# SAT Prep, 2025 Edition
# Practice Test

The Princeton Review®



YOUR NAME: _____
(Print) Last First M.I.

SIGNATURE: _____ DATE: / /

HOME ADDRESS: _____
(Print) Number and Street

_____
City State Zip Code

PHONE NO.: _____
(Print)

DATE OF BIRTH: / /
(Print) Month / Day / Year

**For both the Reading and Writing and the Math, be sure to only fill in the bubbles for the version of Module 2 that you took. If you took the Easier Module 2, only fill in the answer in the Easier column. If you took the Harder Module 2, only fill in the answers in the Easier column.**

## Section 1: Module 1
### Reading and Writing

| | | | | |
|---|---|---|---|---|
| 1. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 2. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 3. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
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| 26. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 27. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |

## Section 1: Module 2 (Easier)
### Reading and Writing

| | | | | |
|---|---|---|---|---|
| 1. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 2. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 3. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
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| 8. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 9. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 10. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 11. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 12. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 13. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 14. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 15. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 16. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
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| 19. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 20. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 21. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 22. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
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| 26. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
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## Section 1: Module 2 (Harder)
### Reading and Writing

| | | | | |
|---|---|---|---|---|
| 1. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 2. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
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| 5. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 6. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 7. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
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| 14. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
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| 16. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 17. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 18. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 19. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 20. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 21. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 22. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
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| 26. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |
| 27. | Ⓐ | Ⓑ | Ⓒ | Ⓓ |

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# Practice Test



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## Section 2: Module 1 Math

1. (A) (B) (C) (D)
2. (A) (B) (C) (D)
3. (A) (B) (C) (D)
4. (A) (B) (C) (D)
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6. (A) (B) (C) (D)
7. (A) (B) (C) (D)
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19. (A) (B) (C) (D)
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21. _____
22. (A) (B) (C) (D)

## Section 2: Module 2 (Easier) Math

1. _____
2. (A) (B) (C) (D)
3. (A) (B) (C) (D)
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5. _____
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7. (A) (B) (C) (D)
8. _____
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10. (A) (B) (C) (D)
11. (A) (B) (C) (D)
12. (A) (B) (C) (D)
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15. (A) (B) (C) (D)
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19. (A) (B) (C) (D)
20. (A) (B) (C) (D)
21. (A) (B) (C) (D)
22. (A) (B) (C) (D)

## Section 2: Module 2 (Harder) Math

1. (A) (B) (C) (D)
2. (A) (B) (C) (D)
3. (A) (B) (C) (D)
4. (A) (B) (C) (D)
5. (A) (B) (C) (D)
6. (A) (B) (C) (D)
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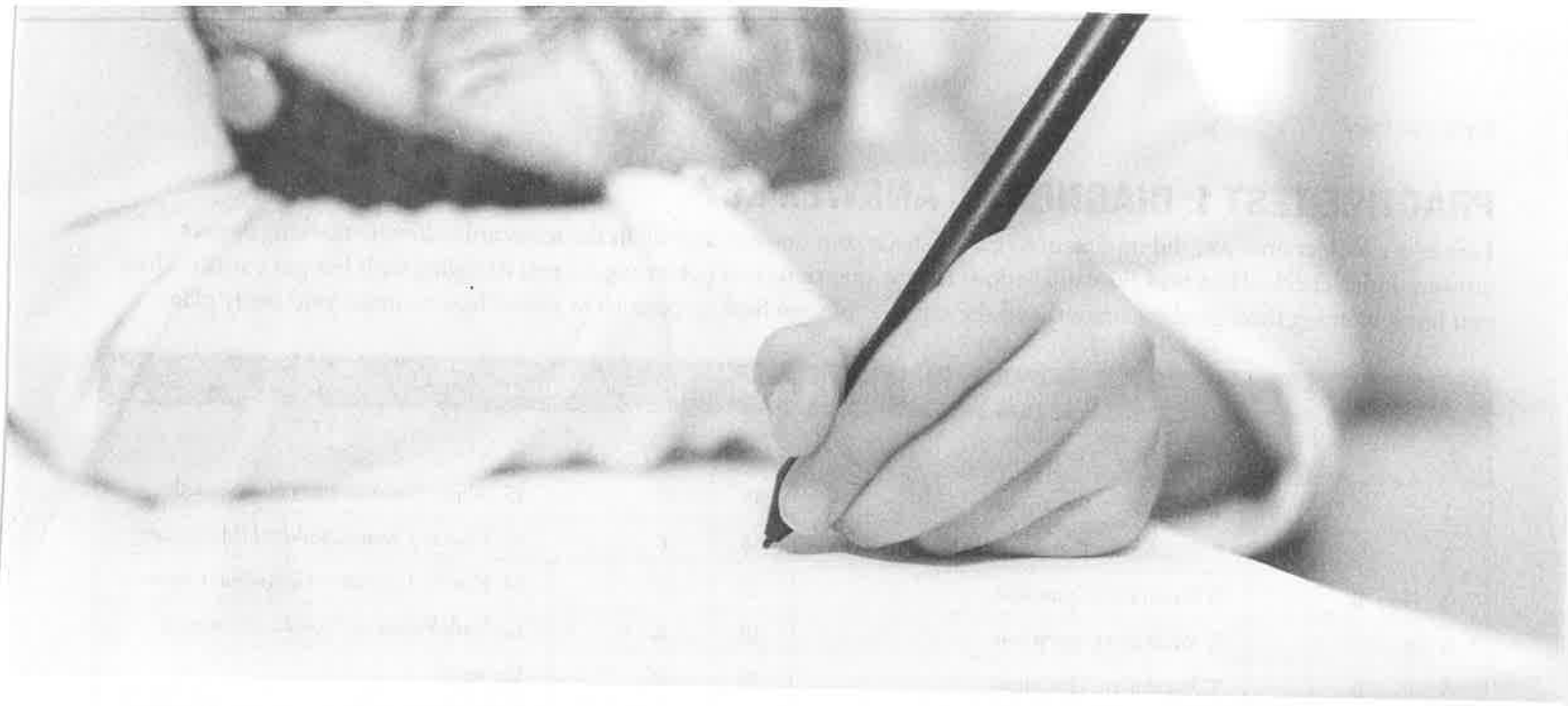
21. (A) (B) (C) (D)
22. (A) (B) (C) (D)



# Chapter 3
# Practice Test 1: Diagnostic Answer Key and Explanations

# PRACTICE TEST 1: DIAGNOSTIC ANSWER KEY

Let's take a look at how you did on Practice Test 1. Check your answers and fill in the scorecard below by marking correct answers with a check. Then read the explanations for any questions you got wrong, or you struggled with but got correct. Once you finish working through the scorecard and the explanations, go back to page 10 to review how to make your study plan.

| Reading and Writing Comprehension—Module 1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Q # | Ans. | ✔ | Chap. # Section | Q # | Ans. | ✔ | Chap. # Section |
| 1 | C | | 7, Vocabulary Questions | 15 | C | | 15, Where Punctuation is Not Needed |
| 2 | C | | 7, Vocabulary Questions | 16 | B | | 14, How to Connect Independent Clauses |
| 3 | B | | 7, Vocabulary Questions | 17 | C | | 14, How to Connect Independent Clauses |
| 4 | C | | 7, Vocabulary Questions | 18 | A | | 12, Verb Forms in Complete Sentences |
| 5 | B | | 7, Vocabulary Questions | 19 | D | | 16, Verbs |
| 6 | A | | 7, Vocabulary Questions | 20 | A | | 13, Extra! Extra! Put Punctuation Around It! |
| 7 | B | | 8, Retrieval Questions | 21 | C | | 17, Transition Questions |
| 8 | B | | 8, Main Idea Questions | 22 | A | | 17, Rhetorical Synthesis Questions |
| 9 | A | | 8, Main Idea Questions | 23 | D | | 17, Rhetorical Synthesis Questions |
| 10 | C | | 8, Claims Questions | 24 | D | | 17, Rhetorical Synthesis Questions |
| 11 | D | | 8, Charts Questions | 25 | B | | 17, Rhetorical Synthesis Questions |
| 12 | C | | 8, Conclusions | 26 | D | | 17, Rhetorical Synthesis Questions |
| 13 | C | | 8, Conclusions | 27 | A | | 17, Rhetorical Synthesis Questions |
| 14 | C | | 16, Nouns | | | | |

| Reading and Writing Comprehension—Module 2: Easier | | | | | | | |
|---|---|---|---|---|---|---|---|
| Q # | Ans. | ✔ | Chap. # Section | Q # | Ans. | ✔ | Chap. # Section |
| 1 | A | | 7, Vocabulary Questions | 15 | A | | 8, Conclusions |
| 2 | A | | 7, Vocabulary Questions | 16 | D | | 8, Conclusions |
| 3 | B | | 7, Vocabulary Questions | 17 | B | | 15, Where Punctuation is Not Needed |
| 4 | B | | 7, Vocabulary Questions | 18 | C | | 12, Verb Forms in Complete Sentences |
| 5 | C | | 7, Vocabulary Questions | 19 | D | | 16, Nouns |
| 6 | D | | 7, Vocabulary Questions | 20 | B | | 12, Verb Forms in Complete Sentences |
| 7 | D | | 7, Purpose Questions | 21 | A | | 15, Dependent Clauses |
| 8 | B | | 7, Purpose Questions | 22 | C | | 16, Pronouns |
| 9 | D | | 7, Dual Texts Questions | 23 | A | | 16, Verbs |
| 10 | B | | 8, Charts Questions | 24 | D | | 17, Transition Questions |
| 11 | D | | 8, Claims Questions | 25 | C | | 17, Transition Questions |
| 12 | B | | 8, Claims Questions | 26 | B | | 17, Transition Questions |
| 13 | A | | 8, Charts Questions | 27 | C | | 17, Rhetorical Synthesis Questions |
| 14 | B | | 8, Claims Questions | | | | |

| Reading and Writing Comprehension—Module 2: Harder | | | | | | | |
|---|---|---|---|---|---|---|---|
| Q # | Ans. | ✔ | Chap. # Section | Q # | Ans. | ✔ | Chap. # Section |
| 1 | A | | 7, Vocabulary Questions | 15 | A | | 8, Conclusions |
| 2 | C | | 7, Vocabulary Questions | 16 | B | | 8, Conclusions |
| 3 | D | | 7, Vocabulary Questions | 17 | D | | 16, Verbs |
| 4 | D | | 7, Vocabulary Questions | 18 | A | | 14, Punctuation with Transitions |
| 5 | A | | 7, Purpose Questions | 19 | B | | 16, Verbs |
| 6 | B | | 7, Purpose Questions | 20 | C | | 14, How to Connect Independent Clauses |
| 7 | B | | 7, Purpose Questions | 21 | D | | 14, How to Connect Independent Clauses |
| 8 | D | | 7, Purpose Questions | 22 | A | | 15, Punctuating Lists |
| 9 | C | | 7, Dual Texts | 23 | B | | 13, Who or What Are You Talking About? |
| 10 | D | | 8, Charts Questions | 24 | A | | 17, Transition Questions |
| 11 | D | | 8, Claims Questions | 25 | D | | 17, Transition Questions |
| 12 | A | | 8, Charts Questions | 26 | B | | 17, Transition Questions |
| 13 | D | | 8, Claims Questions | 27 | A | | 17, Rhetorical Synthesis Questions |
| 14 | C | | 8, Claims Questions | | | | |

| Math—Module 1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Q # | Ans. | ✔ | Chap. # Section | Q # | Ans. | ✔ | Chap. # Section |
| 1 | C | | **24**, Averages | 12 | D | | **21**, Fundamentals of Digital SAT Algebra |
| 2 | B | | **21**, Solving for Expressions | 13 | A | | **21**, Growth and Decay |
| 3 | B | | **24**, Averages | 14 | D | | **22**, Plugging In the Answers (PITA) |
| 4 | A | | **25**, Triangles | 15 | A | | **20**, Exponents and Square Roots |
| 5 | 200 | | **21**, Digital SAT Algebra: Cracking the System | 16 | C | | **23**, The Coordinate Plane |
| 6 | B | | **21**, Solving Systems of Equations | 17 | D | | **21**, Solving Systems of Equations |
| 7 | D | | **23**, Function Fundamentals | 18 | C | | **22**, Plugging In Your Own Numbers |
| 8 | A | | **25**, Triangles | 19 | B | | **22**, Plugging In Your Own Numbers |
| 9 | 7 or –7 | | **21**, When Values are Absolute | 20 | A | | **21**, Writing Your Own Equations |
| 10 | 5 | | **23**, Function Fundamentals | 21 | –0.4 or –2/5 | | **23**, The Coordinate Plane |
| 11 | –11 | | **21**, Simplifying Expressions | 22 | A | | **25**, Triangles |

| Math—Module 2: Easier | | | | | | | |
|---|---|---|---|---|---|---|---|
| Q # | Ans. | ✔ | Chap. # Section | Q # | Ans. | ✔ | Chap. # Section |
| 1 | 8400 | | **24**, Rates | 12 | B | | **25**, Lines and Angles |
| 2 | A | | **21**, Solving for Expressions | 13 | C | | **23**, Equations of a Line |
| 3 | D | | **24**, Percentages | 14 | D | | **24**, Averages, What is a Range? |
| 4 | 61 | | **23**, Function Fundamentals | 15 | D | | **22**, Meaning In Context |
| 5 | 50 | | **20**, How to Read Charts and Graphs | 16 | D | | **22**, Plugging In the Answers (PITA) |
| 6 | –5 | | **23**, The Coordinate Plane | 17 | C | | **21**, Solving Systems of Equations |
| 7 | B | | **21**, Simplifying Expressions | 18 | A | | **23**, The Coordinate Plane |
| 8 | 208 | | **25**, Rectangles and Squares | 19 | A | | **23**, Equations of a Line |
| 9 | B | | **23**, The Coordinate Plane | 20 | B | | **21**, Solving Quadratic Equations |
| 10 | D | | **24**, Probability | 21 | B | | **22**, Plugging In the Answers (PITA) |
| 11 | A | | **23**, Function Fundamentals | 22 | C | | **23**, Equation of a Circle |

| Math—Module 2: Harder | | | | | | | |
|---|---|---|---|---|---|---|---|
| Q # | Ans. | ✔ | Chap. # Section | Q # | Ans. | ✔ | Chap. # Section |
| 1 | C | | **21**, Writing Your Own Equations | 12 | B | | **21**, Growth and Decay |
| 2 | D | | **23**, Equations of a Line | 13 | 13 | | **24**, Averages |
| 3 | B | | **24**, Percentages | 14 | A | | **21**, Simplifying Expressions |
| 4 | C | | **23**, Function Fundamentals | 15 | 108 | | **21**, Solving Quadratic Equations |
| 5 | D | | **22**, Plugging In the Answers (PITA) | 16 | D | | **24**, Averages, What is a Range? |
| 6 | B | | **23**, The Coordinate Plane | 17 | A | | **23**, Graphing Functions |
| 7 | A | | **23**, Parallel and Perpendicular Lines | 18 | –50/4 or –12.5 | | **21**, Solving Quadratic Equations |
| 8 | C | | **25**, Volume | 19 | 1 | | **23**, Equation of a Circle |
| 9 | B | | **25**, Lines and Angles | 20 | B | | **21**, Solving Quadratic Equations |
| 10 | –35/63, –5/9, –0.555, –0.556, –.5555, or –.5556 | | **21**, Fundamentals of Digital SAT Algebra | 21 | A | | **23**, Equations of a Parabola |
| 11 | 837 | | **24**, Percentages | 22 | C | | **22**, Plugging In the Answers (PITA) |

# PRACTICE TEST 1—READING AND WRITING EXPLANATIONS

## Module 1

1. **C** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing word describes Despommier's attitude toward his promotion of vertical farming, so look for and highlight clues in the passage about this attitude. The passage mentions *Despommier's persistence and dedication to the cause*, so a good word to enter into the annotation box would be "determined" or "steadfast."

