S.C.H.O.O.L.S.

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2017 – 2018

ACT PRACTICE TEST 6

EXEMPLAR

(ANSWER KEY)

CLEARED

SUCCESS = AMISS

BACKGROUND✓ MIND✓ MEASURABLES✓ MONEY✓ SCORES ✓ GRADES ✓

PRACTICE TEST 6 ANSWER KEY

ENGLISH TEST

1. **A**	16. **F**	31. **A**	46. **H**	61. **A**
2. **J**	17. **C**	32. **H**	47. **A**	62. **H**
3. **C**	18. **H**	33. **B**	48. **H**	63. **B**
4. **F**	19. **B**	34. **H**	49. **D**	64. **H**
5. **B**	20. **H**	35. **A**	50. **H**	65. **C**
6. **G**	21. **B**	36. **H**	51. **B**	66. **G**
7. **C**	22. **J**	37. **D**	52. **G**	67. **C**
8. **H**	23. **A**	38. **J**	53. **A**	68. **J**
9. **A**	24. **F**	39. **D**	54. **F**	69. **D**
10. **G**	25. **B**	40. **G**	55. **C**	70. **G**
11. **B**	26. **H**	41. **C**	56. **G**	71. **A**
12. **G**	27. **B**	42. **F**	57. **A**	72. **H**
13. **C**	28. **F**	43. **D**	58. **H**	73. **C**
14. **F**	29. **B**	44. **F**	59. **C**	74. **H**
15. **B**	30. **J**	45. **C**	60. **F**	75. **C**

MATHEMATICS TEST

1. **D**	13. **B**	25. **B**	37. **C**	49. **C**
2. **K**	14. **H**	26. **H**	38. **H**	50. **J**
3. **C**	15. **C**	27. **D**	39. **D**	51. **E**
4. **G**	16. **J**	28. **G**	40. **J**	52. **K**
5. **B**	17. **E**	29. **C**	41. **C**	53. **C**
6. **G**	18. **J**	30. **J**	42. **K**	54. **J**
7. **B**	19. **D**	31. **D**	43. **D**	55. **D**
8. **F**	20. **F**	32. **G**	44. **G**	56. **F**
9. **A**	21. **D**	33. **E**	45. **A**	57. **A**
10. **K**	22. **J**	34. **F**	46. **G**	58. **F**
11. **E**	23. **D**	35. **C**	47. **C**	59. **D**
12. **H**	24. **G**	36. **G**	48. **F**	60. **J**

READING TEST

1. **C**	9. **B**	17. **B**	25. **A**	33. **D**
2. **J**	10. **F**	18. **H**	26. **F**	34. **F**
3. **A**	11. **B**	19. **C**	27. **B**	35. **C**
4. **F**	12. **J**	20. **H**	28. **G**	36. **G**
5. **A**	13. **A**	21. **C**	29. **C**	37. **D**
6. **H**	14. **G**	22. **J**	30. **H**	38. **G**
7. **C**	15. **D**	23. **C**	31. **D**	39. **B**
8. **F**	16. **J**	24. **F**	32. **H**	40. **H**

SCIENCE TEST

1. **A**	9. **C**	17. **D**	25. **A**	33. **A**
2. **J**	10. **G**	18. **H**	26. **F**	34. **G**
3. **B**	11. **A**	19. **B**	27. **A**	35. **C**
4. **H**	12. **H**	20. **G**	28. **H**	36. **H**
5. **A**	13. **A**	21. **B**	29. **D**	37. **B**
6. **G**	14. **G**	22. **H**	30. **F**	38. **F**
7. **D**	15. **A**	23. **C**	31. **B**	39. **C**
8. **H**	16. **J**	24. **J**	32. **J**	40. **J**

ANSWERS AND EXPLANATIONS

ENGLISH TEST

Passage I

1. A **Difficulty:** Low

Category: Sentence Structure and Formation

Getting to the Answer: When a period appears in the underlined portion, check to see if each sentence is complete. Here, each sentence is complete and correct; therefore, (A), NO CHANGE, is correct. Choice B creates a run-on sentence. Choices C and D create sentences that are awkward and overly wordy.

2. J **Difficulty:** Medium

Category: Punctuation

Getting to the Answer: The ACT tests very specific punctuation rules. If punctuation is used in a way not covered by these rules, it will be incorrect. No commas are required in the underlined selection; (J) is correct. Choices F, G, and H all contain unnecessary commas.

3. C **Difficulty:** Medium

Category: Sentence Structure and Formation

Getting to the Answer: When a verb is underlined, make sure it places the action properly in relation to the other events in the passage. This passage is written primarily in the present tense; *runs*, (C), is the best answer here. Choices A and B use verb tenses that do not make sense in context. The past tense verb in D is inconsistent with the rest of the passage.

4. F **Difficulty:** Medium

Category: Knowledge of Language / Concision

Getting to the Answer: Very rarely will a correct answer choice be significantly longer than the original selection. The underlined selection is grammatically and logically correct, so check the answer choices for a more concise version. You can eliminate G and H, both of which are wordier than the original. Choice J may be tempting because it's shorter than the underlined selection, but it changes the meaning of the sentence; the back office, not the reader, is what hasn't changed. Choice (F) is correct.

5. B **Difficulty:** Medium

Category: Topic Development / Supporting Material

Getting to the Answer: When an English Test question contains a question stem, read it carefully. More than one choice is likely to be both relevant and correct, but only one will satisfy the conditions of the stem. This paragraph deals with the author's father's refusal to give up his old-fashioned ways. Choice (B) is the most consistent choice. Choices A and D describe the items being inventoried, which is irrelevant to the point of the paragraph. Choice C is redundant; since we already know he uses paper and pencil to keep his inventory, it's understood that he's writing it by hand.

6. G **Difficulty:** Medium

Category: Sentence Structure and Formation

Getting to the Answer: Commas cannot be used to combine independent clauses. Here, the comma connects two independent clauses. Choice (G) correctly replaces the comma with a semicolon. Choice H corrects the run-on error but is unnecessarily wordy. Choice J leaves the meaning of the second clause incomplete.

7. C **Difficulty:** High

Category: Sentence Structure and Formation

Getting to the Answer: Beware of answer choices that make changes to parts of the selection that contain no error; these choices will rarely be correct. As written, this sentence uses incorrect grammatical structure; the verb *is* is incorrect here, so you should eliminate A. Choice (C) eliminates it without introducing additional errors. Choices B and D correct the sentence's grammatical error, but neither uses the necessary contrast transition to relate this sentence to the one before it.

8. H **Difficulty:** Low

Category: Punctuation

Getting to the Answer: Commas are used in a series of three or more; they are incorrect in compounds. "My sister and I" is a compound; no comma is needed, so F is incorrect. Choice (H) corrects the error without adding any new ones. Choice G uses the incorrect pronoun case; because you wouldn't say "me bought him a brand new computer," *me* is incorrect in the compound as well. Choice J incorrectly separates the sentence's subject and its predicate verb with a comma.

9. A **Difficulty:** High

Category: Organization, Unity, and Cohesion / Transitions

Getting to the Answer: When a transition word or phrase is underlined, make sure it properly relates the ideas it connects. The underlined word is the transition between the offer to help transfer records and the information about other ways the computer could be helpful. The second sentence is a continuation of the first, so you can eliminate B and D, both of which suggest a contrast. Choosing between (A) and C is a little more difficult, but remember that new errors may be introduced in answer choices. *In addition* in C would be acceptable if it were followed by a comma, but as written, it's incorrect. Choice (A) is correct.

10. G **Difficulty:** Medium

Category: Punctuation

Getting to the Answer: Semicolons can only combine independent clauses. Here, the second clause is not independent, so the semicolon is incorrect; eliminate F. Choice (G) correctly eliminates the semicolon. Choice H incorrectly places a comma after the conjunction. Choice J creates a run-on sentence.

11. B **Difficulty:** High

Category: Topic Development / Writer's Purpose

Getting to the Answer: When asked about the purpose of particular information, consider the purpose of the larger section. This paragraph describes the father's resistance to technology, which stems in part from his desire to be able to work even in blackout conditions. The information about the town's history shows that blackout conditions seldom occur, making the father's reason a bad one. Choice (B) reflects this reasoning, and it is correct. Choice A is too extreme; the father's reason may be poor, but that does not make him delusional. Choices C and D do not relate to the purpose of the paragraph.

12. G **Difficulty:** Medium

Category: Organization, Unity, and Cohesion / Passage Organization

Getting to the Answer: When asked to add new information, read it into the passage at the points suggested to choose its most logical placement. There are three pronouns in this new sentence; clarity requires that it be placed somewhere that these pronouns have logical antecedents. Placing it after Sentence 1, as (G) suggests, gives each pronoun a clear antecedent: *we* is the author and his sister, *him* is their father, and *it* is the computer. Choice F puts the siblings' hopes about how a computer could help their father before the information that they bought him one. Choice H's placement makes the antecedent for *it* Father's *blackout scenario,* which doesn't make sense in context. Placing the new sentence where Choice J suggests gives the pronoun the antecedent *blackout,* which is also illogical.

13. C **Difficulty:** Medium

Category: Usage

Getting to the Answer: Idiom questions often offer more than one idiomatically correct answer choice; use context to determine which is appropriate. "Sooner than later" is idiomatically incorrect, so you should eliminate A; these are comparison words, but nothing is compared here. Both B and (C) offer proper idioms, but (C) is the one that's appropriate here. Choice D is also incorrect idiomatic usage.

14. F **Difficulty:** Medium

Category: Sentence Structure and Formation

Getting to the Answer: Remember to read for logic as well as for grammar and usage. The best version of this sentence is the way it is written; (F) is correct. Choice G redundantly uses the possessive *office's* where possession has already been indicated by *of.* Choice H misstates the information in the passage; the writer's father received the cell phone before the computer. Choice J incorrectly

indicates that "the disorganized depths of that office" is where the writer's father received his cell phone, not where the cell phone ended up.

15. B **Difficulty:** Low

Category: Organization, Unity, and Cohesion / Passage Organization

Getting to the Answer: When asked to add information, consider both subject matter and tone. This essay is about the author's father's resistance to technology. Choice (B) concludes the essay by referencing something stated at the beginning: that the writer's father tries to *hide* from the future. Choices A, C, and D, while relevant to the paragraph, do not provide strong conclusions to a passage about the father's aversion to technology.

Passage II

16. F **Difficulty:** Medium

Category: Usage

Getting to the Answer: *More* or *-er* adjectives are used to compare two items; for more than two, use *most* or *-est*. This sentence is correct as written, (F); *farthest* is appropriate when comparing all areas of the globe. Choice G uses *most far*, which is incorrect in context. Choice H combines *most* with the *-est* suffix, which is never correct. Choice J uses *farther*, which indicates a comparison that is not present here.

17. C **Difficulty:** Medium

Category: Sentence Structure and Formation

Getting to the Answer: The fact that the underlined portion contains multiple prepositions (*among* and *for*) is a clue to look for a misplaced modifier. It makes the most sense to describe equality as being *among races*, eliminating A and B. Choice D awkwardly places the noun after its modifying phrases, so (C) is correct.

18. H **Difficulty:** Medium

Category: Usage

Getting to the Answer: Most ACT idiom questions will hinge on preposition usage. "Prevented . . . to participate" is idiomatically incorrect, so you can eliminate F. The proper idiom in this context is "prevented . . . from participating," (H). Choices G and J are both idiomatically incorrect.

19. B **Difficulty:** Medium

Category: Topic Development / Supporting Material

Getting to the Answer: When you're asked whether a piece of text is relevant, first determine the topic of the paragraph. This paragraph is about the evolution of the *color line* in baseball. Therefore, information that talks about the development of the industry and the shift in authority is relevant to the paragraph; (B) is correct. Choice A is incorrect because, although the text does talk about previous associations, knowing that range doesn't further the purpose of the paragraph. Choices C and D can be eliminated, since they indicate that the information is irrelevant.

20. H **Difficulty:** Medium

Category: Punctuation

Getting to the Answer: A verb should not be separated from its object by a comma. As written, this sentence places an incorrect comma between the verb *had* and its object; eliminate F. Choice (H) eliminates the comma without introducing any additional errors. Choices G and J both add incorrect commas.

21. B **Difficulty:** Medium

Category: Usage

Getting to the Answer: When a preposition is underlined, you're most likely being tested on idioms. Select the choice that sounds the most correct when read with the following noun phrase—in this case, *professional teams*. Because the leagues are made up *of* professional teams, (B) is correct here. Choices A, C, and D all suggest an incorrect relationship between the leagues and the teams.

22. J **Difficulty:** Medium

Category: Topic Development / Supporting Material

Getting to the Answer: Determining whether or not the underlined text should be deleted will help you quickly eliminate two answer choices. If you eliminate the underlined selection, the passage skips abruptly from the decree losing its force to a discussion of specific African American players. The underlined text introduces

those players generally, as a result of the decree losing its impact, and therefore provides a necessary transition, as indicated in (J). Choices F and G can be eliminated, since they advocate deleting the selection. The reasoning in H is not supported by the passage.

23. A **Difficulty:** Medium

Category: Sentence Structure and Formation

Getting to the Answer: Expect about 25% of your English Test questions to have no error. This sentence is correct as written, (A). Choices B, C, and D all create sentence fragments.

