Answers and Explanations

English Test

1. **C.** At first glance, you may not think the subject of this sentence is plural, but it is: coolness *and* hum. That means you need a plural verb. Believe it or not, *mean* is plural, and the only answer that contains *mean* is Choice (C).

2. **F.** The words before the punctuation mark create a complete sentence, and the words after the punctuation create a complete sentence. Because no conjunction joins the two clauses, a semicolon does. So the sentence is fine as is. Choice (J) makes the sentence a comma splice.

   Choice (H) may have tempted you because, of course, you can punctuate two independent clauses with a period. Hold on, though. Choice (H) uses *its* (the possessive form) to mean *it's* (the contraction of "it is").

3. **C.** The underlined part isn't a complete sentence. *Pointing* without any assistance from another helping verb doesn't work as a verb. You have to change it to a word that functions as a real verb. The paragraph is in simple present tense, so pick Choice (C) rather than Choice (D). Choice (B) creates a new error by pairing a singular verb with a plural subject.

4. **J.** This question may have been a little tricky because the misplaced modifier is hard to spot at first. But after you see that *just* is in the wrong place, you can fix the sentence in a jiffy. *Just* refers to the kinds of players — they weren't just from Clement. It doesn't refer to "made up," so you can't say that the hockey team was "just made up" (unless perhaps the players had all recently painted on clown faces).

5. **B.** Semicolons separate independent clauses. Whenever you see a semicolon in a sentence, the words that come before it and the words that come after it have to make complete sentences. The words that come before the semicolon in this sentence don't create a complete sentence. They make a dependent clause. You separate a beginning dependent clause from the rest of the sentence with a comma. So Choice (B) is the right answer.

6. **J.** The paragraph is about more than just the players from Clement, so the underlined sentence doesn't provide an accurate idea of what the paragraph is about. Cross out Choice (F) and check out your other options. Eliminate Choice (H) because the paragraph is primarily about Sanchez, who wasn't on the team last year. Plus, Choice (H) awkwardly compares *team* to *year.* Choice (G) is vague and uninformative and would be better introducing a paragraph about the number of players on the team rather than the characteristics of individual members. The best answer is Choice (J). The last sentence of the previous paragraph sets up that the next paragraph is about the players.

7. **C.** This sentence begins with a description of someone who's returning to Clement, but the subject of the sentence is *position.* The position isn't returning. Brendan Sanchez is. Choose the answer that makes Sanchez the subject of the sentence without creating a new error. Choices (C) and (D) correct the error. Choice (D) changes the comma to a semicolon, though. A semicolon doesn't work in this sentence because the information that comes before it isn't a complete sentence. Choice (C) corrects the error and deletes unnecessary words.

8. **F.** This question tests you about comma usage. Commas correctly separate elements in a series from one another and appositives from the nouns they describe. This sentence has both a series and a few appositives. Each player's name needs to be surrounded by commas, just the way it appears in the original sentence. The colon in Choice (G) isn't proper because the words that come before a colon must be a complete sentence. You don't use colons to set apart appositives, so Choice (H) is out. The problem with Choice (J) is that comma with no purpose in between *as* and *Clement.*

9. **D.** You don't have any reason to insert a comma anywhere in the underlined words, so cross out Choices (A) and (C).

10. **H.** The passage is a casual article designed to get readers psyched about the hockey team. Sticking a list of players right in the middle of the article probably wouldn't be appropriate. If a list is necessary, which is debatable, it would work better at the end of the article so that it doesn't interrupt the information in the passage. Because the answer is no, cross out Choices (F) and (G). Then all you have to do is pick the right reason for not including the list. The focus of the essay isn't last year's performance, so the answer has to be Choice (H).

11. **D.** Always check an underlined pronoun to make sure it's used properly. "Him and Poldale" is the subject of the sentence. *Him* is the objective form. You can't use an objective pronoun to fill the position of sentence subject. The only answer that changes *him* to *he* is Choice (D).

12. **F.** As weird as it may sound, "it is hoped" is the proper way to say this expression. *Hopefully* is an adverb and is almost always used incorrectly on the ACT. In Standard English (the way it's written in formal books, not the way most high schoolers speak it), you use *hopefully* only to describe the way you did something. For instance, "I entered the ACT test center hopefully, anticipating an awesome score after many diligent hours of careful preparation." "Everyone is hopeful" in Choice (J) isn't improper, but the addition of the preposition *with* doesn't work with the remainder of the sentence.

13. **C.** *Good* is an adjective. *Well* is an adverb. This sentence uses *good* to describe how the Cougars played. You use adverbs to describe the action of verbs, which means *good* doesn't belong here. The proper construction is "played well." Cross out Choices (A) and (B). Choice (D) is redundant. *Sufficiently* and *enough* mean the same thing. The best answer is Choice (C).

14. **G.** Saying that the Cougars have to rebound before you talk about their previous losses doesn't make a whole lot of sense. Sentence 5 mentions last year's losses, so Sentence 4 needs to come after Sentence 5. Choice (G) is the winner here.

15. **A.** You can eliminate Choice (D) because the tone of the passage isn't formal. The essay mentions last season's losses but doesn't dwell on them, so cross out Choice (C). Choice (A) is a better answer than Choice (B) because the essay doesn't provide details about all the players.

16. **J.** This deprived sentence has no verb, which means it's really not a sentence. *Being* can't function as a verb unless it's paired with a helping verb. Choose the answer that gives the sentence a verb. Make sure to use the proper tense. The rest of the paragraph is in present tense. Choice (J) follows that trend. The other two choices suggest that recycling was good in the past.

17. **B.** The comma in the underlined words has no purpose. Take the poor, aimless punctuation mark out of its misery by removing it from the sentence. The only choice that completes this noble task is Choice (B). Choices (C) and (D) try to move the position of *both* around, but *both* is fine just where it is. Recycling is a step in both maintaining and sustaining.

18. **J.** This sentence provides a classic case of redundancy. *Autonomous* and *independence* mean the same thing, so you don't need both of them. Omit *autonomous* by choosing Choice (J) and move on.

19. **A.** The underlined series is punctuated correctly. A comma comes after every item in the list. Semicolons are overkill in this case, so cross out Choice (B). The colon in Choice (C) suggests that everything that comes after it is an example of recycled paper. And Choice (D) is wrong because you need to replace those extra *ands* at the beginning of the list with commas.

20. **G.** The problem with this sentence is another additional redundant repetition. Yikes! It's contagious. If markets are at all-time highs, they've never been greater. You don't need to say it twice. Choice (G) cures the malady. Choice (J) eliminates *greater* but remains repetitious because "have never been" conveys the same message as *all-time.*

21. **A.** The proposed insertion flows fairly well from the sentence before it, but it doesn't work with the sentence after it. If people tend to discontinue participating in recycle programs, the next statement about increased supply and demand for recycled goods doesn't make sense. So the answer is no. Cross out Choices (C) and (D). Now you just have to decide between Choices (A) and (B). The topic isn't *completely* different from the information in the rest of the paragraph. It's about public education and recycling. Choice (A) is better. Inserting the sentence would break up the information that public education has caused increased supply and demand for recycled goods.

22. **G.** If you noticed that the underlined words contain the wrong version of *their,* give yourself a strong pat on the back. *Their* is the possessive form of *they,* and a noun always has to follow it. But a noun doesn't come after *their* in this sentence. Choice (G) presents the correct version, and it doesn't change *large* to "super huge," a choice of words that doesn't fit with the relatively formal tone of the rest of the passage.

23. **B.** Check the words that come before and after the semicolon. The words after it aren't a complete sentence, so you know the semicolon isn't right. If a semicolon doesn't work, a period certainly won't either. Cross out Choice (C). Deciding between Choices (B) and (D) may be a little more challenging. *Which* introduces a nonrestrictive (or nonessential) clause, so it needs to be separated from the rest of the sentence by a comma. Cross out Choice (D). The best way to punctuate the sentence out of the four options is with the colon in Choice (B).