   - (A), (B), and (D) are wrong because *menacing, subdued*, and *misunderstood* are the **Opposite** tone of "determined," which is positive.
   - (C) is correct because *resolute* (firm) matches "determined."

2. **C** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing word describes what action the fishermen take toward traditional fishing methods and modern technology, so look for and highlight clues in the passage where both of these ideas show up. The passage states that the fishermen *use motorized boats and GPS tracking...while still applying age-old knowledge of tides, weather patterns, and fish migratory patterns*, so a good phrase to enter into the annotation box would be "use together" or "use both."

   - (A) and (D) are wrong because *belittle* (put down or criticize) and *replace* are the **Opposite** tone and meaning, respectively, of using the traditional fishing methods and modern technology "together."
   - (B) is wrong because *contemplate* (think about) doesn't match "use together."
   - (C) is correct because *integrate* matches "use together."

3. **B** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing word describes the character's lives, so look for and highlight clues in the passage about their lives. The passage states that each character's story has *truncated yet rich and unique life experiences and histories*, so a good word to enter into the annotation box would be "active" or "interesting."

   - (A) and (D) are wrong because *meaningless* and *shattered* are the **Opposite** tone of "active," which is positive.
   - (B) is correct because *dynamic* matches "active."
   - (C) is wrong because *benign* (nonthreatening) doesn't match "active."

4. **C** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing word describes the organisms, or plants, so look for and highlight clues in the passage about the plants. The passage states that the common perception is that plants *simply respond to their environment*, so a good phrase to enter into the annotation box would be "not active" or "idle."

   - (A), (B), and (D) are wrong because *courageous* (brave), *assertive* (confident), and *adaptable* don't match "not active."
   - (C) is correct because *passive* matches "not active."

5. **B** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing word describes what economists say regarding a commonly held belief, so look for and highlight clues in the passage about this belief. The passage states that *working from home can actually increase productivity and work satisfaction*, which goes against the *commonly held belief that remote work leads to decreased productivity*. Based on this interaction, a good word to enter into the annotation box would be "challenged" or "argued against."

   - (A) and (D) are wrong because *muddied* (confused) and *articulated* (expressed) don't match "challenged."
   - (B) is correct because *questioned* matches "challenged."
   - (C) is wrong because *usurped* (taken over) is the **Opposite** of what happens in the passage—the economists have not taken over the belief as their own; they have a problem with the belief.

6. **A** This is a Vocabulary question, as it asks for what "trying" *most nearly* means in the text. Treat "trying" as if it were a missing or unknown word in the passage. This word describes the effect that the professor's glasses have on his eyes, so look for and highlight clues in the passage about those glasses. The professor states that *these new glasses don't suit me*, so a good word to enter into the annotation box would be "tiring" or "bothersome."

   - (A) is correct because *taxing* (exhausting) matches "tiring."
   - (B) and (D) are wrong because *attempting* and *sampling* go **Beyond the Text**—each is a common definition for *trying* that does not mean "tiring."
   - (C) is wrong because *soothing* is the **Opposite** tone of "tiring," which is negative.

7. **B** This is a Retrieval question, as it asks for a detail *according to the text*. Look for and highlight information in the passage regarding why neural dust would *help researchers more than other types of probes*. The passage states that *Because the dust is biocompatible, it does not damage brain tissue*, and *because it is wireless, it can be used to monitor the brain…without the need for bulky external equipment*. The correct answer should be as consistent as possible with these statements.

   - (A) and (D) are wrong because neither the size of *other probes* nor *electrical current* is discussed in the passage, only the size of *neural dust*.

- (B) is correct because it's consistent with the advantages of neural dust stated in the passage.
- (C) is wrong because it's **Recycled Language**—*monitoring*, *time*, and *brain tissue* are misused from different parts of the passage.

8. **B** This is a Main Idea question, as it asks for the *main idea of the text*. Look for and highlight information that can help understand the main idea. The last sentence of the passage states that *While modernization has impacted the role of the Tohunga...they remain a crucial source of guidance and guardians of cultural heritage*. Since the other sentences expand upon these roles, the last sentence serves as a main idea. The correct answer should be as consistent as possible with the last sentence.
   - (A), (C), and (D) are wrong because they each go **Beyond the Text**—the passage doesn't state how *contemporary society* feels about the Tohunga, what the Tohunga think about *technological advancements*, or that *Tohunga traditions are passed down from to generation*. Each of these is a logical but unsupported assumption.
   - (B) is correct because it's consistent with the main idea of the passage—it paraphrases everything that's said in the last sentence of the passage.

9. **A** This is a Main Idea question, as it asks for the *main idea of the text*. Look for and highlight information that can help understand the main idea. The last sentence of the passage states that *Alleyne had known every brother well, but this was a face that was new to him*. Since the other sentences expand upon Alleyne's knowledge of the order or the surprise the new face poses, the last sentence serves as a main idea. The correct answer should be as consistent as possible with the last sentence.
   - (A) is correct because it's consistent with the main idea of the passage—it paraphrases everything that is said in the last sentence of the passage.
   - (B) is wrong because it goes **Beyond the Text**—the passage does not explain if Alleyne became *more* or less *suspicious* of others in the future because of his encounter with the stranger.
   - (C) is wrong because it's **Extreme Language**—it's not stated that Alleyne *only* trusts men who wear the order's outfit.
   - (D) is wrong because it's **Recycled Language**—*perplexed* and *the order* are misused from different parts of the passage.

10. **C** This is a Claims question, as it asks which choice *most effectively illustrates the claim*. Look for and highlight the claim in the passage, which is that *Tan suggests that upon smelling fragrant aromas, she felt an intuitive and sometimes unexpected sense of cultural recognition*. The correct answer should address and be consistent with each aspect of this claim.
   - (A), (B), and (D) are wrong because they're each **Half-Right**—while each answer makes some reference to the character's food or culture, none of them discuss any *aromas*, or smells.

- (C) is correct because it's consistent with the claim—it references both *aromas* and the *sense of cultural recognition.*

11. **D** This is a Charts question, as it asks for *data from the graph* that will *complete the example.* Read the title, key, and variables from the bar graph. Then, read the passage and highlight the claim or argument that references the information from the graph. The last sentence states that *the percentage of women serving in parliaments was found to be especially prominent.* The correct answer should offer accurate information from the graph evidence in support of this claim.

    - (A) and (B) are wrong because they're the **Opposite** of the information presented in the graph—the percentage of women that serve in the lower chambers of Rwanda, Senegal, Namibia, and Ethiopia are not *relatively equal*, and neither of the two chambers in Ethiopia contain more than 50% women.

    - (C) is wrong because it's **Half-Right**—it's consistent with the graph but irrelevant to the claim, as neither chamber in South Africa has a percentage of women at or above 50%, which would be better support of the percentage of women being *prominent*, or notable.

    - (D) is correct because it's consistent with the graph and the claim—since women make up the majority of seats in the lower chamber of Rwanda, that would be an instance of the percentage of women in a parliament being *especially prominent.*

12. **C** This is a Conclusions question, as it asks for what *most logically completes the text.* Look for and highlight the main focus of the passage, which is that *Mary Shelley's novel Frankenstein was deeply influenced by her marriage to Percy Shelley.* Then, highlight the main point made regarding this focus, which is that *Percy's beliefs may have inspired Mary's exploration...but Frankenstein stands on its own as a work of literary genius.* Therefore, *those who ascribe Percy's influence as the primary motivation for Frankenstein* may be focusing too narrowly only one of the novel's influences. The correct answer should be as consistent as possible with this conclusion.

    - (A) is wrong because it's **Extreme Language**—the passage doesn't state that anyone is viewing the Shelley's relationship through *too personal* of a lens.

    - (B) is wrong because no *other individuals* are implied by the passage to have influenced Frankenstein.

    - (C) is correct because it's consistent with the point made in the second sentence that *Frankenstein stands on its own* despite Percy's influence, which implies there was more to the creation of the novel than just Percy's influence.

    - (D) is wrong because it goes **Beyond the Text**—the view *those* from the last sentence would take is only toward *Frankenstein*'s creation, not *Percy and Mary Shelley's relationship* as a whole.

13. **C** This is a Conclusions question, as it asks for what *most logically completes the text.* Look for and highlight the main focus of the passage, which is that *The purpose of Stonehenge…has long been debated by archaeologists.* Then, highlight the main point made regarding this focus, which is *Stonehenge's design and construction span different time periods, suggesting shifting scientific, religious, ceremonial,* and *social functions depending on the era.* Therefore, the debate regarding Stonehenge's original purpose has yet to be resolved. The correct answer should be as consistent as possible with this conclusion.

- (A) and (B) are wrong because they each go **Beyond the Text** for being too specific or too broad of a conclusion—it's not stated in the passage whether Stonehenge exists in a *central location* or not, and only Stonehenge is discussed, not *different types of monuments.*
- (C) is correct because it's consistent with what the highlighted sentences say about the purpose of Stonehenge.
- (D) is wrong because it's **Recycled Language**—the passage mentions *religious* and *ceremonial* purposes as well as *astronomy,* but it never compares which of these purposes is more useful.

14. **C** In this Rules question, apostrophes with nouns are changing in the answer choices. Determine whether each word possesses anything. The flies possess the movements, but the movements don't possess anything. Eliminate any answer that doesn't match this.

- (A) is wrong because *flies* should have an apostrophe.
- (B) and (D) are wrong because *movements* shouldn't be possessive.
- (C) is correct because *flies* is possessive and *movements* is not.

15. **C** In this Rules question, punctuation is changing in the answer choices. The main meaning of the sentence is *Doris Salcedo created her art installations.* The answer choice comes between the subject and the verb, and there is no other punctuation. A single punctuation mark can't separate a subject and a verb, so eliminate answers with punctuation.

- (A), (B), and (D) are wrong because a single punctuation mark can't come between a subject and a verb.
- (C) is correct because no punctuation should be used here.

16. **B** In this Rules question, punctuation is changing in the answer choices. Look for independent clauses. The first part of the sentence says *The National Day of Listening…is a day encouraging Americans to record the stories of their loved ones,* which is an independent clause. The second part says *people interested in participating can access resources and recommendations about the interview process through the StoryCorps website or app,* which is also an independent clause. Eliminate any answer that can't correctly connect two independent clauses.

- (A) is wrong because a comma without a coordinating conjunction (FANBOYS) can't connect two independent clauses.

- (B) is correct because a semicolon can connect two independent clauses.
- (C) is wrong because some type of punctuation is needed in order to connect two independent clauses.
- (D) is wrong because a coordinating conjunction (*and*) without a comma can't link two independent clauses.

17. **C** In this Rules question, punctuation is changing in the answer choices. Look for independent clauses. The first part of the sentence says *Frederick Catherwood joined an expedition to Central America, where he saw over forty sites full of ruins*, which is an independent clause. The second part says *by creating detailed drawings and paintings of the ruins, Catherwood helped to reintroduce the Mayan civilization to the Western world*, which is also an independent clause. Eliminate any answer that can't correctly connect two independent clauses.

- (A) is wrong because some type of punctuation is needed in order to connect two independent clauses.
- (B) is wrong because a comma without a coordinating conjunction (FANBOYS) can't connect two independent clauses.
- (C) is correct because the period makes each independent clause its own sentence, which is fine.
- (D) is wrong because a coordinating conjunction (*and*) without a comma can't link two independent clauses.

18. **A** In this Rules question, verb forms are changing in the answer choices, so it's testing sentence structure. The subject of the sentence is *analysis*, and there is no main verb, so the answer must provide the main verb. Eliminate any answer that isn't in the correct form to be the main verb.

- (A) is correct because it's in the right form to be the main verb.
- (B) and (C) are wrong because a "to" verb can't be the main verb in a sentence.
- (D) is wrong because an *-ing* verb can't be the main verb in a sentence.

19. **D** In this Rules question, verbs are changing in the answer choices, so it's testing consistency with verbs. Find and highlight the subject, *buildings and the living quarters*, which is plural, so a plural verb is needed. Write an annotation saying "plural." Eliminate any answer that is not plural.

- (A), (B), and (C) are wrong because they are singular.
- (D) is correct because it's plural.

20. **A** In this Rules question, punctuation is changing in the answer choices. The main meaning of the sentence is *American physicists determined that neutrinos...exist.* The phrase *subatomic particles that have no electric charge, very small mass, and a spin of one-half* is Extra Information. It should therefore be set off with matching punctuation before and after. Eliminate answers that do not have matching punctuation before and after the Extra Information.

- (A) is correct because it uses a long dash before and after the Extra Information.
- (B) is wrong because there is no reason to use a colon after *have.*
- (C) and (D) are wrong because they don't use matching punctuation both before and after the Extra Information.

21. **C** This is a transition question, so follow the basic approach. Highlight ideas that relate to each other. The preceding sentence states that *This case overruled another important case...which mandated the loss of citizenship,* and this sentence gives additional information about the *important case* from the previous sentence. These ideas agree, so a same-direction transition is needed. Make an annotation that says "agree." Eliminate any answer that doesn't match.

- (A) and (B) are wrong because they are opposite-direction transitions.
- (C) is correct because this sentence provides additional information on the implications of the case.
- (D) is wrong because this sentence isn't an example.

22. **A** This is a Rhetorical Synthesis question, so follow the basic approach. Highlight the goal(s) stated in the question: *present the study and its findings.* Eliminate any answer that doesn't fulfill this purpose.

- (A) is correct because it describes the study and reveals what the scientists determined (the *findings*).
- (B), (C), and (D) are wrong because they don't present the *findings* of the study.

23. **D** This is a Rhetorical Synthesis question, so follow the basic approach. Highlight the goal(s) stated in the question: *introduce the composition The Creation to an audience already familiar with Franz Joseph Haydn.* Eliminate any answer that doesn't *introduce the composition The Creation* in a way that assumes the audience is *familiar with Franz Joseph Haydn.*

- (A), (B), and (C) are wrong because they don't *introduce the composition.*
- (D) is correct because it introduces *the composition The Creation* and doesn't explain the background of Haydn since the audience is familiar with him.

24. **D** This is a Rhetorical Synthesis question, so follow the basic approach. Highlight the goal(s) stated in the question: *emphasize a similarity between the two elements.* Eliminate any answer that doesn't fulfill this purpose.

- (A) and (C) are wrong because they don't mention a *similarity.*
- (B) is wrong because it only mentions strontium.
- (D) is correct because the word *Both* helps to show a *similarity.*

25. **B** This is a Rhetorical Synthesis question, so follow the basic approach. Highlight the goal(s) stated in the question: *introduce Maya Deren and her film Meshes of the Afternoon to a new audience.* Eliminate any answer that doesn't fulfill this purpose.

- (A), (C), and (D) are wrong because they don't *introduce Maya Deren.*
- (B) is correct because it explains who Deren was and describes the film.

26. **D** This is a Rhetorical Synthesis question, so follow the basic approach. Highlight the goal(s) stated in the question: *introduce Cléo from 5 to 7 to an audience unfamiliar with the film and its director.* Eliminate any answer that doesn't fulfill this purpose.