24. F **Difficulty:** Medium

Category: Usage

Getting to the Answer: The phrase "including Walker's brother Weldy" is properly used here to modify "a few other African Americans"; no change is needed, so (F) is correct. Choice G is incorrect because no comma is used to introduce a clause beginning with *that*. Choices H and J make the sentence wordier unnecessarily.

25. B **Difficulty:** Medium

Category: Sentence Structure and Formation

Getting to the Answer: Use context to determine appropriate verb tense usage. The previous sentence says that Walker *was* a catcher; the introductory phrase in this sentence refers us to the same time period. Only (B) uses a consistent tense. Choices A, C, and D all refer to future actions.

26. H **Difficulty:** Medium

Category: Organization, Unity, and Cohesion / Passage Organization

Getting to the Answer: Since NO CHANGE is not presented as an option, you'll need to find the most logical placement for the new sentence. *Other teams* must contrast with teams already mentioned, and the only place that happens is in Sentences 2 and 3. Sentence 2 talks about one player for the Blue Stockings, and Sentence 3 mentions some additional players for the same team. Sentence 4 turns to the time when segregation returned, so the information about African Americans playing for other teams must come before that, between Sentences 3 and 4, (H).

27. B **Difficulty:** Low

Category: Knowledge of Language / Concision

Getting to the Answer: When you don't spot an error in grammar or usage, check for errors of style. "At the time when" is a longer way of saying *when*; (B) is correct here. Choice C uses *while*, which indicates a continuing period of time, but this sentence refers to a specific moment when Jackie Robinson crossed the color line. Choice D is even wordier than the original.

28. F **Difficulty:** Medium

Category: Knowledge of Language / Precision

Getting to the Answer: Make sure your selection reflects the meaning of the sentence. The best version of this sentence is the way it is written, (F). Choice G changes the meaning of the sentence, implying that Robinson has yet to be recognized as a hero. Choice H also changes the sentence's meaning, indicating that Robinson is doing the recognizing rather than being recognized. Choice J is unnecessarily wordy.

29. B **Difficulty:** High

Category: Knowledge of Language / Style and Tone

Getting to the Answer: A question that asks about the essay's tone will likely include only answer choices that are grammatically correct. Be as picky as possible when determining which choice best fits the stated tone and emphasis. Choice A is too neutral, so it should be eliminated. Choice C does not emphasize the uniqueness of Robinson's role; eliminate it. Choice D mentions collaboration, which emphasizes teamwork rather than uniqueness, so it is also incorrect. Someone who blazes a path goes where no one has gone before. Thus, only (B) maintains a positive tone while showing that Robinson played a unique role.

30. J **Difficulty:** Medium

Category: Topic Development / Writer's Purpose

Getting to the Answer: This question format appears frequently on the ACT; it's asking for the passage's main idea. This essay is about the color barrier in baseball; it would not fulfill an assignment to write about the history of baseball, so you can eliminate F and G. The fact that baseball was played before 1868, H, is not the reason this

essay does not fulfill an assignment on baseball's history. Choice (J) correctly states the reasoning: the essay focuses only on one aspect of the game.

Passage III

31. A **Difficulty:** Medium

Category: Punctuation

Getting to the Answer: An introductory phrase should be separated from the rest of the sentence by a comma. This introductory phrase is set off by a comma; the sentence is correct as written, (A). Choices B and C incorrectly treat the introductory phrase as an independent clause. Choice D incorrectly connects a dependent and an independent clause with the conjunction *and*.

32. H **Difficulty:** Medium

Category: Usage

Getting to the Answer: When a pronoun is underlined, check whether it matches its antecedent. The underlined portion refers to the bridge, so the correct answer will be singular; eliminate F and G. Choice J contains a subject-verb agreement error; the singular *it* requires the singular *was*. Choice (H) is correct.

33. B **Difficulty:** Medium

Category: Sentence Structure and Formation

Getting to the Answer: Make sure verb tenses make sense within the chronology of the passage. The past perfect is used in this sentence, but this tense is only correct when used to describe one past action completed before another. That is not the case here, so A is incorrect; (B) correctly replaces the verb with its past tense form. Choice C changes the meaning of the sentence (the legislature did the authorizing; it wasn't authorized by someone else) and creates a sentence that is grammatically incorrect. Choice D uses a conditional verb phrase, which is inappropriate in context.

34. H **Difficulty:** Low

Category: Knowledge of Language / Concision

Getting to the Answer: When the underlined selection contains a compound, check to see if the words mean the same thing. If so, the correct answer choice will eliminate one of them. *Build* and *construct* mean the same thing, so you can eliminate F and G right away. The only difference between (H) and J is a comma, which is incorrect in a compound; eliminate J.

35. A **Difficulty:** Medium

Category: Punctuation

Getting to the Answer: Where the only difference among the answer choices is comma placement, remember your tested rules. This sentence needs NO CHANGE, (A). Choice B incorrectly places a comma between items in a compound. Choice C places a comma after the conjunction in a compound, which is also incorrect. Choice D incorrectly inserts a comma between a preposition and its object.

36. H **Difficulty:** Medium

Category: Topic Development / Writer's Purpose

Getting to the Answer: Read the sentence without the material in question to determine what it adds to the paragraph and therefore why it was included. Looking at the paragraph as a whole, you can see that the author mentions the amount of money invested, the prominence of the architects, and the accomplishments of the firm the architects brought in to help. Removing one of these details detracts from that description; (H) is the best choice here. Choice F can be eliminated because this is not the only detail that supports the larger point; in and of itself, it's not critical. Removing this one phrase wouldn't impact the transition, as G suggests. Choice J is a trap. The segment in question does concern finances, but the text only mentions the amount of money invested, not how it was raised.

37. D **Difficulty:** High

Category: Usage

Getting to the Answer: On the ACT, *who* will only be correct when used to refer to people. Despite the fact that it's named after a person, "John A. Roebling and Sons" is the name of a company, so *who* isn't appropriate. That eliminates A and B. Choice C might be tempting because it's shorter than (D), but when C is read into the sentence, it creates a grammatical problem: "a company . . . and would later" requires another verb. Choice (D) is correct.

38. J **Difficulty:** Medium

Category: Topic Development / Supporting Material

Getting to the Answer: Consider context when you're asked about the role a piece of text plays. A question that asks what would be lost if text were deleted is really just asking for the function of that text. If you read the paragraphs before and after the sentence in question, you'll see that what is missing is a clear transition; (J) is correct. Choice F distorts the meaning of the sentence, which discusses how long the project actually took, not how long it was expected to take. Choice G is out of scope; danger is only mentioned in this one sentence and then only in terms of how few lives were lost constructing the bridge. Choice H overstates the significance of the detail regarding construction time.

39. D **Difficulty:** Medium

Category: Organization, Unity, and Cohesion / Transitions

Getting to the Answer: When transition words are underlined, focus on the relationship between the sentences or clauses they combine. The preceding sentence talks about the length of the bridge, and the sentence in which the underlined segment appears goes on to describe the cables in more detail. Since the second isn't a result of the first, you can eliminate A. Choice B inaccurately suggests an inconsistent or contradictory relationship between the sentences. Choice C is illogical; these are facts about the bridge, not events occurring simultaneously. The best choice here is no transition at all, as in (D).

40. G **Difficulty:** Low

Category: Usage

Getting to the Answer: When you're tested on Usage, wrong answer choices may have the wrong word in context. They may also be wordy or passive. *Longer* means a comparison: one thing is longer *than* something else. Since this sentence doesn't offer a comparison, *longer* can't be correct. Eliminate F. Choices (G) and H are both grammatically correct in context, but H is unnecessarily wordy. *Lengthy*, in J, is not correct when used to describe a specific length.

41. C **Difficulty:** Medium

Category: Sentence Structure and Formation

Getting to the Answer: When the underlined portion contains a comma, check for a run-on. Because the comma separates two independent clauses, A is incorrect. Choice B eliminates the subject of the second clause, so it is incorrect. Choice D incorrectly combines a semicolon and a FANBOYS conjunction. Choice (C) makes the second clause dependent and correctly separates the clauses with a comma. Choice (C) is correct.

42. F **Difficulty:** Medium

Category: Punctuation

Getting to the Answer: Introductory phrases and clauses should be set off from the rest of the sentence by a comma. The comma here is used correctly, so no change is needed; (F) is correct. Choice G eliminates the comma, making the sentence difficult to understand. Both the colon in H and the semicolon in J would work only if the first clause were independent, which it is not.

43. D **Difficulty:** Medium

Category: Organization, Unity, and Cohesion / Transitions

Getting to the Answer: When a transition word is underlined, check to see what ideas are being connected by the transition. The previous sentence mentions that the bridge was renamed, and the sentence beginning with the underlined portion switches to the present tense to describe the number of vehicles that cross the bridge daily. There is no logical contrast between these ideas, so B and C can be eliminated. Choice A indicates a continuation of the previous thought, but that does not fit the context; eliminate it. Choice (D) is correct, because it transitions from the past-tense description in the previous sentence to the present-tense description of the bridge's daily activity.

44. F **Difficulty:** Medium

Category: Usage

Getting to the Answer: This sentence is correct as written, (F). Choice G replaces *more than* with *over*, which, despite its common usage, is actually a preposition that indicates location, not amount. Choice H is unnecessarily wordy. Choice J is also wordy and uses *amount*, which is incorrect for a countable noun like *vehicles*.

45. C **Difficulty:** Medium

Category: Topic Development / Writer's Purpose

Getting to the Answer: As you read ACT English passages, develop a sense of the topic or *big idea*, just like you do in Reading; this question format is very common on the ACT. This passage is about one specific bridge, so it would not satisfy the requirement set out in the question stem. You can therefore eliminate A and B right away. Now turn to the reasoning. Choice D misstates the topic of the passage; (C) is correct.

Passage IV

46. H **Difficulty:** Medium

Category: Sentence Structure and Formation

Getting to the Answer: Verbs in a compound should be in the same tense. The compound verb in this clause is "was . . . rising . . . and painted." Since the second verb is in the past tense, the first should be as well, so F is incorrect; (H) is correct. Choice G uses the gerund verb form without the necessary helping verb. Choice J is unnecessarily wordy.

47. A **Difficulty:** Medium

Category: Topic Development / Writer's Purpose

Getting to the Answer: Read English Test question stems carefully. Often, all of the choices will be relevant and grammatically correct, but only one will fulfill the requirements of the stem. This question stem asks for a detail that shows a contrast between the quiet night streets and the daytime activity. The original text does this best. The verb in B does not convey the difference in the streets at these two times as well as *flood* in (A). Choice C is too general. Choice D does not provide the necessary contrast.

48. H **Difficulty:** Medium

Category: Usage

Getting to the Answer: Use your Kaplan resources to familiarize yourself with commonly tested idioms. Although all four answer choices form idioms that would be correct in some contexts, one smiles *at* someone or something; (H) is correct.

49. D **Difficulty:** Medium

Category: Knowledge of Language / Concision

Getting to the Answer: When you don't spot an error in grammar or usage, look for errors in style. Choice A is a wordy way of saying *traveled across*, (D). Choices B and C are unnecessarily wordy as well.

50. H **Difficulty:** Low

Category: Sentence Structure and Formation

Getting to the Answer: Read question stems carefully. This one asks which answer choice would NOT be acceptable, which means that three of the choices will be correct in context. Choices F, G, and J are appropriate introductory clauses, but (H) is an independent clause, which makes the sentence a run-on.

51. B **Difficulty:** Medium

Category: Topic Development / Supporting Material

Getting to the Answer: Use your Reading skills for questions like this one that ask for the function of a detail. The underlined portion tells us that the writer's journey will end in California. Choice (B) is correct. The underlined selection does not mention the reasons for the writer's trip, describe her route, or make any comparisons, so A, C, and D are incorrect.

52. G **Difficulty:** Medium

Category: Punctuation

Getting to the Answer: Use commas in a list or series only if there are three or more items. Since the writer only mentions two places she has been, the first comma here is incorrect; eliminate F. Choice (G) corrects this without introducing any additional errors. Choice H eliminates the incorrect comma but removes the one at the end of the selection, which is needed to separate the introductory clause from the rest of the sentence. Choice J does not address the error.

53. A **Difficulty:** Medium

Category: Organization, Unity, and Cohesion / Transitions

Getting to the Answer: To identify the most effective transition, you'll need to read both paragraphs. Paragraph 3

is about how the author has traveled to foreign countries but, within the United States, she only knows New York City. Paragraph 4 describes her drive through the Midwest. The text as written takes the reader from New York City (tall buildings) to the less populated areas, leading to the description of the cornfields. Choice (A), NO CHANGE, is the best choice here. Choice B misstates the passage; the cornfields didn't appear *almost immediately*, but gradually. Choice C and D do not provide appropriate transitions between the paragraphs.

54. F **Difficulty:** Medium

Category: Topic Development / Supporting Material

Getting to the Answer: When you're asked to identify the *most relevant* choice, use context clues. The paragraph is about the change the author experiences as she drives from New York across the country. That contrast is clear in the passage as written; (F) is the best choice here. Choices G and H do not relate to the paragraph's topic. Choice J is opposite; the writer describes many different settings, which is the opposite of *monotonous*.