24. **J.** In this sentence, *strictly* describes "any type of trash." But the right use of *strictly* is to narrow down something to a specific type rather than the more general *any* type. You need to replace *strictly* with a more accurate word. Cross out Choice (G) because referring to types of trash as rigorous just doesn't make sense. In the context of this sentence, *mainly* means mostly and *virtually* means almost. It makes more sense to say "almost any type of trash" than "mostly any type of trash."

25. **B.** One look at the answer choices tells you exactly what kind of error to focus on. All the choices are the same except for the commas. So your job for this question is to figure out where the commas go. Don't waste time looking for any other error. "Recyclable or not" is a phrase that provides more information about the type of trash. You separate it from the rest of the sentence by surrounding it with commas. The only choice that properly puts commas on either side of the phrase is Choice (B). There's no reason for the comma between "recyclable" and "or" in Choice (D).

26. **G.** Examining the answer choices helps you focus on the errors in the underlined words. First, you notice that Choices (G) and (J) change *and* to *to.* The proper construction is "from … to," which means that *to* is correct. Mark through Choices (F) and (H) with your No. 2 pencil and take a closer look at the remaining options. Choice (J) changes TV to television, and Choice (G) changes *weeks'* to *week's. TV* is fine here. The dinners the passage refers to are commonly called "TV dinners" rather than "television dinners." The answer must be Choice (G). It properly changes *weeks'* from the plural possessive to the singular possessive *week's.* There's only one "last week."

27. **C.** *Unsightly* is a more concise way of saying "displeasing to the eye." Including both in the sentence is needlessly repetitious. The answer that corrects the issue is Choice (C).

28. **H.** Sentence 4 provides more detail about the complaints that neighbors make. Therefore, it makes the most sense to put it right after Sentence 2 (and before Sentence 3) because it's the sentence that states that neighbors complain about the "trash magnets" that recycle bins have become. Eliminate Choice (G) right away because Sentence 4 would be out of place without knowing the information in Sentence 2. It works better before Sentence 3 because it refers to removing the recycle bins, and Sentence 3 further explains why stores are willing to engage in the removal. Choice (J) would put Sentence 4 in a paragraph about a different topic, the recycling entrepreneurs. Picking Choice (H) provides the best flow of information in the paragraph.

29. **D.** The underlined words have a subject/verb agreement issue. *Who* refers to *entrepreneurs,* which is a plural noun. Therefore, the verb has to be plural — "have begun." Choice (C) creates a run-on sentence, and Choice (B) incorrectly changes *who* to the possessive form *whose.*

30. **F.** Eliminate answers that mention topics that were only covered in other paragraphs. Choice (G) is about public education, which appears only in the first paragraph. Choice (H) talks about neighbor complaints, which appears only in the second paragraph. The last paragraph doesn't distinguish between small and big businesses, so Choice (J) addresses a topic that hasn't been discussed. The best conclusion for the passage is Choice (F) because it refers to the programs discussed in the last paragraph and relates them to the general passage theme of promoting a greener future that's introduced in the first paragraph.

31. **A.** The sentence is fine the way it is. *That* isn't nonessential and shouldn't be separated by commas. Choice (D) is wrong. If you picked Choice (B) or (C), you created an incomplete sentence that leaves you waiting for more information.

32. **H.** The sentence is unclear and awkward. The reference to "this one" is vague, and it sounds like only "this one" is in the Constitution. Choice (H) changes the reference from "this one" to "this amendment" and clarifies that all ten amendments are in the Constitution.

33. **C.** Cross out Choice (B) because you don't need to change *liberty* to the possessive form; in fact, doing so is wrong. You can also eliminate Choice (D) because it deletes the main verb and makes the sentence incomplete. Between the remaining choices, Choice (C) is more direct and, thus, is the better answer. The emphasis provided by the phrasing in the original sentence is unnecessary.

34. **G.** Knowing how the Fourteenth Amendment made the Bill of Rights applicable is essential to the idea of the sentence. Therefore, you can't separate the underlined portion from the rest of the sentence by any form of punctuation.

35. **D.** The original wording of the sentence is strange. The listed items didn't originate the Bills of Rights. People did. The list includes elements that form the origins of the Bill of Rights. Choice (D) most properly conveys this idea.

36. **H.** Eliminate the answer choice that doesn't show that opposition disappeared soon after the Bill of Rights were ratified. Examine each option by reading it in the sentence. "When the Bill of Rights was ratified," "as soon as the Bill of Rights was ratified," and "after the Bill of Rights was ratified" convey the same general idea as "once the Bill of Rights was ratified." *While* is the same as *during,* which would mean that the opposition decreased at the same time that the Bill of Rights was ratified.

37. **D.** This sentence has a subject/verb agreement problem. The subject *(effect)* is singular and the verb *(are)* is plural. One of them has to change. Cross out Choice (A). *Affect* is almost always used as a verb rather than a noun, so Choice (B) is wrong. Both of the remaining choices change *effect* to the plural, but Choice (C) incorrectly makes the verb singular. Choice (D) corrects the problem without creating a new error.

38. **G.** The phrase "by prohibiting" isn't a verb, so the sentence has no verb and is a fragment. Choice (J) inserts a verb, but *prohibits* goes with *that* rather than "Bill of Rights," which means the sentence is still a fragment. The best answer is Choice (G). It provides a singular verb for the singular subject.

39. **A.** The original sentence correctly uses *which* to introduce a descriptive clause that's not essential to the main point of the sentence, which is that the Bill of Rights protects speech. Choice (D) retains the *which* but creates a sentence fragment. So Choice (A) is the answer here.

40. **G.** Approach this question by eliminating answers you know aren't right. The sentence provides an explanation of free speech, but it doesn't go into enough detail to be thorough. Cross out Choice (H). The main idea of the paragraph is that the Bill of Rights affects daily life. Eliminating Sentence 3 wouldn't take away this idea, so Choice (J) can't be right. The sentence introduces the concept of free speech and explains how it affects daily life, so it isn't irrelevant. The answer has to be Choice (G). The sentence gives the specific examples of the editorial section and Internet blogs to show how free speech plays out in daily life.

41. **D.** You need to separate a list of three or more items with commas. The only *and* is the one that comes before the last item. The only answer that follows these rules is Choice (D).

    Choice (B) looks like it corrects the problem, but *school* and *prayer* aren't separate issues, so you shouldn't separate them with a comma. The issue is school prayer. (Americans may debate about education or school issues but not about school itself.)

42. **G.** Eliminate Choice (J) right away. *But* signals a contrasting idea, but this sentence just expands on the ideas in the sentence that come before it. Choice (H) tells you that *hearing* the Miranda speech is a rights issue. The Bill of Rights doesn't particularly give you the right to hear the speech on TV. (Although that would be a great argument to offer your parents when they tell you to turn off the television and get studying for the ACT. "But Mom, watching this cop show is my Constitutional right!")

The problem with the original sentence is the presence of *and.* You may have been told that you never begin a sentence with *and.* Although that's usually a good practice, it's not a hard and fast rule of Standard English. The issue isn't that the sentence begins with *and.* It's that the *and* is redundant. The sentence later includes *also.* Saying "and the speech is also a *right*" is repetitive. Ditch the *and* and pick Choice (G).

43. **B.** The paragraph provides a series of examples of free speech. Its main idea isn't the Miranda speech, so the full quote would be not only unnecessary but also pretty boring. Eliminate the yes answers, Choices (C) and (D). How many instances of Miranda speeches appear on TV is irrelevant. The best answer is Choice (B). Because the paragraph explores more rights than just Miranda rights, a copy of the full speech would be major overkill.

44. **J.** Pay attention to underlined pronouns. Make sure that they have clear references and that their references agree in number. This sentence says a group can stage a protest as long as the protest is not violent. *They* is plural, but it renames the singular noun *protest.* The proper singular pronoun to refer to *protest* is *it.* The only choice that corrects the problem is Choice (J).