- (A) and (C) are wrong because they don't describe the director, and the audience is unfamiliar with her.
- (B) is wrong because it doesn't *introduce* the film, such as by providing information about it.
- (D) is correct because it describes the film and its director.

27. **A** This is a Rhetorical Synthesis question, so follow the basic approach. Highlight the goal(s) stated in the question: *summarize the study.* Eliminate any answer that doesn't fulfill this purpose.

- (A) is correct because it provides a summary of the study.
- (B) and (C) are wrong because they include only a few details rather than *summarize the study.*
- (D) is wrong because it mentions a specific finding but doesn't *summarize the study.*

## Module 2—Easier

1. **A** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing word describes what experts think about electric vehicle sales, so look for and highlight clues in the passage about electric vehicle sales. The passage mentions that the market *surged in popularity*, and sales increased *from just a few thousand at the start of the decade to more than two million by the end of the decade*. Since the passage does not give any information that suggests this trend will change, a good word to enter into the annotation box would be "predict" or "assume" that sales will continue to increase.

   - (A) is correct because *project* matches "predict."
   - (B) is wrong because *guarantee* is **Extreme Language**—the experts do not say a continued increase will definitely happen.
   - (C) and (D) are wrong because *reject* and *deny* are the **Opposite** of "predict."

2. **A** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing word describes a characteristic of mindfulness, so look for and highlight clues in the passage about mindfulness. The passage mentions mindfulness *can improve physical and cognitive function* and *lead to improvements in overall well-being*, so a good word to enter into the annotation box would be "advantages" or "positives."

   - (A) is correct because *benefits* match "advantages."
   - (B) is wrong because *drawbacks* are the **Opposite** of "advantages."
   - (C) is wrong because *basics* don't match "advantages."
   - (D) is wrong because *physics* is **Recycled Language**—it misuses *physical* from the passage.

3. **B** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing word describes how a discovery affected our understanding of the universe, so look for and highlight clues in the passage about the discovery. The passage mentions that Thorne's work confirms one of Einstein's predictions and that it *provided astronomers with a firmer ground*, so a good word to enter into the annotation box would be "improved" or "made clearer."

   - (A) and (D) are wrong because *confused* and *belittled* (put down or insulted) are the **Opposite** tone of "improved," which is positive.
   - (B) is correct because *clarified* matches "improved" or "made clearer."
   - (C) is wrong because *revolutionized* is **Extreme Language**—Thorne's work confirmed something that was already predicted rather than completely changing how we understand the universe.

4. **B** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing word describes the interaction between the Navajo Nation Council and established principles of the constitution, so look for and highlight clues in the passage about the Council's role. The passage mentions that the Council *is responsible for protecting the civil rights of Navajo citizens*, so a good word to enter into the annotation box would be "protecting" or "upholding."

   - (A) is wrong because *copying* doesn't match "protecting."
   - (B) is correct because *maintaining* matches "protecting" or "upholding."
   - (C) is wrong because *determining* goes **Beyond the Text**—the passage doesn't support that the Council creates or establishes the principles of the constitution, just that it protects what's already there.
   - (D) is wrong because *dismissing* is the **Opposite** tone of "protecting," which is positive.

5. **C** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing word describes the interaction between Vescovo and the four new species of gelatinous animals, so look for and highlight clues in the passage about this interaction. The passage mentions that Vescovo's work was a *finding*, so a good word to enter into the annotation box would be "found" or "documented."

   - (A) is wrong because *reintroduced* doesn't match "found."
   - (B) is wrong because *discounted* (disregarded) is the **Opposite** of "found."
   - (C) is correct because *discovered* matches "found."
   - (D) is wrong because exploring something might lead to a finding or discovery but would not be a finding or discovery itself.

6. **D** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing phrase describes how human emotions might be applied to animals by humans, so look for and highlight clues in the passage about this interaction. The passage mentions that *humans can empathize with a broader diversity of creatures than previously believed*. Since empathy deals with sharing feelings, a good word to enter into the annotation box would be "given to" or "assigned."

   - (A) and (C) are wrong because *conflated with* (combined into) and *united with* don't match "given to."
   - (B) is wrong because *demanded of* is **Extreme Language**—the passage doesn't state that humans require or force animals to have human emotions.
   - (D) is correct because *attributed to* matches "given to."

7. **D** This is a Purpose question, as it asks for the *function of the underlined sentence in the text as a whole.* Read the passage and focus on the sentences before and after the underlined sentence to understand its function. The sentence before states that the female emperor penguin *transfers the egg to the male's care,* and the sentence after continues to explain the male's care of the egg. Therefore, a good function of the underlined sentence to enter into the annotation box would be "explain how male cares for egg."

   - (A) and (C) are wrong because they're both **Right Answer, Wrong Question**—these answers describe the information in the last sentence of the passage rather than the underlined sentence.
   - (B) is wrong because the *physical feature of male penguins* is only first introduced in the underlined sentence, not *earlier in the text.*
   - (D) is correct because it's consistent with the highlighting and annotation.

8. **B** This is a Purpose question, as it asks for the *main purpose of the text.* Read the passage and highlight who or what the passage is focusing on. The passage focuses on *Mrs. Hale and Mrs. Peters* as well as their actions after their eyes met in a look of *dawning comprehension.* Therefore, a good main purpose of the passage to enter into the annotation box would be "describe what women did figuring something out."

   - (A) and (D) are wrong because they each focus on the quilt or a possession, neither of which is the focus of the passage.
   - (B) is correct because it's consistent with the highlighting and annotation.
   - (C) is wrong because it goes **Beyond the Text**—the passage does not offer what the women think of the county attorney.

9. **D** This is a Dual Texts question, which asks how *the author of Text 2* would *respond to the claims of the author of Text 1.* Read Text 1 and highlight the author's claim, which is that *computer-based programs remove the requirement for certain musical compositional skills.* Then, read Text 2 and highlight what Text 2 says about the same topic. The author of Text 2 states that *Computer-based composers must know both the foundations of music theory and the intricacies of the programs that they use to create their works.* The two authors disagree on their shared topic, so enter "Text 2 disagrees with Text 1" into the annotation box.

   - (A) is wrong because it's the **Opposite** of Text 2's point—the author of Text 2 states that computer-based composers do indeed need to know *the foundations of music theory.*
   - (B) is wrong because neither author discusses *performances* or calls those performances *more important.*

- (C) is wrong because it's **Extreme Language**—while the author of Text 2 implies that computer-based composition is not easy, it's never supported that making music with a traditional instrument is *much easier.*
- (D) is correct because it's consistent with the relationship between the passages.

10. **B** This is a Charts question, as it asks for *data from the graph* that will *complete the text.* Read the title, key, and variables from the bar graph. Then, read the passage and highlight the claim or argument that references the information from the graph. The end of the second sentence states that *each of the five major electric car manufacturers posted strong numbers in 2018.* The correct answer should offer accurate information from the graph in support of this claim.

- (A), (C), and (D) are wrong because they're the **Opposite** of the information in the graph—the numbers in these answers are inconsistent with the values for BYD Auto, Tesla, and Volkswagen.
- (B) is correct because it's consistent with the graph.

11. **D** This is a Claims question, as it asks which choice *most effectively illustrates the claim.* Look for and highlight the claim in the passage, which is that Mr. Gummage is an *art teacher who actively encourages his students to improve upon the fundamentals that he teaches.* The correct answer should address and be consistent with each aspect of this claim.

- (A), (B), and (C) are wrong because they're each **Half-Right**—each of these answers expresses some aspect of Mr. Gummage's art style or teaching style, but none of them show him actively encouraging *his students to improve upon the fundamentals.*
- (D) is correct because it states that Mr. Gummage's model was merely *a guide* and that he *continually told his pupils that they must try to excel it, and he helped them to do so.* All of this is consistent with the highlighted claim.

12. **B** This is a Claims question, as it asks which choice *most effectively illustrates the claim.* Look for and highlight the claim in the passage, which is that *Frost describes his prioritization of personal obligations over admiring the beauty of the winter scene.* The correct answer should address and be consistent with each aspect of this claim.

- (A), (C), and (D) are wrong because they're each **Half-Right**—each answer describes an aspect of the winter scene but does not state that the speaker is prioritizing his *personal obligations* over any of the scene's aspects.
- (B) is correct because it's consistent with the claim—it references the beauty of the winter scene, but then clarifies that Frost is focused on the promises he has to keep instead.

13. **A** This is a Charts question, as it asks for *data from the table that supports the researchers' claim.* Read the title and variables from the table. Then, read the passage and highlight the claim that references the information from the table. The last sentence states that *the researchers claim that agro-pastoralists living in Area I were able to gather significant quantities of all eight species due to the area's high vegetation cover.* The correct answer should offer accurate information from the table in support of this claim.

- (A) is correct because it's consistent with the table and highlighting—note that the predicted average in the text was 30, and all citations from Area II are above this number.
- (B) is wrong because it's **Half-Right**—it's consistent with the table, but stating that *there were fewer* citations is the **Opposite** of the claim's point regarding the collection of *significant quantities*, which suggests the correct answer should be discussing the numbers as higher or greater than something, not lower or fewer.
- (C) and (D) are wrong because they're the **Opposite** of the information given in the table—*C. pyramidale* had the highest number of citations from Area II, not the *lowest*, and *M. glaziovi* and *M. tenuiflora*'s citations from Area I were much lower than the predicted average of 30, not *significantly higher.*

14. **B** This is a Claims question, as it asks which choice *most effectively illustrates the claim.* Look for and highlight the claim in the passage, which is that *Machen challenges a comparison regarding literary quality that he believes the reader has made.* The correct answer should address and be consistent with each aspect of this claim.

- (A) and (D) are wrong because they're **Half-Right**—both answers reference a comparison, but neither answer has Machen indicating that he believes the reader has made the comparison. Machen himself makes or addresses the comparisons in these answers without indicating the reader makes them as well.
- (B) is correct because it's consistent with the claim—it both references a comparison and has Machen specifically addressing *you*, the reader, as having made the comparison.
- (C) is wrong because the *cook* and the *farmer* in this answer are not directly compared, nor does Machen state that the reader makes any comparison.

15. **A** This is a Conclusions question, as it asks for what *most logically completes the text.* Look for and highlight the main focus of the passage, which is the *Inca Empire* and the challenges that they faced *farming.* Then, highlight the main point made regarding this focus, which is that *they created a system of terraces that allowed them to grow crops...and practiced preserving their crops.* Since the last sentence already references the first part of this evidence, growing crops, the most likely

conclusion is that the second half of the last sentence will talk about *preserving* crops. The correct answer should be as consistent as possible with this conclusion.

- (A) is correct because it's consistent with what the highlighted sentences say about growing and preserving crops.
- (B) is wrong because *all* is **Extreme Language**—it's not stated by the passage during which periods the Incas harvested crops.
- (C) is wrong because it goes **Beyond the Text**—while it's logical that consistent food sources prolong life spans, there is no evidence for such a connection in the passage.
- (D) is wrong because it's **Recycled Language**—it misuses *freeze* and the concept of *cold* from the third sentence of the passage.

16. **D** This is a Conclusions question, as it asks for what *most logically completes the text.* Look for and highlight the main focus of the passage, which is *the relationship between sleep and memory consolidation.* Then, highlight the main point made regarding this focus, which is that *memory consolidation happens during deep sleep as the brain replays memories and stores them more effectively* and that the *amount and quality of sleep are vital to memory consolidation.* Therefore, the conclusion to the passage should focus on this positive connection between quality and amount of deep sleep and memory consolidation. The correct answer should be as consistent as possible with this conclusion.

- (A) and (B) are wrong because they're each the **Opposite** of the relationship between sleep and memory consolidation stated in the passage—increased sleep should not produce any decreases, or drawbacks.
- (C) is wrong because it's **Half-Right**—while there should be an increase, the passage does not discuss any *connections* between similar memories, just the embedding and storage of memories.
- (D) is correct because it's consistent with what the highlighted sentences say about memory consolidation.

17. **B** In this Rules question, punctuation is changing in the answer choices. The punctuation appears after the preposition *with*, but there shouldn't be punctuation after a preposition, so eliminate answers with punctuation.

- (A), (C), and (D) are wrong because a preposition shouldn't be followed by punctuation.
- (B) is correct because no punctuation should be used here.

18. **C** In this Rules question, verb forms are changing in the answer choices, so it's testing sentence structure. The subject of the sentence is *researchers*, and there is no main verb, so the answer must provide the main verb. Eliminate any answer that isn't in the correct form to be the main verb.

- (A) is wrong because a "to" verb can't be the main verb in a sentence.
- (B) and (D) are wrong because an *-ing* verb can't be the main verb in a sentence.
- (C) is correct because it's in the right form to be the main verb.

19. **D** In this Rules question, apostrophes with nouns are changing in the answer choices. Determine whether each word possesses anything. The members possess the experiences, but the experiences don't possess anything. Eliminate any answer that doesn't match this.

- (A), (B), and (C) are wrong because *experiences* shouldn't be possessive.
- (D) is correct because *experiences* isn't possessive, and *members* shouldn't be possessive either because the word *of* already shows possession.

20. **B** In this Rules question, verb forms are changing in the answer choices, so it's testing sentence structure. The subject of the sentence is *team*, and there is no main verb, so the answer must provide the main verb. Eliminate any answer that isn't in the correct form to be the main verb.

- (A) is wrong because a "to" verb can't be the main verb in a sentence.
- (B) is correct because it's in the right form to be the main verb.
- (C) and (D) are wrong because an *-ing* verb can't be the main verb in a sentence.

21. **A** In this Rules question, punctuation is changing in the answer choices. Look for independent clauses. The first part of the sentence says *Some comets, such as Halley's Comet, can be seen more than once in a lifetime*, which is an independent clause. The second part of the sentence says *while others, such as Comet Shoemaker-Levy 9, are visible only once,* which is a dependent clause. Eliminate any option that doesn't correctly connect an independent + a dependent clause.

- (A) is correct because independent + dependent can be connected with a comma.
- (B), (C), and (D) are wrong because independent + dependent cannot be connected with punctuation other than a comma.

22. **C** In this Rules question, pronouns are changing in the answer choices, so it's testing consistency with pronouns. Find and highlight the word the pronoun refers back to, *the clock*, which is singular, so a singular pronoun is needed. Write an annotation saying "singular." Eliminate any answer that isn't singular or doesn't clearly refer back to *the clock*.

- (A) and (D) are wrong because they are plural.

- (B) is wrong because the word *it* suggests something other than the *clock* being powered, but it's not clear what that would be.
- (C) is correct because *itself* is singular and is consistent with *the clock*.

23. **A** In this Rules question, verbs are changing in the answer choices, so it's testing consistency with verbs. Find and highlight the subject, *May Berenbaum*, which is singular, so a singular verb is needed. All of the answers work with a singular subject, so look for a clue regarding tense. This sentence uses the past tense verb *developed*. Highlight that verb and write an annotation that says "past." Eliminate any answer not in past tense.

- (A) is correct because it's in past tense, and this specific tense correctly suggests that her interest developed during the seminar.
- (B) is wrong because it's in present tense.
- (C) is wrong because it's not in past tense.
- (D) is wrong because it's in future tense.

24. **D** This is a transition question, so follow the basic approach. Highlight ideas that relate to each other. The preceding sentence says *She has portrayed Indian political themes in her work,* and this sentence provides some additional things Gowda *has incorporated*. These ideas agree, so a same-direction transition is needed. Make an annotation that says "agree." Eliminate any answer that doesn't match.