55. C **Difficulty:** Medium

Category: Sentence Structure and Formation

Getting to the Answer: There are a number of ways to correct a run-on sentence, but only one answer choice will do so without introducing any additional errors. Each of the clauses in this sentence is independent; (C) corrects the run-on by replacing the comma with a semicolon. Choice B omits the comma necessary with the coordinating conjunction *but*. Choice D loses the contrast between the clauses that is present in the original.

56. G **Difficulty:** Medium

Category: Usage

Getting to the Answer: When a single adverb is underlined, you are most likely being tested on idioms. Determine what is being modified. The underlined portion modifies the noun *serenity*, so it should be an adjective. Eliminate F. Choices H and J compare this serenity to other states of being, but there is no such comparison in the passage. Choice (G) is correct.

57. A **Difficulty:** Medium

Category: Punctuation

Getting to the Answer: Only two apostrophe uses are tested on the ACT: possessive nouns and contractions. The noun here is possessive; the apostrophe is used correctly in (A). Choice B uses the plural *nights* instead of the possessive. Choice C is unnecessarily wordy and uses the idiomatically incorrect "shadows from the night." Choice D changes the meaning of the sentence.

58. H **Difficulty:** Medium

Category: Knowledge of Language / Concision

Getting to the Answer: If you don't spot a grammar or usage error, check for errors in style. As written, this sentence is unnecessarily wordy, so F is incorrect; (H) provides the best revision. Choices G and J are still unnecessarily wordy.

59. C **Difficulty:** Medium

Category: Organization, Unity, and Cohesion / Transitions

Getting to the Answer: When a transition word or clause is underlined, determine the relationship between the ideas being connected. Look at the relationship between the sentences in this paragraph. The ideas are presented chronologically—that is, in the order in which they happened. Choice (C), *At first*, is the best transition into this series of events. Choices A and B imply contradiction or qualification, which is incorrect in context. Choice D implies that a lot went on prior to the writer's not having any idea what she was looking at, but this is presented as the first in a series of events.

60. F **Difficulty:** High

Category: Sentence Structure and Formation

Getting to the Answer: The correct answer will rarely be longer than the original selection. This question requires no change, so (F) is correct. The pronoun's antecedent appears in the previous sentence ("what I was looking at"), and the *-ing* verb form is used correctly. Choices G, H, and J are wordy; additionally, G introduces the passive voice unnecessarily.

Passage V

61. A **Difficulty:** Low

Category: Punctuation

Getting to the Answer: Commas are used to combine an independent and a dependent clause. This sentence is correct as written, (A), with the comma properly placed after the introductory clause. Choice B places the comma incorrectly; *of 2003* is part of the introductory clause. Choice C omits the necessary comma. Choice D incorrectly uses a semicolon between a dependent and an independent clause.

62. H **Difficulty:** Medium

Category: Sentence Structure and Formation

Getting to the Answer: The underlined portion introduces nonessential information, so it should not form an independent clause. Choices F and G both make the clause an independent one; they should be eliminated. The passage is in the past tense, making the present tense verb in J incorrect. Choice (H) is correct.

63. B **Difficulty:** Medium

Category: Knowledge of Language / Precision

Getting to the Answer: Precision questions require you to look at context; frequently, words will have similar meanings but be used differently. *Height* means "the distance from the top to the bottom of something"; *altitude* means "height above sea level." Since *altitude* is correct in this context, you can eliminate A. Choices (B) and C both use *altitude*, but "at an altitude" is the correct idiom here; (B) is correct. Choice D creates a grammatically incorrect sentence.

64. H **Difficulty:** High

Category: Organization, Unity, and Cohesion / Transitions

Getting to the Answer: When a transition word is underlined, check the logic of the transition as well as the grammar and punctuation. The sentence contrasts the famous and wealthy passengers with passengers who were ordinary people. Eliminate F and J because they do not express contrast. While G presents a contrast, it is grammatically incorrect. *Despite* creates a dependent clause requiring an *-ing* or *-ed* verb form, which is not present in the sentence. Choice (H) is correct, both logically and grammatically.

65. C **Difficulty:** High

Category: Usage

Getting to the Answer: Words like *that*, which are commonly misused in everyday speech, can make a question more challenging. Sound doesn't travel a speed, it travels *at* a speed; eliminate A. Only (C) makes the correction. Sound doesn't travel *to* a speed, as in B; *where*, D, will only be correct on the ACT when used to indicate location or direction.

66. G **Difficulty:** Medium

Category: Topic Development / Writer's Purpose

Getting to the Answer: When asked about the purpose of a paragraph in relation to others, take a few seconds to summarize the paragraph in question, the one before it, and the one after it. The previous paragraph introduced the topic of supersonic aircraft. The paragraph in question transitions to questions of science, which are then discussed in the following paragraph. Choice (G) is correct. The paragraph does not provide an example or a counterargument, making F and H incorrect. The passage does not move from the general topic to a specific story, making J incorrect.

67. C **Difficulty:** Medium

Category: Knowledge of Language / Precision

Getting to the Answer: Read English Test question stems carefully. This one asks for the LEAST acceptable alternative, which means that three of the choices will be correct in the sentence. All of the answer choices mean "change," so read each of them into the sentence. "Change them into," "translate them into," and "transform them into" are all appropriate usage, but "alter them into" is not because it changes the meaning. Choice (C) is correct here.

68. J **Difficulty:** High

Category: Knowledge of Language / Concision

Getting to the Answer: Look for constructions that repeat words unnecessarily; these will be incorrect on the ACT. The sentence tells us that the speed at which

sound travels through gas depends on three things: what kind of gas it is, the temperature, and the pressure; "it is traveling through" is redundant, so F is incorrect. Choice (J) is the most concise answer, and it does not lose any of the meaning of the underlined selection. Choices G and H do not address the error.

69. D **Difficulty:** High

Category: Knowledge of Language / Ambiguity

Getting to the Answer: Don't choose the shortest answer if it fails to make the writer's meaning clear. "Air temperature and pressure decrease with altitude" isn't clear; "air temperature" and "pressure" themselves do not have altitude, and we're not told to what the altitude is referring, so A is incorrect. Choice (D) makes the writer's meaning clear; when altitudes are higher, the decrease in temperature and pressure occur. Choice B does not address the error and even compounds it by replacing *altitude* with *height*. Choice C contradicts the facts in the passage; higher, not lower, altitudes have this effect.

70. G **Difficulty:** Medium

Category: Punctuation

Getting to the Answer: Beware of answer choices that make unnecessary changes to the sentence. The information provided in the two clauses contrasts, so *however* is correct, but it requires a comma to separate it from the rest of the clause. Eliminate F. Choice (G) is correct. Choice H creates an inappropriate cause-and-effect relationship between the clauses. Choice J does not address the punctuation error.

71. A **Difficulty:** Medium

Category: Organization, Unity, and Cohesion / Passage Organization

Getting to the Answer: When you're asked to choose the most logical conclusion, first determine the sentence's function within the paragraph. The first half of this sentence previews a reason that the Concorde cruises at a higher altitude than regular planes, and it ties that reason back to the contrast between the speed of sound at two different altitudes. You need, then, a conclusion to the sentence that both explains why the planes would fly higher and does so in light of the information about altitude in the preceding sentence. The best choice here is (A); the original version of the sentence is the most logical. Choice B doesn't provide a reason; it simply repeats information that has already been stated. Choice C is out of scope; fuel consumption isn't mentioned in the passage. Choice D is a result of the plane's higher altitude, not its cause.

72. H **Difficulty:** High

Category: Sentence Structure and Formation

Getting to the Answer: The use of *since* creates a specific marking point in the past and requires a verb that does the same. You need a simple past verb with *since*; (H) is correct. Choice F uses a tense that indicates an action that is ongoing, but the decommissioning of the Concorde has been completed. Choice G is unnecessarily wordy. The past perfect in J is only correct when used to indicate one past action completed prior to another stated past action, which is not the case here.

73. C **Difficulty:** Medium

Category: Knowledge of Language / Concision

Getting to the Answer: The phrases *about to* and *very soon* are redundant, making A, B, and D all incorrect. Furthermore, sentences beginning with coordinating (FANBOYS) conjunctions will not be correct on the ACT, which is an additional error in A. Only (C) correctly removes the redundancy.

74. H **Difficulty:** Medium

Category: Organization, Unity, and Cohesion / Transition

Getting to the Answer: When a transition word is underlined, check to see if it makes sense in the context. The sentence discusses upcoming advances to supersonic travel. Choice F places the advances in the present, which does not match the future-tense *will* later in the sentence. Choice G is about location rather than time, which does not fit the context. Choices (H) and J both refer to a future time, but only (H) makes sense in context. The answer must be an adverb in order to describe when the advances will take place, but *Upcoming*, choice J, is an adjective. Choice (H) is therefore correct.

75. C **Difficulty:** Medium

Category: Sentence Structure and Formation

Getting to the Answer: Here, the items combined by "not only . . . but also" are "to the rich and famous" and

"be for the masses." These items are correlated in the sentence, but they are not parallel in structure; eliminate A. Choices B and D do not address the error in parallel structure. Choice (C) corrects the error.

MATHEMATICS TEST

1. D **Difficulty:** Low

Category: Essential Skills / Statistics and Probability

Getting to the Answer: The basketball team scored 364 points in 13 games, so they scored an average of $\frac{364}{13} = 28$ points per game. Choice (D) is correct.

2. K **Difficulty:** Low

Category: Essential Skills / Numbers and Operations

Getting to the Answer: To convert a mixed number to an improper fraction, you have two options:

Option 1: Rewrite the whole number part using the denominator of the fraction part, then add. Here, the result is $\frac{28}{7} + \frac{3}{7} = \frac{31}{7}$.

Option 2: Use the shortcut rule, which is: Multiply the whole number by the denominator of the fraction and add the numerator, then write the result over the original denominator. Here, you get $4 \times 7 + 3 = 28 + 3 = 31$ over 7, or $\frac{31}{7}$.

Using either method, you arrive at a numerator of 31, which is (K).

3. C **Difficulty:** Low

Category: Essential Skills / Expressions and Equations

Getting to the Answer: To solve for x, you need to isolate it on one side of the equation. To do this, subtract 18 from both sides, then divide by 4. The result is:

$$\begin{aligned} 4x + 18 &= 38 \\ 4x &= 20 \\ x &= 5 \end{aligned}$$

Choice (C) is correct. Note that you could also Backsolve to answer this question, but the algebra is quicker.

4. G **Difficulty:** Low

Category: Essential Skills / Numbers and Operations

Getting to the Answer: Because John weighs *more* than Ellen, begin by eliminating J and K, as doing so will reduce the chance of a miscalculation error. According to the question, John's 144 pounds represents 1.5 times Ellen's weight. Therefore, Ellen's weight must be $\frac{144}{1.5} = 96$ pounds. Choice (G) is correct.

If you're not sure whether to multiply or divide by 1.5, you could also set up an equation and solve it. Let J = John's weight and E = Ellen's weight. Translating from English to math gives:

$$\begin{aligned} J &= 1.5E \\ 144 &= 1.5E \\ \frac{144}{1.5} &= E \\ E &= 96 \end{aligned}$$

5. B **Difficulty:** Medium

Category: Essential Skills / Numbers and Operations

Getting to the Answer: To find the reciprocal of a number, swap the numerator and the denominator. You could use algebra to answer the question, but Backsolving is likely to be quicker. As usual, start with C:

The reciprocal of $\frac{4}{3}$ is $\frac{3}{4}$ and $\frac{4}{3} \div \frac{3}{4} = \frac{4}{3} \times \frac{4}{3} = \frac{16}{9}$.

This is too big (and it's the flip of what you're looking for), so try (B) next:

The reciprocal of $\frac{3}{4}$ is $\frac{4}{3}$ and $\frac{3}{4} \div \frac{4}{3} = \frac{3}{4} \times \frac{3}{4} = \frac{9}{16}$.

Choice (B) is correct.

6. G **Difficulty:** Medium

Category: Higher Math / Number and Quantity

Getting to the Answer: The inverse operation of cube rooting is cubing, so cube both sides of the equation to solve for x:

$$\sqrt[3]{x} = \frac{1}{4}$$

$$x = \left(\frac{1}{4}\right)^3 = \frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} = \frac{1}{64}$$

That's (G).

7. B **Difficulty:** Low

Category: Higher Math / Algebra

Getting to the Answer: Isolate the variable, then solve for x. To do this, subtract 14 from both sides, then take the square root:

$$x^2 + 14 = 63$$
$$x^2 = 49$$
$$x = \pm 7$$

Choice (B) matches the positive value of x.

8. F **Difficulty:** Medium

Category: Higher Math / Number and Quantity

Getting to the Answer: Don't let the vector notation scare you. Adding vectors works exactly as you would expect it to: To add two vectors, add the corresponding components. The question only asks about the value of a, so focus on the first entries only: $7 + a = 5$, which gives $a = 5 - 7$, or -2. Choice (F) is correct.

9. A **Difficulty:** Low

Category: Essential Skills / Rates, Percents, Proportions, and Unit Conversion

Getting to the Answer: The quickest way to answer this question is to estimate. While you may or may not know 6% of 1,250 off the top of your head, 10% of 1,250 is 125. Because $6\% < 10\%$, the correct answer must be less than 125. Only (A) works.

