does not accurately introduce the events that are described in the second paragraph: Roy did not take matters into his own hands; instead, he was the victim of circumstances. As for (C), the phrase "took a turn for the worse" does not provide an effective transition between the two paragraphs because it does not indicate that the general idea expressed in the first paragraph will be illustrated by a specific example or anecdote in the second paragraph.

6. **(G)** *English/Usage and Mechanics/Punctuation/Commas.* The underlined portion is wrong because the semicolon disrupts a series of elements. The writer intends to list a series of three elements that are joined together by the conjunction "and." In such a case, commas should be used to set off the elements in the series. Semicolons should only be used to set off a series of elements in which one or more of those elements contain a comma. So, (G) is the correct answer choice because it replaces the semicolon with a comma. As for (H), it replaces the semicolon with a comma, but it unnecessarily eliminates the comma that follows "over," which is also required to maintain the series. As for (J), it both fails to replace the semicolon and unnecessarily eliminates the comma.

7. **(A)** *English/Usage and Mechanics/No Change.* The underlined portion is correct. The demonstrative pronoun "that" acts as the subject of the second clause while referring to the idea in the first clause. As for (B), this option leaves the second clause without a subject: the pronoun "that" functions as the object of the preposition "with" and so ceases to function as the subject of the second clause. As for (C), "so" seems to signal a cause-and-effect relationship that is not intended by the writer. Finally, as for (D), the phrase "by which" also seems to signal an inappropriate cause-and-effect relationship.

8. **(H)** *English/Usage and Mechanics/Punctuation/Dashes.* The underlined portion is wrong because the dash is misplaced, thereby disrupting the logical flow of the sentence. A dash is intended to signal an aside that provides further explanation or detail. In this case, the dash should be placed immediately after "everywhere" since that term provides a general description of all the places that follow the preposition "at" ("hen house," "outhouse," "under the porch"). So, (H) is the correct answer choice because it places the dash immediately after "everywhere." (G) is wrong because it seems to transform "everywhere" into a non-restrictive element by setting the term off with commas, thereby implying that it is not essential to the meaning of the sentence. On the contrary, the term "everywhere" is essential in describing the series of places (as stated above). Test this fact by reading the resulting sentence aloud, pausing at each instance of punctuation. As for (J), it simply replaces the dash with a comma and fails to set off the explanatory group of words.

   TIP The placement of dashes depends upon the logical structure of the sentence. In the following example, notice that the dashes are used to set off the aside, or explanatory remark: "Several of the sites identified by local environmental groups—the old barge canal, the closed landfill, and the watch factory—may qualify for federal funds for clean-up efforts." Without the dashes, the meaning of the sentence would not be clear.

9. **(C)** *English/Rhetorical Skills/Style/Idiomatic Expression.* The underlined portion is wrong because the conjunction "because" inverts the cause-and-effect relationship that is intended by the writer. The writer intends to say that Luther's behavior was in response to his grandfather's behavior, not vice versa. The conjunction "so" correctly indicates this cause-and-effect relationship. Therefore, (C) is the correct answer choice. As for (B) and (D), neither of these conjunctions indicates the necessary relationship between Luther's actions and his grandfather's actions.

10. **(F)** *English/Rhetorical Skills/Strategy/Appropriate Supporting Material.* The original material is preferable to the suggested revision because it provides descriptive details that enrich the story. So, (F) is the correct answer choice. The original makes it clear that the "oldest boy" went back to look for Roy. This point is useful because it helps the reader understand that the trip back to the church needed to be made by someone of some maturity.

Additionally, the length of the trek makes it clear that the trip was a long one—especially by foot. The details, while not necessary, do not confuse or repeat other aspects of the story and serve to enhance the narrative.

11. **(B)** *English/Usage and Mechanics/Punctuation/Commas.* The underlined portion is wrong because it is missing a second comma to set off the non-restrictive element ("being too big to carry"). (B) is the correct answer choice because it provides the necessary second comma, which is placed immediately after the verb "carry." As for (C), the placement of the second comma disrupts the logical structure of the sentence and does not properly set off the non-restrictive element. As for (D), it fails to provide the first comma that is necessary to properly set off the non-restrictive element.

12. **(J)** *English/Rhetorical Skills/Style/Clarity of Meaning.* The underlined portion is wrong because the scope of the material that follows the comma is ambiguous. Is the *pew* carved out of wood or is *Roy* carved out of wood? Although it is illogical to assume that Roy is carved out of wood, the writer does not make this point clear. By inserting the phrase "which was" after the comma ("…the back pew, which was…."), the intended meaning could be made unambiguous; however, none of the answer choices provide this phrase. So, (J) is the correct answer choice because it simply eliminates the ambiguous material. As for (G) and (H), they also fail to make clear whether Roy or the pew is carved out of wood.

13. **(B)** *English/Rhetorical Skills/Organization/Sentence-Level Structure.* The most logical sequence of sentences in Paragraph 3 should reflect the correct sequence of events:

Luther went to look for Roy. (Sentence 1)
Luther found Roy. (Sentence 3)
Luther and Roy went home. (Sentence 2)

So, (B) is the correct answer choice.

TIP The sentences in any paragraph should be arranged in some logical order. Usually, the nature of the subject matter and/or word clues will suggest an appropriate sequence:

The ore containing the gold is dug with a huge shovel. It is *then* piled into giant heaps and soaked with a cyanide solution. The *resulting* liquid containing gold compounds is drained off, and the gold is recovered by electrolysis.

First, the artist prepared the canvas. *Then*, she mixed the pigments. *Finally*, she began painting the portrait.

In both of the above examples, notice the italicized word clues and process-oriented nature of the subjects. In some cases, however, the order will depend upon the writer's objective:

The Constitution provides for three branches of government. The executive branch is headed by the President. The legislature consists of the Senate and the House of Representatives. The judiciary is made up of the Supreme Court and the inferior courts.

In this last example, the writer might choose to follow the order in which the branches are introduced in the Constitution itself. Or, if the topic of the essay is the court system, the writer might choose to first mention the judiciary branch.

14. **(J)** *English/Usage and Mechanics/Grammar and Usage/Verb Tense.* The underlined portion is wrong because it suffers from a shift in verb tense. The narrative is presented in the past tense, so the present tense ("is") is inconsistent with the rest of the passage. (J) is the correct answer choice because the past tense ("was") is consistent with rest of the passage. As for (G), the imperfect tense ("has been preparing") indicates that the action mentioned has not yet been "perfected," or completed; however, as the narrative is confined entirely to the past,

the action *has* been completed. As for (H), the future tense ("will be prepared") is inconsistent since the narrative is confined to the past.

15. **(C)** *English/Rhetorical Skills/Strategy/Main Idea.* The assignment asks for an essay on a "specific problem faced by rural schools." However, this essay is a story about Roy, how he fell asleep in Sunday service, and how his family left him behind at the church. So, the essay does not fulfill the given assignment. Therefore, (A) and (B) can immediately be eliminated since they respond to the item stem in the affirmative. As for (D), while it is true that no solution to a problem is offered, the essay does not actually describe a problem that is related to rural schools. Although the fact that the events occurred in a rural area and school is mentioned briefly in Paragraph 1, the essay is anecdotal and instead serves as a narrative that describes the experiences of a middle child (Roy) in a large family. So, (C) is the correct answer choice.

16. **(J)** *English/Usage and Mechanics/Grammar and Usage/Diction.* The underlined portion is wrong because the conjunction "when" does not express the appropriate relationship between the two events described (broadening readership and publishing English translations). The writer intends to say that the broadening of readership was accomplished through the action of publishing English translations. The preposition "by" more clearly communicates this meaning. So, (J) is the correct answer choice. As for (G) and (H), they destroy the logical connection between the two events.

17. **(C)** *English/Rhetorical Skills/Strategy/Effective Transitional Sentence.* The underlined portion is wrong because "honestly" does not signal the appropriate transition between the first and second sentences of Paragraph 2. The first sentence refers to English translations of Indian writings (a *general* reference). The second sentence refers to a *specific* example of such a translation. (C) is the correct answer choice because the phrase "one such offering" provides the appropriate transition, indicating that an example will follow. As for (B) and (D), "nevertheless" and "consequently," respectively, do not provide the appropriate transition from a general reference to a specific example.

18. **(G)** *English/Usage and Mechanics/Grammar and Usage/Pronoun Usage.* The underlined portion is wrong because the pronoun "it," which refers to "Tiny's Granny," is superfluous. Although a sentence can have a compound subject (a subject consisting of two or more elements), it cannot have more than one logical subject, and the logical subject of this sentence is "Tiny's Granny." (G) is the correct answer choice because it simply eliminates the pronoun "it." (H) is wrong for two reasons. First, the parenthetical expression "for example" must be set off by two commas to indicate that it is not part of the main logic of the sentence. Second, the conjunction "and" indicates a compound subject that is not fulfilled in the second part of the sentence; note also that the singular verb "is" does not agree with a compound subject. Finally, as for (J), a second comma is required to set off the parenthetical expression "for example."

19. **(B)** *English/Usage and Mechanics/Grammar and Usage/Diction.* The underlined portion is wrong because the pronoun "which" is inappropriate in this context. In general, the pronoun "who" is used to refer to people, and the pronoun "which" is used to refer to everything else (e.g., dogs, cats, bricks, time, money, illness, etc.). (B) is the correct answer choice because the nominative (subjective) case pronoun "who" correctly refers to the subject "woman." As for (C), the objective case pronoun "whom" is only used to refer to direct objects, indirect objects, and objects of prepositions. As for (D), the phrase "and she" disrupts the logical flow of the sentence, creating a group of words that do not really make any sense.

20. **(G)** *English/Usage and Mechanics/Sentence Structure/Fragments.* The underlined portion is wrong because the participle "being" cannot function as the main, or conjugated, verb of a sentence. As a result, the construction is a sentence fragment. (G) is the correct answer choice because it provides a main verb ("is"). As for (H), "having" is also a participle form and cannot function as a main verb. As for (J), simply omitting the underlined portion does not provide the sentence with a main verb.

21. **(A)** *English/Rhetorical Skills/Strategy/Effective Transitional Sentence.* Paragraph 3 establishes that Tiny's Granny owns nothing, not even her own name. Paragraph 4 discusses the burqua worn by Muslim women in India and goes on to mention that Tiny's Granny is fond of her burqua. Therefore, Tiny's Granny does own one

possession—her burqua. The burqua is the exception to the generalization that Tiny's Granny owns nothing. So, (A) is the correct answer choice because it makes this point and thereby establishes a connection between the two paragraphs. The transition in (B) is not effective since Paragraph 4 does not discuss Granny's "hearty spirit." (C) is perhaps the second-best answer choice because it does attempt to create a connection between Paragraph 3 and the discussion of the burqua. However, the term "nevertheless" sets up an inappropriate contrast. Paragraph 4 states that the burqua is a source of comfort, not that it serves that function despite itself. Finally, (D) provides a statement that is inconsistent with the passage. Since the burqua is a traditional garment worn by most Muslim women, wearing it does not set Tiny's Granny apart from others.

22. **(H)** *English/Usage and Mechanics/Grammar and Usage/Adjectives versus Adverbs* and *Punctuation/Commas.* The underlined portion is wrong for two reasons. First, the adverb "traditionally" is used inappropriately in this context. The writer intends to say that the burqua is a traditional garment, not that the burqua is traditionally a garment; after all, a burqua is always a garment. Second, the comma disrupts the logical flow of the sentence. (H) is the correct answer choice because it solves both of these problems. It uses the adjective "traditional" to modify the noun "garment," and it eliminates the comma. As for (G), the adverb "traditionally" is used correctly to modify the verb "worn"; however, the comma creates a comma splice, joining two independent clauses together without a conjunction. (G) would be an acceptable answer choice if either it included the conjunction "and" following the comma or it replaced the comma with a semicolon. Finally, (J) is wrong because it seems to express the same unintended meaning as the original, and it creates an awkward sentence.

23. **(B)** *English/Usage and Mechanics/Sentence Structure/Fragments* and *Grammar and Usage/Verb Tense.* The underlined portion is wrong because "having viewed" is a participle phrase and therefore cannot function as the main verb of the sentence. Instead, a conjugated verb form is required. (B), (C), and (D) are all conjugated verb forms. However, (B) is the correct answer choice because the plural verb "view" agrees with the plural subject "women." As for (C) and (D), "views" and "has viewed," respectively, are singular verbs that do not agree with the plural subject.

24. **(H)** *English/Usage and Mechanics/Punctuation/Commas.* The underlined portion is wrong because the semicolon disrupts the logical flow of the sentence. The expression "however" must be set off by two commas to indicate that it signals a contrast to the previous sentence and that it is not part of the main logic of the related sentence. So, (H) is the correct answer choice. As for (G), since "Tiny's Granny" is not an independent clause, the semicolon is inappropriate in this context; the semicolon would instead be used to signal two independent clauses that are joined together. For example, "Tiny's Granny has no interest in material possessions; however, she is very fond of her burqua." Finally, as for (J), a second comma is required to set off the expression "however."

25. **(D)** *English/Usage and Mechanics/Sentence Structure/Faulty Parallelism.* The underlined portion is wrong because it creates a sentence that suffers from a lack of parallelism. The sentence contains a series with three elements. The first and third elements ("her blanket…" and "her towel…," respectively) are noun phrases, but the second element ("being her pillow…") is a verb phrase. (D) is the correct answer choice because it eliminates the verb "being," thereby transforming the second element into a noun phrase ("her towel…"). As for (B) and (C), they fail to provide the necessary parallelism because they function as verb phrases rather than noun phrases.

26. **(G)** *English/Usage and Mechanics/Sentence Structure/Faulty Parallelism.* The underlined portion is wrong because it creates a sentence that suffers from a lack of parallelism. The phrase "rather than" sets up a contrast between two elements in the sentence ("a survivor" and "if she were a victim"). As written, however, these two elements are not expressed in parallel language. The first element ("a survivor") is a noun phrase, while the second element ("if she were a victim") functions as a dependent clause. (G) is the correct answer choice because it transforms the second element into a noun phrase ("a victim") by replacing "if she were" with "not." In this case, "not" serves the same function as the phrase "rather than," signaling a contrast between the two elements. As for (H) and (J), they fail to provide the needed parallelism.

27. **(A)** *English/Rhetorical Skills/No Change.* The underlined portion is correct. As written, the writer's intention is rendered in a clear and direct manner. As for (B), the use of the weak passive voice ("her spirit can be embraced") is awkward. In general, the stronger active voice is the preferred method of construction. As for (C), the plural

pronoun "their" does not agree with the singular noun "Granny's burqua." Finally, as for (D), it too uses the weak passive voice ("has a spirit that can be embraced"). Additionally, (D) is needlessly confusing. The writer intends to say that women can embrace Granny's spirit, not that they can embrace the burqua's spirit.

28. **(H)** *English/Usage and Mechanics/Punctuation/Dashes.* The underlined portion is wrong because the comma is inappropriate in this context. An aside ("and the voices of other women in *Truth Tales*") must be set off by either commas or dashes. While this material is appropriate, it is important to signal to the reader that it is not essential to the grammatical structure of the sentence. To verify this fact, read the sentence aloud without including the aside ("And, thanks to Kali for Women, now more people can hear Granny's voice…speak about the truths common to us all."). Since the end of this aside ("*Truth Tales*") is followed by a dash, the underlined comma must be replaced with a dash. So, (H) is the correct answer choice. As for (G) and (J), they fail to provide the second dash that is necessary to set off the aside.

29. **(A)** *English/Rhetorical Skills/No Change.* The underlined portion is correct. As written, the writer's intention is rendered in a clear and direct manner. As for (B) and (C), they are needlessly wordy and awkward compared to the original. As for (D), "shared and common" is redundant. Either of these two words would satisfy the writer's intended meaning.

30. **(J)** *English/Rhetorical Skills/Strategy/Main Idea.* The assignment asks for an essay that shows how "specific life experiences have influenced an author's work." The essay discusses a publishing house called Kali for Women and places emphasis on a particular story contained in their anthology entitled *Truth Tales*; it does not, however, discuss the author of "Tiny's Granny." So, the essay does not fulfill the given assignment. Therefore, (F) and (G) can immediately be eliminated since they respond to the item stem in the affirmative. As for (H), while it is true that the essay only discusses one of the stories included in *Truth Tales* ("Tiny's Granny"), it does not include information about the author of the story. So, (J) is the correct answer choice.