- (A) and (B) are wrong because they are opposite-direction transitions.
- (C) is wrong because *Indeed* would reinforce the previous idea, but this sentence instead includes some additional aspects of Gowda's work.
- (D) is correct because this sentence provides additional information about Gowda's art.

25. **C** This is a transition question, so follow the basic approach. Highlight ideas that relate to each other. The previous sentence states that *speech rhythm...could identify participants with autism reliably across English- and Cantonese-speaking groups,* and this sentence states that *speech intonation...could only reliably identify participants with autism in the English-speaking group*. These ideas disagree, so an opposite-direction transition is needed. Make an annotation that says "disagree." Eliminate any answer that doesn't match.

- (A) and (B) are wrong because they are same-direction transitions.
- (C) is correct because *By contrast* is an opposite-direction transition.
- (D) is wrong because while *Still* is an opposite-direction transition, it doesn't draw a contrast between two things as is needed here.

26. **B** This is a transition question, so follow the basic approach. Highlight ideas that relate to each other. The preceding sentence says *A failed amendment...was proposed in 1916 that would have mandated a public referendum to declare war,* and this sentence states that *another proposal was made in 1935 and again in 1940 to require a public vote to declare war.* These ideas agree, so a same-direction transition is needed. Make an annotation that says "agree." Eliminate any answer that doesn't match.

- (A) is wrong because this sentence isn't making the previous information more specific.
- (B) is correct because this sentence provides a similar proposal from other years.
- (C) is wrong because this sentence isn't an example of something that came before.
- (D) is wrong because this sentence isn't a conclusion based on the previous sentence.

27. **C** This is a Rhetorical Synthesis question, so follow the basic approach. Highlight the goal(s) stated in the question: *provide an explanation and example of a "golden shovel" poem.* Eliminate any answer that doesn't fulfill this purpose.

- (A), (B), and (D) are wrong because they don't *provide an explanation* of what this type of poem is.
- (C) is correct because it explains what the *poetic form* is and provides an *example.*

## Module 2—Harder

1. **A** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing word describes how tonal languages interact with words and phrases using pitch changes, so look for and highlight clues in the passage about this interaction. The passage mentions that *native speakers of tonal languages...are more apt to recognize pitch differences,* which suggests that these native speakers might interact often with pitch differences in some way. Based on this context, a good word to enter into the annotation box would be "pronounce" or "say."

- (A) is correct because *enunciate* matches "pronounce."
- (B) and (D) are wrong because *suggest* and *camouflage* (disguise) don't match "pronounce."
- (C) is wrong because it goes **Beyond the Text**—while changing the pitch of words most certainly could help *distinguish* (differentiate) one word or phrase from another, the actual goal or function of pitch changing isn't discussed in the passage.

2. **C** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing phrase describes an aspect of the influence of dark matter, so look for and highlight clues in the passage about dark matter. The passage mentions that *the importance of the properties of dark matter are widely accepted,* but the presence of the word *though* indicates a contrast. Therefore, the thing that *continues to elude the scientific community* should relate to knowledge about

dark matter, so a good word to enter into the annotation box would be "knowledge" or "comprehension."

- (A), (B), and (D) are wrong because *acknowledgment of, argument about,* and *allegiance to* (loyalty) don't match "knowledge."
- (C) is correct because *understanding of* matches "knowledge."

3. **D** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing word describes what a business must do regarding trust, so look for and highlight clues in the passage about businesses and trust. The passage mentions that *the success of a business venture...is closely related to the concept of credibility,* so a good word to enter into the annotation box would be that business needs to "generate" or "build" trust.

- (A) is wrong because *invalidate* (cancel) is the **Opposite** of what business must do regarding trust.
- (B) and (C) are wrong because *fortify* (strengthen) and *demarcate* (define) don't match "generate." The passage does not support that trust is already present, as these are only *potential* customers, not existing ones.
- (D) is correct because *foster* (grow) matches "build."

4. **D** This is a Vocabulary question, as it asks for a logical and precise word or phrase to complete the text. The missing word describes what certain individuals are likely to do regarding long-term objectives, so look for and highlight clues in the passage about these individuals. The passage mentions that these individuals have *high levels of perseverance* and have *the ability to sustain high levels of effort.* Since perseverance and effort are connected with *determining success,* a good word to enter into the annotation box would be "achieve" or "complete."

- (A) is wrong because *neglect* is the **Opposite** of "achieve."
- (B) and (C) are wrong because *analyze* and *recall* (remember) don't match "achieve."
- (D) is correct because *attain* (accomplish) matches "achieve."

5. **A** This is a Purpose question, as it asks for the *function of the underlined sentence in the text as a whole.* Read the passage and focus on the sentences before and after the underlined sentence to understand its function. The sentence before describes the contents of *the big traveling chest,* and the sentence after references the father's explanation as to why the chest contains what it does. Therefore, a good function of the underlined sentence to enter into the annotation box would be "explain what children ask about chest."

- (A) is correct because it's consistent with the highlighting and annotation.

- (B) and (C) are wrong because they go **Beyond the Text**—each answer makes an assumption about relationship between the children and their mother that isn't supported by the underlined sentence, in which the mother only tells the children to be quiet so the father can explain.
- (D) is wrong because it's the **Opposite** of what happens in the passage—the mother does not encourage the children to be *inquisitive*, or ask questions; she tells them to be quiet.

6. **B** This is a Purpose question, as it asks for the *main purpose of the text*. Read the passage and highlight who or what the passage is focusing on. The passage focuses on *Elizabeth's feelings toward Mr. Darcy*, which are that *It was an union that must have been to the advantage of both*. Therefore, a good main purpose of the passage to enter into the annotation box would be "explain that they benefit from each other."

- (A) and (C) are wrong because they go **Beyond the Text**—while it's likely that Elizabeth has *determination* and *desires* toward romance, the passage is about one specific relationship rather than a general pursuit and does not state what Elizabeth's desires actually are.
- (B) is correct because it's consistent with the highlighting and annotation.
- (D) is wrong because it's **Half-Right**—nothing in the passage supports that Elizabeth finds her current relationship *confusing*.

7. **B** This is a Purpose question, as it asks for the *overall structure of the text*. Read the passage and highlight the connections between ideas in the passage. The first sentence describes the work of *Novelist Wright Morris* and how he *complemented his written works with photographs*. The next three sentences offer a specific example in the novel *The Home Place* and its *perspective on the themes of family*, *memory*, and *rural America*. Therefore, a good overall structure of the passage to enter into the annotation box would be "introduce Morris's work and give an example."

- (A) is wrong because it's **Half-Right**—the first half of the answer is accurate, but the passage does not discuss Morris's specific *convictions*, or beliefs, only the themes present in his photographs.
- (B) is correct because it's consistent with the highlighting and annotation.
- (C) is wrong because while the passage does discuss Morris's storytelling, it never discusses any *other storytellers*.
- (D) is wrong because it's **Extreme Language**—Morris's style is never described as *unique*, nor is a *counterexample* offered, just an example.

8. **D** This is a Purpose question, as it asks for the *function of the underlined sentence in the text as a whole.* Read the passage and focus on the sentences before and after the underlined sentence to understand its function. The sentence before states that *emotions are based on the way the brain interprets sensory inputs*, and the sentence after states that individuals who reported their emotions accurately (according to previous data) *had lower levels of depression and anxiety.* Since the sentence before describes a theory and the sentence after describes the results of an experiment meant to test that theory, a good function of the underlined sentence to enter into the annotation box would be "explain setup of experiment."

   - (A) and (C) are wrong because the highlighted sentence does not offer an *obstacle* or a *concrete example* related to the study.
   - (B) is wrong because it's a **Right Answer, Wrong Question trap**—this answer describes the information in the last sentence of the passage rather than the underlined sentence.
   - (D) is correct because it's consistent with the highlighting and annotation.

9. **C** This is a Dual Texts question, which asks for what *the author of Text 2* would *say about Text 1's characterization of the psychologists' response regarding determinism.* Read Text 1 and highlight the author's characterization of the psychologists' response, which is that it's a *somewhat comforting response to this hypothetical loss of free will.* Then, read Text 2 and highlight what Text 2 says about the same topic. The author of Text 2 states that *the human brain is too complex to accept that it cannot alter that track.* The two authors disagree on a human's willingness to accept or be comfortable with determinism, so enter "Text 2 disagrees with Text 1" into the annotation box.

   - (A) is wrong because it's the **Opposite** of Text 1's characterization of the response—Text 1 considers the response *somewhat comforting*, not *overly critical.*
   - (B) is wrong because it's the **Opposite** of the relationship between the passages—the two authors disagree, and the author of Text 2 believes the human brain would not accept determinism rather than considering it *logical.*
   - (C) is correct because it's consistent with the relationship between the passages—the author of Text 2 does not believe that the human brain will find the concept of determinism comforting at all, or even accept it.
   - (D) is wrong because it's **Recycled Language**—it's the theory of determinism that was *readily accepted* by many according to the author of Text 2, not *Horgan's comments.*

10. **D** This is a Charts question, as it asks for *data from the table* that will *complete the example.* Read the title and variables from the table. Then, read the passage and highlight the claim or argument that references the information from the table. The end of the second sentence states that *poor record keeping from this era makes it likely that the numbers...should not be considered comprehensive.* In

other words, the authors in the table may have produced more work than the numbers listed. The correct answer should offer accurate information from the graph in support of this claim.

- (A) and (B) are wrong because they're **Half-Right**—they're consistent with the table but the **Opposite** of the claim, which states that the real totals may be greater than they appear.
- (C) is wrong because it's the **Opposite** of what's shown in the table—the claim only indicates that the number of contributions may be wrong, not that any of the authors worked *after* the years listed in the figure.
- (D) is correct because it's consistent with the claim, which states that the authors may have contributed more works than what is shown in the table.

11. **D** This is a Claims question, as it asks which finding *would most directly support Johnson, Davis, and Smith's conclusion*. Look for and highlight the conclusion in the passage, which is that *regular exercise can have a positive impact on cognitive abilities in older adults*. The correct answer should be as consistent as possible with this conclusion.

- (A) is wrong because it goes **Beyond the Text**—while this may be true, the passage's conclusion is only in regard to exercise, not environmental factors such as *sunshine and fresh air* that may result from exercising outdoors.
- (B) is wrong because the conclusion is not about which group it is *easier* to get data for, but about the positive impact of exercise on cognitive abilities.
- (C) is wrong because it's the **Opposite** of the conclusion—if both active and sedentary populations have the same cognitive performance after 12 months, this would weaken the claim that exercise has a *positive impact on cognitive abilities*.
- (D) is correct because it's consistent with the highlighted conclusion—slowing and reversing the effects of aging among active elderly populations would be a *positive impact on cognitive abilities*.

12. **A** This is a Charts question, as it asks for *data from the graph that support the Insurance Information Institute's conclusion*. Read the title, key, and variables from the table. Then, read the passage and highlight the conclusion that references the information from the table. The last sentence states that *the percentage by which different factors caused claims largely fluctuated over the period studied*. The correct answer should offer accurate information from the table in support of this claim.

- (A) is correct because it's consistent with the graph and conclusion—it shows a variable that has *fluctuated* for all three years.
- (B) and (D) are wrong because they're the **Opposite** of the graph or conclusion—the percentage of claims caused by fire and lightning damage did not *remain unchanged* during the period, and (D) points out a consistent trend (that wind and hail was always highest), while the conclusion refers to a fluctuation.

- (C) is wrong because it's not relevant to the conclusion—focusing on a single year (2019) cannot illustrate a fluctuation, which requires at least two different years to be compared.

13. **D** This is a Claims question, as it asks which choice *would most directly weaken the biologists' claim.* Look for and highlight the claim in the passage, which is that *humans may also have the ability to regenerate limbs naturally.* Note that the reason biologists believe humans could do so is that humans have *FoxA* as well as the *supplemental genes that interact with FoxA* to cause regeneration to occur. The correct answer should be as inconsistent as possible with the claim or the evidence, while still staying on the topic of the passage.

- (A) is wrong because it's not relevant to the claim—the focus of the claim is not on which group of organisms a process is *more effective* for, but if humans have the necessary genes for regeneration.
- (B) and (C) are wrong because they're the **Opposite** of what the question asks—each would strengthen, not weaken, the claim by displaying similarities in the genetic makeup of animals and humans to that of insects.
- (D) is correct because it would weaken the claim by suggesting that humans have *only a few of the supplemental genes necessary* for regeneration, not all of them.

14. **C** This is a Claims question, as it asks which choice *would most directly support the museum expert's claim.* Look for and highlight the claim in the passage, which is that *MacGregor sought to address* the *issue...by presenting the objects as pieces of a larger story, so that people from diverse ethnicities might find the exhibit more accessible.* The correct answer should be as consistent as possible with this claim.

- (A) is wrong because it's **Recycled Language**—the word "diverse" is meant to apply to *ethnicities* rather than *spiritual and religious beliefs*, and the passage does not connect ethnicity to spiritual or religious beliefs, even if such connections may exist in the real world.
- (B) is wrong because it's not relevant to the claim—there is no connection made in the passage between the works of Shakespeare and *diverse ethnicities.*
- (C) is correct because it's consistent with each aspect of the highlighted claim.
- (D) is wrong because it goes **Beyond the Text** with too specific of a focus—the answer only focuses on Australia and therefore does not address *diverse ethnicities.*

15. **A** This is a Conclusions question, as it asks for what *most logically completes the text.* Look for and highlight the main focus of the passage, which is the *impact of leadership positions on everyday behavior.* Then, highlight the main point made regarding this focus, which is that *it is often hard to anticipate who will rise to leadership positions.* Therefore, the conclusion of the passage should discuss how it's difficult to investigate the impact of leadership positions. The correct answer should be as consistent as possible with this conclusion.

- (A) is correct because it's consistent with what the highlighted sentences say about the challenges researchers will face.
- (B) is wrong because it's the **Opposite** of the challenges the passage indicates that researchers will face—the issue will be finding data on those who may become leaders, not data on those who *currently hold leadership positions.*
- (C) is wrong because it's **Extreme Language**—the passage never states that *only* those who recently left leadership positions can be studied.
- (D) is wrong because it goes **Beyond the Text**—while studies always want large control groups, the focus in the passage is on the challenges researchers face, not a general principle of conducting studies.

16. **B** This is a Conclusions question, as it asks for what *most logically completes the text.* Look for and highlight the main focus of the passage, which is that the *Popol Vuh is one of the most significant surviving sources of ancient Mayan culture.* Then, highlight the main point made regarding this focus, which is that while *Popol Vuh* reflects *pre-colonial Mayan beliefs*, some of its passages include *Catholic and European influence.* Therefore, the conclusion to the passage should address these differing aspects of the *Popol Vuh.* The correct answer should be as consistent as possible with this conclusion.

- (A) is wrong because it's the **Opposite** of what's stated in the passage—the *Popol Vuh* contains many of the early Mayan beliefs, so it's text should not be considered *distinct* from the original Mayan belief.
- (B) is correct because it's consistent with what the highlighted sentences say about the *Popol Vuh.*
- (C) is wrong because it's **Recycled Language**—*European* is misused from the second half of the passage.
- (D) is wrong because it's **Extreme Language**—it's not stated whether the Mayan beliefs were *unique* to the civilization or shared by other civilizations.

17. **D** In this Rules question, verbs are changing in the answer choices, so it's testing consistency with verbs. Find and highlight the subject, *Style Wars*, which is singular, as it is *a documentary*, so a singular verb is needed. Write an annotation saying "singular." Eliminate any answer that is not singular.