To solve this the more traditional way, multiply 1,250 by the decimal form of 6%: $1{,}250 \times 0.06 = 75$.

10. K **Difficulty:** Low

Category: Essential Skills / Numbers and Operations

Getting to the Answer: When the choices are spaced far apart, estimation is generally the quickest way to the correct answer. To estimate, round 5.2 to 5 and 6.8 to 7. Because $5^3 + 7^2 = 125 + 49 = 174$, the correct answer will be close to 174. That would be (K).

11. E **Difficulty:** Low

Category: Higher Math / Number and Quantity

Getting to the Answer: You certainly could reason this question out logically, but it's much easier to just pick a starting balance, make the error described in the question, and see which answer choice matches. Suppose Lexi starts with a balance of \$100. If she accidentally adds \$40 to this amount, the incorrect new balance is \$140. If she had subtracted instead, the correct balance would have been \$60. Thus the incorrect balance is \$140 − \$60 = \$80 more than is should be. Choice (E) is correct.

12. H **Difficulty:** Medium

Category: Essential Skills / Numbers and Operations

Getting to the Answer: To answer this question, you'll need to follow the order of operations (PEMDAS).

First, evaluate the parentheses:

$$3^3 \div 9 + (\mathbf{6^2 - 12}) \div 4$$
$$= 3^3 \div 9 + (\mathbf{36 - 12}) \div 4$$
$$= 3^3 \div 9 + \mathbf{24} \div 4$$

Next, simplify the exponent:

$$\mathbf{3^3} \div 9 + 24 \div 4 = \mathbf{27} \div 9 + 24 \div 4.$$

Then, take care of any multiplication and/or division, from left to right: $27 \div 9 + 24 \div 4 = 3 + 6$.

Finally, take care of any addition and/or subtraction, from left to right: $3 + 6 = 9$.

So (H) is correct.

13. B **Difficulty:** Low

Category: Essential Skills / Expressions and Equations

Getting to the Answer: Each banana costs \$0.24, so the price of x bananas is $\$0.24x$. Similarly, each orange costs \$0.38, so the price of y oranges is $\$0.38y$. Therefore, the total price of x bananas and y oranges is $\$0.24x + \$0.38y$. That's (B).

14. H **Difficulty:** Low

Category: Essential Skills / Rates, Percents, Proportions, and Unit Conversion

Getting to the Answer: To find the percent shaded, divide the number of shaded triangles by the total number of triangles. There are 24 small triangles in all, and 8 of them are shaded: $\frac{8}{24} = \frac{1}{3} = 33\frac{1}{3}\%$. Choice (H) is correct.

15. C **Difficulty:** Medium

Category: Essential Skills / Rates, Percents, Proportions, and Unit Conversion

Getting to the Answer: The ratio of girls to boys is 5:3, so the ratio of girls to the total number of seniors is 5:(3 + 5), or 5:8. Call g the number of girls in the senior class. Set up a proportion and cross-multiply to solve for g:

$$\frac{5}{8} = \frac{g}{168}$$
$$8g = 840$$
$$g = 105$$

There are 105 girls in the senior class, which is (C).

16. J **Difficulty:** Medium

Category: Essential Skills / Statistics and Probability

Getting to the Answer: When a question about averages involves a missing value (here, the final test score), it often helps to think in terms of the sum instead. For Sarah's exam scores to average at least a 90, they must sum to at least $90 \times 4 = 360$. She already has an 89, a 93, and an 84, so she needs at least $360 - (89 + 93 + 84)$, which gives $360 - 266 = 94$ points on her final test. Choice (J) is correct.

17. E **Difficulty:** Low

Category: Essential Skills / Expressions and Equations

Getting to the Answer: Treat inequalities just as you would equations. The only exception is that if you multiply or divide by a negative number, you must flip the inequality symbol.

$$3x - 11 \geq 22$$
$$3x \geq 33$$
$$x \geq 11$$

This matches (E).

18. J **Difficulty:** Medium

Category: Essential Skills / Statistics and Probability

Getting to the Answer: Probability is the number of desired outcomes divided by the total number of possible outcomes. Here, you're given the probability $\left(\frac{3}{4}\right)$ and the number of desired outcomes (48). You're looking for the total number of possible outcomes (the number of dominos in the pile). Let d represent the number of dominos in the pile. Set up an equation using the definition of probability and the given information:

$$P(\text{even \# dots}) = \frac{\text{\# with even \# dots}}{\text{total \# dominos in pile}} = \frac{3}{4}$$
$$\frac{3}{4} = \frac{48}{d}$$
$$3d = 192$$
$$d = 64$$

Choice (J) is correct.

19. D **Difficulty:** Low

Category: Essential Skills / Expressions and Equations

Getting to the Answer: This is a straightforward substitution question, so just be careful of the negative signs. Plug in 4 for x and $-\frac{1}{2}$ for y and simplify:

$$3x - 8y$$
$$= 3(4) - 8\left(-\frac{1}{2}\right)$$
$$= 12 - (-4)$$
$$= 12 + 4$$
$$= 16$$

That's (D).

20. F **Difficulty:** Medium

Category: Essential Skills / Rates, Percents, Proportions, and Unit Conversion

Getting to the Answer: Whenever multiple rates are given, pay very careful attention to the units. As you read the question, decide how and when you will need to convert units. Use the factor-label method as needed. The answer choices are given in hours and minutes, so start by converting the given typing rate from words per second to words per minute:

$$\frac{3.75 \text{ words}}{1 \cancel{\text{ second}}} \times \frac{60 \cancel{\text{ seconds}}}{1 \text{ minute}} = \frac{225 \text{ words}}{1 \text{ minute}}$$

Next, find the number of words in the 25-page transcript:

$$\frac{675 \text{ words}}{1 \cancel{\text{ page}}} \times 25 \cancel{\text{ pages}} = 16{,}875 \text{ words}$$

Finally, let m be the number of minutes it takes the court reporter to type the whole transcript. Set up a proportion and solve for m:

$$\frac{225 \text{ words}}{1 \text{ minute}} = \frac{16{,}875 \text{ words}}{m \text{ minutes}}$$
$$225m = 16{,}875$$
$$m = 75$$

Because 75 minutes is not an answer choice, convert it to hours and minutes: 75 minutes = 1 hour, 15 minutes, making (F) the correct answer.

21. D **Difficulty:** Low

Category: Essential Skills / Geometry

Getting to the Answer: When two parallel lines are cut by a transversal, half of the angles will be acute and half will be obtuse. Each acute angle will have the same measure as every other acute angle. The same is true of every obtuse angle. Furthermore, the acute angles will be supplementary to the obtuse angles. Based on the information provided, $\angle a$ is an acute angle measuring 68°. Based on the figure, $\angle f$ is an obtuse angle, so $\angle a$ must be supplementary to $\angle f$. Therefore, the measure of $\angle f$ is $180° - 68° = 112°$. Choice (D) is correct.

22. J **Difficulty:** Medium

Category: Essential Skills / Rates, Percents, Proportions, and Unit Conversion

Getting to the Answer: If the student copy is $\frac{1}{4}$ the size of the wall map, then 2.5 inches on the student map would be $2.5 \times 4 = 10$ inches on the wall map. Now set up a proportion to find the actual distance between the cities using the scale of the wall map:

$$\frac{1}{100} = \frac{10}{x}$$
$$x = 1{,}000$$

The correct answer is (J).

23. D **Difficulty:** Medium

Category: Essential Skills / Numbers and Operations

Getting to the Answer: The piece of paper is $8\frac{1}{2}$ inches wide. To find the number of $\frac{5}{8}$-inch wide strips of paper you can cut, divide:

$$8\frac{1}{2} \div \frac{5}{8} = \frac{17}{2} \div \frac{5}{8}$$
$$= \frac{17}{2} \times \frac{8}{5}$$
$$= \frac{136}{10} = \frac{68}{5} = 13.6$$

Thus, you can make 13 strips of paper that are $\frac{5}{8}$ of an inch wide and 11 inches long, and you will have a small, thin strip of paper left over. Choice (D) is correct.

24. G **Difficulty:** Medium

Category: Essential Skills / Geometry

Getting to the Answer: This is a pair of parallel lines cut by a transversal, but this time, there's also a triangle thrown into the mix. Begin with segment AB. This is a transversal, so $\angle MAB$ and $\angle ABC$ are alternate interior angles and $m\angle MAB = m\angle ABC = 55°$. Because triangle ABC is isosceles with $AB = AC$, $m\angle ACB$ is also 55° (base angles of an isosceles triangle have equal measures). Choice (G) is correct.

25. B **Difficulty:** Low

Category: Higher Math / Algebra

Getting to the Answer: Use the slope formula to find the slope of the line:

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$= \frac{-6 - 0}{0 - (-10)}$$
$$= -\frac{6}{10}$$
$$= -\frac{3}{5}$$

That's (B).

26. H **Difficulty:** Medium

Category: Higher Math / Algebra

Getting to the Answer: This question seems long, but it actually isn't that complicated. FOIL the first pair of binomials, FOIL the second pair, then add the results by combining like terms:

$$(x + 4)(x - 4) = x(x) + x(-4) + 4(x) + 4(-4)$$
$$= x^2 - 4x + 4x - 16$$
$$= x^2 - 16$$

(If you noticed the difference of squares above, that will save you some time.)

$$\begin{aligned}(2x + 2)(x - 2) &= 2x(x) + 2x(-2) + 2(x) + 2(-2)\\ &= 2x^2 - 4x + 2x - 4\\ &= 2x^2 - 2x - 4\end{aligned}$$

Finally, add the two polynomials by combining like terms:

$$\boxed{x^2}\textcircled{-16} + \boxed{2x^2} - 2x\textcircled{-4} = 3x^2 - 2x - 20$$

Choice (H) is correct.

27. D **Difficulty:** Medium

Category: Higher Math / Geometry

Getting to the Answer: To find the distance between two points that don't have either the same *x*-coordinates or the same *y*-coordinates, plug the points into the Distance formula and evaluate:

$$\begin{aligned}\text{Distance} &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}\\ &= \sqrt{(-2 - 3)^2 + (6 - (-6))^2}\\ &= \sqrt{(-5)^2 + 12^2}\\ &= \sqrt{25 + 144}\\ &= \sqrt{169}\\ &= 13\end{aligned}$$

Choice (D) is correct.

28. G **Difficulty:** Medium

Category: Essential Skills / Rates, Percents, Proportions, and Unit Conversion

Getting to the Answer: Look for shortcuts; you could write an equation and solve for *h*, but is there a faster way? Examine the two percents: 30 percent is half of 60 percent, so 30 percent of *h* will be half of 60 percent of *h*, or half of 80, which is 40. That's (G).

29. C **Difficulty:** Medium

Category: Higher Math / Statistics and Probability

Getting to the Answer: Because the integers in Set *A* are consecutive, their average must equal their middle term. In a set of 7 integers, the middle one is the fourth term. To find the smallest term, count backward from 46: 46, 44, 42, 40. That's (C). You can also answer this question by using Backsolving. Start with (C). If 40 is the smallest integer of Set *A*, then the next six consecutive integers must be 42, 44, 46, 48, 50, and 52. Take the average of these 7 integers:

$$\frac{40 + 42 + 44 + 46 + 48 + 50 + 52}{7} = \frac{322}{7} = 46$$

This matches the condition in the question stem: The average of these consecutive integers equals 46, so (C) must be the correct answer.

30. J **Difficulty:** Medium

Category: Higher Math / Functions

Getting to the Answer: Test the sum for 2, then 3, then 4, then 5 terms of the sequence to see if a relationship can be determined. If $n = 2$, the sum is $1 + 3 = 4$. If $n = 3$, the sum is $1 + 3 + 5 = 9$. If $n = 4$, the sum is $1 + 3 + 5 + 7 = 16$. If $n = 5$, the sum is $1 + 3 + 5 + 7 + 9 = 25$. The sum is always equal to the square of *n*. Therefore, the correct answer is (J).

31. D **Difficulty:** Medium

Category: Higher Math / Number and Quantity

Getting to the Answer: To multiply two matrices, the sizes (# of rows by # of columns) must match in a certain way. Here, the size of the first matrix is 2×2 and the size of the second is 2×1. If you multiply a 2×2 matrix by a 2×1 matrix (which is possible because the middle dimensions match), the result will be a 2×1 matrix (the outer dimensions when the sizes are written as a product). This means you can eliminate A, B, and C, which are all 2×2 matrices. To multiply the matrices, multiply each element in the first row of the first matrix by the corresponding element in the second matrix and add the products. Then repeat the process using the second row of the first matrix:

$$\begin{bmatrix}-2 & 0\\ 1 & -3\end{bmatrix} \cdot \begin{bmatrix}2\\ 2\end{bmatrix} = \begin{bmatrix}-2(2) + 0(2)\\ 1(2) + (-3)(2)\end{bmatrix} = \begin{bmatrix}-4\\ -4\end{bmatrix}$$

Choice (D) is correct.