31. **(B)** *English/Usage and Mechanics/Punctuation/Commas.* The underlined portion is wrong because the comma disrupts the logical flow of the sentence. As written, the comma separates the subject of the sentence ("Bubbles") from its verb ("seem"). The writer intends for "admittedly" to function as an aside; therefore, "admittedly" should be set off by two commas. So, (B) is the correct answer choice because it provides these two commas. (C) is wrong because it fails to solve the problem of the original. As for (D), the placement of the comma separates the verb ("seem") from its object ("a lightweight topic").

32. **(F)** *English/Usage and Mechanics/No Change.* The underlined portion is correct. As written, the sentence contains a well-constructed compound subject (a subject consisting of two or more elements) that agrees with the plural verb "tend." Since there are only two elements in this particular compound subject ("The…idea of bubbles" and "the word *bubble*"), there is no need for commas or semicolons to punctuate the series. As for the remaining answer choices, the insertion of a punctuation mark between the subject and the verb disrupts the logical flow of the sentence.

33. **(D)** *English/Rhetorical Skills/Strategy/Effective Transitional Sentence.* The underlined portion is wrong because "Usually" does not signal the appropriate transition between the second and third sentences of the first paragraph. In short, "Usually" is redundant of the word "generally," which appears only two words later in the sentence. The writer intends for the related sentence to express a point for emphasis, and the word "Indeed" does a far better job of communicating this emphasis. So, (D) is the correct answer choice. As for (B), "Typically" is also redundant of the word "generally." As for (C), the phrase "In fact" is a satisfactory transition; however, the phrase "more often than not" is also redundant of the word "generally."

34. **(H)** *English/Rhetorical Skills/Strategy/Appropriate Supporting Material.* The item stem asks whether the given true statement qualifies as appropriate supporting information at this point in the passage. The theme of the passage is that bubbles, which might seem to be unimportant, are actually manifestations of some important physical principles. The reference to blowing bubbles helps to illustrate this point. The additional information provided in the item stem, however, is not directly relevant to this discussion. The reader does not need information about trading cards or plastic rings. Therefore, (F) and (G) can immediately be eliminated since they

respond to the item stem in the affirmative. As for (J), the writer says to forgive others who dismiss bubbles as trivial, which suggests that he or she thinks of them as otherwise. So, (H) is the correct answer choice.

35. **(C)** *English/Rhetorical Skills/Strategy/Effective Transitional Sentence.* The underlined portion is wrong because the resulting sentence does not suggest a *contrast* to the preceding material and therefore does not provide an effective transition to the rest of the essay. In the first paragraph, the writer describes the common view of bubbles as unimportant and amusing. Therefore, the last sentence of the first paragraph should suggest a contrast to this common view. "Elusive" means "fleeting" or "difficult to capture," so it is not an appropriate word choice to signal the required contrast. The word "important," however, satisfies this contrast and therefore provides the necessary transition to the more serious discussion of bubbles that follows. So, (C) is the correct answer choice. As for (B) and (D), they fail to provide the necessary contrast and effective transition.

36. **(H)** *English/Rhetorical Skills/Strategy/Effective Opening Sentence.* The underlined portion is wrong because the writer intends for the second paragraph to introduce a more serious discussion of bubbles. In fact, the second paragraph provides a scientific description of bubbles. So, (H) is the correct answer choice because it best introduces the actual topic of the second paragraph. As for (G) and (J), they fail to introduce the writer's transition into a more serious discussion of bubbles.

37. **(B)** *English/Usage and Mechanics/Grammar and Usage/Pronoun Usage* and *Diction.* The underlined portion is wrong because the plural pronoun "themselves" does not agree with the singular subject "bubble." (B) is the correct answer choice because the singular pronoun "itself" correctly refers to the singular subject ("bubble"). As for (C), "theirselves" is not an English word. However, if it were a word, it would be considered a plural pronoun and therefore inappropriate in this context since the subject to which it refers is singular. Finally, as for (D), "oneself" is a singular pronoun, but it can only refer to a person, not to an animal or thing ("bubble").

38. **(F)** *English/Usage and Mechanics/No Change.* The underlined portion is correct. The possessive pronoun "its" is appropriate in this context because it refers to the singular noun "bubble." (The bubble possesses a spherical shape.) As for (G), "it's" is the contraction for "it is," and it creates an ungrammatical sentence. As for (H), "its'" is not an English word. Finally, as for (J), the pronoun "there" is used to introduce a clause or a sentence (e.g., There is a mouse in the basement.) However, "there" does not provide the writer's intended meaning, and the phrase "there to" is not idiomatic.

39. **(B)** *English/Usage and Mechanics/Grammar and Usage/Subject-Verb Agreement.* The underlined portion is wrong because the plural verb "lead" does not agree with the singular subject "speculation." (B) is the correct answer choice because the singular verb "leads" agrees with the singular subject. As for (C), it fails to solve the problem of the original. As for (D), the present perfect "have led" is a plural verb form and does not agree with the singular subject ("speculation").

40. **(H)** *English/Usage and Mechanics/Punctuation/Commas.* The underlined portion is wrong because the comma disrupts the logical flow of the sentence. One important use of a comma is to signal the end of an introductory dependent clause (e.g., If you do not do your homework, you will not score high on this test.). The comma that follows "bottle" later in the sentence serves this very function. The comma that follows "after," however, serves no logical function at all. (H) is the correct answer choice because it simply eliminates the comma. As for (G) and (J), either inserting a semicolon or moving the comma after "drinks," respectively, does not solve the problem of the original.

41. **(C)** *English/Usage and Mechanics/Sentence Structure/Faulty Parallelism* and *Unintended Meanings.* The underlined portion is wrong for two reasons. First, it suffers from a lack of parallelism. The underlined portion is part of a sentence that contains a series with three elements. The first and third elements are independent clauses that demonstrate the same logical structure ("Utility workers use…to…" and "carpenters use…to…," respectively). As for the second element, it fails to conform to this structure, providing instead an unparallel element that begins with a preposition ("to"). Second, the underlined portion suffers from misplaced words that serve to confuse the intended meaning. As written, the second element in the series incorrectly implies that the utility workers use a bubble sextant to navigate the airplane pilots. (C) is the correct answer choice because it

rearranges the words so that the second element both demonstrates the appropriate logical structure and provides the writer's intended meaning ("airplane pilots use…to…"). As for (B) and (D), they both use the weak passive voice ("is used") and fail to provide the necessary parallelism.

42. **(J)** *English/Rhetorical Skills/Style/Conciseness.* The underlined portion is wrong because the resulting sentence is redundant and awkward. The words "Perhaps" and "likely" are both terms that indicate probability and uncertainty. (J) is the correct answer choice because it solves the problem by simply omitting the redundant term ("likely"). As for (G) and (H), either "possibly" or "quite possibly," respectively, would create a redundant sentence.

43. **(D)** *English/Rhetorical Skills/Strategy/Appropriate Supporting Material.* The underlined portion is wrong because the fourth paragraph is devoted to discussing the role of carbon dioxide bubbles in leavening bread (the science of leavening). Therefore, the reference to the nature of a "baker's dozen" is not relevant in this paragraph. So, (D) is the correct answer choice because it simply eliminates the underlined material altogether. As for (B) and (C), they fail to solve the problem of the original.

44. **(G)** *English/Usage and Mechanics/Grammar and Usage/Subject-Verb Agreement.* The underlined portion is wrong because the singular verb "makes" does not agree with the plural subject "bubbles." (G) is the correct answer choice because the plural verb "make" agrees with the plural subject ("bubbles"). As for (H) and (J), they fail to solve the problem of the original, offering other singular verb forms.

45. **(A)** *English/Rhetorical Skills/No Change.* The underlined portion is correct. The writer intends for this sentence to represent the conclusion of the essay (summarizing the overall development), and the word "Thus" signals the appropriate transition. As for (B), "Whatever" is not a transitional word. As for (C), the word "However" does function as a transitional word; however, it signals a contrast rather than a summary of the overall development. Finally, as for (D), "Primarily" signals the introduction of an example (e.g., Primarily, bubbles are used by bakers in the making of bread.). However, the conclusion of an essay does not typically introduce a new example.

46. **(G)** *English/Rhetorical Skills/Strategy/Main Idea* and *Effective Opening Sentence.* The item stem asks for material that appropriately introduces the main topic of the essay, indicating how the narrator's interest in raising fish influenced her thinking. As a result, the last sentence of Paragraph 1 should summarize the overall development of the passage. After Paragraph 1, the narrator proceeds to talk about buying an aquarium set and then stocking it with fish. This interest in fish leads to investing in more equipment and other types of fish until the enterprise evolves into a fish-breeding venture and ultimately an interest in studying genetics. So, (G) is the correct answer choice because it indicates that the passage ultimately leads to the narrator's interest in genetics. As for (F), the narrator's business venture is a significant detail, but it does not represent that to which her hobby ultimately leads. As for (H) and (J), the narrator neither proceeds to discuss the problems with walking pets nor the idea that pets should be care-free.

47. **(A)** *English/Usage and Mechanics/No Change.* The underlined portion is correct. The comma is used to signal the end of a dependent clause that is introduced by "when." The material that follows the comma ("the tank looked like…") is the beginning of the independent clause. As for (B), the conjunction "and" seems to signal a new element with the same logical status as the dependent clause; however, the result is a sentence fragment. As for (C), inserting end-stop punctuation immediately after "treated" makes a fragment of the dependent clause introduced by "when." Finally, as for (D), the resulting sentence contains a pronoun error, repeating the subject "tank" with the pronoun "it."

> 🆃🅸🅿 Remember that correct comma usage can usually be verified by reading the material aloud and pausing at the instance of punctuation (exaggerating the pause, if necessary).

48. **(H)** *English/Usage and Mechanics/Grammar and Usage/Adjectives versus Adverbs.* The underlined portion is wrong because the adverb "bewilderingly" is used inappropriately in this context. Adverbs are used to modify verbs (and sometimes adjectives), whereas adjectives are used to modify nouns. In this case, therefore, the adjective "bewildering" should be used to modify the noun "variety." So, (H) is the correct answer choice. The

narrator intends to suggest that she was bewildered by the variety of fish that were available. As for (G), it fails to solve the problem of the original, and the plural verb "were" does not agree with the singular subject "variety of fish." As for (J), it solves the problem of the original, but it creates a sentence fragment since the main clause lacks a main verb.

49. **(D)** *English/Rhetorical Skills/Style/Conciseness* and *Usage and Mechanics/Sentence Structure/Misplaced Modifiers.* The underlined portion is wrong for two reasons. First, the material that precedes the comma is redundant and fails to provide a logical transition to the rest of the sentence. The fact that the narrator did not have any fish at this point in time is not a causal explanation for her realization that each species is the result of genetic selection. Also, note that the fact that she did not have any fish was already expressed in the last sentence of Paragraph 2. Second, the material that precedes the comma functions as a dangling modifier. Since an introductory modifier is intended to modify the first important noun or pronoun that follows it, the phrase "not having any fish yet" seems to modify the pronoun "it." However, in this context, the pronoun "it" is used in the idiom "it occurred to me" (e.g., *It* is raining) and therefore does not have a referent. (D) is the correct answer choice because it simply eliminates the introductory phrase. As for (B) and (C), these changes not only result in choppy sentences, but they also fail to eliminate the redundant material.

50. **(J)** *English/Rhetorical Skills/Style/Idiomatic Expression.* The underlined portion is wrong because "consequenting" is simply not an English word. The narrator intends to use the word "consequence"; however, if she had used this word, it would have been redundant of "result." In either case, the resulting construction is needlessly repetitious. (J) is the correct answer choice because it simply eliminates "consequenting." As for (G), it fails to solve the problem of the original. As for (H), "effect" is also redundant of "result."

51. **(A)** *English/Rhetorical Skills/No Change.* The underlined portion is correct. The item stem asks for the answer choice that provides the most descriptive details about the guppies. As written, the sentence indicates that the narrator had two fancy guppies with red tails. The fact that the fish were "red-tailed" and "fancy" is important because these physical characteristics made it possible for the narrator to sell the guppies to the store. As for the other three answer choices, they do not provide as much detail as the original.

52. **(J)** *English/Usage and Mechanics/Punctuation/Commas.* The underlined portion is wrong because the expression "though" must be set off by two commas to indicate that it signals a contrast to the previous sentence and that it is not part of the main logic of the related sentence. So, (J) is the correct answer choice. As for (G), the comma between "take" and "long" serves no logical function. As for (H), it is missing the first comma (between "long" and "though") to set off the parenthetical expression; without both commas to set off the expression, the intended meaning of the sentence is obscured.

53. **(B)** *English/Usage and Mechanics/Grammar and Usage/Verb Tense* and *Diction.* The underlined portion is wrong because "to gave" is not a correct verb form. The past tense verb form of "give" is "gave"; however, the past tense is not appropriate in this context. The infinitive verb form ("to give") is required here because it functions as a noun, specifically, the object of the preposition "for." So, (B) is the correct answer choice. (C) is wrong because "to given" is neither the correct infinitive ("to give") nor past participle ("given") verb form. As for (D), the past participle "given" results in the following construction: "it didn't take long…for the…female given birth to her young." However, as stated above, the infinitive verb form is required in this context to function as the object of the preposition "for." While the past participle construction could conceivably appear in a properly formed English sentence (e.g., "The extra food was set aside for the female fish that was given young for which to care."), the resulting meaning is not what is intended by the narrator in this context.

54. **(G)** *English/Rhetorical Skills/Style/Conciseness.* The underlined portion is wrong because it is unnecessarily wordy. The parenthetical remark "you could hardly see them" is redundant of the phrase "almost invisible." So, (G) is the correct answer choice because it simply eliminates the parenthetical remark altogether. As for (H) and (J), they fail to solve the problem of the original. In fact, these options emphasize the redundancy by integrating the parenthetical remark into the main logical structure of the sentence.

55. **(A)** *English/Usage and Mechanics/No Change.* The underlined portion is correct. The expression "however" is set off by two commas to indicate that it signals a contrast to the previous sentence and that it is not part of the main logic of the related sentence. The second comma serves the additional function of separating the two independent clauses in the sentence that are joined by the conjunction "and." As for (B) and (C), the phrases "soon however" and "however and soon," respectively, are not appropriate parenthetical expressions and the resulting constructions are comma splices. As for (D), without the commas and the conjunction "and," the result is an ungrammatical construction.

56. **(F)** *English/Rhetorical Skills/Strategy/Appropriate Supporting Material.* The item stem asks how a particular revision would affect the related sentence. In Paragraph 4, the narrator includes details of her perceptual experience with the fish, and noting that she found the variations in color to be "fascinating" is an important aspect of this perceptual experience. So, (F) is the correct answer choice. As for (G), the narrator's writing skills are not the source of interest described in Paragraph 4. (Do not be distracted by the word "fascination.") As for (H), the narrator does not discuss "biological selection" at this point in the passage. Also, whether she finds the variations in color fascinating would not seem to add to or detract from a discussion on biological selection. (Do not be distracted by the word "variations.") Finally, as for (J), the revision would affect the narrator's perceptual experience of the fish, not the *actual* details of the fish.

57. **(D)** *English/Rhetorical Skills/Style/Clarity of Meaning* and *Usage and Mechanics/Sentence Structure/ Misplaced Modifiers.* The underlined portion is wrong because the placement of the adverb "also" makes the sentence ambiguous. As written, the adverb "also" seems to modify the verb phrase "begin to make"; however, the writer intends for "also" to modify the verb "read up." So, (D) is the correct answer choice because it places the adverb ("also") closer to the verb that it modifies ("read up"). As for (B) and (C), the adverb "also" does seem to modify the verb "read up"; however, (B) and (C) result in sentences that do not accommodate the words following the underlined portion. Additionally, (B) inverts the logical connection between the two ideas in the sentence. The narrator intends to say that "reading up" was the means to "making sense," not vice versa.

   🔵 In general, a modifier should be placed as close as possible to what it modifies to avoid ambiguity.

58. **(G)** *English/Rhetorical Skills/Organization/Sentence-Level Structure.* The item stem asks for the effect of repeating the "When I" structure throughout the passage. The central theme of the selection is the chronological development (an organizing principle that accounts for events in the order in which they occurred) of the narrator's personal experience with aquarium fish. Notice that the first person references throughout the passage indicate the transitions between important stages in the development of the narrator's hobby. (I bought the first aquarium; I set it up; I bought some fish; the fish reproduced; I became very interested in the fish; now, I sell them to the pet store.) So, (G) is the correct answer choice. As for (F), the development of the passage moves forward, not backward, in time. As for (H), the length of time that elapsed is not particularly important; it is the unfolding of the successive events that is significant. Finally, as for (J), the purpose of the repetitive phrasing is not to show that the narrator's views remained unchanged. On the contrary, the purpose of the phrasing is to show how the narrator's views changed.