- (A), (B), and (C) are wrong because they are plural.
- (D) is correct because it's singular.

18. **A** In this Rules question, punctuation with a transition is changing in the answer choices. Look for independent clauses. The first part of the sentence says *Unlike all other waterfowl, the black-headed duck does not build a nest.* There is an option to add *instead* to this independent clause, but it's not contrasting with the previous idea as nothing came before. Eliminate options with *instead* in the first part.

- (A) is correct because it puts *instead* with the second independent clause and puts a semicolon between the independent clauses.
- (B) is wrong because it puts *instead* with the first independent clause.
- (C) and (D) are wrong because the sentence contains two independent clauses, which cannot be connected with commas alone.

19. **B** In this Rules question, verbs are changing in the answer choices, so it's testing consistency with verbs. Find and highlight the subject, *Stephanie Kwolek*, which is singular, so a singular verb is needed. All of the answers work with a singular subject, so look for a clue regarding tense. The same sentence uses past tense verbs: *found* and *aligned*. Highlight those verbs and write an annotation that says "past." Eliminate any answer not in past tense.

- (A) is wrong because it's in future tense.
- (B) is correct because it's in past tense and correctly suggests that Kwolek found the polymer while in the process of doing the research.
- (C) is wrong because it's not in past tense.
- (D) is wrong because it's in present tense.

20. **C** In this Rules question, punctuation is changing in the answer choices. Look for independent clauses. The first part of the sentence says *Herpetologist Teresa Camacho Badani led an expedition...to collect specimens of an endangered species of amphibian*, which is an independent clause. The second part says *previously known only from a single individual...the Sehuencas water frog...is now being bred in captivity in an effort to restore the population*, which is also an independent clause. Eliminate any answer that can't correctly connect two independent clauses.

- (A) is wrong because some type of punctuation is needed in order to connect two independent clauses.

- (B) is wrong because a coordinating conjunction (*but*) without a comma can't connect two independent clauses.
- (C) is correct because the period makes each independent clause its own sentence, which is fine.
- (D) is wrong because a comma without a coordinating conjunction (FANBOYS) can't connect two independent clauses.

21. **D** In this Rules question, punctuation is changing in the answer choices. Look for independent clauses. The first part of the sentence states that *a helicopter landed…after completing a pioneering 24-mile flight,* which is an independent clause. The second part says *powered by a rechargeable battery and carrying a 50-pound weight…the fully electric helicopter was copiloted by Martine Rothblatt and Ric Webb,* which is also an independent clause. Eliminate any answer that can't correctly connect two independent clauses.

- (A) is wrong because a comma without a coordinating conjunction (FANBOYS) can't connect two independent clauses.
- (B) is wrong because a coordinating conjunction (*and*) without a comma can't connect two independent clauses.
- (C) is wrong because some type of punctuation is needed in order to connect two independent clauses.
- (D) is correct because the period makes each independent clause its own sentence, which is fine.

22. **A** In this Rules question, commas and semicolons are changing in the answer choices. The sentence already contains a semicolon near the end, and the part after this semicolon is not an independent clause, which suggests that the sentence contains a list separated by semicolons. Check the verb at the beginning of each item to see where the semicolons should be placed. The list consists of 1) *take close-up pictures of Uranus and Neptune, the previously unexplored outer planets,* 2) *find the furthest extent of the Solar System*, and 3) *collect data about the interstellar space beyond the Solar System*. Eliminate any answer that doesn't put semicolons between the list items.

- (A) is correct because it has a semicolon after the first item.
- (B) and (C) are wrong because they don't have a semicolon after the first item, which ends with *planets.*
- (D) is wrong because it puts the semicolon after *Neptune*, separating it from *the previously unexplored outer planets*, a description that refers to *Uranus and Neptune.*

23. **B** In this Rules question, punctuation is changing in the answer choices. The punctuation appears near the word *journalist* and the person's name. The word *journalist* is a title for Maximiliáno Durón, so no punctuation should be used. Eliminate answers that use punctuation.

- (A) is wrong because a comma shouldn't be used between the subject *Maximiliáno Durón* and its verb *calls*.
- (B) is correct because titles before names have no punctuation.
- (C) and (D) are wrong because a comma isn't used after a title.

24. **A** This is a transition question, so follow the basic approach. Highlight ideas that relate to each other. The first sentence states that *local legend credits Marie Harel with the invention of Camembert cheese,* though *she likely learned the technique from a priest*, and this sentence states that *Harel will likely continue to receive recognition for the cheese.* These ideas disagree, so an opposite-direction transition is needed. Make an annotation that says "disagree." Eliminate any answer that doesn't match.

- (A) is correct because *Nevertheless* is an opposite-direction transition and correctly implies that despite the fact that Harel may not have completely invented the cheese, she will still be recognized for it.
- (B), (C), and (D) are wrong because they are same-direction transitions.

25. **D** This is a transition question, so follow the basic approach. Highlight ideas that relate to each other. The preceding sentence states that *researchers have found evidence* for the asteroid theory, and this sentence explains that the *shocked quartz* and *tektites* in the areas provide evidence. These ideas agree, so a same-direction transition is needed. Make an annotation that says "agree." Eliminate any answer that doesn't match.

- (A) is wrong because the evidence isn't a result of a hypothesis; a hypothesis is based on evidence.
- (B) is wrong because it's an opposite-direction transition.
- (C) is wrong because this sentence isn't a restatement of the preceding sentence.
- (D) is correct because this sentence specifies what kind of *evidence* has been found.

26. **B** This is a transition question, so follow the basic approach. Highlight ideas that relate to each other. The preceding sentence describes a new fingerprinting technique, and this sentence states that it can provide *more reliable evidence* for *court cases*. These ideas agree, so a same-direction transition is needed. Make an annotation that says "agree." Eliminate any answer that doesn't match.

- (A) and (D) are wrong because they are opposite-direction transitions.
- (B) is correct because this sentence draws a conclusion from the evidence in the previous sentences.

- (C) is wrong because this sentence does not describe a separate thing that is similar to something that was previously described.

27. **A** This is a Rhetorical Synthesis question, so follow the basic approach. Highlight the goal(s) stated in the question: *make and support a generalization about sports-related concussions.* Eliminate any answer that doesn't fulfill this purpose.

- (A) is correct because *short- and long-term consequences* is a generalization (a broader look at something), and the information after the colon supports this generalization.
- (B) is wrong because it makes a *generalization* but doesn't *support* it.
- (C) and (D) are wrong because they give specific details instead of a *generalization.*

# PRACTICE TEST 1—MATH EXPLANATIONS

## Module 1

1. **C** The question asks for a comparison of the means, or averages, of two data sets. One approach is to ballpark. Both data sets contain the numbers 3, 8, 8, 11, and 24. Data set S contains an additional, smaller number, so its mean will be less, which makes (C) correct. To solve mathematically, use the average formula $T = AN$, in which $T$ is the *Total*, $A$ is the *Average*, and $N$ is the *Number of things*. There are 6 values in data set S, so $N = 6$. Find the *Total* by adding the 6 integers to get $T = 2 + 3 + 8 + 8 + 11 + 24 = 56$. The average formula becomes $56 = (A)6$. Divide both sides of the equation by 6 to get $9.\overline{3} = A$, which means that the mean of data set S is $9.\overline{3}$. Repeat the same steps to find the mean of data set T. There are 5 values in data set T, so $N = 5$. Find the *Total* by adding the 5 integers to get $T = 3 + 8 + 8 + 11 + 24 = 54$. The average formula becomes $54 = (A)(5)$. Divide both sides of the equation by 5 to get $10.8 = A$, which means that the mean of data set T is 10.8. Since $9.\overline{3}$ is less than 10.8, the mean of data set S is less than the mean of data set T. Using either method, the correct answer is (C).

2. **B** The question asks for the value of an expression. Plug in 8 for $x$ in the expression $30 - x$ to get $30 - 8$. Simplify the expression to get $30 - 8 = 22$. The correct answer is (B).

3. **B** The question asks for a value given a specific situation. Since the question includes the word *average*, use the formula $T = AN$, where $T$ is the *Total*, $A$ is the *Average*, and $N$ is the *Number of things*. To find the number of liters of water that drained from the tank, subtract the remaining liters of water from the initial liters of water to get $7{,}854 - 1{,}192 = 6{,}662$ liters of water. Since the question states that 1,192 liters of water remained after the *valve remained open for 44 seconds*, the *Number of things* is 44. The average formula becomes $6{,}662 = (A)(44)$. Divide both sides of the equation by 44 to get $151.4 \approx A$. The correct answer is (B).

4. **A** The question asks for the value of the measure of an angle on a geometric figure. Use the Geometry Basic Approach. Start by redrawing the figures on the scratch paper. The question states that the triangles are similar and that $B$ corresponds to $E$, and the figure shows that both $A$ and $D$ are right angles, so $C$ must correspond to $F$. Since angle $E$ has a measure of 52°, angle $B$ also has a measure of 52°. Label this information on the figures. All triangles contain 180°, so the third angle in each triangle has a measure of 180° – 90° – 52° = 38°. Label angles $C$ and $F$ as 38°. The question asks for the measure of angle $C$, which is 38°. The correct answer is (A).

5. **200** The question asks for a value given a specific situation. Translate the information in bite-sized pieces. One piece of information states that *$b$ is the number of bats sold and $g$ is the number of gloves sold*, and another piece states that the *company made $26,000 from the sale of equally-priced bats and equally-priced gloves*. Since the sum of $500b$ and $300g$ equals the total money made from selling the two types of softball equipment, 500 and 300 must be the cost per bat and the cost per glove, respectively. To find how much less the price of a glove is than the price of a bat, subtract 300 from 500: 500 – 300 = 200. Each glove costs $200 less than each bat. The correct answer is 200.

6. **B** The question asks for the value of an expression given a system of equations. When a Digital SAT question asks for the value of an expression, there is usually a straightforward way to solve for the expression without needing to completely isolate either variable. Try stacking and adding the two equations.

$$\begin{array}{r} 8x - y = -17 \\ +\,(-7x = 14) \\ \hline x - y = -3 \end{array}$$

The question asks for the value of $x - y$, so stop here. The correct answer is (B).

7. **D** The question asks for a value based on a function. The question states that $d$ represents the number of days after starting a fundraising campaign and $f(d)$ represents the amount of money in the account $d$ days after starting the campaign. Plug in $d = 0$ to determine how many dollars were in the account before the campaign started. The function becomes $f(0) = 750(0) + 12{,}000$, then $f(0) = 0 + 12{,}000$, and finally $f(0) = 12{,}000$. There was $12,000 in the account before the fundraising campaign started. The correct answer is (D).

8. **A** The question asks for a value given a relationship between two geometric figures. Use the Geometry Basic Approach. Start by drawing two equilateral triangles of different sizes, then label the figure with the given information. The question states that *one side of triangle S is 9 inches long*, so label this on the figure. The perimeter of a geometric shape is the sum of the lengths of its sides, and all three sides in an equilateral triangle are equal, so the perimeter of triangle S is 9 + 9 + 9 = 27 inches. The question states that *equilateral triangle T has a perimeter that is one-third the*

*perimeter of equilateral triangle S*, so the perimeter of triangle T is $\frac{1}{3}(27) = 9$ inches. Triangle T has three equal sides, so one side of triangle T is $\frac{9}{3} = 3$ inches long. The correct answer is (A).

9. **7 or –7**

The question asks for a possible value of an expression given an equation with an absolute value. With an absolute value, the value inside the absolute value bars can be either positive or negative, so this equation has two possible solutions. To find the solutions, either set $7x + 14$ equal to 49 or set $7x + 14$ equal to $-49$. The question asks for the value of $x + 2$, which is equivalent to dividing $7x + 14$ by 7. When $7x + 14 = 49$, divide both sides of the equation by 7 to get $x + 2 = 7$. When $7x + 14 = -49$, divide both sides of the equation by 7 to get $x + 2 = -7$. Either 7 or $-7$ is a possible value of $x + 2$. The correct answer is 7 or $-7$.

10. **5** The question asks for the value of a constant in a function that represents values given in a table. In function notation, the number inside the parentheses is the $x$-value that goes into the function, or the input, and the value that comes out of the function is the $y$-value, or the output. The table includes five input values and five output values, all of which must work in the equation $g(x) = kx + 34$. Pick any pair of values from the table and plug them into the given equation to solve for $k$. Plug in $x = -6$ and $g(x) = 4$ to keep the numbers small. The equation of function $g$ becomes $4 = k(-6) + 34$, or $4 = -6k + 34$. Add $6k$ to both sides of the equation to get $6k + 4 = 34$, and then subtract 4 from both sides of the equation to get $6k = 30$. Divide both sides of the equation by 6 to get $k = 5$. The correct answer is 5.

11. **–11** The question asks for a constant in an equivalent expression. The question asks for the value of $c$, which is multiplied by $x^4$, so focus on the terms with $x^4$. Rewrite the first expression with only those terms to get $-3x^4 + (-8x^4)$, which becomes $-11x^4$. Set this equal to the term with $x^4$ in the second expression to get $-11x^4 = cx^4$, then divide both sides of this equation by $x^4$ to get $-11 = c$. The correct answer is $-11$.

12. **D** The question asks for an equation in terms of a specific variable. The question asks about the relationship among variables and there are variables in the answer choices, so one option is to plug in. However, that might get messy with three variables. All of the answer choices have $m$ by itself, so the other option is to solve for $m$. To isolate $m$, first cross-multiply to get $(n)(2) = (22m)(3s)$, or $2n = 66ms$. Divide both sides of the resulting equation by $66s$ to get $\frac{2n}{66s} = m$. The correct answer is (D).

13. **A** The question asks for an equation that represents a specific situation. The number of ants is decreasing by a multiple over time, so this question is about exponential decay. Write down the growth and decay formula. When the change is a multiple instead of a percentage, the formula is *final amount* = (*original amount*)(*multiplier*)$^{\text{number of changes}}$. In this case, the *original amount* is 96,000. The question states that the number of ants decreases *by one-half every 4 days*, so the *multiplier* is $\frac{1}{2}$. The question asks for the number of ants *20 days after the infection started*, so the *number of changes* is $\frac{20}{4} = 5$. The formula becomes *final amount* = $96{,}000\left(\frac{1}{2}\right)^5$, or *final amount* = $96{,}000\left(\frac{1}{32}\right)$, and finally *final amount* = 3,000. The correct answer is (A).

14. **D** The question asks for the $y$-value of a point that satisfies a system of inequalities. The answers contain specific values, so plug in the answers. Rewrite the answer choices on the scratch paper and label them as "$y$." Start with one of the middle numbers and try (C), 3. The question provides an $x$-value of 39, which is possible based on the first inequality, so plug $x = 39$ and $y = 3$ into the second inequality. The second inequality becomes $39 - 7(3) < 16$, then $39 - 21 < 16$, and finally $18 < 16$. This is not true, so eliminate (C). The value on the left side of the inequality was close to being less than 16, so try (D), 4, next. Plug $x = 39$ and $y = 4$ into the second inequality to get $39 - 7(4) < 16$, which becomes $39 - 28 < 16$, and then $11 < 16$. This is true, so stop here. The correct answer is (D).