32. G **Difficulty:** Medium

Category: Higher Math / Geometry

Getting to the Answer: This is an area question with a twist—you're cutting a piece out of the rectangle. To find the area of the remaining space, you will need to subtract the area of the sandpit from the area of the original playground. Recall that the area of a rectangle is length × width. The dimensions of the original playground are $x + 7$ and $x + 3$, so its area is $(x + 7)(x + 3)$ which FOILS to $x^2 + 10x + 21$. The sandpit is a square with side x, so its area is x^2. Remove the pit from the playground, and the remaining area is $x^2 + 10x + 21 - x^2 = 10x + 21$. Choice (G) is correct.

33. E **Difficulty:** High

Category: Higher Math / Number and Quantity

Getting to the Answer: Because $m > 0$, m is a positive number; likewise, because $n < 0$, n is a negative number. Consider each answer choice and decide whether the expression must be positive, negative, or could be either depending on the values of m and n. Keep in mind that m and n can be even or odd integers.

A: $-n^m \rightarrow$ If m is even, n^m is positive so $-n^m$ is negative. However, when m is odd, n^m is negative, so $-n^m$ is positive. Eliminate this choice.

B: $-mn \rightarrow$ Because one number is positive and the other is negative, the product mn must be negative, so $-mn$ must be positive. Eliminate this choice.

C: $m^n \rightarrow m$ is positive, so m raised to any exponent will also be positive. A negative exponent simply means to take the reciprocal of the number, not to give the number a negative sign. Eliminate this choice.

D: $-n - m \rightarrow -n$ equals −(−number), which is positive, and m is positive, so $-n - m$ is a positive minus a positive. If $m > -n$, then $-n - m$ will be negative. However, if $-n > m$, then $-n - m$ will be positive. Eliminate this choice.

(E): $n - m \rightarrow n$ is negative and m is positive, so $n - m$ is a negative minus a positive. This must be negative, so (E) is the correct answer.

34. F **Difficulty:** Medium

Category: Essential Skills / Geometry

Getting to the Answer: Use the midpoint formula and the given midpoint to solve for m and n:

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

$$(-3,-2) = \left(\frac{1 + m}{2}, \frac{9 + n}{2}\right)$$

Once you have the formula set up and all the given information plugged in, separate the coordinates into two equations and solve for the variables:

$$-3 = \frac{1 + m}{2} \quad \text{and} \quad -2 = \frac{9 + n}{2}$$

$$-6 = 1 + m \qquad -4 = 9 + n$$

$$-7 = m \qquad -13 = n$$

Thus $(m,n) = (-7,-13)$, which is (F).

35. C **Difficulty:** Low

Category: Higher Math / Functions

Getting to the Answer: When given a function and a value of x, plug in the number value for each x in the equation and simplify. Make sure you follow the order of operations:

$$f(x) = 16x^2 - 20x$$

$$f(3) = 16(3)^2 - 20(3)$$

$$= 16(9) - 60$$

$$= 144 - 60 = 84$$

Choice (C) is the answer.

36. G **Difficulty:** Low

Category: Essential Skills / Geometry

Getting to the Answer: To find the length of a line segment on the coordinate plane, you would normally need to use the Distance formula. This requires the coordinates of the segment's two endpoints. Because A (1,5) and C (1,1) have the same x-coordinate, a much faster way is to simply subtract the y-coordinate of C from the y-coordinate of A. The length of segment AC is $5 - 1$, or 4. Choice (G) is correct.

37. C **Difficulty:** Medium

Category: Higher Math / Functions

Getting to the Answer: With nested functions, work from the inside out. To answer this question, substitute the entire rule for $g(x)$ for x in the function $f(x)$, then simplify:

$$\begin{aligned} f(g(x)) &= \frac{1}{3}(3x^2 + 6x + 12) + 13 \\ &= x^2 + 2x + 4 + 13 \\ &= x^2 + 2x + 17 \end{aligned}$$

Choice (C) is correct.

38. H **Difficulty:** Medium

Category: Higher Math / Algebra

Getting to the Answer: Perpendicular lines have negative-reciprocal slopes. Because the line in the question has a slope of $\frac{2}{3}$ (the coefficient of x), the line you are looking for must have a slope of $-\frac{3}{2}$. Eliminate F and G. The question also says that this line contains the point (4,–3). Plugging all of this information into the equation of a line, $y = mx + b$, will allow you to find the final missing piece of the equation—the y-intercept:

$$\begin{aligned} y &= mx + b \\ -3 &= -\frac{3}{2}(4) + b \\ -3 &= -6 + b \\ 3 &= b \end{aligned}$$

With a slope of $-\frac{3}{2}$ and a y-intercept of 3, the line is $y = -\frac{3}{2}x + 3$, which matches (H).

39. D **Difficulty:** Medium

Category: Higher Math / Algebra

Getting to the Answer: This looks like a chemistry or physics question, but in fact it's just a "plug in the number and solve for the missing quantity" question. Be sure to plug 95 in for C (not F). To clear the fraction (rather than distributing it), multiply both sides of the equation by the reciprocal of $\frac{5}{9}$:

$$\begin{aligned} C &= \frac{5}{9}(F - 32) \\ 95 &= \frac{5}{9}(F - 32) \\ \frac{9}{5} \times 95 &= F - 32 \\ F - 32 &= 171 \\ F &= 171 + 32 = 203 \end{aligned}$$

Choice (D) is correct.

40. J **Difficulty:** Medium

Category: Higher Math / Algebra

Getting to the Answer: First, translate from English to math: "3 times x is increased by 5" translates to $3x + 5$, and "the result is less than 11" translates to < 11. Put these together to write an inequality and then solve for x:

$$\begin{aligned} 3x + 5 &< 11 \\ 3x &< 6 \\ x &< 2 \end{aligned}$$

This inequality is graphed with an open circle at 2 (because x cannot equal 2) and shaded to the left, where the numbers are less than 2. Your graph should look like (J).

41. C **Difficulty:** Medium

Category: Higher Math / Geometry

Getting to the Answer: Because $QS = QR$, triangle QRS must be a 45°-45°-90° triangle and the hypotenuse is $5\sqrt{2}$. Remember that $\cos = \frac{\text{adjacent}}{\text{hypotenuse}}$. Therefore:

$$\begin{aligned} \cos R &= \frac{5}{5\sqrt{2}} \\ &= \frac{1}{\sqrt{2}} \\ &= \frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2} \end{aligned}$$

Choice (C) is correct.

42. K **Difficulty:** High

Category: Essential Skills / Rates, Percents, Proportions, and Unit Conversion

Getting to the Answer: You need to find the ratio of angelfish to puffers. You're given two ratios: tangs to angelfish and tangs to puffers.

Both of the given ratios contain tangs, but the tang amounts (5 and 2) are not the same. To directly compare them, find a common multiple (10). Multiply each ratio by the factor that will make the number of tangs equal to 10:

tangs to angelfish: (5:2) × (2:2) = 10:4

tangs to puffers: (2:3) × (5:5) = 10:15

Now that the number of tangs are the same in both ratios, you can merge the two ratios to compare angelfish to puffers directly: **4**:10:**15**. So the proper ratio of angelfish to puffers is 4:15, which is (K).

43. D **Difficulty:** Low

Category: Higher Math / Geometry

Getting to the Answer: This question is testing whether you can substitute into a formula correctly. Because you are told the diameter is 6, you know the radius, r, of the sphere is 3. Plug this value into the formula and simplify:

$$V = \frac{4}{3}\pi(3)^3 = \frac{4}{3}\pi(27) = 36\pi$$

Choice (D) is correct.

44. G **Difficulty:** Medium

Category: Higher Math / Algebra

Getting to the Answer: To simplify the given expression, look for factors in the fraction term that will cancel. Use the denominator as a hint as to how to factor the numerator. Be careful—you cannot simply cancel the $x + 1$ in the denominator with the $x + 1$ at the end of the expression.

$$\frac{x^2 - 5x - 6}{x + 1} + x + 1 = \frac{\cancel{(x+1)}(x-6)}{\cancel{x+1}} + x + 1$$
$$= x - 6 + x + 1$$
$$= 2x - 5$$

Choice (G) is correct.

45. A **Difficulty:** Medium

Category: Higher Math / Algebra

Getting to the Answer: Don't let the language throw you—*greatest monomial factor* just means the greatest common factor. Look for the largest number that divides evenly into 60 and 45. (Use the answer choices as a hint). The number is 15, so eliminate D and E. Next, look for the highest power of each variable that appears in *both* terms: a^2 and plain b. Thus, the greatest monomial factor is $15a^2b$, which is (A).

46. G **Difficulty:** Low

Category: Higher Math / Statistics and Probability

Getting to the Answer: Percent change is calculated by dividing the amount of change by the original amount. In 1985, the population was 3,000; in 1995, the population was 2,000. Thus the amount of change was 1,000. Divide this by the original amount (the 1985 population) to find that the percent change was 1,000 ÷ 3,000 = 0.3333, or 33.33%. The population went *down* from 1985 to 1995, so this is a decrease of 33.33%, which is (G).

47. C **Difficulty:** Medium

Category: Higher Math / Statistics and Probability

Getting to the Answer: This question requires brute force. You need to list the data value corresponding to each year, order the values from least to greatest, find the median (the middle value), match it to a year in the graph, and then select the correct answer.

85	86	87	88	89	90
3,000	1,000	5,000	5,000	4,000	3,000
91	92	93	94	95	
4,000	1,000	3,000	2,000	2,000	

Order the data, keeping the year labels:

86	92	94	95	85	90
1,000	1,000	2,000	2,000	3,000	3,000
93	89	91	87	88	
3,000	4,000	4,000	5,000	5,000	

The median of this group is the sixth value, or 3,000. The years 1985, 1990, and 1993 all had populations of 3,000. The only one of these years among the answer choices is 1990, which is (C).

48. F **Difficulty:** Medium

Category: Higher Math / Statistics and Probability

Getting to the Answer: Identify which pieces of information from the table you need. The question asks for the probability that a randomly chosen person from the study is employed and has a college degree, so you need the total of both females and males with college degrees who are employed compared to all the participants in the study. There are 188 employed females with a college degree and 177 employed males with a college degree for a total of 365 employed people with a college degree out of 800 participants, so the probability is $\frac{365}{800}$, which reduces to $\frac{73}{160}$, (F).

49. C **Difficulty:** High

Category: Higher Math / Statistics and Probability

Getting to the Answer: Distinct permutations are permutations without repetition. You need to find the number of unique orderings of the letters GEOMETRY. If all eight letters were different, the number of unique orderings would be 8!. Because the E is repeated, you must divide by 2! to account for the repeated E. The result is $\frac{8!}{2!}$, which is (C).

Note that this process is the same as using the formula for "indistinguishable" outcomes: $\frac{n!}{a! \times b! \times \ldots}$. The number of letters is 8 (so $n = 8$), and there are 2 indistinguishable E's, so $a = 2$ and there is no b.

50. J **Difficulty:** Low

Category: Higher Math / Geometry

Getting to the Answer: To match an inequality to its graph, you need to consider three things: the equation of the line, whether the line should be solid or dashed, and the direction of the shading. You can use any, or all, of these things to eliminate choices. Here, the shading is below (or less than) the line, so the inequality symbol should be $<$. Eliminate G and K. The line is dashed, but all the symbols are strict inequalities, so this doesn't help. The y-intercept of the line is -4 and the line rises 4 units for each 3 units that it runs, so the slope is $\frac{4}{3}$. This means the correct inequality is $y < \frac{4}{3}x - 4$, which is (J).

51. E **Difficulty:** Medium

Category: Higher Math / Functions

Getting to the Answer: Occasionally, you may encounter a function that is defined in terms of two or three independent variables. These functions behave just as you would expect them to. As with any function, substitute the given values for the corresponding variables and simplify. Here, $x = 2$, $y = -1$, and $z = 3$.

$$\begin{aligned} h(x,y,z) &= 4xy^2 - yz^3 \\ h(2,-1,3) &= 4(2)(-1)^2 - (-1)(3)^3 \\ &= 4(2)(1) - (-1)(27) \\ &= 8 + 27 \\ &= 35 \end{aligned}$$

Choice (E) is correct.

52. K **Difficulty:** Medium

Category: Higher Math / Geometry

Getting to the Answer: Write the formula for the area of a circle, using r to represent the radius of the original circle in the question: $A = \pi r^2$. This is the area of the original circle. Then write the formula for the area of the new larger circle, using $3r$ as the radius: $A = \pi(3r)^2 = \pi(9r^2) = 9\pi r^2$.

Now, divide the two areas (area of the new circle by the area of the original circle) to find out how many times larger the area of the new circle is compared to the area of the original circle.

$$\frac{\text{area of new circle}}{\text{area of original circle}} = \frac{9\pi r^2}{\pi r^2} = 9$$

Choice (K) is correct.

53. C **Difficulty:** High

Category: Higher Math / Functions

Getting to the Answer: You don't really have to know anything about trig functions to answer this question. You just need to know the definition of *period:* The period of a repeating function is the distance along the x-axis required for the function to complete one full cycle. For a sine curve, this means one full wave (one up "bump" and one down "bump"). Here, that happens between 0 and π, which means the period is π. Choice (C) is correct.

If you happen to know the normal period of sine, which is 2π, you could also set the x term ($2x$) equal to that period and solve for x. You'll get $2x = 2\pi$, which simplifies to $x = \pi$.