59. **(C)** *English/Usage and Mechanics/Punctuation/Commas.* The underlined portion is wrong because the comma only serves to disrupt the logical flow of the sentence. The comma seems to function as the introduction to a direct quotation (e.g., He said, "I'd pay twice that amount."); however, there is no direct quotation in the sentence. (C) is the correct answer choice because it simply eliminates the comma. As for (B), replacing the comma with a semicolon does not solve the problem of the original. As for (D), it fails to solve the problem of the original and inserts an additional comma that serves no logical function.

60. **(H)** *English/Rhetorical Skills/Organization/Sentence-Level Structure.* As noted above, the central theme of the selection is the chronological development of the narrator's personal experience with aquarium fish. This additional sentence, therefore, belongs with the discussion about the reproduction of the fish (Paragraph 4). So, (H) is the correct answer choice. As for the other answer choices, the additional sentence would not be relevant in the context of those paragraphs.

61. (C) *English/Usage and Mechanics/Grammar and Usage/Adjectives versus Adverbs* and *Sentence Structure/ Unintended Meanings.* The underlined portion is wrong for two reasons. First, the adverb "artistically" is used inappropriately in this context. Remember that adverbs are used to modify verbs (and sometimes adjectives), whereas adjectives are used to modify nouns. In this case, therefore, the adjective "artistic" should be used to modify the noun "ability." Second, neither can the adjective "much" be used to modify an adverb ("artistically") nor the noun "much" be used to express the writer's intended meaning. The idea that how these characteristics can be combined is quantifiable ("…how much…ability…skill…and…expertise can combine….") does not make sense. Therefore, the adjective "much" should simply be eliminated. So, (C) is the correct answer choice. As for (B), the adjective "many" can only be used to modify a plural subject (e.g., many artistic abilities). As for (D), the conjunction "how" is required to express the intended meaning of the sentence.

62. (F) *English/Usage and Mechanics/No Change.* The underlined portion is correct. As written, the writer's intention is rendered in a clear and direct manner. As for (G), the resulting sentence does not express the writer's intended meaning. Instead, it illogically suggests that the singular characteristics (ability, skill, and expertise) are each combinations of something. However, there is no evidence to suggest the nature of these combinations. As for (H) and (J), they result in awkward sentences. In this context, the infinitive verb form ("to further") is preferred to the gerund form ("furthering"). While both the infinitive and the gerund forms function as nouns, they are not always interchangeable.

63. (B) *English/Usage and Mechanics/Sentence Structure/Faulty Parallelism.* The underlined portion is wrong because it suffers from a lack of parallelism. The sentence contains a series with three elements. The first and second elements are noun clauses that demonstrate the same logical structure ("a designer" and "an inventor," respectively). As for the third element, it fails to conform to this structure, inserting the phrase "besides being" and resulting in an unparallel element that functions as a dependent clause. So, (B) is the correct answer choice because it simply eliminates the phrase "besides being," thereby creating a parallel element ("an expert legal witness"). As for (C) and (D), they fail to solve the problem of the original and are needlessly wordy compared to (B).

64. (J) *English/Rhetorical Skills/Style/Conciseness.* The underlined portion is wrong because the resulting sentence is awkward and needlessly wordy. In this context, the adjective "important" is redundant of the adverb "significantly." (Note, however, that "significantly important" is a grammatically correct construction.) (J) is the correct answer choice because it solves the problem by simply omitting the redundant adjective "important" and replacing the adverb "significantly" with the adjective "significant." As for (G) and (H), they fail to eliminate the redundancy.

65. (B) *English/Usage and Mechanics/Sentence Structure/Fragments.* The underlined portion is wrong because the resulting construction lacks a main verb and is therefore a sentence fragment. The infinitive form "to help" cannot function as a main verb. Instead, a conjugated verb form (one that exhibits tense) is required. (B) and (C) both provide conjugated verbs ("is helping" and "will help," respectively); however, (C) is wrong because the future tense ("will help") is inconsistent with the time sequence established at the end of the related sentence. The writer says that the effect is being achieved "right now," so the present tense verb form ("is helping") is required. Therefore, (B) is the correct answer choice. As for (D), simply omitting the underlined portion does not provide the sentence with a main verb. As a result, "illuminate" seems to function as the main verb; however, the plural verb "illuminate" does not agree in number with the singular subject "work."

66. (H) *English/Rhetorical Skills/Style/Conciseness.* The underlined portion is wrong because the resulting sentence is needlessly wordy. Later in the sentence, the writer states that Latimer was born in 1848. Therefore, the phrase "in the last century" is not only redundant but also inaccurate (the last century was the twentieth century, not the nineteenth century). (Note, however, that this type of error is not tested by the ACT test.) So, (H) is the correct answer choice because it simply eliminates the repeated material. As for (G), the adjective "nineteenth-century" is redundant of "1848." Finally, as for (J), not only is the phrase "the nineteenth century" redundant of "1848," but the order of elements results in an awkward sentence.

67. **(D)** *English/Rhetorical Skills/Strategy/Effective Transitional Sentence.* The item stem asks for the transition that provides the most effective link between Paragraph 2 and Paragraph 3. Paragraph 2 discusses Latimer's early career, while Paragraph 3 discusses a later stage in his career. However, chronological order is not the only connection between these two paragraphs since the writer also describes the development of Latimer's professional success. So, the underlined portion is wrong. (D) is the correct answer choice because this transition not only includes the element of succession (reference to "early") but also the element of advancement ("Building"). As for (B), it fails to solve the problem of the original. As for (C), it not only fails to include the element of succession, but it is also inaccurate because Latimer was not merely "hoping" to be successful.

68. **(F)** *English/Rhetorical Skills/No Change.* The underlined portion is correct. As written, the writer's intention is rendered in a clear and direct manner. As for (G), it destroys the logical integrity of the sentence. (G), for example, includes the meaningless phrase "did he executed." As for (H), it changes the writer's intended meaning, implying that Latimer was only one of several people who executed drawings. Finally, as for (J), the conjunction "both" fails to maintain the logical parallelism between the two elements. The conjunction "both" is used with the conjunction "and," not the conjunction "but."

69. **(A)** *English/Usage and Mechanics/No Change.* The underlined portion is correct. As for (B) and (C), the commas disrupt the logical flow of the sentence. As for (D), the semicolon suggests that a second independent clause will follow; however, the material that follows is not an independent clause.

70. **(H)** *English/Usage and Mechanics/Sentence Structure/Fragments.* The underlined portion is wrong because the resulting construction lacks a main verb and is therefore a sentence fragment. (H) is the correct answer choice because it provides a main verb ("contributed"). As for (G), it fails to solve the problem of the original. As for (J), the participle verb form "contributing" cannot function as a main verb.

71. **(A)** *English/Rhetorical Skills/No Change.* The underlined portion is correct. As written, the writer's intention is rendered in an unambiguous manner. Latimer was an expert in the field of electric lighting by virtue of his professional experience, and he contributed to the field by offering his testimony in court. The other answer choices are wrong because the elements are arranged in such a way as to render the meanings illogical. As for (B), it illogically implies that Latimer was deemed to be an expert "through his testimony." As for (C), it illogically suggests that Latimer was a "witness of electric lighting." Finally, (D) is wrong because it refers to Latimer's "testimony of electric lighting," which does not make sense.

72. **(G)** *English/Usage and Mechanics/Sentence Structure/Fragments* and *Unintended Meanings.* The underlined portion is wrong because the resulting construction is a sentence fragment. As written, the construction implies that the company's legal department was joined to or by something or someone else. However, there is no object for the verb "was joined." The writer actually intends to say that Latimer joined the Edison Electric Light Company. (G) is the only answer choice that expresses this idea. Note also that the parenthetical remark refers directly to the name of the company and should therefore immediately follow "Edison Electric Light Company." Based on this information, (H) can quickly be eliminated. However, at closer inspection, (H) is also wrong for the same reasons as the original. As for (J), "was joined of" is not idiomatic.

73. **(C)** *English/Usage and Mechanics/Punctuation/End-Stop Punctuation* and *Sentence Structure/Fragments.* The underlined portion is wrong because the end-stop punctuation (the period) is inappropriate in this context. The period disrupts the logical structure of the dependent clause that precedes the comma ("when General Electric…Patent Control"), resulting in a sentence fragment followed by a group of words without a coherent logical structure. (C) is the correct answer choice because it simply eliminates the period and makes lowercase what had been the first word of the following sentence ("the"). The resulting sentence contains a well-constructed dependent clause (introduced by "when") that is attached to an independent clause with the subject "Latimer" and main verb "became." As for (B) and (D), the comma disrupts the logical flow of the sentence. Additionally, (B) is wrong because the phrase "then the Board of Patent Control" seems to function as an aside, incorrectly suggesting that the "Board of Patent Control" was the name of each of the two companies at their formation. (In fact, the two companies formed the board.)

74. **(G)** *English/Rhetorical Skills/Strategy/Effective Transitional Sentence.* The underlined portion is wrong because the adverb "unfortunately" does not serve a useful function in the sentence. As a result, the sentence does not provide an effective transition to Paragraph 5. In this context, the adverb "unfortunately" modifies the verb "eulogized"; however, it does not make sense to say that it was unfortunate that Latimer was highly regarded by his friends and colleagues. So, (G) is the correct answer choice because it simply eliminates the adverb "unfortunately" and instead begins the sentence with the preposition "upon." As for (H), the adverb "thereupon" does not serve the same function as the preposition "upon," and it does nothing to improve upon the original. As for (J), the resulting sentence is awkward, and the pronoun "it" does not have a clear referent.

75. **(D)** *English/Rhetorical Skills/Strategy/Main Idea.* The assignment asks for an essay that illustrates "how an important figure in a certain field did not receive the recognition that person deserved." However, this essay focuses on Latimer's professional success in the field of electric lighting and indicates that he was both well-received and well-recognized. So, the essay does not fulfill the given assignment, and therefore (A) and (B) can immediately be eliminated since they respond to the item stem in the affirmative. As for (C), while it is true that Latimer's contributions to the field of electric lighting were important, this answer choice does not address whether he received the appropriate recognition for these contributions. So, (D) is the correct answer choice.

TEST 2: MATHEMATICS

1. **(A)** *Mathematics.* The first statement in the box establishes that all drivers who live in Ohio have car insurance, and the last statement in the box establishes that Maria is a licensed driver who lives in Ohio. Therefore, Maria has car insurance. So, (A) is the correct answer choice. As for (B), this statement may or may not be true because the first statement in the box does not say that *only* Ohio drivers have car insurance; it says that *all* Ohio drivers have car insurance. So, Antonia, who is not an Ohio driver, may or may not have car insurance. As for (C), this statement also may or may not be true because the fact that Catherine has car insurance (third statement in box) does not mean that she necessarily lives in Ohio; non-Ohio drivers may also have car insurance. By similar reasoning, (D) may or may not be true. Finally, as for (E), Jorge is a resident of Maine (fifth statement in box), but there is no information provided in the box regarding licenses for residents of that state.

2. **(F)** *Mathematics/Algebra/Manipulating Algebraic Expressions/Evaluating Expressions.* Simply evaluate the expression, substituting -3 for x: $\dfrac{x^2 - 1}{x + 1} = \dfrac{(-3)^2 - 1}{-3 + 1} = \dfrac{9 - 1}{-2} = \dfrac{8}{-2} = -4$. So, (F) is the correct answer choice.

3. **(B)** *Mathematics/Arithmetic/Common Arithmetic Items/Percents.* Simply perform the indicated operations: Total Pay $- 18\%$ of Total Pay $=$ Take-Home Pay $\Rightarrow \$320 - 0.18(\$320) = \$320 - \$57.60 = \$262.40$. So, (B) is the correct answer choice.

    Alternatively, reason that the amount of take-home pay is $100\% - 18\% = 82\%$ of the total pay: $0.82(\$320) = \$262.40$. This alternative approach requires one less calculation. In either case, however, the computation is much less difficult with the use of a calculator.

4. **(J)** *Mathematics/Geometry/Lines and Angles.* Since $\overline{XY} \cong \overline{XZ}$, $\angle Y = \angle Z$ and therefore $\angle Z = 50°$. The sum of the degree measures of the interior angles of a triangle is 180. So, $50° + 50° + \angle X = 180° \Rightarrow 100° + \angle X = 180° \Rightarrow \angle X = 80°$. So, (J) is the correct answer choice.

5. **(E)** *Mathematics/Arithmetic/Simple Manipulations* and *Geometry/Circles* and *Rectangles and Squares.* Since each circle has a diameter of 3 inches, it is possible to cut 12 such circles from a 9" by 12" sheet of construction paper. For 50 such cut-outs (to represent the centers of the flowers), Shari and Juan will need $\dfrac{50}{12} = \dfrac{48}{12} + \dfrac{2}{12} = 4\dfrac{2}{12}$ sheets of construction paper, which means that they will need at least 5 sheets of construction paper. So, (E) is the correct answer choice.

6. **(H)** *Mathematics/Algebra.* This is a number line item. Even though the figure does not indicate the position of zero, the item stem states that the numbers increase in value from left to right. Therefore, since A is to the left of B on the number line, the only certain conclusion that can be drawn is that $A < B$. So, (H) is the correct answer choice. Since the position of zero is not indicated on the number line, no conclusion can be reached as to whether B is positive or negative.

7. **(E)** *Mathematics/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Simple Equations.* Solve for x: $2(x - 5) = -11 \Rightarrow 2x - 10 = -11 \Rightarrow 2x = -11 + 10 = -1 \Rightarrow x = -\dfrac{1}{2}$. So, (E) is the correct answer choice.

    You can double-check this reasoning by substituting $-\dfrac{1}{2}$ for x into the equation:

    $$2\left(-\dfrac{1}{2} - 5\right) = -11 \Rightarrow 2\left(-\dfrac{11}{2}\right) = -11 - 11 = -11 \checkmark$$

    🔴 Note that substituting each of the answer choices for x may be used as an alternative method to solving this item. However, in this case, the direct solution method (solving for x) is much more efficient.

8. **(F)** *Mathematics/Algebra/Manipulating Algebraic Expressions/Factoring Expressions.* One way to solve this item is to factor the polynomial: $x^2 - x - 20 = (x + ?)(x - ?) = (x + 4)(x - 5)$. So, (F) is the correct answer choice.

TIP An alternate method of solving this item is to test the answer choices:

    F. $(x - 5)(x + 4) = x^2 - x - 20$ ✓

    G. $(x - 4)(x + 5) = x^2 + x - 20$ ✗

    H. $(x + 2)(x - 10) = x^2 - 8x - 20$ ✗

    J. $(x + 5)(x - 4) = x^2 + x - 20$ ✗

    K. $(x + 10)(x - 2) = x^2 + 8x - 20$ ✗

It will be helpful also to observe that on testing (G), (J) can be eliminated since on a multiple-choice test that is constrained to a single correct answer both components of the same factorization cannot be the correct answer choice.

9. **(A)** *Mathematics/Coordinate Geometry/Graphs of Linear Equations* and *Slope-Intercept Form of a Linear Equation.* The most direct solution method is to recognize that every value for y in a line that is both parallel to and 7 units above the x-axis must be 7. So, (A) is the correct answer choice.

Double-check this reasoning by drawing the line on a graph:
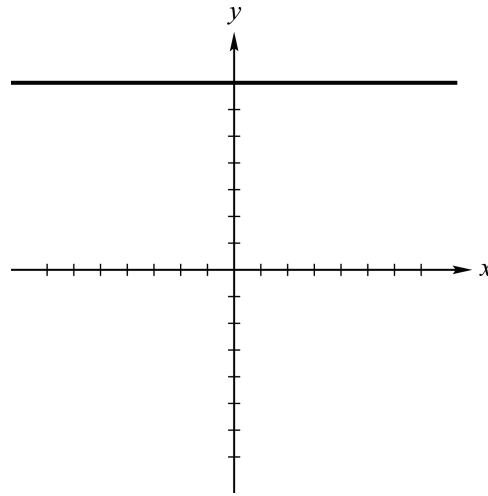
The graph demonstrates that $y = 7$ regardless of the value of x.