15. **A** The question asks for an equivalent form of an expression. Although there are variables in the answer choices, plugging in on this question would be difficult given all the exponents. Instead, use bite-sized pieces and Process of Elimination to tackle this question. Start by rewriting the expression with fractional exponents. In a fractional exponent, the numerator is the power and the denominator is the root. Taking the 9th root of a value raised to the 5th power can be written using the fractional exponent $\frac{5}{9}$. The expression becomes $s^{\frac{5}{9}}t^{\frac{5}{9}}$, which can also be written as $(st)^{\frac{5}{9}}$. The correct answer is (A).

16. **C** The question asks for the interpretation of a feature of a graph. Start by reading the final question, which asks for the best interpretation of the $y$-intercept. The $y$-intercept is the $y$-value when $x = 0$. The question states that the graph represents the value *of the item x months after it was purchased*, so $x = 0$ means the value at the time it was purchased. Eliminate (B) because it is about a range of months instead of the initial value, and eliminate (D) because it is about the value of the item six months after it was purchased instead of at the time it was purchased. Compare the remaining answer choices. The difference between (A) and (C) is whether the value is \$2 or \$200. Check the units of the $y$-axis. The question states that $y$ is the value of the item *in hundreds of dollars*, so 2 on the $y$-axis means the initial value was \$200. The correct answer is (C).

17. **D** The question asks for a system of equations with exactly one real solution. A system of linear equations in two variables has exactly one solution when the $y$-terms are the same and the $x$-terms are different or vice versa. Eliminate (A) because it contains two equations of horizontal lines, which are parallel and have no solutions. Eliminate (B) and (C) because the $y$-terms and the $x$-terms are the same. Keep (D) because the $y$-terms are the same and the $x$-terms are different. Another approach is to enter all four pairs of equations into the built-in calculator and see which pair intersects once. The graphs of the equations in (D) intersect once, so that system of equations has exactly one real solution. Using either method, the correct answer is (D).

18. **C** The question asks for an equation in terms of specific variables. The question asks about the relationship between variables and there are variables in the answer choices, so plug in. The question states that $n$ represents the number of the term of the sequence and that the first term of the sequence is 56. Thus, when $n = 1$, $s = 56$. Plug these values into the answer choices and eliminate any that are not true. Choice (A) becomes $56 = \frac{1}{2}(56)^{1-1}$, or $56 = \frac{1}{2}(56)^0$. Any number raised to the power of zero is 1, so this becomes $56 = \frac{1}{2}(1)$, or $56 = \frac{1}{2}$. This is not true, so eliminate (A). Choice (B) becomes $56 = \frac{1}{2}(56)^1$, or $56 = 28$; eliminate (B). Choice (C) becomes $56 = 56\left(\frac{1}{2}\right)^{1-1}$, or $56 = 56\left(\frac{1}{2}\right)^0$. This becomes $56 = 56(1)$, or $56 = 56$. This is true, so keep (C), but check (D) just in case. Choice (D) becomes $56 = 56\left(\frac{1}{2}\right)^1$, or $56 = 28$; eliminate (D), The correct answer is (C).

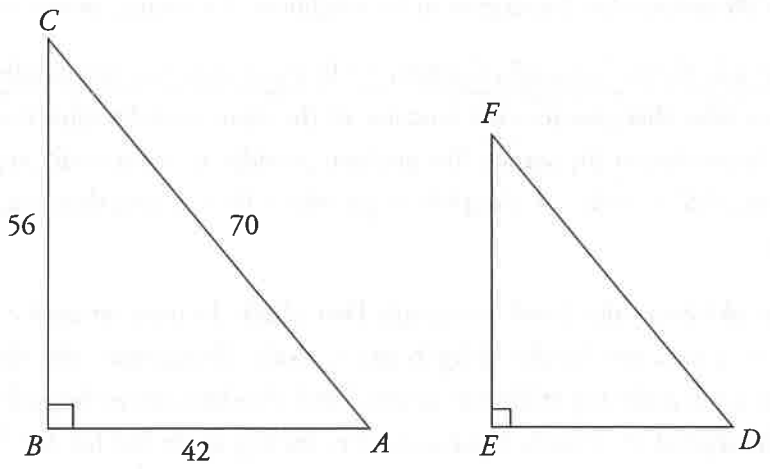
19. **B** The question asks for the value of a constant that represents a decrease. The question is about the relationship between values, so plug in. Plug in 100 for the number of movies available in 2022 because 100 works well with percentages. *Percent* means out of 100, so translate 9% as $\frac{9}{100}$. Because the number of movies available decreased by 9% from the starting number of 100, take 9% of 100 and subtract it from 100. The result is $100 - \frac{9}{100}(100) = 100 - 9 = 91$. Thus, the streaming service has 91 movies available in 2023. This is the target value; circle it. Because the number of movies decreased from 100 to 91, (B) is a likely answer. To test it, plug in 0.91 for $m$. The question states that *the number of movies available in 2023 is m times the number of movies available in 2022*, so multiply the number of movies available in 2022, 100, by 0.91 to get $(100)(0.91) = 91$. This matches the target value for the number of movies available in 2023, so stop here. The correct answer is (B).

20. **A** The question asks for an inequality that represents a given situation. Translate the information in bite-sized pieces and eliminate after each piece. Translate *the maximum value of q* as $q$ is less than or equal to, or $q \leq$. Eliminate (C) and (D) because the inequality sign is the wrong direction. Translate *7 times the value of r* as $7r$. Eliminate (B) because it does not include this term. Choice (A) also correctly translates *14 more than* as + 14. The correct answer is (A).

21. **–0.4 or –2/5**

The question asks for the $x$-coordinate of the $x$-intercept of a graph that is a translation of another graph. When a graph is translated, or transformed, up or down, the $y$-value changes. Start by isolating $y$. Subtract $5x$ from both sides of the equation to get $3y = -5x - 8$. Divide both sides of the equation by 3 to get $y = -\frac{5}{3}x - \frac{8}{3}$. To translate this graph up 2 units, add 2 to the $y$-value. The equation of the new graph is $y = -\frac{5}{3}x - \frac{8}{3} + 2$. At this point, the best option is to enter this equation into the built-in calculator, then scroll and zoom as needed to see a gray dot at the $x$-intercept. Click on the dot to see that the coordinates of the point are (–0.4, 0). The question asks for the $x$-coordinate of the $x$-intercept, which is –0.4. It is also possible to solve algebraically by making $y = 0$ in the equation of the new graph and solving for $x$. This might lead to the decimal form –0.4 or to the fractional form $-\frac{2}{5}$, both of which will be accepted as correct. The correct answer is –0.4 or –2/5.

22. **A** The question asks for the value of a trigonometric function. Use the Geometry Basic Approach. Start by drawing two right triangles that are similar to each other, meaning they have the same proportions but are different sizes. Be certain to match up the corresponding angles that are given in the question, and put the longest side opposite the right angle. The drawing should look something like this:



The question asks for the value of cos $D$. Trig functions are proportional, and angle $A$ corresponds to angle $D$, so cos $A$ = cos $D$. Use SOHCAHTOA to remember the trig functions, and find cos $A$. The CAH part of the acronym defines cosine as $\frac{\text{adjacent}}{\text{hypotenuse}}$. The side adjacent to angle $A$ is 42, and the hypotenuse is 70, so cos $A = \frac{42}{70}$. Since cos $D$ = cos $A$, cos $D$ is also $\frac{42}{70}$. The numerator and denominator are both multiples of 14, so reduce the fraction to get cos $D = \frac{3}{5}$. The correct answer is (A).

## Module 2—Easier

1. **8400** The question asks for a value given a rate. Begin by reading the question to find information about the rate. The question states that the factory *makes 1,200 vehicles in 1 day*, but asks for the number of vehicles in 1 week. There are 7 days in 1 week, so set up a proportion, being sure to match up the units. The proportion is $\frac{1{,}200 \text{ vehicles}}{1 \text{ day}} = \frac{x \text{ vehicles}}{7 \text{ days}}$. Cross-multiply to get $(1)(x) = (1{,}200)(7)$, which becomes $x = 8{,}400$. Leave out the comma when entering the answer in the fill-in box. The correct answer is 8400.

2. **A** The question asks for the value of an expression based on an equation. There isn't a straightforward way to get from $10a$ to $9a$, so start by isolating $a$. Divide both sides of the equation by 10 to get $a = 3$. Next, substitute 3 for $a$ in the expression $9a$ to get $9(3) = 27$. The correct answer is (A).

3. **D** The question asks for a value based on a percentage. Translate the English to math in bite-sized pieces. The question states that Talula *baked 340 cookies and gave 20% of them to her neighbors. Percent* means out of 100, so translate 20% as $\frac{20}{100}$. Translate *of* as times. Thus, 20% of 340 becomes $\frac{20}{100}(340) = 68$ cookies that Talula gave to her neighbors. The correct answer is (D).

4. **61** The question asks for the value of a function. In function notation, the number inside the parentheses is the $x$-value that goes into the function, or the input, and the value that comes out of the function is the $y$-value, or the output. The question provides an input value, so plug $x = 6$ into the function to get $h(6) = 11(6) - 5$. Simplify to get $h(6) = 66 - 5$, and then $h(6) = 61$. The correct answer is 61.

5. **50** The question asks for a value based on a graph. First, check the units on each axis of the bar graph. *Days* are on the $x$-axis, and *number of dogs* is on the $y$-axis. The question asks about day 7, so find 7 on the $x$-axis. Look at the top of the bar for day 7, and then look left to the $y$-axis, using the mouse pointer or the edge of the scratch paper as a ruler. The top of the bar for day 7 is at 50. Thus, 50 dogs visited the dog park on day 7. The correct answer is 50.

6. **–5** The question asks for a value based on a graph. Specifically, the question asks for the value of $x$ at the $x$-intercept on the graph of a parabola. This is the point at which $y = 0$ and the graph intersects the $x$-axis. Look on the graph for the point on the parabola at which the $y$-coordinate equals 0 and the graph touches the $x$-axis. This point is (–5, 0), so the $x$-value is –5. The correct answer is –5.

7. **B** The question asks for an equivalent form of an expression. There are variables in the answer choices, so plugging in is an option. However, that might get messy with two variables and exponents, so the other option is to factor. Both 14 and 7 are divisible by 7, and both terms have $a$, so factor $7a$ out of both terms. Divide $14a$ by $7a$ to get 2, and divide $7ab^2$ by $7a$ to get $b^2$. The expression becomes $7a(2 + b^2)$. The correct answer is (B).

8. **208** The question asks for a measurement of a geometric figure. Use the Geometry Basic Approach. Start by drawing a rectangle on the scratch paper, then label the figure with the given information. Label one pair of opposite sides as 80 and the other pair of opposite sides as 24. The perimeter of a geometric shape is the sum of the lengths of the sides. Add all four side lengths to get 80 + 24 + 80 + 24 = 208. The correct answer is 208.

9. **B** The question asks for the value of a constant in the coordinates of a point on a line. The constant $n$ represents the $y$-value when $x = 3$. First, see if any answers can be eliminated by ballparking. Find 3 on the $x$-axis, and then move up from there to the line, using the mouse pointer or scratch paper as a ruler. Move left from there to the $y$-axis to see that the $y$-value is between 3 and 4. Check all four answer choices on a calculator: they are all between 3 and 4, so nothing can be eliminated. Instead, use the two points shown on the graph to find the slope of the line. The points are (0, 5) and (12, 0). Use those two points to calculate the slope of the line using the formula $slope = \frac{y_2 - y_1}{x_2 - x_1}$. The formula becomes $slope = \frac{5 - 0}{0 - 12}$, or $slope = -\frac{5}{12}$. Use the slope formula again, this time with one of the known points and the point that includes $n$. Use the points $(3, n)$ and (12, 0), and the formula becomes $slope = \frac{n - 0}{3 - 12}$, or $slope = -\frac{n}{9}$. Set this equal to the slope from the first two points to get $-\frac{n}{9} = -\frac{5}{12}$. Cross-multiply to get $(-9)(-5) = (n)(12)$, or $45 = 12n$. Divide both sides of the equation by 12 to get $\frac{45}{12} = n$. Both numbers in the fraction are multiples of 3, so reduce the fraction to get $\frac{15}{4} = n$. The correct answer is (B).

10. **D** The question asks for a probability based on a situation. Probability is defined as $\frac{\text{number of outcomes that give you what you want}}{\text{total number of possible outcomes}}$. Read carefully to find the numbers that make up the probability. The question states that there are *18 cards*, so that is the total number of possible outcomes. Each card has a different number, so out of the 18 cards, 1 of them has a 6 written

on it. Thus, there are 18 – 1 = 17 cards that do not have a 6 written on them, and the number of outcomes that give you what you want is 17. Therefore, the probability that a single card does not have a 6 written on it in $\frac{17}{18}$. The correct answer is (D).

11. **A** The question asks for the value of a function. In function notation, the number inside the parentheses is the $x$-value that goes into the function, or the input, and the value that comes out of the function is the $y$-value, or the output. The question provides an input value, so plug $x = 3$ into the function to get $g(3) = -2(3)^2$. Simplify to get $g(3) = -2(9)$, and then $g(3) = -18$. The correct answer is (A).

12. **B** The question asks for the value of an angle on a figure. Use the Geometry Basic Approach. Redraw the figure on the scratch paper, and add the labels. When a line intersects two parallel lines, two kinds of angles are created: big and small. All the small angles are equal to each other, all the big angles are equal to each other, and any small angle plus any big angle = 180°. The angle marked $d°$ is a small angle, and the angle marked 148° is a big angle. Thus, $d + 148 = 180$. Subtract 148 from both sides of the equation to get $d = 32$. The correct answer is (B).

13. **C** The question asks for an equation that represents a graph. One approach is to enter the equation from each answer choice into the built-in graphing calculator and see which graph looks most like the line of best fit of the scatterplot. Another approach is to compare features of the graph to the answer choices. The equations in the answer choices are all close to the form $y = mx + b$, in which $m$ is the slope and $b$ is the $y$-intercept, except the $mx$ and $b$ terms are reversed. The $y$-intercept is the $y$-coordinate of the point where $x = 0$, which is between 12 and 14 on this graph. Eliminate (A) and (B) because they have negative $y$-intercepts. Compare the remaining answer choices. The difference between (C) and (D) is the sign of the slope. The line of best fit descends from left to right, so it has a negative slope. Eliminate (D) because it has a positive slope. Using either method, the correct answer is (C).

14. **D** The question asks which answer correctly compares the data represented by a dot plot to the data from a related data set. Range is easy to calculate, if necessary, so start there. Subtracting 8 from each value will not change the range because the greatest value and the least value will both decrease by 8, which means the difference between them will be the same in data set S as it is in data set R. Eliminate (A) and (B) because they say that the ranges are different, not equal. Mean is a measure of center, and the center will change when the values change. Subtracting 8 from every value will make the mean less, so the mean of data set S is less than the mean of data set R. Eliminate (C) because it says that the two means are equal. The correct answer is (D).

15. **D** The question asks for the interpretation of a number in context. Start by reading the final question, which asks for the meaning of the number 25. Then label the parts of the equation with the information given. The question states that $c$ represents cooperative missions and $s$ represents solo missions. The number 25 is multiplied by $s$, so it must have something to do with solo missions. Eliminate (A) and (B) because they are about cooperative missions, not solo missions. Since $s$

already represents the number of solo missions, 25 cannot represent the same thing; eliminate (C), so (D) must be correct. The question also states that 1,000 is the total points scored, so it makes sense that the two coefficients on the left side of the equation represent numbers of points per mission. Because 25 is multiplied by $s$, it represents the number of points per solo mission. The correct answer is (D).