54. J **Difficulty:** High

Category: Higher Math / Algebra

Getting to the Answer: Solving equations that involve radicals may seem daunting, but they work just like other equations. In fact, they're usually easier to solve than quadratic equations because you don't have to worry about factoring. As a general rule, you need to: 1) isolate the radical part; 2) eliminate the radical by squaring both sides of the equation if the radical is a square root, cubing both sides if it's a cube root, and so on; and 3) isolate the variable. To solve the equation here, the steps are:

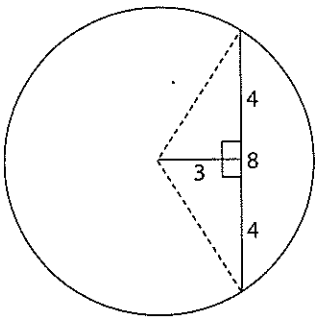
$$\begin{aligned}\sqrt[3]{4x - 12} + 25 &= 27\\ \sqrt[3]{4x - 12} &= 2\\ \left(\sqrt[3]{4x - 12}\right)^3 &= 2^3\\ 4x - 12 &= 8\\ 4x &= 20\\ x &= 5\end{aligned}$$

Choice (J) is correct. Note that you could also use Backsolving to answer this question.

55. D **Difficulty:** Medium

Category: Higher Math / Geometry

Getting to the Answer: The chord is perpendicular to the line segment from the center of the circle, so that line segment must be its perpendicular bisector. This allows you to add the following measures to the figure:



The two right triangles have legs 3 and 4, so they are both 3-4-5 right triangles with hypotenuse 5. This hypotenuse is also the radius of the circle, so plug that into the area formula to solve:

$$\begin{aligned}A &= \pi r^2\\ &= \pi(5)^2\\ &= 25\pi\end{aligned}$$

The correct answer is (D).

56. F **Difficulty:** High

Category: Higher Math / Functions

Getting to the Answer: Don't let the function notation intimidate you. The graphs of two functions intersect when the function equations are equal. Therefore, you need to set the equations equal to each other and solve for x.

$$\begin{aligned}f(x) &= g(x)\\ 3^{3x+3} &= 27^{\left(\frac{2}{3}x - \frac{1}{3}\right)}\end{aligned}$$

When the equations have variables in the exponents, you must rewrite one or both of them so that either the bases are the same or the exponents themselves are the same. In this question, the two bases seem different at first glance but, because 27 is actually 3^3, you can rewrite the equation as:

$$3^{3x+3} = \left(3^3\right)^{\left(\frac{2}{3}x - \frac{1}{3}\right)}$$

This simplifies to $3^{3x+3} = 3^{2x-1}$. Now that the bases are equal, set the exponents equal to each other and solve for x:

$$\begin{aligned}3x + 3 &= 2x - 1\\ x + 3 &= -1\\ x &= -4\end{aligned}$$

Choice (F) is correct.

57. A **Difficulty:** High

Category: Higher Math / Functions

Getting to the Answer: To solve a logarithmic equation, rewrite the equation in exponential form and solve for the variable. To rewrite the equation, use the translation $\log_b y = x$ means $b^x = y$. The left side of the given equation has two logs, so you'll need to

combine them first using properties of logs before you can translate. Don't worry about the right-hand side of the equation just yet.

$$\log_b x - \log_b y = \log_b\left(\frac{x}{y}\right)$$

$$\log_3(5x - 40) - \log_3 5 = \log_3\left(\frac{5x - 40}{5}\right)$$

$$= \log_3(x - 8)$$

Now the equation looks like $\log_3(x - 8) = 2$, which can be rewritten as $3^2 = x - 8$. Simplifying yields $9 = x - 8$, or $17 = x$. Choice (A) is correct.

58. F **Difficulty:** High

Category: Higher Math / Functions

Getting to the Answer: Fortunately, "cannot be determined" is not one of the answer choices here, because that would be very tempting. There is in fact enough information to answer this question. You just have to use what you know about arithmetic sequences—specifically, that to get from one term to the next, you add the same number each time. Here, you don't know what that number is, so call it n. The five terms in the sequence are:

4

$4 + n$

$4 + n + n$

$4 + n + n + n$

$4 + n + n + n + n$

These terms are already listed in order, so the median is the middle term, which is $4 + n + n$, or $4 + 2n$. The mean is the sum of all the terms divided by the number of terms: $\frac{20 + 10n}{5} = 4 + 2n$. Thus, the mean and the median have the same value, making the difference between them equal to 0, which is (F).

59. D **Difficulty:** High

Category: Higher Math / Geometry

Getting to the Answer: You are given the cosine of $\angle BAC$ and the length of the hypotenuse of the triangle, so begin by using these and SOHCAHTOA to find the length of the side adjacent to $\angle BAC$ (which is AB):

$$\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$0.6 = \frac{AB}{15}$$

$$AB = 0.6(15) = 9$$

So the adjacent side, $\overline{AB}$, is 9, and triangle ABC is a right triangle with a leg length of 9 and a hypotenuse of length 15. Triangle ABC must therefore be a 3-4-5 right triangle (scaled up by a factor of 3), and $\overline{BC}$ must have a length of 12. Choice (D) is correct.

60. J **Difficulty:** High

Category: Higher Math / Geometry

Getting to the Answer: The question states that the points lie on the graph of a parabola (which is a nice, symmetric U shape), so use what you know about parabolas to answer the question. Notice that the x-values in the table increase by 2 each time. To find the y-value when $x = -4$, you just need to imagine adding one extra row to the top of the table. Now, think about symmetry—you can see from the points in the table that (2,–5) is the vertex of the parabola. The points (0,–3) and (4,–3) are equidistant from the vertex, as are the points (–2,3) and (6,3). This means the point whose x-value is -4 should have the same y-value as the last point in the table (8,13). So, when $x = -4$, $y = 13$. Choice (J) is correct.

READING TEST

Passage I

Suggested Passage Map notes:

¶1: Countess Olenska (CO) no longer pretty

¶2: CO 1st in NY as little girl adopted by aunt Medora (M)

¶3: M repeatedly widowed, NY accepting of M's eccentricities

¶4: All kind to Ellen (E) [aka CO], M not follow mourning rules

¶5: E was well-liked, fearless child; E's odd edu.

¶6: E married Polish nobleman, ended in disaster

¶7: NY expected CO to be more stylish and vibrant

1. C **Difficulty:** Low

Category: Key Ideas and Details / Detail

Getting to the Answer: Remember that the correct answer to Detail questions will be directly stated in the passage. Your notes should guide you as you locate specific references to the details in question. Line 23 mentions Ellen's parents' "regrettable taste for travel" in the context of describing what the people of New York thought. Predict something like "travel." Choice (C) matches this prediction. Choice A is a misused detail; Medora does teach her niece to play the piano, but nothing in the passage suggests that this was undesirable. Choice B is a misused detail; Spanish shawl dances are described as "outlandish," but this is within the context of Medora and Ellen's eccentric, but accepted, behaviors. Choice D is a misused detail; while Medora often adopted children, this is never described as undesirable.

2. J **Difficulty:** High

Category: Craft and Structure / Writer's View

Getting to the Answer: Consider how the author writes about New York society. In lines 24–25, she writes that "people thought it a pity that the pretty child [Ellen] should be in such hands," meaning that they did not feel the eccentric Medora was a good influence on Ellen. People call Medora "misguided" (line 30), and the author notes that she scandalized her family by not adhering to the "unalterable rules" of mourning (lines 31–32). All in all, New York society seems to have some rigid and snobbish rules. On the other hand, New Yorkers "looked indulgently on [Medora's] eccentricities" (lines 20–21), and New York "resigned itself to Medora" (lines 38–39). The author's view of New York society as it pertains to Medora seems to be mixed, which matches (J). Choice F doesn't take into account New York society's acceptance of Medora's odd behavior, G is opposite, and H is not mentioned in the passage.

3. A **Difficulty:** Medium

Category: Key Ideas and Details / Inference

Getting to the Answer: To answer Inference questions, you will have to go beyond what is directly stated in the passage. However, the correct answer choice will be supported by evidence from the passage, so make sure you make a prediction that has solid textual support. You can predict, based on lines 56–67, that Ellen was unable to help her aunt because her own marriage to the immensely rich Polish nobleman "had ended in disaster." Choice (A) matches this prediction. Choice B is a distortion; since both Medora and Ellen left New York the amount of their communication over the years is unknown. Choice C is a distortion; while the author tells you that Ellen had an incoherent education, nothing in the passage suggests that she resented this. Choice D is a distortion; though the passage makes it clear that Medora was eccentric, this is in no way related to receiving help from her niece.

4. F **Difficulty:** Medium

Category: Key Ideas and Details / Global

Getting to the Answer: Generalization questions require you to synthesize information, sometimes from the entire passage. Predicting an answer is particularly important for questions like this. Make sure you can support your prediction with information in the passage. Lines 68–70 suggest that Newland has spent time thinking about Ellen, and lines 74–93 describe Newland's observations of Ellen. Newland is not disappointed that Ellen is not as "stylish" as others expected (lines 84–87). You can predict that Newland is thoughtful and, unlike many of the other characters in the passage, nonjudgmental. Choice (F) matches this prediction. Choice G is out of scope; it might seem reasonable to conclude that Newland is likable, but the passage does not provide any evidence to directly support this. Also, there is nothing to suggest that he is withdrawn. Choice H is opposite; Newland's observations about Ellen in the last paragraph clearly indicate that he is interested in her. Choice J is a distortion; Newland's observation that Ellen is not as stylish as New York society might expect says nothing about his own stylishness, nor does the author ever describe his level of sociability.

5. A **Difficulty:** Medium

Category: Craft and Structure / Writer's View

Getting to the Answer: Wharton writes that Medora has "many peculiarities" (line 31) and that "New York

looked indulgently on her eccentricities" (lines 20–21). This matches the first part of answer choice (A). Since you may not know what *peripatetic* means, hold on to (A) while you research the other answers. Though Wharton states that each time Medora returns to New York she looks for a less expensive house, indicating reduced circumstances, this doesn't necessarily mean that Medora is impoverished, and there is no suggestion that she is resentful. Eliminate B. Medora may be kind (she does, after all, take in orphaned Ellen), but *loyal* doesn't describe someone who "invariably parted from her husband or quarrelled with her ward" (lines 15–16), eliminating C. Choice D mixes up Medora with Ellen; these words describe Ellen as a child, so D is incorrect. Choice (A) must be correct, even if you don't know that *peripatetic* means "traveling from place to place."

6. H **Difficulty:** Medium

Category: Craft and Structure / Vocab-in-Context

Getting to the Answer: The word *flout* is used in the author's description of Medora wearing a veil considered too short for acceptable mourning and dressing Ellen in a crimson dress and amber beads" (line 37). Both of these are examples of Medora's "misguided . . . many peculiarities" (lines 30–31), which go against accepted New York behavior. Thus (H), *disregard*, is a good match. Choice F is too strong to describe Medora's behavior, as she does partially follow, rather than totally eliminate, the rules of mourning. Choice G is opposite, and while J looks similar to the word *flout*, it doesn't make sense in the passage.

7. C **Difficulty:** Medium

Category: Key Ideas and Details / Global

Getting to the Answer: Make sure you have good evidence for your prediction, and the right answer choice will be easy to find. Line 21 mentions Medora's *eccentricities*, line 31 mentions her *peculiarities*, and line 44 mentions the *outlandish arts* that Medora teaches Ellen. From these descriptions, you can predict that Medora is unconventional or eccentric. Choice (C) matches this prediction. Choice A is out of scope; although Medora does not adhere to conventions, as indicated by lines 31–32, there is nothing to suggest that this is attributable to arrogance. Choice B is a distortion; the description of the short veil that Medora wore to her brother's funeral in lines 34–36 might suggest immodesty, but the author makes clear that this is evidence of Medora's willingness to flout social conventions and never mentions any immodest dress or behavior. Choice D, which means following established practice, is opposite; you are told in lines 31–32 that one of her peculiarities is to "flout the unalterable rules that regulated American mourning."

8. F **Difficulty:** Low

Category: Key Ideas and Details / Detail

Getting to the Answer: Detail questions like this one are straightforward, but it can sometimes be difficult to find exactly where in the passage the relevant information comes from. Make sure that you are answering the specific question being asked so that other details don't distract you. Medora teaches Ellen "drawing from the model" (line 49), which is described as "a thing never dreamed of before," so predict Ellen or Countess Olenska. Choice (F) matches your prediction. Choice G is out of scope; Newland is not described as having learned anything at all, let alone something controversial. Choice H is a distortion; Medora teaches Ellen, but the passage does not mention Medora learning anything herself. Choice J is a distortion; Count Olenska is only mentioned indirectly as the rich nobleman whom Medora marries. The passage makes it clear that Ellen is Countess Olenska; don't be fooled by this initially tempting, but incorrect, choice.