45. **D.** The essay gives a pretty thorough explanation of the First Amendment, but the author tells you that the Bill of Rights is more than just the First Amendment. Because the essay doesn't go into detail about the freedoms granted by the other amendments, the answer to this question is no. Cross out Choices (A) and (B). Your task is to choose the best answer of the two remaining. Choice (D) is better than Choice (C) because it's more comprehensive. Even if it included an explanation of the Right to Bear Arms, the essay probably wouldn't fulfill the intended goal.

46. **G.** When a title follows a person's name, you have to surround it with commas. Choice (F) is wrong. Choice (H) isn't any better. Because the title comes before the name in Choice (G), no commas are necessary. Choice (J) is also technically correct; commas surround the nonessential clause. But Choice (G) is less wordy, so it's a better choice than Choice (J).

47. **A.** Because a comma comes after 1830, the clause that comes after it must be nonessential. You introduce nonessential clauses with *which,* not *that.* The sentence is fine as it is. Choices (C) and (D) use the progressive tense, which makes it sound like the Act is still in the process of appropriating.

48. **H.** Pick the answer that's not like the others. Choices (F), (G), and (J) all imply force without the other's consent. Choice (H) is gentler and more benevolent than the others. It doesn't belong and is, therefore, the correct answer.

49. **B.** The question asks you to determine what the result would be if the author deleted the description of the Indian Removal Act. This description provides relevant information about the event that precipitated the issues between Jackson and Native Americans. You can cross out Choice (C) because the description is definitely relevant. You have to know the ramifications of the Act to understand what the Native Americans fought to win a victory over. Therefore, the information is related to the rest of the passage, and Choice (A) can't be right. Choice (D) is clearly wrong. The information supports rather than contradicts the idea that Jackson didn't care about the interests of the Native Americans. The answer has to be Choice (B).

50. **J.** The original sentence is a fragment. It doesn't have a main verb. Read each answer choice in the sentence. The only option that gives the sentence a verb is Choice (J).

Mathematics Test

1. C. Substitute x = 6 into the expression 4x - 7. Calculate 4(6) - 7 = 24 - 7 = 17.

2. G. Solve the equation 5y + 12 = 37 by first subtracting 12 from both sides to get 5y = 25. Then divide both sides by 5 to get y = 5.

3. A. To find 15% of 200, convert the percentage to a decimal (0.15) and multiply: 0.15 × 200 = 30.

4. H. Distribute 6 through the parentheses: 6(x + 4) = 6·x + 6·4 = 6x + 24.

5. D. If the shirt costs $48 after a 20% discount, then $48 represents 80% of the original price (since 100% - 20% = 80%). Set up the equation 0.80 × original = 48, so original = 48 ÷ 0.80 = 60.

6. F. Use the slope formula m = (y_2 - y_1)/(x_2 - x_1) with points (1, 3) and (5, 11). Substituting gives m = (11 - 3)/(5 - 1) = 8/4 = 2.

7. B. Substitute x = 2 into the function f(x) = 3x² - 2x + 5. Calculate f(2) = 3(2)² - 2(2) + 5 = 3(4) - 4 + 5 = 12 - 4 + 5 = 13.

8. J. First evaluate the expression inside the absolute value: -15 + 6 = -9. The absolute value of -9 is 9, since absolute value makes any number positive.

9. C. The area of a rectangle is length × width. Calculate 14 × 9 = 126 square inches.

10. G. Solve 4x - 3 = 2x + 11 by first subtracting 2x from both sides to get 2x - 3 = 11. Add 3 to both sides to get 2x = 14. Divide by 2 to get x = 7.

11. A. The circumference of a circle with diameter d is C = πd. Substitute d = 16 and π ≈ 3.14 to get C = 3.14 × 16 = 50.24 cm.

12. H. Factor the quadratic equation x² - 5x - 14 = 0. Looking for two numbers that multiply to -14 and add to -5, we get -7 and 2. So (x - 7)(x + 2) = 0, giving x = 7 or x = -2. From the choices, 7 is the answer.

13. D. To find the percentage of red candies, divide the number of red by the total: 20/50 = 0.40 = 40%.

14. F. The two points (2, 8) and (2, -5) have the same x-coordinate, so they lie on a vertical line. The distance between them is the absolute value of the difference in y-coordinates: |8 - (-5)| = |13| = 13.

15. B. If 3/5 of a number equals 45, set up the equation (3/5)n = 45. Multiply both sides by 5/3 to get n = 45 × (5/3) = 225/3 = 75.

16. J. Calculate 2⁵ by multiplying 2 by itself five times: 2 × 2 × 2 × 2 × 2 = 32.

17. C. Let the four consecutive even integers be n, n+2, n+4, and n+6. Their sum is n + (n+2) + (n+4) + (n+6) = 84. Simplifying: 4n + 12 = 84, so 4n = 72, and n = 18.

18. G. Use FOIL to expand (x - 7)(x + 3). First: x·x = x². Outer: x·3 = 3x. Inner: -7·x = -7x. Last: -7·3 = -21. Combining gives x² + 3x - 7x - 21 = x² - 4x - 21.

19. A. The perimeter of a square is 4 times the side length. Calculate P = 4 × 12.5 = 50 cm.

20. H. For inverse variation, y = k/x where k is the constant. Using y = 8 when x = 3, we get 8 = k/3, so k = 24. When x = 6, y = 24/6 = 4.

21. D. Arrange the numbers in order: 9, 11, 14, 15, 18, 20, 22. The median is the middle value (the 4th value out of 7), which is 15.

22. F. If log₂(x) = 6, then by the definition of logarithm, 2⁶ = x. Calculate 2⁶ = 2 × 2 × 2 × 2 × 2 × 2 = 64.

23. B. Evaluate each square root separately: √144 = 12 and √64 = 8. Therefore √144 + √64 = 12 + 8 = 20.

24. J. The total number of balls is 8 + 5 + 7 = 20. The probability of selecting a green ball is the number of green balls divided by the total: 7/20.

25. C. For a right triangle, sin²(θ) + cos²(θ) = 1. If cos(θ) = 0.8, then sin²(θ) + (0.8)² = 1, so sin²(θ) + 0.64 = 1. Therefore sin²(θ) = 0.36, and sin(θ) = 0.6 (positive since θ is acute).

26. G. Solve the inequality 2x + 5 ≤ 17 by subtracting 5 from both sides: 2x ≤ 12. Divide both sides by 2: x ≤ 6.

27. A. The sides 5, 12, and 13 form a right triangle (since 5² + 12² = 25 + 144 = 169 = 13²). For a right triangle, the area is (1/2) × leg₁ × leg₂ = (1/2) × 5 × 12 = 30.

28. H. Substitute x = 4 into (3x + 2)². First calculate 3(4) + 2 = 12 + 2 = 14. Then square: 14² = 196.

29. D. The sum of interior angles of a polygon with n sides is (n - 2) × 180°. For a hexagon (n = 6): (6 - 2) × 180° = 4 × 180° = 720°.

30. F. If 3^(x+1) = 27, recognize that 27 = 3³. So 3^(x+1) = 3³, which means x + 1 = 3, and therefore x = 2.

31. B. Simplify √72 by finding perfect square factors. Since 72 = 36 × 2, we have √72 = √(36 × 2) = √36 × √2 = 6√2.

32. J. This is an arithmetic sequence with first term a₁ = 7 and common difference d = 4. The nth term is aₙ = a₁ + (n-1)d. For the 10th term: a₁₀ = 7 + (10-1)(4) = 7 + 36 = 43.

33. C. To subtract matrices, subtract corresponding elements. A - B = [4-1 3-2; 2-3 5-1] = [3 1; -1 4].

34. G. The volume of a cylinder is V = πr²h. Substituting r = 5 and h = 12: V = 3.14 × (5)² × 12 = 3.14 × 25 × 12 = 942 cm³.