TIP Alternatively, find the slope of the line ($m = 0$ since the change in "rise" is 0) and the y-intercept ($b = 7$): $y = mx + b = (0)x + 7 = 7$. Note that the x-axis is a horizontal line and that the equation of any horizontal line is of the form $y = b$, where b is the y-intercept.

10. **(G)** *Mathematics/Algebra/Manipulating Algebraic Expressions/Basic Algebraic Manipulations* and *Arithmetic/ Complicated Manipulations/The "Flying-X" Method.* Use the "flying-x" method for adding fractions to solve this item: $\dfrac{3p}{5} + \dfrac{3q}{2} = \dfrac{3p \cdot 2 + 3q \cdot 5}{5 \cdot 2} = \dfrac{6p + 15q}{10}$. So, (G) is the correct answer choice.

TIP Alternatively, assume some values for p and q, such as $p = 1$ and $q = 1$: $\dfrac{3p}{5} + \dfrac{3q}{2} \Rightarrow \dfrac{3(1)}{5} + \dfrac{3(1)}{2} = \dfrac{21}{10}$. Then,

substitute 1 for both p and q in each of the answer choices; the correct answer choice will return a value of $\dfrac{21}{10}$:

F. $\quad \dfrac{9(1)(1)}{10} = \dfrac{9}{10}$ ✗

G. $\quad \dfrac{6(1)+15(1)}{10} = \dfrac{21}{10}$ ✓

H. $\quad \dfrac{6(1)+3(1)}{2} = \dfrac{9}{2}$ ✗

J. $\quad \dfrac{3(1)+15(1)}{5} = \dfrac{18}{5}$ ✗

K. $\quad \dfrac{3(1)+3(1)}{7} = \dfrac{6}{7}$ ✗

11. **(C)** *Mathematics/Arithmetic/Common Arithmetic Items/Proportions and Direct-Inverse Variation.* Set up a direct proportion and solve for the missing quantity: $\dfrac{\text{model measurement}}{\text{plane measurement}} = \dfrac{1}{20} \Rightarrow \dfrac{x}{41} = \dfrac{1}{20} \Rightarrow x = \dfrac{41}{20} = 2\dfrac{1}{20}$. So, (C) is the correct answer choice.

TIP Alternatively, reason abstractly to determine the correct answer. Since the model is $\dfrac{1}{20}$ the size of the actual plane, the wing of the model should be $\dfrac{1}{20}$ of 41 feet: $\dfrac{1}{20}(41) = \dfrac{1}{20}(40+1) = \dfrac{1}{20}(40) + \dfrac{1}{20}(1) = 2 + \dfrac{1}{20} = 2\dfrac{1}{20}$.

Although this approach may save time, note that there is always the risk of inverting numbers or confusing operations (e.g., multiplication instead of division, or vice versa). The direct proportion solution method provides an equation format that helps to avoid such errors.

12. **(K)** *Mathematics/Algebra/Manipulating Algebraic Expressions/Evaluating Expressions.* For this item, translate the item stem into algebraic terminology and then solve for x. Let P equal the original pizza; A equal the number of slices that Ahn ate; B equal the number of slices that Bill ate; and C equal the number of slices that Carl ate. Then, set up the equation: $P - (A+B+C) = 1 + \dfrac{P}{2} \Rightarrow P - (4+3+2) = 1 + \dfrac{P}{2}$. Finally, solve for P: $P - 9 = 1 + \dfrac{P}{2} \Rightarrow P - \dfrac{P}{2} = 9 + 1 \Rightarrow \dfrac{P}{2} = 10 \Rightarrow P = 20$. So, (K) is the correct answer choice.

TIP Alternatively, test the answer choices, starting with the middle value (18). The correct answer choice will yield 1 more than half of its value:

H. $\quad 18 - 9 = 9$ (9 is half of 18.) ✗

Since 18 yielded too few slices, try the next larger number:

**J.** $\quad 19 - 9 = 10$ (10 is 0.5 more than half of 19.) ✗

By process of elimination, (K) must be the correct answer choice.

K. $\quad 20 - 9 = 11$ (11 is 1 more than half of 20.) ✓

13. (D) *Mathematics/Arithmetic/Common Arithmetic Items/Percents.* The most direct approach to solving this item is to recognize that the shipping cost after a 60% increase is equal to 160% of the original shipping cost. Therefore, find 160% of $80: $80 \bullet 1.6 = \$128.00$. So, (D) is the correct answer choice.

TIP Alternatively, reason through this item step-by-step by first determining the amount of increase before determining the new cost: $\$80 \bullet 0.6 = \$48.00$ (amount of increase). Then, determine the new cost by finding the sum of the original cost and the amount of increase: $\$80 + \$48 = \$128$.

14. (H) *Mathematics/Geometry/Rectangles and Squares.* In order to solve this item, first determine the areas for both sections of the ceiling:
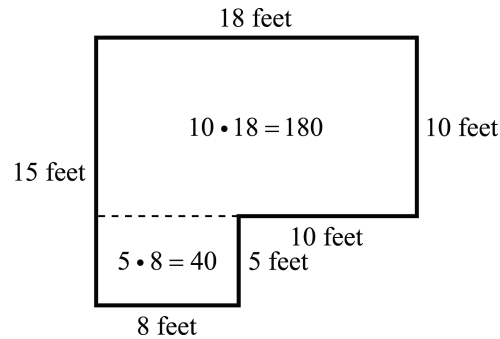

Then, find the total area of the ceiling by finding the sum of these two areas: $180 + 40 = 220$ square feet. Since each can of paint covers approximately 100 square feet, the painter will need three 1-quart cans of paint. So, (H) is the correct answer choice.

15. (E) *Mathematics/Algebra/Manipulating Algebraic Expressions/Evaluating Expressions.* For this item, simply evaluate the given expression using $x = -4$: $3x^2 - 15x \Rightarrow 3(-4)^2 - 15(-4) = 3(16) + 60 = 48 + 60 = 108$. So, (E) is the correct answer choice.

TIP Alternatively, you can recognize that -4 can be factored out of the expression: $3x^2 - 15x \Rightarrow 3(-4)^2 - 15(-4) = -4[3(-4) - 15] = -4(-27) = 108$.

16. (G) *Mathematics/Geometry/Lines and Angles.* Since the given figure is a trapezoid, a simple way to solve this item is to recognize the feature of parallel lines.
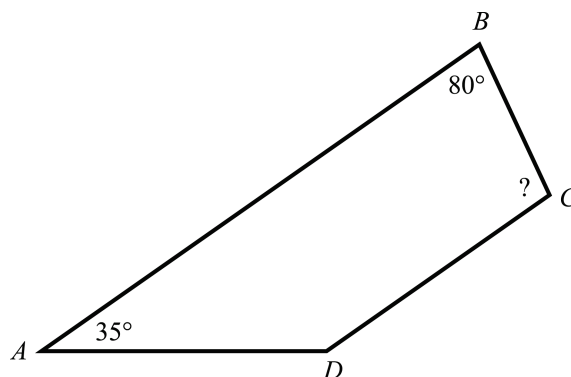
When two parallel lines are intersected by a transversal, two sets of angles result (big angles and little angles). All of the big angles are equal; all of the little angles are equal; and the sum of any big angle and any little angle is 180°. In this case, $\overline{AB}$ and $\overline{DC}$ are cut by $\overline{BC}$ (extended to function as the transversal). Rotate the answer sheet so that $\overline{AB}$ and $\overline{DC}$ are parallel to the bottom of your writing surface:
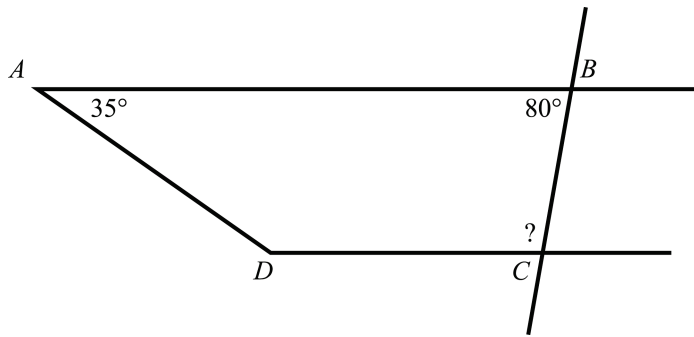
Therefore: $80° + \angle C = 180° \Rightarrow \angle C = 100°$. So, (G) is the correct answer choice.

🅣🅘🅟 Alternatively, "guesstimate" the measure of $\angle C$. Since the angle appears to be slightly larger than 90°, the correct answer must be 100°. (Use the corner of the answer sheet as a basis for comparison.)

17. (D) ***Mathematics/Algebra/Manipulating Algebraic Expressions/Basic Algebraic Manipulations.*** Simplify the expression by combining like terms: $\left(6a^3 - 5ac^2 + 14c\right) - \left(8c - 3a^3 - 2ac^2\right) = 6a^3 - 5ac^2 + 14c - 8c + 3a^3 + 2ac^2 = 3a^3 + 2ac^2 = 6a^3 + 3a^3 - 5ac^2 + 2ac^2 + 14c - 8c = 9a^3 - 3ac^2 + 6c$. So, (D) is the correct answer choice.

18. (J) ***Mathematics/Algebra/Expressing and Evaluating Algebraic Functions/Function Notation.*** This item deals with function notation. Simply evaluate the function $f(-2)$ by substituting -2 for x in the given equation: $f(x) = 3x^2 + 5x - 5$ and $f(-2) = 3(-2)^2 + 5(-2) - 5 = 12 - 10 - 5 = -3$. So, (J) is the correct answer choice.

19. (C) ***Mathematics/Arithmetic/Common Arithmetic Items/Percents.*** In order to solve this item, use a variable such as x to represent the price of a tire. In this case, four tires would ordinarily cost $4x$; however, on sale, they would only cost $3x$ (a savings of $4x - 3x = x$ off of the regular price): $\frac{x}{4x} = \frac{1}{4} = 0.25 = 25\%$. So, (C) is the correct answer choice.

🅣🅘🅟 Alternatively, assume the cost for a tire, such as $100. On that assumption, four tires would normally cost $400; on sale, however, they would only cost $300. So, the savings is $400 - \$300 = \$100$, which is a $\frac{100}{400} = \frac{1}{4} = 25\%$ discount.

20. (J) ***Mathematics/Statistics and Probability/Probability.*** For this item, simply recognize that the probability of heads versus tails (or vice versa) when tossing a coin is always 50%, or $\frac{1}{2}$ (regardless of any previous pattern). So, (J) is the correct answer choice. Any other expectation is often referred to as "The Gambler's Fallacy," which is based upon a misunderstanding of statistics and probability, in which past events are assumed to affect present events even though no connection exists between the two.

21. (C) ***Mathematics/Arithmetic/Simple Manipulations.*** This item stem asks for the number of possible combinations for a four-character sequence (under certain restrictions) that are available from alphabetic and numeric characters. The first character in the sequence can be chosen from the entire alphabet, except for letter O. So, there are 25 options for the first position. The second character in the sequence can be chosen from the entire alphabet. So, there are 26 options for the second position. At this point, using the counting principle, the number of possible code combinations is $25 \cdot 26$. The third and fourth characters in the sequence can be chosen from any of the 10 digits (0–9). Therefore, the total number of possible code combinations is $25 \cdot 26 \cdot 10 \cdot 10$. So, (C) is the correct answer choice.

22. **(J)** *Mathematics/Geometry/Rectangles and Squares* and *Algebra/Solving Simultaneous Equations.* Create a system of equations in which l represents length and w represents width: $l = w + 6$ and $2l + 2w = 48$. Then, substitute the value for l into the second equation: $2(w+6) + 2w = 48 \Rightarrow 2w + 12 + 2w = 48$. Finally, solve for w: $4w = 36 \Rightarrow w = 9$. So, (J) is the correct answer choice.

TIP Alternatively, use the same system of equations listed above, substituting each of the answer choices for w, starting with the middle value (15):

> **H.** $\qquad 2l + 2w = 48$
>
> $\qquad 2(15 + 6) + 2(15) = 48$
>
> $\qquad 2(21) + 2(15) = 48$
>
> $\qquad 42 + 30 = 72 \neq 48$ ✘

Since a width of 15 yields a larger perimeter than 48, try the next smaller number (9):

> **J.** $\qquad 2l + 2w = 48$
>
> $\qquad 2(9 + 6) + 2(9) = 48$
>
> $\qquad 2(15) + 2(9) = 48$
>
> $\qquad 30 + 18 = 48 = 48$ ✓

23. **(A)** *Mathematics/Coordinate Geometry/Slope of a Line.* One way to approach this is to choose two points and then use their coordinates to find the slope. For example, use the coordinates of points P and Q, which are $(0,2)$ and $\left(\dfrac{3}{2}, 3\right)$, respectively: $m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{3 - 2}{\dfrac{3}{2} - 0} = \dfrac{1}{\dfrac{3}{2}} = \dfrac{2}{3}$. So, (A) is the correct answer choice.

TIP Alternatively, use the definition of the slope (rise divided by run) and count units. The vertical distance (rise) from P to Q is 2 units and the horizontal distance (run) from P to Q is 3 units, so the slope is $\dfrac{2}{3}$.

24. **(K)** *Mathematics/Geometry/Lines and Angles.* The most direct approach to solving this item is to recognize that the sum of the degree measures of angles forming a straight line is 180°. Since angles $\angle FZE$ and $\angle CZE$ form a straight line: $\angle FZE + \angle CZE = 180° \Rightarrow 52° + \angle CZE = 180° \Rightarrow \angle CZE = 128°$. So, (K) is the correct answer choice.

TIP Alternatively, reason that $\angle AZB$ is equal to $\angle DZE$, so $\angle DZE$ measures 24°. Then, since $\overleftrightarrow{CF}$ is a straight line: $\angle FZE + \angle DZE + \angle DZC = 180° \Rightarrow 52° + 24° + \angle DZC = 180° \angle DZC = 104°$. Also: $\angle CZE = \angle DZC + \angle DZE \Rightarrow \angle CZE = 104° + 24° = 128°$. Although this second approach is more time-consuming, it is equally effective and not unmanageable. When finding an approach that works, do not waste valuable time trying to determine whether there is another, more efficient solution.

25. **(C)** *Mathematics/Geometry/Complex Figures* and *Rectangles and Squares* and *Triangles/Working with Triangles.* The area of a parallelogram is the product of its base and height. Since the base is 11 squares across and the height is 4 squares along a perpendicular to the base, the area of the parallelogram is $11(5) \cdot 4(5) = 55 \cdot 20 = 1,100$. So, (C) is the correct answer choice.

Another way to solve this item is to treat the given figure as a composite figure:
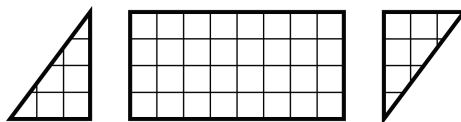
The area of the composite figure is the sum of the areas of the rectangle and the two triangles. Since the rectangle has a width of 8 squares, or $8 \cdot 5 = 40$ millimeters, and a height of 4 squares, or $4 \cdot 5 = 20$ millimeters, the area of the rectangle is $20 \cdot 40 = 800$ square millimeters. Since each of the triangles has a base of 3 squares, or $3 \cdot 5 = 15$ millimeters, and a height of 4 squares, or $4 \cdot 5 = 20$ millimeters, the area of each triangle is $\frac{1}{2} \cdot 20 \cdot 15 = 150$ square millimeters. Therefore, the area of the composite figure is $800 + 150 + 150 = 1,100$ square millimeters.

TIP Alternatively, arrive at this conclusion by means of approximating the total number of squares. Each triangle appears to contain 7 squares, while the rectangle definitely contains 32 squares. Since the area of each square is 25 square millimeters, the total area is approximately $25(32 + 14) = 25 \cdot 46 = 1,150$ square millimeters.

26. **(H)** *Mathematics/Algebra/Expressing and Evaluating Algebraic Functions/Functions as Models.* Since the projectile hits the ground at $d = 0$, the item stem asks for the value of t when $d = 0$: $0 = -5t^2 + 18t + 8 = (5t + 2)(-t + 4)$. So, $t = -\frac{2}{5}$ or $+4$. Since time elapsed is always positive, $t = 4$. Therefore, (H) is the correct answer choice.