9. B **Difficulty:** Medium

Category: Craft and Structure / Function

Getting to the Answer: Locate where the author mentions Medora's mother and read the next few lines. The author writes that "her mother had been a Rushworth" (line 18), that Medora married "one of the crazy Chiverses" (lines 19–20), and that because of these two conditions, "New York looked indulgently on her eccentricities" (lines 20–21). In other words, given her mother and her marriage, people were not surprised by Medora's unconventional life, which matches (B). There is no support for A, so it is out of scope. Choice C is opposite; New Yorkers "thought it a pity that the pretty child should be in such

hands" (lines 24–25), and D is true but not relevant to Medora's eccentricities.

10. F **Difficulty:** High

Category: Key Ideas and Details / Inference

Getting to the Answer: Remember that Inference questions will have details in the wrong answer choices that are meant to throw you off. Making a good prediction before reviewing the choices will guard against this. The beginning of the passage (line 4) implies that Newland knew Ellen when he was young. Lines 55–59 state that no one had heard from Ellen for some time, and after a few years, she came back to New York, as Medora had done before her. Predict that at the dinner, Newland and Ellen had not seen one another for an extended period of time. Choice (F) matches your prediction. Choice G is extreme; although Newland is clearly paying attention to Ellen in the last paragraph, there is nothing to suggest that either of them is interested in a romantic relationship. Choice H is extreme; while Ellen's lack of *stylishness* (lines 86–87) might suggest that she is not interested in New York society's conventions, it goes too far to say that she is disappointed. Choice J is opposite; the passage clearly portrays Ellen and Newland's encounter as a re-acquaintance.

Passage II

Suggested Passage Map notes:

¶1: Researchers in Junagadh, India, attempt accurate forecast

¶2: 1st trad. rule: monsoon begins 45 days after *Cassia fistula* tree blooms

¶3: 2nd trad. rule: north or west wind = good monsoon, east = drought

¶4: Trad. rules not exact, but general trend is correct

¶5: Dr. K started in 1990 when old saying was exactly correct

¶6: Meteorologist Sahu disagrees w/ Dr. K

¶7: Dr. K hopes research will show trad. methods are valid; holds conference

¶8: Dr. K started NGO to support further research

11. B **Difficulty:** Medium

Category: Key Ideas and Details / Detail

Getting to the Answer: More difficult Detail questions can be approached using elimination and careful reading. Remember the EXCEPT. For EXCEPT questions, review the answer choices methodically, eliminating those which fail to meet the conditions of the question stem. The passage deals in some depth with both the flowering of the *C. fistula* tree, C, and the wind during Holi, A, so you can eliminate those first. Paragraph 5 states that Dr. Kanani became interested in traditional methods when a tenth-century rule of thumb "proved strikingly correct," which suggests that D has been tested. In contrast, the bird behavior is merely listed as an example of a rule of thumb uncovered in one of Kanani's conferences, making (B) the correct answer.

12. J **Difficulty:** Medium

Category: Craft and Structure / Function

Getting to the Answer: Identify the paragraph in which these words appear; it ends with the statement that farmers need more precise forecasts than traditional methods provide. However, science has not developed good alternatives for farmers in different regions. Match this with (J). Choice F is opposite; the author writes that "Every year, the average rainfall over the whole country is calculated, and this prediction is proved correct" (lines 65–67). Choice G isn't mentioned in the passage, and H is a distortion.

13. A **Difficulty:** Low

Category: Key Ideas and Details / Detail

Getting to the Answer: Your map should tell you that information about the winds observed during the Holi festival is in the third paragraph. In that paragraph, the author states that "the north or west suggests a good monsoon, whereas wind from the east indicates drought" (lines 33–35), which matches (A). Choices B and C are the wrong direction, and D, southwest, is not mentioned.

14. G **Difficulty:** Medium

Category: Craft and Structure / Writer's View

Getting to the Answer: Inference questions encompassing the whole text will draw on evidence from the entire

passage. A good prediction depends on your ability to synthesize the major ideas from throughout the passage. The passage mentions several traditional methods and their general accuracy. Even the scientific skepticism described in the passage admits a place for traditional methodology. The passage validates traditional methods, so predict that the author finds these methods to be valuable. Choice (G) matches this prediction. Choice F is out of scope; while the author briefly discusses the origins of some methods, she never expresses more interest in the development of the methods. Choice H is a distortion; the skepticism gets relatively little treatment and is followed by a detailed discussion of the progress toward making a real science of traditional methods. Choice J is opposite; the author never casts interest in traditional methods as a fad, and, as noted before, mentions the success of traditional methods more than once.

15. D **Difficulty:** Low

Category: Key Ideas and Details / Detail

Getting to the Answer: Look to your notes to find specific locations for tested details. According to paragraph 5, Bhadli's storm method offers a 72-day warning. None of the other cited methods provide the same sort of accuracy over such a specific and extended time period, so look for Bhadli's method among the choices. Choice (D) matches this prediction. Choice A is a distortion; while the author mentions bird behavior as a possible predictor discussed at a conference, no information is given about the nature of this prediction. Choice B is a distortion; the flowering of the *Cassia fistula* tree does provide a specific and accurate prediction, but it gives only 45 days' advance warning. Choice C is a distortion; while the passage describes a loose correlation between the character of the monsoon and the wind direction on Holi, this method doesn't predict when the monsoon will arrive.

16. J **Difficulty:** Low

Category: Craft and Structure / Function

Getting to the Answer: Beware of answer choices that present details that are narrower than the main point of the paragraph or sum up surrounding paragraphs instead of the target of the question. Focus on the overall topic of the paragraph and how it helps build the story or argument in the passage. The passage in general describes the accuracy of traditional methods of weather prediction. The paragraph provides an example of a traditional method and introduces you to Dr. Kanani and his interest in applying scientific rigor to these methods; this can serve as your prediction. Choice (J) matches this prediction. Choice F is a misused detail; this sums up the first paragraph. Choice G is a misused detail; this accounts only for the last sentence of the cited paragraph. Choice H is a distortion; while the ancient saying is examined in the passage, this choice casts this examination as the central issue.

17. B **Difficulty:** Low

Category: Key Ideas and Details / Detail

Getting to the Answer: For Detail questions, rely on your notes to direct your research to the relevant part of the passage. The topic sentences of the paragraph, lines 70–73, read: "Dr. Kanani hopes that his research will put traditional methods on a proper scientific footing. He and his colleagues have even set up a sort of peer-review forum." Predict that the conference's goal is this establishment of traditional methods as worthy subjects of scientific inquiry. Choice (B) matches this prediction. Choice A is out of scope; the passage never discusses the disappearance of traditional methods. Choice C is a misused detail; while Dr. Kanani does, in fact, publish the methods in the local press, this is not the objective of the conference. Choice D is out of scope; the passage never mentions the exchange of ideas between geographically distant farmers.

18. H **Difficulty:** Medium

Category: Key Ideas and Details / Inference

Getting to the Answer: Beware of general answer choices. Attack the question stem, get a good understanding of what it's really asking, and make a solid prediction. The question asks you for the reason farmers predict the weather using traditional methods. What do they hope to accomplish? When the question is rephrased, the answer seems more obvious; predict that the correct choice, according to the first paragraph, will show that they want to know what to plant, so they need to know what's coming. Choice (H) matches this prediction. Choice F is out of scope; the passage never mentions the accessibility of the methods. Choice G is a distortion; while

"'normal' monsoons" are discussed in paragraph 6, this is in reference to modern meteorology, not traditional methods of forecasting. Choice J is a distortion; while traditional methods do get the basics right, the question asks why the farmers are trying to get the basics right in the first place.

19. C **Difficulty:** Medium

Category: Craft and Structure / Function

Getting to the Answer: Eliminate answers that are inconsistent with the central concerns of the passage. Reread the specific reference and the surrounding text, which identifies the flowering of *C. fistula* as a monsoon predictor that isn't "perfect," but still of value and interest. Predict that the correct choice will account for both an appreciation of this traditional method and an awareness of its limitations. Choice (C) matches this prediction. Choice A is extreme; while the author feels that the predictive data are useful and noteworthy, calling them "remarkably predictive" goes too far. Choice B is out of scope; the author never attempts to generalize on the relative value of precision. Choice D is out of scope; again, the author neither casts traditional methods as rules of thumb and scientific methods as complex formulas nor attempts to elevate one over the other.

20. H **Difficulty:** Low

Category: Key Ideas and Details / Detail

Getting to the Answer: Consult your notes to direct your research to the relevant text. Sahu says in lines 58–61 that traditional prediction may be "OK as a hobby," but "may not be applicable to this modern age." Then he concedes that modern era forecasts are not always helpful to farmers in the way traditional methods claim to be. That some utility exists despite scientific skepticism serves as a good prediction and an accurate paraphrase of his attitude. Choice (H) summarizes Sahu's attitude and matches this prediction. Choice F is opposite; the author identifies Sahu as claiming the methods "cannot be relied upon" (lines 59–60). Choice G is opposite; Sahu rejects traditional methods from the scientific view. Choice J is out of scope; Sahu never mentions the appeal of the methods, only their trustworthiness as predictors.

Passage III

Suggested Passage Map notes:

Passage A

¶1: Country music (C) born in central & southern Appalachians

¶2: Originated in 1920s from multiple sources

¶3: The term "country" replaced "hillbilly"

¶4: Hank Williams 1st to take country national; artists

¶5: Nashville, TN = country home w/ Grand Ole Opry (1925)

¶6: C relatives = honky tonk, Western Swing

¶7: C expresses Am. identity

Passage B

¶1: Bluegrass (B) origin and description

¶2: B diff. from C: highlight 1 musician at a time, diff. instruments, vocal harmonies

¶3: Own category in late 1950s, named after Bill Monroe's band

¶4: Today: movies, festivals

¶5: B themes = working class; reflects Am.

21. C **Difficulty:** Medium

Category: Key Ideas and Details / Detail

Getting to the Answer: Use your Passage Map to locate this detail; the second paragraph should include the necessary information. Use the list of the sources of country music ("spirituals as well as folk music, cowboy songs, and traditional Celtic melodies") to make your prediction. Choice (C) is correct because country music is not rooted in jazz. Rather, jazz was combined with country music to create Western Swing. Paragraph 6 states, "Additionally, Western Swing emerged as one of the first genres to blend country and jazz musical styles, which required a great deal of skill and creativity." Choice A is opposite; paragraph 2 describes the many sources of country music with the sentence, "Rooted in spirituals as well as folk music, cowboy songs, and traditional Celtic melodies, country music originated in the 1920s." Choice

B is opposite; spirituals influenced the development of country music. Choice D is opposite; country music is rooted in cowboy songs.

22. J **Difficulty:** Medium

Category: Key Ideas and Details / Detail

Getting to the Answer: The answer to a Detail question is stated in the passage. However, because all answer choices are in the passage, be careful to assess each one in terms of the actual question asked. A look at your notes or a quick scan of the passage should provide enough information to make a prediction about where to find the best country music. Match that prediction to the correct answer. Choice (J) is correct; in paragraph 5, the author writes "Country singers are considered to have reached the pinnacle of the profession if they are asked to become members of the Opry." To hear the best music, it makes sense to go to the place where those at the pinnacle, or top of their field, perform. Choice F is a misused detail; one would hear honky-tonk music, a derivative of country, but not country music itself, in these bars. Choice G is a misused detail; Ireland is the original home of the Ulster Scots, many of whom settled in Appalachia. Choice H is a misused detail; though country music had its origins in the mixture of music created in Appalachia, the author does not state that it is the place to hear the best music.

23. C **Difficulty:** High

Category: Craft and Structure / Vocab-in-Context

Getting to the Answer: As with all Vocab-in-Context questions, use the surrounding clues to define the word in question. The word appears in paragraph 3, where the original term *hillbillies* is used to describe "Appalachian inhabitants who were considered poor, uneducated, isolated, and wary." The more accepting word *country* has replaced *hillbillies*, indicating that *pejorative* is an adjective used to highlight the negative characteristics described in the paragraph. This matches (C), since *disparaging* means "belittling, or bad." Choice A is a synonym for *original* rather than a word that means *negative*. Choice B is out of scope, as the author never expresses that the negative view is accurate, and D refers to where the people live rather than describing the term (i.e., it is not a mountain-dwelling term).

24. F **Difficulty:** Low

Category: Craft and Structure / Writer's View

Getting to the Answer: Both passages introduce several genres of American music, but this question refers to Passage B, so research the passage carefully. In the first paragraph, the author introduces bluegrass music and writes that it is "a mixture of Scottish, Welsh, Irish, and English melodic forms, infused, over time, with African-American influences" (lines 75–77) and that laments "are common themes" (line 82). These are exactly the components of the song in the question, making (F) correct. The other answers refer to Passage A and are described as having different derivations.

25. A **Difficulty:** Medium

Category: Key Ideas and Details / Detail

Getting to the Answer: Locate the paragraph in which bluegrass instruments are described, and match those descriptions with the correct answer choice. Your notes point to only one paragraph in which musical instruments are mentioned. Scan the answer choices, then reread the information in that paragraph to determine which answer choice characterizes the information given. Choice (A) is correct; musical instruments are described in the second paragraph and include typical ones such as "banjo, guitar, mandolin, bass, harmonica, and Dobro (resonator guitar)." But the paragraph goes on to include far less typical ones, such as "household objects, including washboards and spoons," which are not usually considered musical instruments, but are sometimes included in a bluegrass band. Choice B is a misused detail; African-American influences are provided as one more source of the bluegrass genre, but instrumentation is not referenced. Choice C is a misused detail; this is an example of a bluegrass piece used in a movie soundtrack. Choice D is out of scope; the reference to the Ozark mountains concerns the origin of bluegrass and has nothing to do with a description of musical instruments.