35. A. Calculate 5 factorial: $5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$.

36. H. The expression $(x + 2)/(x^2 - 4)$ is undefined when the denominator equals zero. Factor the denominator: $x^2 - 4 = (x + 2)(x - 2)$. This equals zero when $x = 2$ or $x = -2$.

37. D. If the angles are in ratio 1:2:3:4, let them be k, 2k, 3k, and 4k. The sum of angles in a quadrilateral is $360°$: $k + 2k + 3k + 4k = 360°$, so $10k = 360°$ and $k = 36°$. The largest angle is $4k = 4(36°) = 144°$.

38. F. For $f(x) = -x^2 + 3$, since $-x^2 \leq 0$ for all real x, we have $-x^2 + 3 \leq 3$. The maximum value is 3 (when $x = 0$), so the range is $y \leq 3$.

39. B. If $4^{(2x)} = 256$, recognize that $256 = 4^4$. So $4^{(2x)} = 4^4$, which means $2x = 4$, and therefore $x = 2$.

40. J. The volume of a cone is $V = (1/3)\pi r^2 h$. Substituting $r = 7$ and $h = 24$: $V = (1/3) \times 3.14 \times (7)^2 \times 24 = (1/3) \times 3.14 \times 49 \times 24 = 1{,}230.88$ cm³.

41. C. Find the GCF by listing factors. Factors of 48: 1, 2, 3, 4, 6, 8, 12, 16, 24, 48. Factors of 72: 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72. The greatest common factor is 24.

42. G. First evaluate $f(3) = 2(3) + 5 = 6 + 5 = 11$. Then evaluate $g(11) = (11)^2 - 1 = 121 - 1 = 120$.

43. A. If the mean of five numbers is 24, then their sum is $5 \times 24 = 120$. The sum of the four known numbers is $18 + 22 + 26 + 30 = 96$. The fifth number is $120 - 96 = 24$.

44. H. In a right triangle, the two acute angles are complementary (they sum to $90°$). If one acute angle is $35°$, the other is $90° - 35° = 55°$.

45. D. For direct variation with y^2, $x = ky^2$ where k is the constant. Using $x = 32$ when $y = 4$, we get $32 = k(4)^2$, so $32 = 16k$, and $k = 2$. When $y = 6$, $x = 2(6)^2 = 2(36) = 72$.

Reading Test

1. **C.** The passage is clearly not a poem, so cross out Choice (D). A *fable* tells a story with a moral lesson and often uses humanized animals as its main characters. That definition is too specific to apply to this passage. So you can narrow down your options to Choices (B) and (C). You may have noticed a hint of romance in the story, but it's mostly about an instance when the young protagonist, Eyvind, has experiences, such as watching Marit outgrow him and experiencing embarrassment at being called a *youngster,* that mark his development from a child to a young man. Choice (C) is the best answer.

2. **F.** Marit is the one who coaxes the bashful children into the party. She dances more than anyone else. You can hardly describe her as bashful. Cross out Choice (G). You probably wouldn't use the adjective *grandmotherly* to describe a tireless dancer, either. Choice (J) is out. Marit doesn't pay much attention to Eyvind, but that doesn't categorize her as callous. The best answer is Choice (F). *Gregarious* means social and outgoing.

3. **D.** The tingling sensation occurs in the last line of the paragraph that describes the scene in which the tall fellow pushes Eyvind away. The tingling doesn't occur right after the fellow calls him a youngster, though. It happens after he sees Marit laughing and dancing. The line says that this is the first time Eyvind has experienced this feeling, and it implies that he's disappointed that Marit has outgrown him. The best answer is Choice (D). The passage doesn't say that Eyvind drank ale. Nor does the paragraph give any indication that Eyvind experienced physical injury from the push.

4. **J.** Cross out the answers that express a legitimate time when Eyvind was timid. Start with Choice (F) because Lines 58–59 say that he didn't dare join in the dancing at first. He didn't stand up for himself when the bushy-haired man pushed him, so you can cross out Choice (G), too. The passage says that Eyvind moved back away from the dance floor when he watched Marit dance, which suggests timidity. Choice (H) is out. The passage says that Eyvind didn't get an invitation to enter the little room, so he definitely didn't fail to respond to it. Choice (J) describes the one time when Eyvind wasn't timid because it didn't happen.

5. **A.** The description doesn't portray particularly harsh or dangerous conditions, which means that Choices (B) and (D) aren't right. The first paragraph doesn't mention anything about Scandinavian life. The answer has to be Choice (A). The introductory paragraph sets the natural backdrop for the main events of the story.

6. **J.** Marit doesn't pay much attention to Eyvind. The answer that best describes this fact is Choice (J). Nothing in the passage implies that she loves Eyvind, and her feelings toward him aren't strong enough to be repulsion or pity.

7. **C.** The author describes the little room to point out that Eyvind didn't get invited to Marit's family's inner circle. You don't have to make any inferences to cross out Choice (A). No one danced in the little room. The grandmother isn't a major figure in the passage, so the purpose of the scene probably isn't to learn more about her. Eliminate Choice (D). Old people were in the room but not necessarily because Marit invited them. Choice (B) isn't right. The best answer is Choice (C). The passage says that Marit invited guests she really cared for to the room. She didn't invite Eyvind. So she must not really care for Eyvind, something that Eyvind finds strange. From this little scene, you realize that Eyvind makes more of his relationship with Marit than she does.

8. **G.** *Bands* refers to the groups of girls that walked together to the party. The passage also refers to them as *gangs,* but it doesn't give a negative impression of them. They aren't ruffians. Keep Choice (G) in mind and cross out Choice (F). The passage says they marched along, but that doesn't mean they were in a parade. Choice (H) is wrong. If you picked Choice (J), you probably tried to answer the question without looking at the passage. A *band* is often a group of musicians, but that's not the case in this passage.

9. **B.** POE to the rescue! Cross out choices that make you think beyond the scope of the passage or that are just plain wrong. Choice (C) is one of the just plain wrong ones. Eyvind wasn't invited to the grandmother's room, so he couldn't have spent all his time there. The passage says that Eyvind danced, so he didn't just sit and watch Marit. Cross out Choice (A). The passage doesn't specifically state that Eyvind was in the corner or that he sulked. He seemed to be in a state of shock rather than depression. Cross out Choice (D). The fact that he was experiencing new feelings and noticing changes in Marit implies that he realized his life was changing. Choice (B) is best.

10. **G.** You can't make assumptions about everyday weather in the village from the description of one evening. Choice (F) makes you infer way beyond the information in the passage. Likewise, just because groups of children make their way to the party by running from farmhouse to farmhouse doesn't mean that all villagers travel that way. Lines 53–55 suggest that the villagers prefer dancing to the new musician rather than the old one, but that's because he's a better player and knows more songs. The passage doesn't say that he's necessarily older. Cross out Choices (H) and (J) and consider Choice (G). Because the passage tells you that people of different ages attended the dance, you can reasonably assume that the villagers participate in activities with different age groups, even if those activities include just this one dance.

11. **A.** The act appears in the third paragraph of Passage A. Compare each answer choice to the information in the paragraph to see which one is a result of the act's passage. Choice (A) paraphrases the last sentence of the paragraph, which says that one provision of the act was a temporary program to help make more mortgage financing available to homebuyers. Choice (B) may seem right at first, but the passage says that the condition on lenders to write down loan balances was voluntary, so the act didn't force actions on lenders. The passage doesn't include information on how the public viewed the FHA, so Choice (C) is wrong. Choice (D) is clearly wrong; the act is providing for more federal government intervention in the financial situation. Choice (A) is the answer.

12. **J.** To answer vocabulary-in-context questions, replace the original word with each answer choice to see which one makes sense. The original sentence says that the interventions failed to *stem* the growing crisis. The interventions didn't fail to *originate* the growing crisis, so Choice (F) doesn't fit. Choice (G) sounds way too awkward. You're down to Choices (H) and (J). You may be able to say that the interventions failed to *remove* the growing crisis, but the better answer is Choice (J). It sounds better to say that interventions failed to *stop* the growth rather than *remove* it.