16. **D** The question asks for the value of a function. In function notation, the number inside the parentheses is the $x$-value that goes into the function, or the input, and the value that comes out of the function is the $y$-value, or the output. The question provides an output value of 5, and the answers have numbers that could represent the $x$-value, so plug in the answers. Start with one of the middle numbers and try (B), 25. Plug 25 into the function for $x$ to get $g(25) = \frac{\sqrt{25}}{2}$, which becomes $g(25) = \frac{5}{2}$, and then $g(25) = 2.5$. This does not match the output value given in the question, so eliminate (B). The result was too small, so also eliminate (A). Another perfect square is likely to result in an integer output, so try (D), 100, next. Plug 100 into the function for $x$ to get $g(100) = \frac{\sqrt{100}}{2}$, which becomes $g(100) = \frac{10}{2}$, and then $g(100) = 5$. This matches the output value given in the question, so stop here. The correct answer is (D).

17. **C** The question asks for the value of a variable in a system of equations. The second equation gives the value of $x$, so plug in $-7$ for $x$ in the first equation to get $y = (-7)^2 - 7$. Simplify the right side of the equation—keeping in mind that a negative number squared becomes positive—to get $y = 49 - 7$, and then $y = 42$. The correct answer is (C).

18. **A** The question asks for the value of a function. In function notation, $y = f(x)$. The number inside the parentheses is the $x$-value that goes into the function, or the input, and the value that comes out of the function is the $y$-value, or the output. The question asks for the value of $f(0)$, which means $x = 0$ and the question is asking for the $y$-intercept. Find $x = 0$ on the graph and move straight down to see that the graph crosses the $y$-axis at $(0, -5)$. When $x = 0$, $y = -5$. The correct answer is (A).

19. **A** The question asks for the equation of a line. All of the answer choices are linear equations in slope-intercept form, $y = mx + b$, where $m$ is the slope and $b$ is the $y$-intercept. The question states that the graph *has a slope of* $\frac{1}{6}$. Therefore, $m = \frac{1}{6}$. Eliminate (C) and (D) because they have the wrong slope. The question also states that the line *passes through the point* $(12, -7)$, so plug $x = 12$ and $y = -7$ into the remaining two answer choices. Choice (A) becomes $-7 = \frac{12}{6} - 9$, then $-7 = 2 -$

9, and finally $-7 = -7$. This is true, so keep (A), but check (B) just in case. Choice (B) becomes $-7 = \frac{12}{6} - 7$, then $-7 = 2 - 7$, and finally $-7 = -5$. This is not true; eliminate (B). The correct answer is (A).

20. **B** The question asks for the number of solutions to a quadratic equation. One method is to use the built-in graphing calculator. Enter the equation without the "= 0" part to see a parabola, and then scroll and zoom to see how many times, if any, the parabola intersects the $x$-axis. There are two points of intersection, at (–0.5, 0) and (2.5, 0), so there are exactly two real solutions, and the answer is (B). To determine the number of solutions algebraically, use the discriminant. The discriminant is the part of the quadratic formula under the square root sign and is written as $D = b^2 - 4ac$. When the discriminant is positive, the quadratic has exactly two real solutions; when the discriminant is 0, the quadratic has exactly one real solution; and when the discriminant is negative, the quadratic has no real solutions. The quadratic is given in standard form, $ax^2 + bx + c = 0$, so $a = 4$, $b = -8$, and $c = -5$. The discriminant is $D = (-8)^2 - 4(4)(-5)$, which becomes $D = 64 + 80$, and then $D = 144$. This is positive, so there are exactly two real solutions. Using either method, the correct answer is (B).

21. **B** The question asks for a value given a specific situation. Since the question asks for a specific value and the answers contain numbers in increasing order, plug in the answers. Rewrite the answer choices on the scratch paper and label them as "# of blue tokens." Next, start with a number in the middle and try (B), 16. The question states that the *jar contains a total of 37 red and blue tokens*. If there are 16 blue tokens, there are $37 - 16 = 21$ red tokens. The question also states that *the mass of one red token is 90 grams*, so 21 red tokens have a mass of $(21)(90) = 1{,}890$ grams. The question also states that *the mass of one blue token is 120 grams*, so 16 blue tokens have a mass of $(16)(120) = 1{,}920$ grams. Add the total grams of the red and blue tokens to get $1{,}890 + 1{,}920 = 3{,}810$ grams. This matches the combined mass given in the question, so stop here. The correct answer is (B).

22. **C** The question asks for the equation of a circle that has been shifted in the $xy$-plane. The equation of a circle in standard form is $(x - h)^2 + (y - k)^2 = r^2$, where $(h, k)$ is the center and $r$ is the radius. Shifting a circle to the right 7 units does not change the radius, and all the equations in the answer choices are equal to 64, so focus on the center. Moving a circle left or right does not change the $y$-value. Eliminate (A) and (B) because the $(y - k)^2$ portion of the equation is different. To move a circle left or right, change the $x$-value. In circle R, $(x - h) = (x + 3)$, so $-h = 3$ and $h = -3$. Since the $x$-value of the center of circle R is –3, the $x$-coordinate of the center of circle S, which is shifted to the right 7 units, is $-3 + 7 = 4$. Thus, the value of $h$ in circle S is 4. The term $(x - 4)^2$ must appear in the correct answer, so eliminate (D). To check, enter the equation of circle R and the equation in (C) for circle S into the built-in graphing calculator, and confirm that circle S is 7 units to the right of circle R. The correct answer is (C).

## Module 2—Harder

1. **C** The question asks for an equation that represents a specific situation. Translate the information in bite-sized pieces and eliminate after each piece. One piece of information says that *apples are sold in bags of 4 apples per bag, and bananas are sold in bunches of 6 bananas each.* Since the number of bags of apples is represented by $a$ and the number of bunches of bananas is represented by $b$, the correct equation must include the terms $4a$ and $6b$. Eliminate (B) and (D) because they do not contain these terms. When (A) is expanded, it includes those two terms but also includes $6a$ and $4b$, which do not match the information in the question; eliminate (A). The correct answer is (C).

2. **D** The question asks for an equation that represents a graph. One approach is to enter the equation from each answer choice into the built-in graphing calculator and see which graph looks most like the line of best fit of the scatterplot. Another approach is to compare features of the graph to the answer choices. The equations in the answer choices are all close to the form $y = mx + b$, in which $m$ is the slope and $b$ is the $y$-intercept, except the $mx$ and $b$ terms are reversed. The $y$-intercept is the $y$-coordinate of the point where $x = 0$, which is between 1 and 2 on this graph. Eliminate (A) and (B) because they have negative $y$-intercepts. Compare the remaining answer choices. The difference between (C) and (D) is the sign of the slope. The line of best fit goes up from left to right, so it has a positive slope. Eliminate (C) because it has a negative slope. Using either method, the correct answer is (D).

3. **B** The question asks for a value based on survey data. Since 45% of the respondents do not plan to compete in the upcoming race, apply that percentage to all 120 members of the cycling club. *Percent* means out of 100, so translate 45% as $\frac{45}{100}$. Taking the percent of a number translates to multiplication, so 45% of 120 becomes $\frac{45}{100}(200)$. Use scratch paper or a calculator to do the math to get that 54 members of the cycling club do not plan to compete in the upcoming race. The correct answer is (B).

4. **C** The question asks for the function that represents values given in a table. In function notation, the number inside the parentheses is the $x$-value that goes into the function, or the input, and the value that comes out of the function is the $y$-value, or the output. The table includes four pairs of input and output values, and the correct equation must work for every pair of values. Plug in values from the table and eliminate functions that don't work. Because 0 and 1 are likely to make more than one answer work, try the first row of the table and plug $x = -1$ and $f(x) = -11$ into the answer choices. Choice (A) becomes $-11 = -(-1)^2 - 4(-1) - 5$. Simplify to get $-11 = -1 + 4 - 5$, and then $-11 = -2$. This is not true, so eliminate (A). Choice (B) becomes $-11 = -5(-1)^2 + 3(-1) - 5$. Simplify to get $-11 = -5 - 3 - 5$, and then $-11 = -13$; eliminate (B). Choice (C) becomes $-11 = -4(-1)^2 + 2(-1) - 5$. Simplify to get $-11 = -4 - 2 - 5$, and then $-11 = -11$. This is true, so keep (C), but check (D) just in case. Choice (D) becomes $-11 = -2(-1)^2 + 4(-1) - 5$. Simplify to get $-11 = -2 - 4 - 5$, and then $-11 = -11$. This is also true, so try another pair of values.

Try the last row of the table and plug $x = 2$ and $f(x) = -17$ into the remaining answer choices. Choice (C) becomes $-17 = -4(2)^2 + 2(2) - 5$. Simplify to get $-17 = -4(4) + 4 - 5$, then $-17 = -16 + 4 - 5$, and finally $-17 = -17$. Keep (C) and check (D). Choice (D) becomes $-17 = -2(2)^2 + 4(2) - 5$. Simplify to get $-17 = -2(4) + 8 - 5$, then $-17 = -8 + 8 - 5$, and finally $-17 = -5$; eliminate (D). The correct answer is (C).

5. **D** The question asks for a value given a function. In function notation, the number inside the parentheses is the $x$-value that goes into the function, or the input, and the value that comes out of the function is the $y$-value, or the output. The question provides an output value of 20, and the answers have numbers that could represent the $x$-value, so plug in the answers. Rewrite the answers on the scratch paper and label them as "$c$." Start with one of the middle numbers and try (B), 20. Plug 20 into the function for $x$ to get $f(20) = \frac{20 - 12}{8}$, which becomes $f(20) = \frac{8}{8}$, and then $f(20) = 1$. This does not match the output value of 20 given in the question, so eliminate (B). The result was too small, so also eliminate (A), and try (C), 148, next. Plug 148 into the function for $x$ to get $f(148) = \frac{148 - 12}{8}$, which becomes $f(148) = \frac{136}{8}$, and then $f(148) = 17$. Eliminate (C). Only (D) remains, so it must be correct. The output value for (C) was closer to 20 but still too small, so it makes sense that a larger number is needed. The correct answer is (D).

6. **B** The question asks for the value of a constant in the coordinates of a point on a line. The constant $n$ represents the $y$-value when $x = 3$. First, see if any answers can be eliminated by ballparking. Find 3 on the $x$-axis, and then move up from there to the line, using the mouse pointer or scratch paper as a ruler. Move left from there to the $y$-axis to see that the $y$-value is between 3 and 4. Check all four answer choices on a calculator: they are all between 3 and 4, so nothing can be eliminated. Instead, use the two points shown on the graph to find the slope of the line. The points are (0, 5) and (12, 0). Use those two points to calculate the slope of the line using the formula $slope = \frac{y_2 - y_1}{x_2 - x_1}$. The formula becomes $slope = \frac{5 - 0}{0 - 12}$, or $slope = -\frac{5}{12}$. Use the slope formula again, this time with one of the known points and the point that includes $n$. Use the points $(3, n)$ and (12, 0), and the formula becomes $slope = \frac{n - 0}{3 - 12}$, or $slope = -\frac{n}{9}$. Set this equal to the slope from the first two points to get $-\frac{n}{9} = -\frac{5}{12}$. Cross-multiply to get $(-9)(-5) = (n)(12)$, or $45 = 12n$. Divide both sides of the equation by 12 to get $\frac{45}{12} = n$. Both numbers in the fraction are multiples of 3, so reduce the fraction to get $\frac{15}{4} = n$. The correct answer is (B).

7. **A** The question asks for the slope of a line. The question states that line $m$ is perpendicular to line $l$, which means they have equal slopes. The question gives the equation of line $l$, so find the slope of that line. First, convert the equation of line $l$ into slope-intercept form, $y = mx + b$, in which $m$ is the slope and $b$ is the $y$-intercept. Subtract 7 from both sides of the equation to get $4y = -16x - 7$. Divide both sides of the equation by 4 to get $y = -4x - \frac{7}{4}$. The slope of line $l$ is thus $-4$. It is also possible to convert the equation of line $l$ into standard form by adding $16x$ to both sides of the equation and subtracting 7 from both sides of the equation to get $16x + 4y = -7$. In standard form, $Ax + By = C$, the slope is $-\frac{A}{B}$. In this case, $A = 16$ and $B = 4$, so the slope of line $l$ is $-\frac{16}{4} = -4$. Using either form of a linear equation, the slope of line $l$ is $-4$. Since line $m$ is parallel and has the same slope, the slope of line $m$ is also $-4$. The correct answer is (A).

8. **C** The question asks for the density of a rectangular solid. Use the Geometry Basic Approach. Start by drawing a rectangular solid on the scratch paper as best as possible, and then label the length, width, and height as 1.1, 0.8, and 0.8, respectively. Other information about the concrete block is given, so use the units to determine what to do next. The question asks for the density in kilograms per cubic meter, and the question gives the mass in kilograms, so look for a way to find a value in cubic meters. Since the side lengths are in meters, the volume will be in cubic meters. Write down the formula for the volume of a rectangular solid or prism, either from memory or after looking it up on the reference sheet. The formula is $V = lwh$. Plug in the side lengths given in the question to get $V = (1.1)(0.8)(0.8)$, or $V = 0.704$ cubic meters. The mass in kilograms divided by the volume in cubic meters equals the density in kilograms per cubic meter. This happens to be the formula for density, which can be written as $D = \frac{m}{V}$. Plug in the known values to get $D = \frac{1{,}690}{0.704}$. Divide the fraction on the right side of the equation to get $D \approx 2{,}400.57$. The nearest whole number is 2,401. The correct answer is (C).

9. **B** The question asks for the value of an angle on a figure. Use the Geometry Basic Approach. Redraw the figure on the scratch paper, and add the labels. When a line intersects two parallel lines, two kinds of angles are created: big and small. All the small angles are equal to each other, all the big angles are equal to each other, and any small angle plus any big angle = 180°. Angle $q$ is a small angle, and angle $r$ is a big angle, so they add up to 180. Since $q = 10c - 11$ and $r = 15c + 41$, add

those expressions together and set them equal to 180. The equation becomes $(10c - 11) + (15c + 41) = 180$. Combine like terms on the left side of the equation to get $25c + 30 = 180$. Subtract 30 from both sides of the equation to get $25c = 150$. Divide both sides of the equation by 25 to get $c = 6$. Be careful: the question asks for the value of $p$, which is a small angle. Plug $c = 6$ into the equation for the other small angle, $q$, to get $q = 10(6) - 11$, which becomes $q = 60 - 11$, and then $q = 49$. Because $p$ and $q$ are both small angles, $p$ is also 49. The correct answer is (B).

10. **–35/63, –5/9, –0.555 –0.556, –.5555, or –.5556**

The question asks for a value given an equation. A linear equation has infinitely many solutions when the $x$-terms are the same and the constants are the same. The question asks for the value of $q$, which is not part of an $x$-term, so focus on the constants and ignore the $x$-terms. Distribute on the left side of the equation to get $-7q = \frac{35}{9}$. Divide both sides of this equation by –7 to get $q = \frac{35}{(9)(-7)}$, or $q = -\frac{35}{63}$. When the answer is negative, there is space in the fill-in box for six characters, including the negative sign. This fraction fits, so there is no need to reduce it, although the reduced form will also be accepted as correct. Decimal forms, such as –0.555 or –.5556, will also be accepted. The correct answer is $-\frac{35}{63}$ and equivalent forms.