TIP Alternatively, substitute each of the answer choices for t in the given equation until finding the value that yields 0:

   F. $-5(1)^2 + 18(1) + 8 = 21$ ✘

   G. $-5(2)^2 + 18(2) + 8 = 24$ ✘

   H. $-5(4)^2 + 18(4) + 8 = 0$ ✓

27. **(B)** *Mathematics/Coordinate Geometry/Distance Formula* and *Geometry/Triangles/Working with Triangles.* Use the distance formula ($d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$) to determine the lengths of $\overline{AB}$ (base) and $\overline{AC}$ (height): $\overline{AB} = \sqrt{[1 - (-2)]^2 + (1 - 1)^2} = \sqrt{9} = 3$ and $\overline{AC} = \sqrt{[-2 - (-2)]^2 + [1 - (-3)]^2} = \sqrt{16} = 4$. Then, find the area of $\triangle ABC$: $\frac{1}{2} \cdot 4 \cdot 3 = 6$. So, (B) is the correct answer choice.

TIP Alternatively, simply count the number of units to find the lengths of the base and height. $\overline{AB}$ runs from -2 to $+1$, a distance of 3 units, and $\overline{AC}$ runs from -3 to $+1$, a distance of 4 units.

28. **(F)** *Mathematics/Algebra/Manipulating Algebraic Expressions/Manipulating Expressions Involving Exponents.* Simplify the given expression by performing the indicated operations: $-\left(-3a^3\right)^2 = -\left[(-3)^2 \left(a^3\right)^2\right] = -\left(9a^6\right) = -9a^6$. So, (F) is the correct answer choice.

Another way to approach simplifying the given expression is to perform the indicated operations on its expanded form: $-\left(-3a^3\right)\left(-3a^3\right) = -9a^6$.

TIP Alternatively, assume a value for a, such as $a = 1$ (do not assume $a = 0$), and plug it into the given expression: $-\left(-3a^3\right)^2 = -(-3)^2 = -9$. Then, substitute 1 for a in each of the answer choices to determine which expression yields a value of -9:

F. $-9(1)^6 = -9$ ✓

G. $-3(1)^5 = -3$ ✗

H. $3(1)^5 = 3$ ✗

J. $6(1)^6 = 6$ ✗

K. $9(1)^6 = 9$ ✗

Note that assuming a value for a greater than 1 will result in more time-consuming arithmetic.

29. **(E)** *Mathematics/Arithmetic/Simple Manipulations.* For this item, set up an equation: $\dfrac{5}{12} \cdot x = 120 \Rightarrow 5x = 120 \cdot 12 \Rightarrow x = \dfrac{120}{5} \cdot 12 = 24 \cdot 12 = 288$. So, (E) is the correct answer choice.

Alternatively, recognize that (A), (B), and (C) can immediately be eliminated since all of these values are less than 120. 120 is a *fraction* of the unknown value; therefore, the correct answer must be greater than 120. So, (D) and (E) are the only possible answer choices:

D. $204 \cdot \dfrac{5}{12} = 85$ ✗

E. $288 \cdot \dfrac{5}{12} = 120$ ✓

🛈 Another alternative strategy is to recognize that $\dfrac{5}{12}$ is nearly $\dfrac{6}{12} = \dfrac{1}{2}$, and then reinterpret the item stem to read: "120 is nearly $\dfrac{1}{2}$ of what number?" The answer to this question would be 240. However, since $\dfrac{5}{12}$ is a little less than $\dfrac{6}{12}$, or $\dfrac{1}{2}$, the correct answer must be greater than 240. Therefore, (E) is the only possible answer choice.

30. **(F)** *Mathematics/Algebra/Manipulating Algebraic Expressions/Basic Algebraic Manipulations.* Simplify the given expression by factoring $b^2 - 9$ and then multiplying by the reciprocal: $\dfrac{b+3}{b^2-9} \div \dfrac{1}{b-3} = \dfrac{b+3}{(b-3)(b+3)} \cdot (b-3) = 1$. So, (F) is the correct answer choice.

🛈 Alternatively, assume a value for b, such as $b = 2$: $\dfrac{2+3}{2^2-9} \div \dfrac{1}{2-3} = \dfrac{5}{-5} \div \dfrac{1}{-1} = 1$.

31. **(E)** *Mathematics/Arithmetic/Simple Manipulations.* Test each of the answer choices, using $-\dfrac{1}{2}$ as a benchmark. $-\dfrac{3}{4}$ is less than $-\dfrac{2}{4}$, or $-\dfrac{1}{2}$, so (B) can be eliminated. $-\dfrac{7}{8}$ is less than $-\dfrac{4}{8}$, or $-\dfrac{1}{2}$, so (C) can be eliminated. $-\dfrac{9}{16}$ is less than $-\dfrac{8}{16}$, or $-\dfrac{1}{2}$, so (D) can be eliminated. Finally, $-\dfrac{5}{32}$ is greater than $-\dfrac{16}{32}$, or $-\dfrac{1}{2}$, so (E) is the correct answer choice. Note that this reasoning proceeds from the fact that $-\dfrac{5}{32} > -\dfrac{1}{2} > -\dfrac{9}{16} > -\dfrac{3}{4} > -\dfrac{7}{8}$.

🛈 Alternatively, convert the answer choices from fractions to decimals.

32. **(F)** *Mathematics/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Simple Inequalities.* Simply manipulate the given inequality: $\frac{4}{3}x > -1 \Rightarrow 4x > -3 \Rightarrow x > -\frac{3}{4}$. So, (F) is the correct answer choice.

33. **(C)** *Mathematics/Geometry/Rectangles and Squares.* For this item, use the given information to create an equation. Since the area of the original dance floor is $8 \cdot 10 = 80$ square feet, the area of the new dance floor will be $2 \cdot 80 = 160$ square feet. The width of the new dance floor will be $8 + 2 = 10$ feet, so its new length must be: $l \cdot 10 = 160 \Rightarrow l = 16$ feet. Now, subtract the length of the original dance floor from the length of the new dance floor: $16 - 10 = 6$ feet. So, (C) is the correct answer choice.

34. **(F)** *Mathematics/Trigonometry/Definitions of the Six Trigonometric Functions* and *Geometry/Triangles/ Pythagorean Theorem.* This item requires an understanding of the basic trigonometric functions.
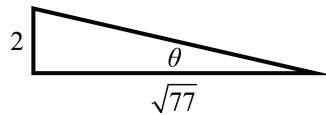
$\tan \theta = \frac{\text{opposite}}{\text{adjacent}} = \frac{2}{\sqrt{77}}$. Since $\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$, use the Pythagorean theorem to find the length of the hypotenuse: $h^2 = 2^2 + (\sqrt{77})^2 = 4 + 77 = 81 \Rightarrow h = \sqrt{81} = 9$. Therefore, $\sin \theta = \frac{2}{9}$. So, (F) is the correct answer choice.

35. **(B)** *Mathematics/Coordinate Geometry/Slope-Intercept Form of a Linear Equation.* Convert the given equation to slope-intercept form ($y = mx + b$): $x + 2y = 6 \Rightarrow 2y = -x + 6 \Rightarrow y = -\frac{1}{2}x + 3$. The slope of this line is $-\frac{1}{2}$ and the y-intercept is 3. Since lines that are parallel have the same slope, (B) is the correct answer choice.

36. **(G)** *Mathematics/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Simple Equations.* In order to solve the given formula for r, simply distribute P on the right side of the equation and then manipulate the resulting equation until r is isolated: $A = P(1 + rt) \Rightarrow A = P + Prt \Rightarrow A - P = Prt \Rightarrow -\frac{A - P}{Pt} = r$. So, (G) is the correct answer choice.

TIP Note that this item neither demands an understanding of finance nor requires values to be substituted for the variables.

37. **(D)** *Mathematics/Algebra/Solving Simultaneous Equations.* For this item, set up a simple system of equations, letting T and C represent the contributions of Tanya and Charles, respectively: $T + C = 24$ and $C = \frac{1}{2}T$. Now, substitute the value for C into the first equation and solve for T: $T + \frac{1}{2}T = 24 \Rightarrow \frac{3}{2}T = 24 \Rightarrow T = 16$.

TIP Alternatively, test the answer choices, starting with the middle value ($12). If Tanya contributed $12, then Charles contributed $12 \cdot \frac{1}{2} = \$6$. So, (C) is wrong because $\$12 + \$6 = \$18$, which is less than $24. Since (C) is not enough of a contribution, try the next larger choice. If Tanya contributed $16, then Charles contributed $16 \cdot \frac{1}{2} = \$8$. $\$16 + \$8 = \$24$, so (D) is the correct answer choice.

A slightly more sophisticated approach to solving this item is to reason that for each dollar Charles contributed, Tanya contributed two dollars. So, for each three dollars contributed, Charles is responsible for $\frac{1}{3}$ the amount and Tanya is responsible for $\frac{2}{3}$ the amount. Therefore, Tanya contributed $\frac{2}{3} \cdot \$24 = \$16$.

38. **(F)** *Mathematics/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Inequalities Involving Absolute Value.* The given inequality states that the absolute value of $x-1$ is greater than 5, which means that $x-1$ is either greater than 5 or less than −5. Therefore: $x-1 > 5$, which is equal to $x > 6$. And: $x-1 < -5$, which is equal to $x < -4$. So, (F) is the correct answer choice.

   🅣🅘🅟 Alternatively, use substitutions to determine whether statements are true or false and in turn eliminate answer choices. For example, test (G), assuming that $x = 5.5$: $5.5 - 1 > 5 \Rightarrow 4.5 > 5$ (False statement). So, (G) can be eliminated. Unfortunately, substitution, in this case, is not a precise strategy; however, eliminating one or two answer choices greatly improves the odds of guessing correctly from the remaining answer choices.

39. **(E)** *Mathematics/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Equations Involving Radical Expressions.* Since x must be positive for the given statement to be true, simply square all three parts of the statement: $4^2 < \left(\sqrt{x}\right)^2 < 9^2 \Rightarrow 16 < x < 81$. So, (E) is the correct answer choice.

40. **(J)** *Mathematics/Trigonometry/Definitions of the Six Trigonometric Functions.* This item requires an understanding of the sine relationship: $\sin A = \dfrac{\text{opposite}}{\text{hypotenuse}} = \dfrac{\overline{CB}}{\overline{AB}} \Rightarrow \dfrac{3}{7} = \dfrac{14}{\overline{AB}} \Rightarrow 3\overline{AB} = 7(14) \Rightarrow \overline{AB} = \dfrac{98}{3}$. So, (J) is the correct answer choice.

41. **(A)** *Mathematics/Coordinate Geometry/Graphs of Quadratic Relations.* One way to approach this item is to recognize various principles of coordinate geometry. First, since the parabola opens upward, the coefficient of the x^2 term must be positive, so (C), (D), and (E) can be eliminated. Next, recognize that the equation $x = -\dfrac{b}{2a}$ defines the axis of symmetry of a parabola. So, (A) and (B) can both be put into the form $y = ax^2 + bx + c$:

   A. $y = (x+2)(x-3) = x^2 - x - 6$

   The equation for (A) defines a parabola with an axis of symmetry at $x = -\left(-\dfrac{1}{2}\right) = \dfrac{1}{2}$.

   B. $y = (x-2)(x+3) = x^2 + x - 6$

   The equation for (B) defines a parabola with an axis of symmetry at $x = -\left(\dfrac{1}{2}\right) = -\dfrac{1}{2}$.

   The graph of the equation, however, shows that the axis of symmetry is slightly to the right of the y-axis, so (A) is the correct answer choice.

   🅣🅘🅟 Alternatively, test each of the answer choices by plugging in points shown on the graph. Begin with $(3,0)$:

   A. $0 = (3+2)(3-3) = 0$ ✓
   B. $0 = (3-2)(3+3) = 6$ ✗
   C. $0 = -(3-2)(3+3) = -6$ ✗
   D. $0 = (3-2)(3-3) = 0$ ✓

E. $0 = -(3+2)(3+3) = -30$ ✘

So, (B), (C), and (E) can be eliminated. Now, plug in $(-2, 0)$:

A. $0 = (-2+2)(-2-3) = 0$ ✓
D. $0 = -(-2-2)(-2-3) = -20$ ✘

Another alternative strategy is to recognize that the zeros (at -2 and 3) must fit into the factored form $(x-?)(x-?)$, which results in $[x-(-2)](x-3) = (x+2)(x-3)$.

42. **(J)** *Mathematics/Statistics and Probability/Averages.* Set up an equation to express the given information, letting T represent the sum total of the 5 integers in the set: $\dfrac{T}{5} = 4 \Rightarrow T = 20$. Then, remove the integer 3 from the set, thereby reducing T by 3 and reducing the number of elements in the set to 4. As a result, the new average is: $\dfrac{20-3}{4} = \dfrac{17}{4} = 4\dfrac{1}{4}$. So, (J) is the correct answer choice.

> **TIP** Alternatively, approach this item less formally by simply reasoning that the sum of the 5 integers is 20 and the sum of the 4 integers is $20 - 3 = 17$, so the average of the 4 integers is $\dfrac{17}{4}$, or $4\dfrac{1}{4}$.

43. **(B)** *Mathematics/Algebra/Solving Quadratic Relations.* Since one solution to $x^2 - kx - 8 = 0$ is $x^2 = -k$, substitute $-k$ for x into the equation and then solve for k: $0 = (-k)^2 - k(-k) - 8 = k^2 + k^2 - 8 = 2k^2 - 8 = 2(k^2 - 4) = 2(k-2)(k+2) \Rightarrow k = \pm 2$. So, (B) is the correct answer choice. (Or, instead of factoring, solve for k as follows: $0 = (-k)^2 - k(-k) - 8 = k^2 + k^2 - 8 = 2k^2 - 8 \Rightarrow 2k^2 = 8 \Rightarrow k^2 = 4 \Rightarrow k = \pm 2$.)

> **TIP** Alternatively, test each of the answer choices by plugging in the values for k, starting with the positive values since they are the easiest to manage:

A. $x^2 - 4x - 8 = 0$ ✘

The factors of 8 are {1, 8} and {2, 4}, no combination of which (either positive or negative) will total 4. So, next try (B):

B. $x^2 - 2x - 8 = (x-4)(x+2) = 0$ ✓

Since the first value works, plug in the second value for (B):

B. $x^2 - (-2)x - 8 = x^2 + 2x - 8 = (x+4)(x-2) = 0$ ✓

The second value also works, so (B) must the correct answer choice. The substitution approach is not as concise, but it is an equally effective problem-solving strategy.

44. **(J)** *Mathematics/Geometry/Triangles/Working with Triangles.* Congruent triangles can be superimposed upon each other, which means that they have the same shape and size. Similar triangles, on the other hand, have the same shape but not necessarily the same size. Triangle T_1 is similar to triangle T_3 but not necessarily congruent to triangle T_3, so statement I must not be part of the correct answer choice. Therefore, (H) and (K) can be eliminated. Since triangle T_1 is both congruent to triangle T_2 and similar to triangle T_3, all three triangles are necessarily similar, so statement II must be part of the correct answer choice. Therefore, (G) can be eliminated. In

the special case in which similar triangles also have the same dimensions, they are congruent. So, statement III must be true since T_1 may be congruent to T_3. Therefore, (J) is the correct answer choice.

45. **(B)** *Mathematics/Arithmetic/Solving Complicated Arithmetic Application Items.* For this item, it is important to recognize that $\frac{1}{8}$ inch must be allowed for each saw cut. So, the width of each block is $1\frac{1}{2}+\frac{1}{8}=\frac{13}{8}$ inches. Now, determine the number of $\frac{13}{8}$-inch units that make up a 6-foot piece of lumber: $6 \cdot 12 \div \frac{13}{8}=72 \div \frac{13}{8}=$ $72 \cdot \frac{8}{13}=\frac{576}{13}=44\frac{4}{13}$. So, George can make 44 full-sized blocks from the 6-foot piece of lumber. Therefore, (B) is the correct answer choice.

46. **(G)** *Mathematics/Coordinate Geometry/Slope-Intercept Form of a Linear Equation.* The item stem sets up a system of equations. At the point of intersection, the *y*-coordinate of each line is 2; therefore, at $y=2$ and $x=4$, $kx+1=x-2$. Now, substitute 4 for *x*: $k(4)+1=4-2 \Rightarrow 4k=1 \Rightarrow k=\frac{1}{4}$. So, (G) is the correct answer choice.

Since the point of intersection (4,2) is a shared point, it can therefore be used in either equation. So, another way to solve for *k* is to substitute (4,2) for *x* and *y* in the first equation: $2=k(4)+1=4k+1 \Rightarrow 4k=1 \Rightarrow k=\frac{1}{4}$.