13. **C.** Look in Passage A's second paragraph where it says that the government's improvisational (or unplanned) response to the crisis has contributed to the public's failing confidence in its ability to restore the financial system. Choice (C) provides a nice paraphrase of this idea. Choice (D) is wrong because although the passage summarizes some of the actions of the Federal Housing Authority, it doesn't indicate how the economy responded to those actions. Choice (B) contains one of those debatable words — *completely* — that raises a red flag. Nothing in the passage suggests that anyone's confidence has been completely restored. Choice (A) is out because the passage doesn't associate lack of confidence with lack of attention to borrowers. In fact, much of the passage is about how the government attempted to address issues related to borrowing.

14. **F.** This question was a pretty easy one. "Deleveraging" appears in the first sentence, so you don't have to look deep in the passage to find it. The first passage says that it means to reduce debt, sell assets, and obtain capital from any source. So you can cross out Choices (G), (H), and (J) with confidence. The only answer left is Choice (F). Home mortgage rates aren't part of the definition.

15. **C.** Passage B defines redlining as "the identification of an area, usually a neighborhood or ZIP code area, where no mortgage loans are to be issued." Choice (C) paraphrases this definition best. Choice (A) is wrong because the passage indicates that redlining is a financial institution practice rather than a government one. While the passage implies that the effect of redlining is to discriminate against certain classes and races, the actual practice is based on identifying certain neighborhoods to deny mortgage loans to. So Choice (B) is incorrect. You can't justify Choice (D); redlining regards denying loans rather than granting them. You can't assume that because the practice of redlining denies loans to certain neighborhoods, it therefore limits loans (and particularly subprime loans) to only the wealthy.

16. **J.** The first paragraph in Passage B explains the subprime lending crisis and its effects. The author doesn't express anti-government opinions nor does he mention government actions to combat the crisis, so Choices (F) and (H) are out. You can also cross out Choice (G). The paragraph specifically states that the crisis seemed at first to be specific and limited, but it grew to have global ramifications. The best answer is Choice (J). The paragraph starts with a quick history of the subprime lending crisis and ends with its global effects.

17. **B.** Although Passage B claims that financial institutions can promote positive social development, the discussion of supply and demand in Lines 87-89 introduces the power that lenders use to exclude borrowers, a practice that is negative rather than positive. Choice (A) is wrong. Passage B mentions ways in which lenders choose blacklisted neighborhoods later in the paragraph, but not in the context of supply and demand. The second paragraph concerns domestic lending practices and not the global economy, so you can't justify Choice (D). Choice (B) is best. The author defines supply and demand as "lenders" and "customers" to identify who controls what elements of the lending relationship and clarify that lenders have the power to control the supply of mortgage financing.

18. **F.** Passage A is critical of government intervention and Passage B doesn't discuss government's involvement in the crisis experienced in 2007 and 2008, so Choice (J) is clearly wrong. Choice (G) is stated by Passage A but not Passage B, and Choice (H) is stated by Passage B but not Passage A, so neither choice provides a statement that both passages would agree with. Passage A talks about the difficulty individuals have obtaining short-term funding and the government's largely unsuccessful attempts to remedy the problem, and Passage B spends the entire second paragraph discussing the difficulties homebuyers have in getting mortgage loans. Choice (F) is best.

19. **D.** The temporary program mentioned in Passage A is designed to make mortgage loans more easily available to homebuyers. Passage B claims that certain neighborhoods are redlined, meaning they're denied mortgages, so these neighborhoods wouldn't likely benefit from the program. Choice (D) is correct. Passage B isn't concerned with government spending or public confidence in the economy, so Choices (A) and (C) are out. The author's discussion of interconnectedness regards the spread of the financial crisis and not the issue of certain ZIP codes being denied loans, so eliminate Choice (B).

20. **H.** Passage A mentions the effect of the crisis on individuals, corporations, and state and local governments in addition to the national economy, and although Passage B mentions global effects, its primary concern is with the ability of certain homebuyers to secure mortgages. Choice (F) doesn't work. Passage A emphasizes the difficulty in securing funding in the first paragraph and indicates that government programs have failed, so it would be a stretch to say

the author is much more optimistic about the housing market than the author of Passage B is. Choice (G) is out. Choice (J) is clearly incorrect. Passage A suggests that government intervention has largely failed, and Passage B doesn't mention government help at all. Choice (H) is the best option. Passage A says the government's attempts to stem the crisis have failed, and Passage B blames the discriminatory practices of financial institutions on the inability of those in certain neighborhoods to secure mortgages to buy homes.

21. **D.** You can begin eliminating answer choices just by reading the first word in each option. The passage is more informative than argumentative, so you can make a pretty good bet that its purpose isn't to discredit or argue. You may not want to cross out Choices (A) and (C) based on this observation alone, but you should definitely examine the other two choices more closely. Choice (B) is too specific for a main-idea question. The passage discusses more elements than just typography. Choice (D) sounds right. It's general enough to encompass the whole passage and is a good summary of the last paragraph, which says that *bibliography* requires attention to many aspects of the text.

22. **G.** Don't try to answer this question based on your own definition of *cunning.* Substitute each choice for *cunning* in the passage and pick the one that makes the most sense. The sentence before the reference presents what would be a logical answer to a question. Then the author says that this answer would have some *cunning* (or correctness) given certain circumstances. Choices (F), (H), and (J) don't convey the same meaning. The answer that's most similar to *correctness* is Choice (G): The answer would have some wisdom given certain circumstances.

23. **C.** This question is pretty easy after you figure out which part of the passage gives you the answer. If you skim the questions before you read the passage, you know that you'll encounter a question about estimating a book's age. When you get to the third paragraph and read about estimating the age of a book within five to ten years, you know to mark that particular sentence.

24. **H.** The quotes in the question appear in Lines 20–23 in the first paragraph. From this sentence, you know that "being literary" means looking at a page and seeing a poem. Someone who thinks "like a bibliographer" sees the physical aspects of the document, such as type (meaning the style of the letters), paper, and space on the page. Choice (H) is almost a word-for-word copy of the passage.

    If you picked Choice (G) or (J), you read too much into the passage. The passage says that physical aspects are determined by economics, but that fact doesn't mean that the bibliographer is especially concerned with the financial aspects of creating a document. The bibliographer's primary focus is on the physical aspects themselves. The debatable word *altogether* in Choice (F) should have raised a red flag.

25. **A.** If you answered Question 23 correctly, you probably got this one, too. The third paragraph states that looking at a document's physical aspects reveals its age. Choices (B) and (D) concern style and story rather than physical elements. Cross out both of them. The paragraph specifically mentions letterforms, bindings, format, ornament stocks, and ruled borders as revealing age but not paper type. Choice (A) is a better answer than Choice (C).

26. **H.** The last paragraph defines *bibliography*. Pick the answer that best summarizes the last paragraph. Its gist is that bibliography is the broad study of texts, including the history of how the text was made and how it was read. Choice (J) focuses on one specific element of the way a text was made. Cross it out. Choice (H) is the best summary.

    If you picked Choice (F) or (G), you relied on the definition of bibliography that you're familiar with — the list of resources your teachers make you include at the end of your research papers. The result of that tedious task isn't what the author of this passage is talking about.

27. **A.** A discussion of letterforms appears in the third paragraph. The author says they reflect the social conventions of the time they were created. "Social conventions" and "standard practices" have pretty much the same meaning. Pick Choice (A). Beware of Choice (C): It contains the debatable word *exact.* The passage says you can

estimate a document's age from its letterforms. Estimating isn't the same as knowing its exact age. The passage never says that the way letters are formed in a work reveals whether it's a poem, prayer, or other type of literature, so Choice (D) is wrong. If you picked Choice (B), you probably read in the first paragraph that the physical aspects of a document are always determined by the economics of book production. That's not enough information to say that the style of letterforms reveals the creator's specific socioeconomic status.