11. **837** The question asks for a new value after two changes to an initial value. Start by finding the number of unique visitors after the initial 25% decrease. Translate 25% as $\frac{25}{100}$ and multiply by the previous average of 620 unique visitors each day to get $\frac{25}{100}(620) = 155$. The number of unique visitors decreased by 25%, so the new number is $620 - 155 = 465$ unique visitors each day. Next, find 180% of this new number. Translate 180% as $\frac{180}{100}$ and multiply it by 465 to get $\frac{180}{100}(465) = 837$ unique visitors each day during the promotion. The correct answer is 837.

12. **B** The question asks for the value of a percent decrease given a function that represents a specific situation. The value of the function is decreasing by a certain percent, so this question is about exponential decay. Write down the growth and decay formula: *final amount* = (*original amount*)$(1 \pm \textit{rate})^{\textit{number of changes}}$. The *number of changes* is given in terms of hours, but the question asks about the increase *every 75 minutes*. There are 60 minutes in 1 hour, so set up a proportion: $\frac{60 \text{ minutes}}{1 \text{ hour}} = \frac{75 \text{ minutes}}{h \text{ hours}}$. Cross-multiply to get $(1)(75) = (60)(h)$, or $75 = 60h$. Divide both sides of the equation by 60 to get $\frac{75}{60} = h$. Reduce the fraction to get $\frac{5}{4} = h$. Now, plug in

$\frac{5}{4}$ for $h$ in the function to get $M(h) = 302(0.87)^{\left(\frac{4}{5}\right)\left(\frac{5}{4}\right)}$, which becomes $M(h) = 302(0.87)^1$. The amount of the isotope is decreasing once, so $0.87 = 1 - rate$. Add *rate* to both sides of the equation to get $rate + 0.87 = 1$, and then subtract 0.87 from both sides of the equation to get $rate = 0.13$. The question asks for $d\%$, which is the rate as a percentage, so multiply 0.13 by 100 to get 13%. The correct answer is (B).

13. **13** The question asks for the mean, or average, of a data set. For averages, use the formula $T = AN$, in which $T$ is the *Total*, $A$ is the *Average*, and $N$ is the *Number of things*. First, apply this formula to group X, in which there are 40 packages with a mean, or average, mass of 24 kg. In group X, $N = 40$ and $A = 24$. The average formula becomes $T = (40)(24)$, or $T = 960$ kg. Now do the same for group Y, in which there are 110 packages with a mean, or average, mass of 9 kg. In group Y, $N = 110$ and $A = 9$. The average formula becomes $T = (110)(9)$, or $T = 990$ kg. Now calculate the average of all 150 packages. The number of packages combined is given as 150, and the total of the masses of all of the packages is 960 + 990 = 1,950 kg. Therefore, $N = 150$ and $T = 1{,}950$. The average formula becomes $1{,}950 = (A)(150)$. Divide both sides of the equation by 150 to get $13 = A$. The correct answer is 13.

14. **A** The question asks for an expression that must be an integer. The question provides a quadratic in both standard form, which is $ax^2 + bx + c$, and factored form, which is $a(x - m)(x - n)$. Use FOIL to expand the factored form quadratic into standard form: $(px - q)(x - r) = px^2 - prx - qx + qr$. Combine the middle terms to get $px^2 - (pr + q)x + qr$. Now set this equal to the standard form expression, $11x^2 - kx + 63$, and match up terms. It might make things clearer to write the two expressions above each other:

$$11x^2 - kx + 63$$

$$px^2 - (pr + q)x + qr$$

Therefore, $p = 11$, $(pr + q) = k$, and $qr = 63$. Examine the answer choices to see if any answers can be eliminated quickly. Eliminate (B) because $p = 11$ and $\frac{63}{11}$ is not an integer. Since $qr = 63$, $q = \frac{63}{r}$. The question states that $q$ is an integer, so any value that is equivalent to $q$ will also be an integer. Thus, $\frac{63}{r}$ must be an integer. The correct answer is (A).

15. **108** The question asks for the least possible value that is greater than a constant in a quadratic equation. To determine when a quadratic equation has exactly two real solutions, use the discriminant. The discriminant is the part of the quadratic formula under the square root sign and is written as $D = b^2 - 4ac$. When the discriminant is positive, the quadratic has exactly two real solutions; when the discriminant is 0, the quadratic has exactly one real solution; and when the discriminant is negative, the quadratic has no real solutions. Thus, the discriminant of this quadratic must

equal a positive number. Since the quadratic is in standard form, which is $ax^2 + bx + c = 0$, $a = 3$, $b = -36$, and $c = k$. Plug these into the discriminant formula to get $D = (-36)^2 - 4(3)(k)$, or $D = 1{,}296 - 12k$. The discriminant must be greater than 0, so $1{,}296 - 12k > 0$. Add $12k$ to both sides of this inequality to get $1{,}296 > 12k$, then divide both sides of the inequality by 12 to get $108 > k$, or $k < 108$. If $k < 108$ and $k < m$, the value of $m$ can be greater than or equal to 108, or $m \geq 108$. The correct answer is 108.

16. **D** The question asks which answer correctly compares the data represented by a dot plot to the data from a related data set. Range is easy to calculate, if necessary, so start there. Subtracting 8 from each value will not change the range because the greatest value and the least value will both decrease by 8, which means the difference between them will be the same in data set S as it is in data set R. Eliminate (A) and (B) because they say that the ranges are different, not equal. Mean is a measure of center, and the center will change when the values change. Subtracting 8 from every value will make the mean less, so the mean of data set S is less than the mean of data set R. Eliminate (C) because it says that the two means are equal. The correct answer is (D).

17. **A** The question asks for the equation that defines a function. The question asks about function $h$, which is transformed, or translated, from the graph of function $h$. When a graph is transformed, subtracting inside the parentheses shifts the graph to the right. Since $h(x) = g(x - 3)$, the graph of function $h$ is shifted 3 units to the right of the graph of function $g$. The graph of function $g$ contains a point at $(6, -3)$, so the graph of function $h$ must include a point 3 units to the right at $(9, -3)$. In function notation, $h(x) = y$, so $x = 9$ and $h(x) = -3$. Plug these values into the answer choices and eliminate any answer that doesn't work. Choice (A) becomes $-3 = \frac{-9}{9-6}$, then $-3 = \frac{-9}{3}$, and finally $-3 = -3$. This is true, so keep (A), but check the remaining answers just in case. Choice (B) becomes $-3 = \frac{-9}{9-3}$, then $-3 = \frac{-9}{6}$, and finally $-3 = -\frac{3}{2}$. This is not true, so eliminate (B). Choice (C) becomes $-3 = \frac{-9}{9}$, or $-3 = -1$; eliminate (C). Choice (D) becomes $-3 = \frac{-9(9-3)}{9-3}$, then $-3 = \frac{-9(6)}{6}$, and finally $-3 = -9$; eliminate (D). The correct answer is (A).

18. $-\frac{50}{4}$ **or** $-12.5$

The question asks for the value of a constant in a system of equations. The equations are both equal to $y$, so set them equal to each other. The new equation becomes $x^2 - 6x - c = 3.5$. Put the quadratic in standard form, which is $ax^2 + bx + c = 0$, by setting one side equal to 0. Subtract 3.5 from both sides of the equation to get $x^2 - 6x - c - 3.5 = 0$. The question states that *the system has exactly one real solution*, so use the discriminant. The discriminant is the part of the quadratic formula under the square root sign, and it can be written as $D = b^2 - 4ac$. When the discriminant is positive, the quadratic has exactly two real solutions; when the discriminant is 0, the quadratic has exactly one

real solution; and when the discriminant is negative, the quadratic has no real solutions. In this case, the quadratic has exactly one real solution, so the discriminant must equal 0.

In this equation, the constant $c$ is part of the $c$ term in the discriminant, so be careful not to confuse the constant $c$ in the original equation with the $c$ in the discriminant. With the equation in standard form, $a = 1$, $b = -6$, and $c = -c - 3.5$. Plug these values into the discriminant formula and set it equal to 0 to get $(-6)^2 - 4(1)(-c - 3.5) = 0$. Simplify the left side of the equation to get $36 + 4c + 14 = 0$, and then $50 + 4c = 0$. Subtract 50 from both sides of the equation to get $4c = -50$, and then divide both sides of the equation by 4 to get $c = -\frac{50}{4}$. This fraction fits in the fill-in box, so there is no need to reduce it, although the reduced form, $-\frac{25}{2}$, will also be accepted as correct. The decimal form, –12.5, will also be accepted. The correct answer is $-\frac{50}{4}$ and equivalent forms.

19. **1** The question asks for the radius of a circle given the equation of the graph in the $xy$-plane. The equation of a circle in standard form is $(x - h)^2 + (y - k)^2 = r^2$, where $(h, k)$ is the center and $r$ is the radius. However, the equation of this circle is not in standard form, so look for another way to find the radius. One method is to complete the square for both terms in order to put the equation in standard form. A much simpler approach is to enter the equation into the built-in graphing calculator. Zoom in to see that there are several gray dots on the graph, which can be seen if they disappear by clicking on the equation or on the circle itself. Four of the gray dots are where the circle intercepts the $x$- and $y$-axes. Click on the other two dots, which are at the top and bottom of the circle and form the diameter. The points are (0.25, –0.75) and (0.25, 1.25). They have the same $x$-coordinate, so the distance between the two points, or the diameter, is the difference between the $y$-coordinates: $1.25 - (-0.75) = 2$. Be careful: the diameter of the circle is 2, but the question asks for the radius. The radius of a circle is half of the diameter, so the radius is 1. The correct answer is 1.

20. **B** The question asks for the value of a constant that is part of the product of the solutions to a quadratic equation. It takes a lot of algebra to answer this question, but a shortcut is to recall that, when a quadratic is in standard form, $ax^2 + bx + c$, the product of the solutions is $\frac{c}{a}$. In the given quadratic, $a = 18$ and $c = -mn$, so the product of the solutions is $\frac{-mn}{18}$. The question states that the product of the solutions is $kmn$, so set the two ways to represent the product of the solutions equal to each other to get $\frac{-mn}{18} = kmn$. Multiply both sides of the equation by 18 to get $-mn = 18kmn$, then divide both sides of the equation by $mn$ to get $-1 = 18k$. Finally, divide both sides of the equation by 18 to get $-\frac{1}{18} = k$. The correct answer is (B).

21. **A** The question asks for the value of an expression with three constants in a quadratic equation. The question states that the vertex of the parabola is at (–1, 4), and that the parabola does not intersect the $x$-axis. Since the $y$-coordinate of the vertex is positive and the parabola does not intersect the $x$-axis, the parabola must open upwards. The vertex of a parabola is expressed as $(h, k)$. Use this information to rewrite the parabola in vertex form, which is $y = a(x - h)^2 + k$. Plug in the values for $h$ and $k$ from the vertex to get $y = a(x + 1)^2 + 4$. Expand $(x + 1)^2$ using FOIL to get $y = a(x^2 + 2x + 1) + 4$. Next, distribute the $a$ to get $y = ax^2 + 2ax + a + 4$. Finally, since this vertex form of the parabola is equal to the given standard form of the same parabola, set them equal to each other: $ax^2 + 2ax + a + 4 = ax^2 + bx + c$. Write the two equations above each other to see the matching terms more clearly:

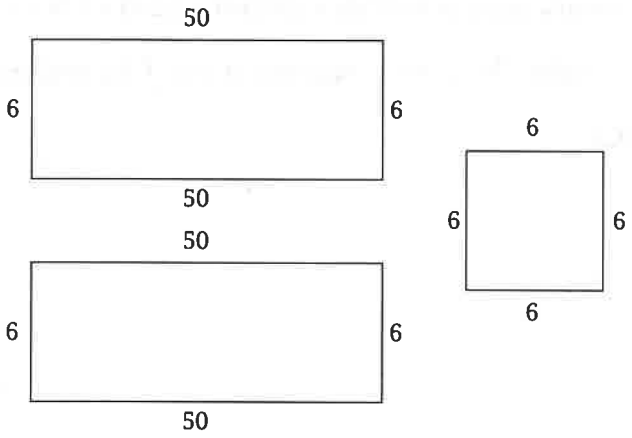
$$ax^2 + 2ax + a + 4$$

$$ax^2 + bx + c$$

Given this, the $ax^2$ terms cancel, $2a = b$ and $a + 4 = c$. Thus, $a - b - c$ becomes $a - 2a - (a + 4)$. Combine like terms to get $-2a - 4$.

Since the parabola opens upwards, the value of $a$ must be positive. Since the question asks for a specific value, and the answers contain numbers in increasing order, plug in the answers. Rewrite the answer choices on the scratch paper and label them as "$-2a - 4$." Next, start with a number in the middle and try (B), –4. The equation becomes $-2a - 4 = -4$. Add $2a$ to both sides of the equation to get $-4 = 2a - 4$, and then add 4 to both sides of the equation to get $0 = 2a$. Finally, divide both sides of the equation by 2 to get $0 = a$. This is not positive, so eliminate (B). The result was close to being a negative number, so try (A), –5, next. The equation becomes $-2a - 4 = -5$. Add $2a$ to both sides of the equation to get $-4 = 2a - 5$, and then add 5 to both sides of the equation to get $1 = 2a$. Finally, divide both sides of the equation by 2 to get $\frac{1}{2} = a$. This is positive, so stop here. The correct answer is (A).

22. **C** The question asks for a measurement of a geometric figure. Use the Geometry Basic Approach. Because the surface area of a 3-dimensional figure is the sum of the areas of its faces, draw three rectangles of different sizes to represent the faces of the rectangular solid. Label the height of 50 on two of the rectangles. Since the question asks for a specific value and the answers contain numbers in increasing order, plug in the answers. Rewrite the answer choices on the scratch paper and label them as "*side length of base*." Next, start with a number in the middle and try (B), 6. Label the remaining sides lengths of the rectangles as 6. The figures should now look something like this:




Use the formula for the area of a rectangle, $A = lw$, to find the area of each face. One 6 × 50 face has an area of 300, and one 6 × 6 face has an area of 36. There are 4 faces with an area of 300 and 2 faces with an area of 36 for a surface area of (4)(300) + (2)(36) = 1,200 + 72 = 1,272. Thus, $S = 1{,}272$.

If the two prisms were cut into two identical prisms parallel to the square base, the resulting shapes would each be a shorter rectangular prism with a height of $\frac{50}{2} = 25$ and a square base with a side length of 6. Perform the same calculations to find the surface area of one of the smaller prisms. One 6 × 25 face has an area of 150, and one 6 × 6 face has an area of 36. There are 4 faces with an area of 150 and 2 faces with an area of 36 for a surface area of (4)(150) + (2)(36) = 600 + 72 = 672. The question states that *each resulting prism has a surface area of* $\frac{31}{56}S$, so plug in 1,272 for $S$. The result is $\frac{31}{56}(1{,}272) \approx 704$. This does not match the surface area of one of the smaller prisms, so eliminate (B).

It might be difficult to determine whether a larger or smaller number is needed, so pick a direction and try (C), 12. The dimensions of the original single prism are now 50 × 12 × 12. There are four faces with an area of (50)(12) = 600 and two faces with an area of (12)(12) = 144 for a surface area of (4)(600) + (2)(144) = 2,400 + 288 = 2,688. The dimensions of one of the smaller prisms are now 25 × 12 × 12. There are four faces with an area of (25)(12) = 300 and two faces with an area of (12)(12) = 144 for a surface area of (4)(300) + (2)(144) = 1,200 + 188 = 1,488. Plug in 2,688 for $S$ to get $\frac{31}{56}(2{,}688) = 1{,}488$. This is the surface area of one of the smaller prisms, so stop here. The correct answer is (C).