TIP Alternatively, test each of the answer choices by substituting the provided values back into the equations:

    F. $2=-1(4)+1=-4+1=-3$ ✖

    G. $2=\frac{1}{4}(4)+1=1+1=2$ ✔

47. **(E)** *Mathematics/Coordinate Geometry/Slope of a Line* and *Geometry/Rectangles and Squares.* For this item, it is important to be familiar with the properties of a rectangle. The slope of the given line is $\frac{3}{4}$. A side that is adjacent to the side described by $y=\frac{3}{4}x-2$ must be perpendicular to that side; therefore, the line containing the adjacent side must have a slope that is the negative reciprocal of $\frac{3}{4}$, which is $-\frac{4}{3}$. So, (E) is the correct answer choice.

48. **(J)** *Mathematics/Arithmetic/Common Arithmetic Items/Properties of Numbers.* The factors of 30 are 1 and 30, 2 and 15, 3 and 10, and 5 and 6. So, (J) is the correct answer choice.

49. **(B)** *Mathematics/Geometry/Rectangles and Squares* and *Triangles/Working with Triangles.* If the rectangle is not the special case of a square, then $\triangle ABE$ is congruent to $\triangle CDE$ but not to $\triangle ADE$ or $\triangle BCE$. If the rectangle is the special case of a square, then $\overline{AC}$ and $\overline{BD}$ intersect at 90°, making $\triangle ADE$, $\triangle ABE$, $\triangle BCE$, and $\triangle CDE$ all congruent. Therefore, rectangle *ABCD* is a square *if and only if* $\triangle ABE$ is congruent to $\triangle ADE$. So, (B) is the correct answer choice.

50. **(H)** *Mathematics/Algebra/Solving Simultaneous Equations.* Set up a system of equations in which *x* represents the cost of 1 pencil and *y* represents the cost of 1 pen: $2x+y=0.55$ and $x+2y=0.95$. Then, manipulate the second equation in order to isolate *x*: $x+2y=0.95 \Rightarrow x=0.95-2y$. Now, substitute that value for *x* into the first equation and solve for *y*: $2(0.95-2y)+y=0.55 \Rightarrow 1.90-4y+y=0.55 \Rightarrow 3y=1.35 \Rightarrow y=0.45$. Finally, substi-

tute that value for y into the second equation and solve for x: $x + 2(0.45) = 0.95 \Rightarrow x = 0.05$. So, 1 pencil and 1 pen would cost $\$0.05 + \$0.45 = \$0.50$. Therefore, (H) is the correct answer choice.

51. **(A)** *Mathematics/Algebra/Manipulating Algebraic Expressions/Basic Algebraic Manipulations* and *Evaluating Expressions* and *Arithmetic/Common Arithmetic Items/Complex Numbers.* For this item, recognize the following pattern of four that appears within the series: $i + i^2 + i^3 + i^4 = i + (-1) + (-i) + 1 = 0$. So, the following pattern is also true: $i^5 + i^6 + i^7 + i^8 = i + (-1) + (-i) + 1 = 0$. Therefore, the sum of $i + i^2 + i^3 + \cdots + i^{48} = 12(i + i^2 + i^3 + i^4) = 12(0) = 0$. Now, according to the pattern, since $i^5 = i$, i^{49} must also equal i, and the sum of $i + i^2 + i^3 + \cdots + i^{49} = 0 + i = i$. So, (A) is the correct answer choice.

52. **(G)** *Mathematics/Trigonometry/Determining Trigonometric Values.* The values for the graph of the sine function are positive in the first and second quadrants ($0 < x < \pi$), and the values for the graph of the cosine function are negative in the second and third quadrants $\left(\dfrac{\pi}{2} < x < \dfrac{3\pi}{2}\right)$. Therefore, given the restrictions provided in the item stem, the possible values of x are $\dfrac{\pi}{2} < x < \pi$. So, (G) is the correct answer choice.

🅣🅘🅟 Alternatively, recognize that $\cos x$ is equal to the x-coordinate point on the unit circle, and $\sin x$ is equal to the y-coordinate point on the unit circle. Therefore, the points with y-coordinate greater than 0 and x-coordinate less than 0 are in quadrant II, which rotates from $\dfrac{\pi}{2}$ to π.

53. **(C)** *Mathematics/Geometry/Complex Figures* and *Circles* and *Rectangles and Squares.* The largest circle that can fit within a rectangle measuring 6 centimeters (width) by 8 centimeters (length) has a diameter of 6 centimeters and therefore a radius of 3 centimeters:
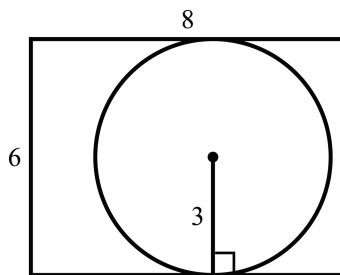
A circle with a radius of 3 centimeters has an area of $\pi(3)^2 = 9\pi$. So, (C) is the correct answer choice.

54. **(H)** *Mathematics/Geometry/Circles.* $\overset{\frown}{AB}$ measures $\dfrac{1}{12}$ of the circumference of the given circle. The circle has a radius of 6 inches, so its circumference measures $2\pi(6) = 12\pi$. Therefore, $\overset{\frown}{AB}$ measures $12\pi \cdot \dfrac{1}{12} = \pi$. So, (H) is the correct answer choice.

55. **(C)** *Mathematics/Geometry/Lines and Angles.* Given the definition of standard position, with the vertex at $(0,0)$, the graph could depict an angle of $40° + n360°$, which includes 40°, 400°, 760°, 1,120°, and −320° when n is equal to 0, 1, 2, 3, and −1, respectively. However, a 680° angle would be equivalent to a 320° angle, which (as the diagram below shows) is not equivalent to 40°.
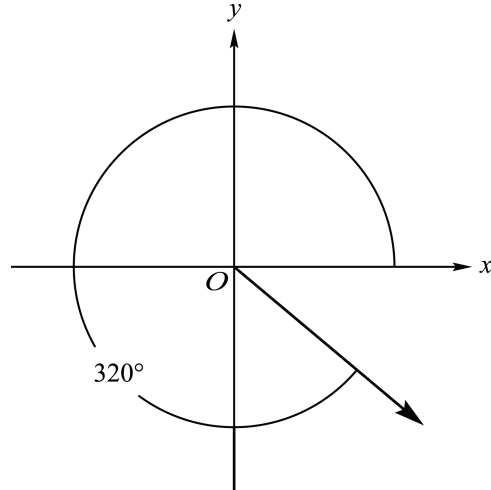
So, (C) is the correct answer choice.

56. (K) *Mathematics/Arithmetic/Solving Complicated Arithmetic Application Items* and *Algebra/Manipulating Algebraic Expressions/Creating Algebraic Expressions.* Determine the average speed of the plane by dividing the total distance traveled by the total time of the trip: $\text{speed} = \dfrac{\text{distance}}{\text{time}} \Rightarrow 350 = \dfrac{8x + 7(325)}{8 + 7} \Rightarrow 8x + 7(325) = 15(350)$. So, (K) is the correct answer choice.

57. (D) *Mathematics/Geometry/Complex Figures* and *Triangles/Pythagorean Theorem* and *Working with Triangles* and *Rectangles and Squares* and *Arithmetic/Common Arithmetic Items/Ratios.* Since $\overline{AB}$, $\overline{CD}$, and $\overline{EF}$ are parallel, *ABCD* and *CDEF* are trapezoids. So, the lengths of $\overline{BC}$ and $\overline{CF}$ must be determined in order to find the areas of these quadrilaterals. First, draw a horizontal line through point *D*, labeling the endpoints *J* and *K* and dividing the two quadrilaterals into a total of four figures:
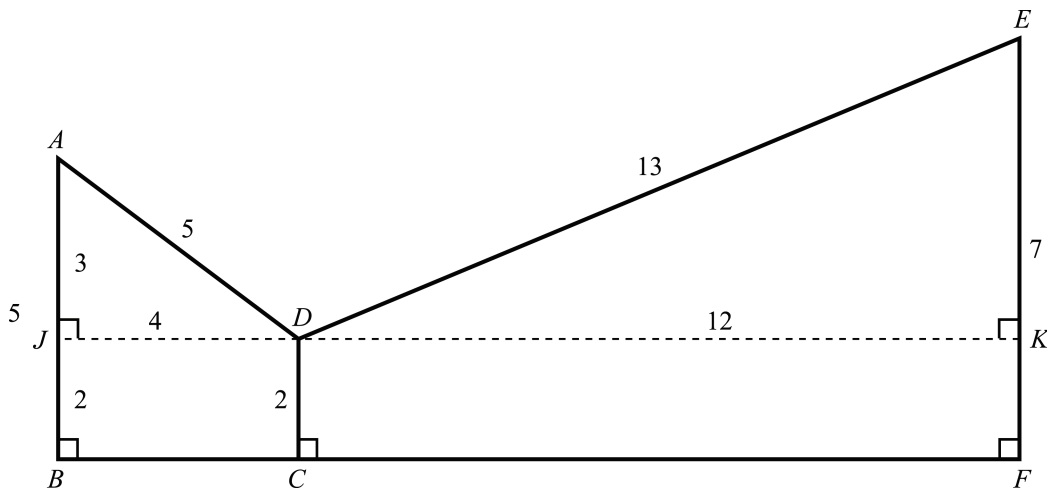
Then, use the Pythagorean theorem to find the lengths of $\overline{JD}$ and $\overline{DK}$. $\triangle ADJ$ is a 3-4-5 triangle, so $\overline{JD} = 4$, and $\triangle DEK$ is a 5-12-13 triangle, so $\overline{DK} = 12$. Now, find the areas of the two trapezoids by either one of two methods. Either use the appropriate formula for finding the area of a trapezoid: $\text{area}_{ABCD} = \dfrac{1}{2}(2+5) \cdot 4 = \dfrac{1}{2}(28) = 14$ and $\text{area}_{CDEF} = \dfrac{1}{2}(2+7) \cdot 12 = \dfrac{1}{2}(108) = 54$. Or, find the sum of the areas of the rectangle and right

triangle that form each trapezoid: $\text{area}_{JBCD} = (2)(4) = 8$ and $\text{area}_{\triangle AJD} = \frac{1}{2}(3)(4) = 6$, so $\text{area}_{ABCD} = 8+6 = 14$; and $\text{area}_{CDKF} = (2)(12) = 24$ and $\text{area}_{\triangle EDK} = \frac{1}{2}(5)(12) = 30$, so $\text{area}_{CDEF} = 24+30 = 54$. Then, find the ratio of the area of quadrilateral *ABCD* to quadrilateral *CDEF*: $\frac{\text{area}_{ABCD}}{\text{area}_{CDEF}} = \frac{14}{54} = \frac{7}{27} = 7:27$. So, (D) is the correct answer choice.

TIP Alternatively, use the "eliminate-and-guess" strategy. (A) can immediately be eliminated since quadrilateral *ABCD* is clearly not larger than quadrilateral *CDEF*. *ABCD* is actually less than half the size of *CDEF*. So, (B) and (C) can also be eliminated since each of these ratios is greater than $1:2$. As for (D) and (E), these ratios are equivalent to approximately $1:4$ and $1:5$, respectively. Since *ABCD* appears to be *approximately* one-fourth the size of *CDEF*, both (D) and (E) are reasonable answer choices. So, at this point, there would be a 50 percent chance of guessing correctly.

58. **(K)** *Mathematics/Geometry/Lines and Angles.* Remember that when two parallel lines are intersected by a transversal, two sets of angles result (big angles and little angles). All of the big angles are equal; all of the little angles are equal; and the sum of any big angle and any little angle is 180°. In this case, lines *p* and *q* are not parallel; if extended, they would intersect to the left of line *r*. Therefore, the sum of *a* and *b* must be greater than 180. So, (K) is the correct answer choice.

59. **(E)** *Mathematics/Coordinate Geometry/Graphs of Quadratic Relations* and *Algebra/Solving Quadratic Relations.* A circle with center $(2,-3)$ is represented by the equation $r^2 = (x-2)^2 + (y+3)^2$. Since the radius must remain constant, and the circle includes points $(1,a)$ and $(a,3)$, solve the equation:

$$(1-2)^2 + (a+3)^2 = (a-2)^2 + (3+3)^2$$
$$(-1)^2 + \left(a^2 + 6a + 9\right) = \left(a^2 - 4a + 4\right) + 6^2$$
$$1 + a^2 + 6a + 9 = a^2 - 4a + 4 + 36$$
$$a^2 + 6a + 10 = a^2 - 4a + 40$$
$$10a = 30$$
$$a = 3$$

60. (G) *Mathematics/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Equations Involving Absolute Value.* Since $|ax+b| = |bx+a|$, either:

1. $ax+b = bx+a$,
2. $ax+b = -(bx+a)$,
3. $-(ax+b) = bx+a$, or
4. $-(ax+b) = -(bx+a)$

However, cases (1) and (4) are the same, and cases (2) and (3) are the same. Therefore:

$ax+b = bx+a$ or $ax+b = -(bx+a)$
$ax-a = bx-b$ or $ax+a = -bx-b$
$a(x-1) = b(x-1)$ or $a(x+1) = -b(x+1)$

Since $a^2 \neq b^2$, the first possibility is a true statement only when $x=1$, and the second possibility is a true statement only when $x=-1$. So, (G) is the correct answer choice.

TIP Alternatively, eliminate answer choices by substituting values for a and b such that $a^2 \neq b^2$ (e.g., $a = 1$ and $b = 2$) and substituting the potential values for x to test for equality:

$$x = 1 : |1(1) + 2| = |2(1) + 1|$$
$$3 = 3 \qquad \checkmark$$

So, (H) and (K) can be eliminated.

$$x = -1 : |1(-1) + 2| = |2(-1) + 1|$$
$$|-1 + 2| = |-2 + 1|$$
$$|1| = |-1|$$
$$1 = 1 \qquad \checkmark$$

Since 1 and −1 are possible values for x, (F) can be eliminated. Now, test (J) by substituting a third value (any other real number) for x (e.g., $x = 2$):

$$|1(2) + 2| = |2(2) + 1|$$
$$|2 + 2| = |4 + 1|$$
$$4 \neq 5 \qquad ✗$$

So, by process of elimination, (G) must be the correct answer choice.

TEST 3: READING

1. **(A)** *Reading/Prose Fiction/Implied Idea.* It can be inferred from lines 52–59 that Miguel Chico had negative feelings about the situation since he "mumbled something noncommittal," felt the atmosphere to be "charged with…antagonism," and ultimately lost his appetite. Therefore, (B) and (C) can be eliminated since "gregarious" and "optimistic," respectively, are descriptions of positive feelings. As for (D), "depressed" is too drastic of a term to describe Miguel Chico's feelings in this scene. Therefore, (A) is the correct answer choice. Miguel Chico feels "uncomfortable" in the kitchen.

2. **(H)** *Reading/Prose Fiction/Implied Idea.* There is considerable tension between Josie and her mother, and this tension goes beyond what the author describes as the usual conflict between generations. In lines 75–76, Josie specifically says that she doubts that her mother will ever approve of anything that she does. So, (H) is the correct answer choice. As for (F), the desserts are symbolic of a more general underlying tension. (G) is wrong because it is a misreading of the passage. Finally, (J) is wrong because Josie does not want to live like Miguel Chico.

3. **(C)** *Reading/Prose Fiction/Application.* For this item, it is necessary to abstract from the relationship between Josie and her mother the essential character of their interaction and to apply that to a different situation. The most significant aspect of their relationship is the tension that they feel between each other. This tension is paralleled in Miguel Chico's relationship with his father (lines 77–85). So, (C) is the correct answer choice. As for the remaining answer choices, there is simply no information to suggest that any of these relationships support a similar conclusion.

4. **(H)** *Reading/Prose Fiction/Explicit Detail.* According to the second paragraph, Miguel Chico and Josie both enjoyed discussing movies. So, (H) is the correct answer choice. As for the remaining answer choices, there is no explicit information in the passage to support the idea that they shared any of these interests.

    TIP The phrase "according to the passage" indicates that this item is asking for an explicit detail (rather than an implied idea) that may be found in the passage.

5. **(D)** *Reading/Prose Fiction/Implied Idea.* Josie feels that Eduviges grants Miguel special privileges (lines 60–61) because she allows him to eat between meals (lines 47–48). So, (B) can be eliminated since it does not include Statement I. According to the second paragraph, Mama Chona considers Miguel Chico to be one of her "pets," so it can be safely assumed that Josie feels minimized in the context of her cousin. (A) and (C) can be eliminated since neither of these answer choices includes Statement III. Therefore, (D) is the correct answer choice.