28. **F.** The best way to answer this question is to begin with POE. The passage isn't clear about exactly what high literature is, so you have to figure out what it is not. Choice (J) can't be right because the passage doesn't say anything about works produced by royalty. The passage talks about poems and prayers specifically, but it doesn't suggest that these two genres form a separate kind of literature. So cross out Choice (H). Choice (G) is probably wrong, too. The point of the last paragraph is that analyzing literature should include the way it was made as well as whatever is traditionally done with "high" literature. The passage associates costs of production with the physical aspects of a document (the way it's made), so the cost of production doesn't distinguish "high" literature. The only answer choice left standing is Choice (F). The author advocates examining the physical aspects of a work as well as its literary value. The first sentence of paragraph two refers to the relationship between form and meaning, suggesting that those who are literary focus more on meaning than form. *Bibliography,* then, takes into consideration form and meaning and isn't limited to analyzing just meaning in the way that those who study only "high" literature are.

29. **C.** The passage lists the common components as the introduction, illustrations, notes, and list of textual variants. Eliminate answers that don't relate to these components. The passage doesn't mention test banks, so cross out Choice (A). Choice (B) refers to illustrations, but the passage doesn't get specific enough for you to say that the illustrations are computerized. So Choice (B) is wrong. An author's biography could be part of an introduction, but the passage doesn't say so. Choice (D) is out. Textual variants refer to different variations of the text. The best answer is Choice (C).

30. **H.** The second paragraph tells you how the conventions of textual design evolve. The answer that paraphrases this sentence is Choice (H). The passage doesn't discuss what makes a text more aesthetically pleasing or popular, so Choices (G) and (J) aren't right. Choice (F) doesn't work because although the passage mentions that costs affect style, it doesn't say anything about how costs concern the way texts evolve.

31. **D.** A *main purpose* or *main idea* is by definition broad and general. So an answer with the word *overview* is often correct because it encompasses nearly everything. Hence, Choice (D) is your winner here. Choice (A) is wrong because the passage barely mentions prehistoric animals. In Choice (B), *refute,* which means to disprove, is rarely a correct answer. (Passages discuss or describe; they don't often refute or criticize.

32. **J.** The line implies that the plants, although prehistoric, still exist today and goes on to tell you where they may be found. Choice (F) is exactly backward; the plants are *not* extinct. Choice (G) is illogical in the context of the passage. Choice (H) contradicts the rest of the sentence, which tells you how widespread the plants are.

33. **A.** This question is about pure detail. Lines 40–43 state that scientists considered the widespread distribution of the cycad a mystery.

34. **G.** The answer to this specific-information question comes right out of the passage. The first sentence of the second paragraph says that this fossil record (referring to the early plant life fossils discussed in the first paragraph) shows how plants have evolved over time. Choice (G) is a nice paraphrase of this statement. The passage doesn't compare plant fossils to animal fossils, so Choice (F) is out. The word *all* in Choice (H) indicates that it's probably not right. The first paragraph says that the fossils develop from plants that haven't decayed, so cross out Choice (J).

35. **C.** A passage often suggests; it rarely refutes (to *refute* is to disprove). Pangaea, which appears in paragraph four, was the one large supercontinent that later broke into smaller continents, taking the cycad seeds and plants with them. The author mentions this idea as a possible way to explain the seeds' widespread distribution. Choice (A) is wrong because the cycad is not extinct today; it's *extant* (still in existence). Choice (B) is going too far. Although the passage says that the plants in prehistoric times were huge, it doesn't mention or imply that the cycad was the largest plant.

36. **F.** You know that Choice (G) can't be right. Cycads still exist, so they didn't become extinct in the Jurassic Period. The second paragraph says that the Cretaceous Period came after the Jurassic Period, so cross out Choice (J). If you picked Choice (H), you focused on the age of rocks that contain fossils of flowers rather than the age of the Jurassic Period. The best answer is Choice (F). If no evidence of flowers exists until the period after the Jurassic Period, the Jurassic Period probably didn't have any flowering plants.

Science Test

In each of the following sections, we explain how to interpret the tables and figures that accompany each passage in the Science Test. Then we go into more detailed explanations of the specific questions and their answers. This isn't a suggestion that you spend time examining the passage material before you attempt the questions.

1. **C.** Study 1 used pure water for all three trials. Study 2 used wood for all three trials. This info immediately leads you to the correct answer: wood and pure water. Only Study 1 used Choice (A), concrete and pure water, while only Study 2 used Choice (B), wood and oil. Neither study used Choice (D), aluminum and sea water.

2. **H.** For this question, you have to understand what both tables are telling you and then combine the information. Aluminum is the densest of the three materials and, therefore, has the least buoyancy, as shown in Table 1. By looking in Table 2, you can see that oil is the least dense of the fluids, and thus, provides the least buoyancy. The combination of the least buoyant material and the least buoyant fluid would mean that the maximum weight supported would be less than any of the other combinations given and, therefore, less than 7 kg.

3. **A.** You're looking for the answer that the passage *doesn't* support. Pay careful attention to what the statements say. If you confuse more buoyant and less buoyant, you'll quickly reach the wrong conclusion. Even if you pick Choice (A) right away as the correct answer, check the others to make sure you haven't missed something important.

   Choices (A) and (B) refer to Table 2. Choices (C) and (D) refer to Table 1. From the tables, you can see that sea water provided the most buoyancy because it supported the maximum weight before the wood boat sank. Oil provided the least buoyancy. From Table 1, you can conclude that wood was the most buoyant boat material. Aluminum was the least. Choices (C) and (D) are true because wood was the most buoyant.

4. **F.** This question involves looking at the weights supported and evaluating the effect of varying boat material and fluid type. Table 1 tells you that the wooden boat was significantly more buoyant than the other materials. It supported a weight of nearly twice that of the aluminum boat. Table 2 shows you that the range of weight supported by the different fluids was small, varying only from 11 to 14. This small range indicates that fluid type had a smaller effect on buoyancy than material type.

   Cross out Choice (G) right away. The question clearly states that you should base your answer on the data in Tables 1 and 2. Boat size isn't a part of the studies, so you can't conclude anything about it.

5. **B.** The text that comes before the tables tells you how density relates to buoyancy and how buoyancy relates to the weight applied to the object before it sinks. After you figure out that substances with similar densities have similar buoyancies, you can look in the tables to find which boat materials had a similar amount of weight applied to them before the boat sank. In Table 1, aluminum and concrete were very similar, whereas wood was much different. Go ahead and eliminate Choices (A) and (C) because you know that the density of wood isn't similar to aluminum or concrete. Pick Choice (B).

6. **H.** To answer this question correctly, make sure you understand that denser fluids provide more buoyancy to objects submerged in them and that a more buoyant object can float and carry more weight before it sinks. Armed with this knowledge, you can go to Table 2 and see that sea water provided the most buoyancy to the boat because it supported the maximum weight. Therefore, sea water is the densest. Choice (J) is obviously wrong because the studies don't address gasoline at all.

7. **A.** Study 1 involves three boats of different materials, and each is placed in water. So, it's true that the liquid used was the same for each boat and the material was different. Study 2 involves one boat placed in different liquids, so the material used remained constant and the liquids changed. Choice (A) is the only answer that correctly states the study set up.

8. **G.** Look at the figures for a ramp angle of 10 degrees. At a mass of 40 kg, the block's time is 0.62 seconds. When the block's mass is 50 kg, its time is 0.57 seconds. A 60kg block resulted in a time of 0.54 seconds. It appears that time decreases only as mass increases. The same is true for other ramp angles. The answer is Choice (G).

9. **A.** You can look at any of the three masses for Block A to answer this question. For each mass, the ramp angle of 10 degrees produced the smallest time for Block A to reach the ground. So Choice (A) is your answer.

   You can also think about this question logically to check your answer. Based on Figure 1, you see that as the ramp angle was reduced, the 50-kg weight hung by the cord less and less and was supported by the ramp more and more. Therefore, as the ramp angle decreased, the friction between the ramp and the 50-kg block became more significant and the weight of the 50-kg block became less significant in slowing the fall of Block A. The friction force was smaller in magnitude than the weight of the 50-kg block, which means that as the ramp angle decreases, Block A reaches the ground in a smaller amount of time.

10. **G.** For this question, pay attention to the trends shown in Table 1. One of the trends is that as the mass of Block A increased, the time for Block A to reach the ground decreased. This trend makes sense logically because a heavier block would more easily overcome the frictional and gravitational forces exerted on the cable by the 50-kg block. Look at Table 1 at a ramp angle of 30 degrees and a Block A mass of 60 kg. You see that Block A took 0.68 seconds to reach the ground. So if the mass of Block A were increased to 70 kg, you know that the time for Block A to reach the ground would have to decrease. Therefore, the answer has to be something less than 0.68 seconds. The only choice that's less than 0.68 seconds is Choice (G).

11. **C.** Consider the trends in Table 1 to help you with this question. A lower ramp angle made Block A reach the ground faster. So did a higher mass of Block A. Armed with this knowledge, you can quickly pick Choice (C). Rule out Choice (B) because none of the data supports it.

12. **J.** For this question, think about what the amount of time it takes for Block A to reach the ground means. A small amount of time means that the block slid quickly and wasn't at all in equilibrium. A large amount of time means that the block was moving slowly and wasn't far from being in equilibrium. In other words, as the amount of time to reach the ground increased, the system came closer to equilibrium. If the system were perfectly at equilibrium, then the time for Block A to reach the ground would be infinitely large. From Table 1, you can see that the largest time occurred with a ramp angle of 40 degrees and a Block A mass of 40 kg. Based on the trends in the table, you know that as the ramp angle was increased, the time for Block A to reach the ground also increased. Therefore, with a mass of 40 kg and a ramp angle larger than 40 degrees, you'd expect the system to be close to equilibrium. Hence, Choice (J) is the winner here.

Using the same logic, you can eliminate the other choices. From the table, you'd expect Choice (A) to yield a time somewhere between 0.66 seconds and 0.78 seconds, which wouldn't indicate equilibrium. Similarly, you'd expect Choice (D) to yield a time between known data points in the table. For Choice (G), you'd expect a time faster than 0.62 seconds based on the trends, meaning that Choice (J) is the only possible answer.

13. **C.** This question asks you to apply your knowledge of the trends shown in the table to a graphical representation. All the choices indicate that as the ramp angle increases, time also increases, so you have to look more closely at the numbers shown in the table to determine the correct answer. Increasing the ramp angle from 10 to 20 degrees increased the time a small amount. You can look at any of the masses used to verify this trend. Increasing the ramp angle from 20 to 30 degrees increased the time by a larger amount, and increasing it from 30 to 40 degrees increased the time by an even larger amount. After you see this trend, you can determine that the time for Block A to reach the ground grows exponentially with ramp angle. In other words, the graph's curve gets steeper as it moves up to the right, just as the one shown in Choice (C) does. For Choice

(A) to be right, the relationship between ramp angle and time would have to be steady. The line in Choice (B) becomes less steep as it moves to the right. Choice (D) may be tempting, but it would work only if the data increased linearly between three data points.

14. **H.** The genetic theory supports the idea that vision problems are hereditary and can't be changed by using eyes in a certain way. Choices (F), (G), and (J) all talk about a specific use of one's vision, which isn't part of the genetic theory. Choice (H) is the only possible answer here.

15. **B.** Both theories discuss correcting vision at a young age, but the method of correction differs. You can eliminate all the choices besides Choice (B) by noticing that they're either referenced by only one or none of the theories. Neither theory supports Choice (A) (though the environmental theory would say that a lot of reading affects vision). Only the genetic theory discusses Choice (C), and neither theory discusses Choice (D).

16. **J.** To answer this question, you need to identify the belief that the environmental theory discusses negatively and that the genetic theory supports. The environmental theory doesn't specifically address any negative effects of thinking that vision problems are hereditary. People who assume that vision errors are hereditary can still correct their vision by using the methods of the environmental theory. So cross out Choice (F). Choice (G) is wrong for the same reason. Thinking that vision problems have been around for awhile doesn't create more vision problems. Both theories suggest that you can correct vision errors through multiple ways, so Choice (H) isn't

right, either. Environmental theorists talk about the negative effects of wearing glasses at an early age, which is a practice endorsed by the genetic theory folks. The environmental theorists say that the practice of wearing glasses promotes more vision problems. Choice (J) is the correct answer.

17. **A.** For this question, just look closely at the environmental theory to see which choice it supports. Choice (A) is correct because the environmental theory says that vision errors result from focusing too long on nearby objects, which is something that could happen at any time in life. Choice (B) is incorrect because the environmental theory makes the exact opposite claim, stating that watching television affects vision. Choice (C) is incorrect because the environmental theory doesn't support laser eye surgery. The theory also supports the idea that vision problems can be both prevented and reversed, which makes Choice (D) incorrect.

18. **H.** Skim through the choices to see which ones are inconsistent with the environmental theory. From the remaining answers, choose the one that's consistent with the genetic theory.

Cross out Choice (F) because the environmental theory never claims that eyeglasses don't allow humans to see well. It just argues that glasses aren't a strong solution to underlying vision errors. The environmental theory states that focusing on nearby objects creates vision problems, so eliminate Choice (G). This leaves you with Choices (H) and (J) as possibilities. Choice (J) is consistent with both theories because siblings have similar genetic makeups and are brought up in similar environments. The correct answer has to be Choice (H). Exercising eye muscles promotes vision according to the environmental theory but isn't helpful according to those who hold to the genetic theory.

19. **A.** Look at the choices to find one that both theories support. Choice (A) works because both theories say that vision errors can be identified in children. The genetic theory doesn't support Choices (B) and (D), and Choice (C) doesn't go along with the environmental theory's premise that glasses make vision problems worse.

20. **H.** Think about what traits people who come from the same societies may have in common. In many cases, people in the same society have shared genetics because their families and ethnicities have lived near each other for generations. They may also share similar environmental factors, such as hobbies and lifestyles, because of societal customs. Therefore, societies that are more prone to vision errors could be that way because of genetic factors or environmental factors. So evidence that vision errors are more common in certain societies and less common in others supports both the genetic theory and the environmental theory.

21. **B.** Study 1 used five batteries of different voltages. Study 2 used the same 9.0 volt battery from Study 1. Across both studies, the student used five different batteries. Choice (B) is correct.

22. **F.** This question asks you to look at Table 1, which portrays the data for Study 1, and find when the voltage across Resistor 2 was smallest. The column labeled "Resistor 2 ( )" shows you that the smallest voltage measured was 1.34 V and that this voltage occurred when the battery used was 1.5 V. Choice (F) is the correct answer. You can also figure this one out simply by knowing the trends from Study 1. The voltage across each resistor increased when the battery voltage increased. Therefore, you know that the smallest voltage across any of the resistors occurred with the smallest battery voltage, which was 1.5 V.

23. **C.** You have to look at the text for each study to find the answer to this question. The first study varied the battery voltage and measured the voltage across each resistor. The second study varied the Resistor 1 resistance and measured the current through each resistor. This information corresponds with Choice (C).

24. **H.** This question is about Study 2, so look at Table 2. As you can see, the current through each of the three resistors decreased as the Resistor 1 resistance increased. This trend tells you to jump straight to Choice (H) because it's the only one that says that both currents decreased. Even if you didn't recognize this overall trend, you can look at Table 2 and find the decreasing trend for each individual resistor. Choices (F), (G), and (J) are incorrect because they say that the current through one of the resistors increased as Resistor 1 resistance increased.