    TIP The process of elimination (POE) is a powerful test-taking strategy and a useful way to reduce the time it takes to answer an item.

6. **(H)** *Reading/Prose Fiction/Main Idea.* The central focus of Passage I is the conflict between what Josie and Miguel Chico want as individuals and what is expected of them as members of a family and a community. Miguel Chico has one way of dealing with this conflict: he is ingratiating. Josie has a different approach: she is abrasive. So, (H) is the correct answer choice. As for (F), although both Josie and her mother pursue their own agendas, neither side is really callous. Similarly, (G) is wrong because the author does not suggest that anyone is ignorant or unintelligent. Finally, as for (J), there is conflict, but it is not caused by disinterest.

7. **(B)** *Reading/Prose Fiction/Implied Idea.* The passage does not specifically describe Eduviges's character; however, it can be inferred from the passage that she is "controlling" because she tells Josie and Miguel Chico what to do. Even though she grants Miguel Chico permission to eat between meals, she is still in control of the situation. So, (B) is the correct answer choice. As for (A), none of Eduviges's behavior in the passage indicates that she is nurturing. As for (C), she is not "disinterested" in Josie; in fact, she is quite interested since she is very controlling. Finally, as for (D), Eduviges's character would not be considered "charitable" because she is overly critical.

8. **(F)** *Reading/Prose Fiction/Implied Idea.* In lines 77–85, the author says that Miguel Chico would never speak to his father with such a harsh tone. Miguel Chico understands that it was a habit of the older generation to be less liberal with its praise of those family members who are most close to them. So, it can reasonably be inferred that Miguel Chico would feel "nervous" in his father's presence. Therefore, (F) is the correct answer choice. As for the remaining answer choices, these feelings have positive connotations and are therefore inaccurate in describing Miguel Chico's response to his father.

9. **(A)** *Reading/Prose Fiction/Implied Idea.* In lines 16–22, the author states that Josie considers herself to be an intelligent realist. So, "direct and honest" is the most accurate description of such a self-assessment. As for (B), Josie does not think of herself as popular. If anything, she probably recognizes that her cousin Miguel Chico is much more popular than she is with her family. As for (C), Josie does not consider herself to be a difficult person; instead, she prides herself on her straightforward attitude. Finally, as for (D), Josie does not think of herself as sympathetic or kindly; in line 13, she says that her family is so nice that it makes her sick.

10. **(J)** *Reading/Prose Fiction/Implied Idea.* As noted in the explanation for item #5 on this test, Josie feels that Miguel Chico is treated favorably. So, (H) can be eliminated. In lines 70–73, Josie says that she feels as though she is the sister of a perfect child and a saint, referring to Ofelia and Serena. So, (J) is the correct answer choice.

11. **(C)** *Reading/Social Science/Explicit Detail.* In lines 44–46, the author states that men agreed to extend property rights to women so that men could protect their assets from creditors. So, (C) is the correct answer choice. As for (A), any moral obligation to the rights of women was a by-product to their receiving these rights; it was not the primary reason that they were afforded property rights. As for (B) and (D), though these answer choices are related to ideas that are developed in the passage, they are not the primary reason why men granted property rights to women.

12. **(F)** *Reading/Social Science/Explicit Detail.* This item is a thought-reverser, as indicated by the word clue "EXCEPT." Therefore, three of the four rights *were* called for at the meeting in Seneca Falls. In the fourth paragraph, the author mentions divorce, education, and jobs but specifically says that the right to vote was not one of the goals of the movement at that time. So, (F) is the correct answer choice.

    🔟 The "EXCEPT" is a thought-reverser, and a thought-reverser turns the ordinary question inside-out. The correct answer is the one that is <u>NOT</u> mentioned in the passage. The three that are mentioned are wrong answers. You should always circle thought-reversers in your test booklet so that you don't overlook them.

13. **(D)** *Reading/Social Science/Explicit Detail.* In lines 13–14, the author states that the basic unit of political life at the time of the women's suffrage movement was the family. So, (D) is the correct answer choice.

14. **(F)** *Reading/Social Science/Vocabulary.* In each of the given line references (34, 36, and 52), the adjective "radical" is used to describe the nature of women's suffrage. Of all the rights granted to women, suffrage represented the most drastic concession, so "revolutionary or extreme" is the best definition for radical in this context. So, (F) is the correct answer choice. As for (G), while women's rights both required and represented change, suffrage, in and of itself, was not "changeable." As for (H), the demand for women's suffrage was publicly articulated. Finally, as for (J), while something that is "radical" may be "erratic and unpredictable," these ideas do not describe the term as it used in this context.

15. **(A)** *Reading/Social Science/Development.* In the first paragraph, the author states that by 1910 the women's suffrage movement was more than 60 years old, yet women had secured the right to vote in only four states. The author makes this point in order to show how little had been accomplished up to that point in time. So, (A) is the correct answer choice. As for (B), the author states that the movement was already 60 years old. As for (C), while this statement may be true, it is not a point that the author attempts to make in the first paragraph. Finally, as for (D), while this statement can certainly be inferred from the passage, the author's primary purpose is to emphasize how few states had secured the women's right to vote.

16. **(H)** *Reading/Social Science/Implied Idea.* Susan B. Anthony stated that the apathy of women was the greatest obstacle to securing the vote for women (lines 63–65), so it can reasonably be inferred that she found the movement to be almost self-defeating, which would cause great frustration. So, (H) is the correct answer choice. As for the remaining answer choices, these ideas are not completely unrelated to the passage; however, they all fail to accurately express the irony of the situation that is intended by the author of the passage.

17. **(B)** *Reading/Social Science/Explicit Detail.* According to the passage, the Seneca Falls Convention was held in 1848 (line 38), the Massachusetts referendum was held in 1895 (lines 55–58), and the General Federation of Women's Clubs endorsed suffrage in 1914 (lines 84–85). As to when the National American Woman Suffrage Association began, this information is not as explicitly stated as are the other dates. According to the first paragraph, the NAWSA was 20 years old in 1910 (lines 3–6), which means that it was formed in 1890 (approximately 40 years after the Seneca Falls Convention). So, (B) is the correct answer choice.

18. **(J)** *Reading/Social Science/Implied Idea.* According to the second paragraph, the women's suffrage movement represented, for most, a challenge to a bedrock principle of American society: the integrity of the family. This view regarded the family as the buffer between social anarchy and stability. By this line of reasoning, compromising the integrity of the family would mean that the source of social order would be at risk. So, (J) is the correct answer choice. As for (F), the author specifically notes in lines 32–35 that the demand for female suffrage was opposed by many Americans *despite* a tradition of individual rights. (G) is wrong because it is simply a misreading of the passage. Nothing in the passage suggests that extending women the right to vote would result in greater apathy. As stated in the explanation for item #16 on this test, apathy is mentioned by Susan B. Anthony in reference to the position of women toward enfranchisement. Finally, as for (H), men were prepared to grant important concessions (e.g., property rights and coeducation) to women, so equal political footing would not be the primary point of contention.

19. **(B)** *Reading/Social Science/Vocabulary.* In line 24, the author refers to a "crippling liability" that hampered the women's movement. Given the negative connotation of the adjective "crippling," it can be inferred that a "liability" is a disadvantage, or drawback. So, (B) is the correct answer choice.

20. **(H)** *Reading/Social Science/Main Idea.* The first five paragraphs of the passage primarily explain why the women's movement did not make much progress on the issue of the right to vote. In the final paragraph, however, the author says that changes taking place outside of the movement accelerated the rate of change and then she proceeds to describe these changes. In the last sentence of the passage, the author says that support for suffrage grew gradually. (H) best captures this idea of a slow development over time. As for (F), the goals were accomplished slowly, but the last paragraph stresses the role of organizations rather than individuals. As for (G), this idea echoes a minor point made in the third paragraph; however, it is not the main point of the passage. Finally, as for (J), progress was indeed "gradual," but defusing the challenge that women's suffrage would undermine the political order is not a reason for this progress that the author develops in the important final paragraph.

21. **(B)** *Reading/Humanities/Explicit Detail.* In this item stem, recognize the word clues "religion" and "support groups." These ideas are mentioned in the second half of the fourth paragraph, in which the author says that all of these institutions provide a communal life that counters isolation and alienation. So, (B) is the correct answer choice. As for the remaining answer choices, these ideas echo concepts that may be found in the passage, but they fail to answer the question that is being asked.

22. **(G)** *Reading/Humanities/Vocabulary.* In line 65, "engendered" is used in the context of a key word clue: "irony" (line 63). At this point in the passage, the author indicates a twist in reasoning: commercial television, which is a form of media that serves to threaten traditional values, is able to "engender," or produce, a type of television program (soap operas) that attempts to reinforce those same values. As for the remaining answer choices, each of these words has a negative connotation, suggesting that "engendered" means something opposite to what it actually means ("produced").

23. **(D)** *Reading/Humanities/Explicit Detail.* At the end of the fourth paragraph, the author specifically refers to the conflict between communal life and isolation and alienation. Then, in lines 59–60, the author refers to the tension between an individual life and communal life. Finally, in the last paragraph, the author elaborates upon this idea of conflict between the individual and the community. So, (D) is the correct answer choice. As with item #21 on this test, the wrong answer choices all echo themes that are developed in the passage but do not respond to the question that is being asked.

24. **(H)** *Reading/Humanities/Main Idea.* According to the author's analysis, soap operas present an idealized view of American life (line 78), which provides a counterbalance to society's real feelings of isolation and alienation. The author intends to emphasize that the soap opera is idealized, not realistic. So, (H) is the correct answer choice. As for (F), this idea is simply a misreading of the passage. Even if good is to be associated with the ideal and evil with the real, the daytime soap opera does not depict this dialectic inconsistently but instead functions as a balancing mechanism for two conflicting but real tendencies. As for (G), as stated above, the soap opera is idealized, not realistic. Finally, as for (J), the author does refer to soap opera communities that have existed for over 30 years (lines 38–39); however, while the idea that they will exist throughout the next several decades can be inferred from the passage, it is not relevant to the main point of the passage.

25. **(A)** *Reading/Humanities/Explicit Detail.* In the final paragraph, the author specifically states that loyalty is the most important feature of soap opera plots (lines 72–74). So, (A) is the correct answer choice. As for (B) and (C), in lines 74–75, the author allows that passion and ambition, respectively, are also features of soap opera plots. However, these features remain subordinate to loyalty and are ultimately overridden by the characters' loyalty to family and community. As for (D), the idea that idealism is the most important aspect of soap operas is a confusion of the external and internal points of view that are presented by the author. From an *internal* point of view, soap operas are tales about loyalty, ambition, and passion. From an *external*, or social critic's, point of view, however, soap operas are idealized depictions of the American identity.

26. **(H)** *Reading/Humanities/Implied Idea.* As already discussed in the explanation for item #22 on this test, the author suggests that an irony concerning soap operas is that the mass media, which itself threatens the values of family and community, is the source of soap operas, which are supposed to reinforce those values. So, (H) is the correct answer choice. As for (F), the author would most likely endorse this point, but it does not address the issue of irony. As for (G), the author does mention this point, and it does seem ironic that the small town has played a role in the commercialization of American society; however, this particular irony concerning soap operas is not addressed by the author. Finally, as for (J), just as with (F), the author may endorse this point, but it does not address the issue of irony.

27. **(B)** *Reading/Humanities/Implied Idea.* In the second paragraph, the author discusses different theories concerning soap operas, and in the first sentence of the third paragraph, she allows that these theories carry some measure of plausibility before proceeding to develop a different view. From these introductory remarks, it can reasonably be inferred that the author believes that no one theory had before accounted for the phenomenon of the soap opera. Researchers, therefore, would have been confused by the soap opera's popularity. So, (B) is the correct answer choice. As for the remaining answer choices, none of these adjectives provide good descriptions of the author's commentary on what might be referred to as the theory of the soap opera.

28. **(J)** *Reading/Humanities/Explicit Detail.* Recognize that the answer to this item is most likely located at the end of either a paragraph or the passage itself, as indicated by the word clue "inevitably." In the last paragraph, the author discusses the character dynamic in soap operas. In the last sentence of this paragraph, she states that all conflict is resolved at the end of a soap opera plot so that traditional family values may be reaffirmed. So, (J) is the correct answer choice.

29. **(C)** *Reading/Humanities/Explicit Detail.* In the fifth paragraph (lines 49–62), the author explains that American life has always been defined by the quest for individual success and that this success comes at the expense of the sense of family and community (individualism vs. community). So, (C) is the correct answer choice. As for (A) and (B), it is not new ideas as such that are in tension with the group but the need of the individual to establish

him/herself as an individual (though perhaps by means of such new cultural trends and technologies, respectively). Finally, as for (D), community values are not a threat to the American family.

30. **(J)** *Reading/Humanities/Explicit Detail.* In lines 41–42, the author specifically mentions mobility (relocation) and loss of extended family (smaller family units) as factors that have caused the constant transformation of American society. So, (J) is the correct answer choice. As for (F), mythically *stable* communities would not play a part in the constant *instability* of American society. As for (G) and (H), the author does not claim that either a search for or reaffirmation of the communal life is a factor that caused the ever-changing condition of American society.

31. **(D)** *Reading/Natural Science/Explicit Detail.* This item is a thought-reverser, as indicated by the word clue "NOT." Therefore, three of the four answer choices are true of flu vaccines. In the second paragraph, the author states that vaccines must continually be reformulated and that scientists must make their best efforts to anticipate the nature of the viral mutations before they occur. So, (A) and (B) can be eliminated. While the passage does not specifically measure the effectiveness of flu vaccines, it does indicate that they are somewhat effective, given their limitations. So, (C) can be eliminated. Therefore, (D) is the correct answer choice. The author does not say that vaccines can *prevent* flu pandemics. In fact, given the discussion of genetic drift and shift, it would seem that the occasional pandemic is inevitable.

    🔵 The "EXCEPT" is a thought-reverser, and a thought-reverser turns the ordinary question inside-out. The correct answer is the one that is <u>NOT</u> mentioned in the passage. The three that are mentioned are wrong answers. You should always circle thought-reversers in your test booklet so that you don't overlook them.

32. **(J)** *Reading/Natural Science/Implied Idea.* In the first sentence of the second paragraph, the author characterizes the polio and smallpox viruses as "more stable" than influenza viruses. So, (J) is the correct answer choice. As for (F), the discussion implies that all viruses *can* reproduce. As for (G), the author goes on to show that flu viruses can be very deadly. Finally, as for (J), there is no evidence in the passage to support this claim. In fact, the technical discussion in the second paragraph implies that viruses in general have surface proteins and that these proteins determine their infective qualities.

33. **(B)** *Reading/Natural Science/Explicit Detail.* In the second paragraph, the author states that decisions about vaccines for the following winter's flu season must be made in mid-February. Since winter begins in December, flu vaccines must therefore be formulated approximately 10 months ahead of time. So, (B) is the correct answer choice.

34. **(H)** *Reading/Natural Science/Implied Idea.* The passage compares three flu outbreaks, explaining that the Asian flu was less deadly than the Spanish flu and that the Hong Kong flu was less deadly than the Asian flu. So, it can reasonably be inferred that the Spanish flu pandemic was the most deadly of the three outbreaks. Therefore, (H) is the correct answer choice.

35. **(A)** *Reading/Natural Science/Vocabulary.* In the fourth paragraph, the author explains that the Hong Kong flu outbreak was the mildest of the three outbreaks and offers "partial immunity" as a possible explanation. In this context, therefore, "tempered" (line 46) must mean reduced or diminished. So, (A) is the correct answer choice. As for (B) and (C), these words suggest the opposite meaning. Finally, as for (D), "concealed" bears no relationship to "tempered" whatsoever.

36. **(F)** *Reading/Natural Science/Explicit Detail.* As stated in the explanation for item #31 on this test, the author states in the second paragraph that scientists must make their best efforts to anticipate the nature of viral mutations before they occur. In line 11, the author actually uses the phrase "best guess." So, (F) is the correct answer choice. As for the remaining answer choices, they might be used by scientists at some level (e.g., A scientist would take into account a history of flu viruses in making the educated guesses.); however, there is no explicit evidence in the passage to support any of these claims.