25. **B.** The two main components of the circuit examined in these studies were the battery used and the resistance of Resistor 1. For both studies, one of these components was varied while the other was held constant. In Study 1, battery voltage was varied, while Resistor 1 resistance was held constant at   . In Study 2, Resistor 1 resistance was varied and battery voltage was held constant at 9.0 V. Therefore, the configuration used in both studies was a battery voltage of 9.0 V and a Resistor 1 resistance of   . You can tell that Choices (A) and (C) are incorrect because Study 2 didn't use a battery voltage of 1.5 V. Similarly, Choices (C) and (D) are incorrect because Study 1 didn't use a Resistor 1 resistance of   .

26. **F.** To answer this question, you have to extrapolate the data given in Table 1. The table tells you that the voltage measured across Resistor 2 increased as the battery voltage increased. The question asks you to extrapolate out to a battery voltage of 12.0 V, which would mean that the voltages across each of the resistors would increase. With a 9.0 V battery, the voltage across Resistor 2 was 8.04 V, so you know the answer you're looking for has to be greater than 8.04 V. Choice (F) is the only one greater than 8.04 V, so it's the correct answer.

27. **D.** From Table 1, you can see that the voltage across Resistors 2 and 3 was always the same; that's because they were arranged in parallel in the circuit. Armed with this info, you can eliminate Choice (A). When you look at Table 2, you may notice that the current through Resistor 1 was always equal to the sum of the currents through Resistors 2 and 3. This trend leads you to the correct answer of Choice (D). Even if you didn't notice this trend, though, you can go ahead and determine that the other choices are incorrect. The current through Resistor 2 was never greater than the current through Resistor 1, so Choice (B) is wrong. The current through Resistors 2 and 3 was never equal, so Choice (C) is also incorrect.

28. **J.** You find the answer to this question by reading the figure titles. Figure 1 provides information about the most common elements, and Figure 2 provides information about the less common elements. The only answer choice that appears on Figure 1 is Choice (J), titanium. The other answers are on Figure 2, so they must be less common then titanium.

29. **B.** Look for the largest percent by weight but focus only on the elements listed in the answer choices. Figure 1 provides what you need to get the right answer. The largest concentrations overall are oxygen and silicon, but neither of those are choices, so you have to keep going to the right to find the next highest element.

30. **G.** You need to look at Table 2 to answer this question. The question states that chromium is dangerous in larger concentrations, so locate the place with the highest percent by weight of chromium. That place is the lunar highlands, Choice (G). Choice (F) is incorrect because the lunar lowlands have lower concentrations than the lunar highlands (although the percent by weight in the lowlands is also potentially hazardous). Choices (H) and (J) are wrong because the graph shows that the concentrations of chromium on the Earth are the smallest.

31. **C.** To answer this question, you just need to find which elements are present in higher concentrations in the Earth's crust than in the lunar lowlands. The elements that fit this description are oxygen, silicon, sodium, potassium, hydrogen, phosphorus, manganese, carbon, and chlorine. This information leads you to Choice (C) because both sodium and potassium are present in higher concentrations on the Earth than in the lunar lowlands. Choice (A) is wrong because aluminum is present in higher concentrations in the lunar lowlands than in the Earth's crust. The same applies to Choices (B) and (D).

32. **J.** The question says that hydrogen, oxygen, and carbon are all important for fuel, which lets you know that they're desirable on the Moon. So, ideally, they'd be in at least as high of a concentration on the Moon as they are in the Earth's crust. Choice (F) isn't an issue because it says that the oxygen levels in the soil are satisfactory. Choice (G) might cause enough concern to prevent an outpost construction in the lunar highlands, but if you look at the graph, you see a more pertinent issue with hydrogen. Choice (J) causes a lot of concern because hydrogen is necessary for fuel, yet it's present in much smaller concentrations on the Moon than on the Earth. Choice (J) is the correct answer. Choice (H) talks only about the Earth, so it isn't particularly relevant to prospective lunar inhabitants.

33. **A.** This question requires you to look at three elements and list them in order from lowest to highest concentration according to their presence in the lunar lowlands. You can answer this one pretty quickly just by looking at Figure 1. Of calcium, iron, and aluminum, iron has the lowest percent by weight. Calcium comes next, and aluminum has the highest percent by weight. Choice (A) is the correct answer.

34. **F.** Table 2 shows the relationship between soil temperature and Scoville heat. As the soil temperature increases, the heat for each plant and the average heat of the test group increases only. The correct answer is Choice (F).

35. **B.** To answer this question, go to Table 1 to find out which watering frequency would result in an average of 4,500 Scoville heat units. The test group that had the closest to this number of heat units was the group with two days between watering. It had an average of 4,460 Scoville heat units. Choice (B) is the best answer.

36. **H.** To answer this question, focus on Table 2, which shows the results of Study 2, which consisted of watering the plants every three days. When you look at the data for 30°, you see that the average number of Scoville heat units for the test group was 5,080. This is very close to Choice (H), which is the correct answer. None of the other choices are very close to 5,080. Choice (F) is so low that it doesn't seem at all likely to occur in Study 2, in which the plants received water every three days.

37. **B.** For this question, focus on the trends that the data present. Table 1 shows that when the scientist watered the plants every five days, the average number of Scoville heat units was 5,980. However, when the scientists watered the plants more often, such as every day, the average number of Scoville heat units was only 4,020. These results indicate that the increase in watering frequency resulted in less spicy peppers. Therefore, when a jalapeño plant is watered more often, the spiciness of its peppers decreases. Choice (B) is the correct answer.

38. **F.** The correct answer to this question conveys the element that wasn't tested in either of the studies. Choice (F) is the correct answer because neither study varied the soil composition. Choice (G) is incorrect because the point of Study 2 was to vary the soil temperature and observe the effects. Choice (H) is incorrect because the frequency of water was held constant in Study 2, and holding a variable constant doesn't generate more data. Eliminate Choice (J) because the light provided to the plants was held constant in both studies.

39. **A.** You have to look up each of the answer choices individually in the tables to answer this question. Choice (A) appears in Table 1 and shows the Scoville heat units ranging from 5,200 to 6,700, which is a range of 1,500. Choice (B) appears in both Table 1 and Table 2; it shows a range of 700 in Table 1 and 600 in Table 2. Choice (C) is present in Table 2 and shows a range of 500 Scoville heat units. Choice (D) appears in Table 2 and shows a range of 600. Choice (A) has the largest range by a long shot, which makes it the correct answer.

40. **J.** The key to answering this one correctly is recognizing the trends shown in Tables 1 and 2. Table 1 shows that the spiciest peppers were produced with the least frequent watering (every 5 days), and Table 2 shows that the spiciest peppers were produced with the highest soil temperature (30 degrees Celsius). The combination of these factors should result in the spiciest jalapeño peppers, assuming that the plants survive the hot and dry conditions.

Writing Test

Sample response

As more high school graduates head for college than have in past decades, fewer pursue trade careers, resulting in a decrease in the number of plumbers, electricians, mechanics, and other technicians. Part of the issue may be that government funding for education is extended to four-year colleges rather than vocational training. If more federal funding were allocated to vocational training, more graduates would probably use those funds to gain skills to meet the high demand for expert technicians. Federal funding should be allocated to liberal arts programs, but more funds than the current allocation should be directed to trade training and education. Many of today's most popular careers may not exist in ten years, and the skills gained during preparation for a specific career may become obsolete. The communication and problem-solving skills gained in studying the liberal arts are also skills that translate well to whatever the job market may have in store for the future. So investing in liberal arts degrees may have a greater long-term impact than funding vocational programs. Graduates with important critical-reasoning skills may be more adaptable to a fluctuating job market and may be better positioned to move into high-paying careers or creating businesses that provide job opportunities for others. Studies have shown that over decades, those who major in English, history, philosophy, and other liberal arts areas may achieve higher salaries than those who work in tech fields. Scrapping an investment in liberal arts to fund vocational programs may have severe long-term effects.

Therefore, the government should find ways to subsidize both educational avenues. Funding should be allocated to vocational training at a rate proportional to the demand for trade positions in society. Rather than simply taking money from liberal arts to give to trade-based education, alternative funding solutions should be sought. Then, society will benefit in both the short and long term.