37. **(C)** *Reading/Natural Science/Explicit Detail.* In line 24, the author specifically states that the odds of creating an effective vaccine are "no better than 50–50." So, since a favorable outcome is neither highly unlikely nor guaranteed, (A), (B), and (D) can all be eliminated. Therefore, (C) is the correct answer choice.

38. **(G)** *Reading/Natural Science/Explicit Detail.* In the sixth paragraph, the author begins to explain the process of mutation regarding the influenza virus. In lines 48–52, the author notes that its genetic material is packaged as RNA, or ribonucleic acid. So, (G) is the correct answer choice. As for (F), the arrangement of genes of any given sort would be "normal," except when compared with some other arrangement. For example, the "normal genetic" makeup of the Spanish flu would mutate into the "abnormal" genetic makeup of the Asian flu, the "normal" genetic makeup of the Asian flu would mutate into the "abnormal" genetic makeup of the Hong Kong flu, and so on. As for (H), the passage goes on to describe drift and shift. Finally, as for (J), this statement is neither accurate nor responsive to the question that is being asked.

39. **(B)** *Reading/Natural Science/Explicit Detail.* In lines 85–86, the author states that reassortments capable of infecting human beings are quite rare. So, (B) is the correct answer choice. As for (A), the author states that genetic reassortment is common (lines 84–85). Finally, as for (C) and (D), these ideas are suggested by the author, but they are not responsive to the question that is being asked.

40. **(H)** *Reading/Natural Science/Implied Idea.* In the ninth paragraph, the author mentions the process of "shift" and explains this process in reference to genetic reassortment, which is discussed in the previous paragraph. This process of genetic reassortment depends upon segmentation. So, it can be reasonably inferred from the passage that the characteristic of segmentation makes antigenic shift possible. Therefore, (H) is the correct answer choice.

TEST 4: SCIENCE

Passage I

1. **(A)** *Science/Research Summary/Analysis.* The graph of the line in Figure 1 has a positive slope (moving upward from left to right), so as total annual precipitation increases, average discharge also increases. So, (A) is the correct answer choice. As for (B), such a relationship would be described by a line with a slope of zero (horizontal line). As for (C), such a relationship would be described by a line with a negative slope (moving downward from left to right). Finally, as for (D), such a relationship would be described by a line that first moves upward (from left to right) and then spikes downward.

   TIP When an item asks about a specific study, do not waste time rereading the entire passage. Simply locate the relevant information in the specific study. All the information you need to answer the item will be in that study.

2. **(F)** *Science/Research Summary/Analysis.* According to Table 1, Catchments A, B, and C have limestone bedrock, with erosion rates of 0.9, 1.9, and 2.7, respectively. Annual precipitation at those locations is 67.5, 142.5, and 202.0, respectively. A direct relationship exists between these two variables since they both increase; in such a case, the slope of the line is positive. So, (F) is the correct answer choice.

3. **(D)** *Science/Research Summary/Analysis.* According to Figure 1, when Catchment C has a total annual precipitation of approximately 200 cm, it has an average discharge of nearly 11 cubic meters per second. So, taking into consideration the apparent direct relationship between precipitation and discharge, if Catchment C received 300 cm of precipitation, it would most likely have an average discharge of *at least* 12 cubic meters per second. So, (D) is the correct answer choice.

4. **(J)** *Science/Research Summary/Analysis.* According to Table 2, Catchment C has the greatest level of precipitation but only a mid-range temperature, and Catchment H has the highest temperature but only a mid-range level of precipitation. In other words, there is no readily apparent relationship between the two variables. So, (J) is the correct answer choice. As for (F), (G), and (H), these statements describe a direct relationship, a constant relationship, and an inverse relationship, respectively.

5. **(B)** *Science/Research Summary/Application.* According to Table 1, all three of the limestone bedrock catchments have higher dissolved run off readings than they do solid run off readings, indicating that erosion of the limestone bedrock is most likely a chemical process. As for (A), this statement reverses the aforementioned relationship. As for (C) and (D), both quartzite catchments have higher solid run off readings than they do dissolved run off readings.

6. **(F)** *Science/Research Summary/Analysis.* The item stem suggests that the total annual precipitation in each of three hypothetical areas is much lower (25 cm) than that in Catchments A, B, and C (67.5 cm, 142.5 cm, and 202.0 cm, respectively). Based on that assumption, much less erosion would be expected—certainly less than 0.9 cm/1,000 yr as shown for Catchment A in Table 1. So, (F) is the correct answer choice. As for (G), the expected erosion rate would be less than 2 cm/1,000 yr. As for (H) and (J), since the erosion of limestone is most likely a chemical process rather than a mechanical process, the total annual precipitation would not be a factor.

Passage II

7. **(B)** *Science/Conflicting Viewpoints/Analysis.* The Hydrothermal Vent Hypothesis states that organic molecules formed in hydrothermal vents where the temperatures ranged from 700°C to 10°C. This hypothesis would be considerably strengthened by evidence that the chemical reactions that produce organic compounds do, in fact, occur in this temperature range. So, (B) is the correct answer choice.

8. **(G)** *Science/Conflicting Viewpoints/Comprehension.* According to both hypotheses (which really only differ in where they consider the organic molecules to have originated), the step that occurred after the formation of

organic molecules was the formation of polymers and then, later, of self-replicating cells. So, (G) is the correct answer choice.

9. **(B)** *Science/Conflicting Viewpoints/Comprehension.* Even though the two hypotheses propose different sources of origin for organic molecules (hydrothermal vents vs. outer space), they both agree that the subsequent stages took place in the ocean depths. So, (B) is the correct answer choice.

10. **(H)** *Science/Conflicting Viewpoints/Analysis.* The Outer Space Hypothesis argues that organic molecules were originally found in various objects in space and were then transported into the oceans on Earth. This idea assumes, of course, that the molecules arrived with space debris. So, (H) is the correct answer choice. As for (G), though the Outer Space Hypothesis assumes that there were oceans, it does not assume that oceans completely covered Earth.

11. **(A)** *Science/Conflicting Viewpoints/Analysis.* The Hydrothermal Vent Hypothesis assumes that organic molecules formed in the ocean depths. Therefore, if it was discovered that organic molecules pre-dated the oceans, this discovery would do serious damage to the Hydrothermal Vent Hypothesis. On the other hand, this discovery would not disprove the Outer Space Hypothesis since organic molecules may have fallen from outer space for a long period of time before some finally "took root" in newly formed oceans. So, (A) is the correct answer choice.

12. **(H)** *Science/Conflicting Viewpoints/Comprehension.* The first step after the formation of simple organic molecules was the formation of polymers. So, (H) is the correct answer choice.

13. **(C)** *Science/Conflicting Viewpoints/Application.* The Outer Space Hypothesis maintains that organic molecules came from a variety of possible sources in outer space. A new finding that more organic molecules were brought to Earth by interplanetary dust particles than by any other source (e.g., meteorites, comets, and asteroids) would not necessarily weaken the Outer Space Hypothesis; instead, it would simply support the generalization that most organic molecules were brought to Earth by interplanetary dust particles. So, (C) is the correct answer choice.

Passage III

14. **(G)** *Science/Data Representation/Comprehension.* According to the overview for Passage III, the top graph in each set shows the distance of the motorbike from the starting line versus elapsed time. At $t = 0$, Motorbikes 1 and 2 are at $d = 0$, so they are at the starting line. Motorbike 3, however, is already some distance from the starting line at $t = 0$. So, (G) is the correct answer choice.

15. **(D)** *Science/Data Representation/Comprehension.* Recognize that the three graphs in each set are simply different ways to describe the same observations. In Set 2, for example, the third graph shows positive acceleration followed by negative acceleration; the second graph shows an increase in velocity followed by a decrease in velocity; and the first graph shows an object covering distance faster and faster until it begins to slow, covering distance slower and slower until it finally stops. This pattern resembles the description of a car accelerating from a standstill and then slowing to a stop. So, (D) is the correct answer choice.

16. **(H)** *Science/Data Representation/Comprehension.* The third graph in Set 2 shows negative (below the line) acceleration from point B to point C, and the second graph in that same set shows that velocity decreases during that same period of time. So, (H) is the correct answer choice.

17. **(A)** *Science/Data Representation/Application.* This item stem provides a hypothetical situation. The important distinction that is made between the positive and negative velocities in this situation is the change in direction. (A) is the only answer choice that describes a situation in which there is a change in direction (A to B; B to A). As for (B), (C), and (D), they all describe situations in which there is no change in direction (a falling rock, a sandbag passed down a line of people, and a balloon floating to the ceiling, respectively), exhibiting motion in one direction.

18. **(J)** *Science/Data Representation/Analysis.* According to the third graph in Set 3, Motorbike 3 does not accelerate from point A to point B and again does not accelerate from point C to point D. However, the second

graph in Set 3 shows that Motorbike 3 has a positive velocity from point C to point D. The only reason that Motorbike 3 shows a zero velocity from point A to point B is because it has yet to start moving. So, (J) is the correct answer choice.

Passage IV

19. (D) *Science/Data Representation/Comprehension.* According to the third column in Table 1, iron (Fe) melts at 1,535°C, so it would have to be at least that hot to be in liquid form. So, (D) is the correct answer choice.

20. (J) *Science/Data Representation/Analysis.* In Table 1, the atomic number increases by 1 in each successive row, but the corresponding melting points show no recognizable pattern, increasing and decreasing seemingly at random. So, (J) is the correct answer choice.

21. (A) *Science/Data Representation/Comprehension.* According to the overview for Passage IV, the first ionization energy is the energy that removes one electron from the neutral atom to form a +1 ion. Therefore, the element with the LEAST amount of first ionization energy is the correct answer. $Sc = 631$; $Ti = 658$; $V = 650$; and $Cr = 652$. So, (A) is the correct answer choice.

22. (F) *Science/Data Representation/Analysis.* According to Table 1, each listed metal has an atomic radius that is greater than its ionic radius. For example, Cr has an atomic radius of 1.18 angstroms and an ionic radius of 0.87 angstroms. So, (F) is the correct answer choice.

23. (D) *Science/Data Representation/Application.* The item stem defines the second ionization energy as the energy needed to remove one electron from the +1 ion. Since the first ionization energy is the energy required to remove one electron from the neutral atom, the energy required to change the neutral Zn atom into its +2 ion will be the sum of its second ionization energy (1,733 kJ/mole) and first ionization energy (906 kJ/mole). So, (D) is the correct answer choice.

Passage V

24. (G) *Science/Data Representation/Comprehension.* In Figure 1, the percentage of seeds collected is indicated on the *y*-axis and the mass of a seed is indicated on the *x*-axis. Therefore, the tallest bars on the graph (along the *y*-axis) represent the largest percentage of seeds collected. The tallest bar on the graph represents a mass of approximately 0.8 mg, which falls between 0.6 mg and 1.0 mg. So, (G) is the correct answer choice.

25. (C) *Science/Data Representation/Analysis.* This item stem asks for the study site(s) whose data *disprove* the given hypothesis. According to Figure 2, in the greenhouse pots and the cleared meadow sites, seeds managed to grow despite their small size. Although they did not perform as well as the larger seeds, seeds under 0.5 mg were able to grow and produce plants at these sites. In the uncleared meadow site, however, the smaller seeds (≤ 0.6 mg) did not grow. So, (C) is the correct answer choice.

🅣 Taking a second to figure out what the item is asking can help you narrow down what information you need to review from the passage.

26. (H) *Science/Data Representation/Comprehension.* According to Figure 3, the average mass of the seeds produced by plants grown in the greenhouse from 2 mg parent seeds was slightly less than 2.5 mg. So, (H) is the correct answer choice.

27. (C) *Science/Data Representation/Analysis.* According to Figure 2, the mass of the plants was greatest for plants grown in the greenhouse pots (15 g to 34 g) and was smallest for plants grown in the uncleared meadow sites (0 g to 26 g). So, (C) is the correct answer choice. Notice that no seeds at all were produced by parent seeds that ranged from 0.1 mg to 0.6 mg in the uncleared meadow sites.

28. **(F)** *Science/Data Representation/Comprehension.* According to Figure 2, in the uncleared meadow sites, parent seeds with a mass of 0.9 mg would produce very little plant mass (approximately 2 g), but the plant would grow. According to Figure 3, those same parent seeds would produce no seeds at all. So, (F) is the correct answer choice.

Passage VI

29. **(A)** *Science/Research Summary/Comprehension.* This item stem essentially asks for the range of values along the *x*-axis in Figure 1 that corresponds to the highest value along the *y*-axis. According to Figure 1, the wavelength range of 440 nm to 460 nm would produce the greatest rate of photosynthesis (well above 100% of rate at 690 nm). So, (A) is the correct answer choice.

30. **(F)** *Science/Research Summary/Comprehension.* According to the explanatory material for Study 1, the bacteria that were added to the algae required oxygen for survival. The greater the amount of oxygen released by photosynthesizing algae, the greater the number of bacteria that clustered around the algae. So, (F) is the correct answer choice.

31. **(D)** *Science/Research Summary/Analysis.* None of the studies refer to the intensity of light. The studies do refer to color and wavelength; however, color and wavelength do not affect intensity. So, (D) is the correct answer choice.

32. **(G)** *Science/Research Summary/Analysis.* The item stem states that the color of a substance is the result of the light that it does NOT absorb. In other words, a blue object does not absorb blue light. In Figure 2, the dotted line represents carotenoids. Carotenoids absorb violet, blue, and green, but they do not absorb yellow and orange. As a result, carotenoids would appear yellow-orange. So, (G) is the correct answer choice.

33. **(D)** *Science/Research Summary/Analysis.* In Study 1, the bacteria were added to the photosynthesizing algae because they required oxygen for survival. The greater the amount of oxygen released by the algae, the greater the number of bacteria that clustered around the algae. So, the bacteria function as indicators of the oxygen released by photosynthesis. Since most of the bacteria were found around the region of algae exposed to the red and orange light, these colors are better at promoting photosynthesis than are the other colors of the spectrum. Note that the explanatory material for Study 1 also states that a smaller number of bacteria were found in the blue light region. So, (D) is the correct answer choice.

34. **(J)** *Science/Research Summary/Application.* The item stem states that the activities of living organisms are affected by temperature. In Studies 1 and 2, tests were performed on living organisms. In Study 3, however, a test was performed on solutions of photosynthetic pigments that were isolated from plant cells. Therefore, this study did not require living material. So, (J) is the correct answer choice.

Passage VII

35. **(D)** *Science/Research Summary/Comprehension.* According to the explanatory material for Experiment 2, the experiment consisted of first dissolving sections of *steel pipe* in *acid* and then adding an *oxidant* and diluting the resulting solutions in *water* to create *test solutions* for analysis. So, (D) is the correct answer choice.

36. **(G)** *Science/Research Summary/Comprehension.* According to the overview for Passage VII, the absorbance measured depends on the amount of MnO_4^- present in the solution. In Experiment 1, four solutions that were known to already contain MnO_4^- were treated only with acid. In Experiment 2, however, an oxidant was required to convert Mn^{+2} to MnO_4^- so that it could be compared to the standard solutions. So, (G) is the correct answer choice.

37. **(C)** *Science/Research Summary/Analysis.* According to the overview for Passage VII, solutions that contain MnO_4^- absorb light, and the absorbance measured depends on the amount of MnO_4^- present. Experiment I

shows a direct relationship between absorbance and MnO_4^- concentrations. If not enough oxidant were added in Experiment 2, not all of the Mn^{+2} would be converted to MnO_4^-, and less light would therefore be absorbed. So, (C) is the correct answer choice.

38. **(F)** ***Science/Research Summary/Comprehension.*** The greater the amount of MnO_4^- present, the more light absorbed. According to Table 1, Pipe A created the test solution with the highest level of adjusted absorbance (.850). Therefore, Pipe A had the highest content of Mn. So, (F) is the correct answer choice.

39. **(C)** ***Science/Research Summary/Comprehension.*** According to Table 1, Sample D (the test solution created from Pipe D) has an adjusted absorbance of 0.500. According to Figure 1, a 0.500 absorbance reading corresponds to a concentration of Mn that falls between 1 and 1.50. So, (C) is the correct answer choice.

40. **(J)** ***Science/Research Summary/Application.*** In order to determine the amount of the ion in a solution, it is necessary to use the correct wavelength of light. The item stem states that copper (Cu) forms a blue solution of Cu^{+2} ions when dissolved in acid and that blue solutions absorb light at 675 nm. Therefore, the spectrometer would be reset at 675 nm for both the standard solutions containing Cu^{+2} ions and the metal pipe test solution. So, (J) is the correct answer choice.