26. F **Difficulty:** High

Category: Key Ideas and Details / Detail

Getting to the Answer: The answer to a Detail question is stated in the passage. Locate the paragraph in which the differences between country and bluegrass music

are discussed. Paragraph 2 includes the information you need to answer the question. Be sure to keep straight which details describe each genre of music. Choice (F) is correct. Paragraph 2 details two characteristics of bluegrass music: first, that "bluegrass highlights one player at a time, with the others providing accompaniment," and second, that "bluegrass incorporates baritone and tenor harmonies." Choice G is opposite; country music features a single voice. Choice H is opposite; country musicians commonly play the same melodies together. Choice J is a distortion; which instruments are used is not cited as a difference between the music styles.

27. B **Difficulty:** Medium

Category: Key Ideas and Details / Inference

Getting to the Answer: Locate the paragraphs that mention laments and high, lonesome sound, and consider what the author means by including these two details. The reference to *laments* in the first paragraph and the reference to "high, lonesome sound" in the last paragraph are examples of "the hard-scrabble life of the American worker," which matches (B). Choice A is out of scope; the elements mentioned in the question stem do not necessarily reflect Irish music; bluegrass has multiple sources. Choice C is a misused detail; Shania Twain is an example of a country singer and is mentioned in Passage A only. Choice D is a misused detail; though bluegrass was originally called *hillbilly*, this is the name for the genre, not the theme.

28. G **Difficulty:** Medium

Category: Craft and Structure / Vocab-in-Context

Getting to the Answer: Vocab-in-Context questions require that you understand the context of a cited word or phrase. Locate the reference, and focus your research on the text immediately preceding and immediately following the word or phrase in question. The introductory paragraph states, "One of the most enjoyable ways to analyze culture is through music." Look for an answer choice that indicates that music can provide specific insight about a culture as a whole. Choice (G) matches this prediction. Choices F, H, and J are distortions; *quintessential* does not mean old-fashioned, charming, or conventional (typical).

29. C **Difficulty:** Medium

Category: Integration of Knowledge and Ideas / Synthesis

Getting to the Answer: When asked to use a quote to find support in one paragraph for information in another, be sure to read the quote in the context of the paragraph. First, find the paragraph in which the quote from Passage A appears, then match the quote to one in Passage B. Choice (C) is correct; Flatt and Scruggs are mentioned in Passage B, paragraph 3, in which they are characterized as "the foremost artists on their instruments." The best artists are certainly "talented and sophisticated." Choice A is a misused detail; this quote refers to bluegrass themes, whereas the question asks for one that supports talented and sophisticated musicians. Choice B is out of scope; the "pace and complexity" of the music does not necessarily relate to the skill of the musicians themselves. Choice D is out of scope; the relation between bluegrass and country music refers to the kinship of the genres, not the musicians.

30. H **Difficulty:** Medium

Category: Integration of Knowledge and Ideas / Synthesis

Getting to the Answer: When looking for something on which both authors would agree, first determine what each one actually states in the passage, then consider what must be true based on those statements. The evolution, or gradual change, in music, as with anything else, must start from somewhere, so look to the parts of each passage that detail the genesis of the music genres, then consider the progression from there. Choice (H) is correct; both authors detail the various music sources that became either country or bluegrass. In the first passage, the author mentions "folk music, cowboy songs, and traditional Celtic melodies," and in the second passage, the author refers to "Scottish, Welsh, Irish, and English melodic forms, infused, over time, with African-American influences." Both authors affirm that the two music genres are *indigenous*. Thus, it must be true that both country and bluegrass music have evolved from their various roots to become American music, supporting agreement on the fact that music can evolve. Choice F is out of scope; each passage mentions how its particular music genre is popular (as explained in the next sentence in the explanation—the Czech festivals and international growth), but

both authors don't describe why *both* genres are popular, only their own. Choice G is a misused detail; the Grand Ole Opry showcases country music only, not bluegrass. Choice J is out of scope; the passages don't each discuss both genres, only their own.

Passage IV

Suggested Passage Map notes:

¶1: 1999, Pluto about to lose planet status

¶2: Marsden says Pluto given special status, not demoted

¶3: Discussion started in 1930, Pluto small & elongated orbit

¶4: 1992 Jewitt and Luu discovered QB1, Luu says Pluto is a TNO

¶5: 70 TNOs are known, Pluto is biggest

¶6: Binzel suggests Pluto be made 1st entry in TNO catalog

¶7: Marsden agrees Pluto is TNO, but doesn't want new way of classifying TNOs

¶8: Marsden wants to give Pluto its own special number in an existing asteroid catalog

¶9: Luu disagrees w/ Marsden

¶10: A'Hearn trying to settle dispute

¶11: General public will still think of Pluto as 9th planet

31. D **Difficulty:** Low

Category: Key Ideas and Details / Detail

Getting to the Answer: Luu strongly disagrees with the view that Pluto should be labeled an asteroid (lines 84–88). She goes so far as to use the term *idiotic* in reference to others in her profession, so predict something like *indignation*. Choice (D) matches this prediction. Choice A is a distortion; while *shock* may be an initially tempting choice, it's clear that Luu's surprise stems from her disagreement with the opinion, not her lack of preparation to hear it. Choice B is opposite; *excitement* suggests some degree of positive response, which Luu clearly does not display. Choice C is opposite; Luu quite clearly expresses her feelings on the classification controversy.

32. H **Difficulty:** Medium

Category: Key Ideas and Details / Inference

Getting to the Answer: If you get stuck, eliminating answers that have no support in the passage will greatly reduce the number of choices. The passage states that, if astronomers had known about the other TNOs, Pluto would not have been named a planet (lines 49–52). The size of Pluto is indicated as the reason it was discovered before the others. You can infer that a better system of detection would have discovered other TNOs, eliminating Pluto's status as a planet. Account for this in your prediction. Choice (H) matches your prediction. Choice F is a distortion; Pluto's size does indeed make it different from the other planets, but the lack of this knowledge is not cited as the sole reason for its initial classification. Choice G is a distortion; although the icy Pluto is said to belong with neither the *rocky planets* nor the *gas giants* (lines 28–29), this information is included as a way to differentiate Pluto from the planets, and the lack of this knowledge initially is not identified as the reason for Pluto's original classification. Choice J is a distortion; the controversy that would later surround Pluto's initial classification as a planet was never drawn into the discussion of the original classification.

33. D

Category: Craft and Structure / Writer's View

Difficulty: Medium

Getting to the Answer: As interested as the author is in how to describe Pluto, at no point does the author offer a personal opinion. Because of this, you cannot assume that the author would agree with anything other than a neutral statement, as (D) is. The author does not side with those who would call Pluto a TNO, making A incorrect, nor those who argue that it should remain a planet, C. Choice B is a distortion; IAU stands for International Astronomical Union, not a classification.

34. F

Category: Key Ideas and Details / Detail

Difficulty: Low

Getting to the Answer: Your notes on the passage should show the location of key details and terminology so you can quickly find them as you research the question stem.

Neptune is mentioned only a few times; the fourth paragraph mentions Neptune in relation to trans-Neptunian objects, and the seventh paragraph mentions Neptune and Centaurs, one of the answer choices. Sure enough, an examination of the description reveals that Centaurs, a great prediction, are asteroids similar to Pluto "nudged" inside Neptune's orbit. Choice (F) matches this prediction. Choice G is a misused detail; the passage states that IAU stands for International Astronomical Union. Choice H is a misused detail; TNO stands for trans-Neptunian objects, things beyond Neptune. Choice J is a misused detail; the term "ice dwarf" is used in connection with the discovery of a TNO.

35. C

Category: Key Ideas and Details / Inference

Difficulty: Low

Getting to the Answer: Inference questions such as this ask that you interpret the referenced lines, drawing on your reading of the passage as a whole. The quote making up the majority of the referenced lines comes from a scientist who, in the passage, takes a position against creating a new classification. Your prediction should reflect the issue of whether the existing categories are suitable. Choice (C) matches this prediction. Choice A is a misused detail; this is certainly discussed in the passage, but this doesn't pertain to the cited lines or the speaker in question. Choice B is a misused detail; distance from the sun and from Neptune is significant to certain classification schemes, but this is not the central issue in Pluto's specific case. Choice D is a misused detail; that the scientific community and general public have differing opinions is irrelevant to the cited lines.

36. G **Difficulty:** High

Category: Craft and Structure / Vocab-in-Context

Getting to the Answer: Vocab-in-Context questions require that you understand the context of a cited word or phrase. Locate the reference and focus your research on the text immediately preceding and immediately following the word or phrase in question. Investigating the word in question contextualizes it within the argument of a scientist who "doesn't like the idea of establishing a new catalog of solar system objects" (lines 62–63) and argues that "astronomers already have a perfectly serviceable list of numbered minor bodies" (lines 64–65). Predict something like *sufficient* to replace the word in question. Choice (G) matches this prediction. Choice F invokes the most common meaning of the word, which doesn't make sense in context and is usually a trap answer; the scientist does *not* want to change the system. Choices H and J don't work in context, since describing a particular classification system as *beneficial* or *durable* is awkward.

37. D **Difficulty:** Low

Category: Key Ideas and Details / Global

Getting to the Answer: Remember that Global questions will attempt to make tempting answer choices out of issues discussed in the passage only briefly. A recurring theme throughout the passage is giving Pluto a "very special designation" (line 19) or honor (line 80), which differs from the predominantly scientific concerns over Pluto's classification discussed elsewhere. Predict an answer that touches on this idea of honoring or distinguishing Pluto in some way. Choice (D) matches this prediction. Choice A is out of scope; the role of the IAU is never discussed by the cited experts. Choice B is a misused detail; the author does relay some information about the ways in which public opinion is unlikely to change, but this is not a significant concern for scientists dealing with deeper issues. Choice C is out of scope; none of the cited scientists seem particularly concerned with being credited for solving the problem.

38. G **Difficulty:** Medium

Category: Key Ideas and Details / Detail

Getting to the Answer: The passage ends with a discussion of one scientist's attempt to find consensus about Pluto's status. In this part of the passage, the major ideas are listed. Binzel's idea is rejected because Pluto "would still be an anomaly." Luu forcefully asserts that "Pluto is certainly not an asteroid." Both criticisms are based on the idea that neither category adequately describes Pluto, so predict that the correct answer will focus on the inadequacy of any categorization scheme. Choice (G) matches this prediction. Choice F is a misused detail; the public's recognition of Pluto's controversial status or a potential change in category are not significant issues

to scientists. Choice H is a distortion; Pluto's orbit plays little role in the discussion of its classification, and its surface is never mentioned. Choice J is a misused detail; the existence of Pluto-like objects nearer to the sun than Neptune functions as a criticism of only one theory.

39. B **Difficulty:** Medium

Category: Key Ideas and Details / Detail

Getting to the Answer: Detail questions will sometimes require a broad approach to information from a variety of locations in the text. Your notes will help you to sort out the specifics. Lines 24–27 discuss Pluto's size in relation to other planets, and lines 27–28 describe its orbit as anomalous. A good prediction will account for both. Choice (B) matches this prediction. Choice A is a misused detail; distance from the sun versus distance from Neptune is significant only in certain classification systems for non-planets. Choice C is out of scope; the year of Pluto's discovery in relation to those of other planets is never discussed. Choice D is out of scope; Pluto's shape is not compared to other planets.

40. H **Difficulty:** High

Category: Key Ideas and Details / Detail

Getting to the Answer: Tougher Detail questions will require an investigation of several sections of text. Count on your notes to direct you, even when the search is fairly extensive. Lines 24–27 tell you that Pluto is smaller than other planets, which is why scientists need to reclassify it, yet its large size compared to asteroids and TNOs (lines 101–102) is what keeps many scientists confused about its proper category. Lines 46–49 cite Pluto's size as the exact reason that it was found 60 years before the next body like it. Your prediction should account for this classification difficulty as well as Pluto's early discovery. Choice (H) matches this prediction. Choice F is a distortion; categorizing of Pluto as a TNO is only a proposed solution to the classification problem and takes into consideration issues other than size, most importantly, its relation to Neptune. Choice G is opposite; it is Pluto's relatively small size that potentially allows it the same classification as an asteroid. Choice J is a misused detail; the passage never relates Pluto's size to the nature of the planet's orbit.

SCIENCE TEST

Passage I

1. A **Difficulty:** Low

Category: Interpretation of Data

Getting to the Answer: The question stem tells you that you're looking for a mineral composed of 32% zinc and 12% calcium. Table 1 lists the percentages of calcium and zinc in a variety of minerals, so look there for an answer. According to Table 1, hornblende is composed of 30 to 35% zinc and 10 to 20% calcium. Choice (A) is thus correct.

2. J **Difficulty:** Low

Category: Interpretation of Data

Getting to the Answer: Diagram 1 presents the most common minerals in each soil horizon. A geologist digging down into the A horizon would encounter mostly quartz and mica. Quartz isn't included as a possible answer, but mica is. Choice (J) is thus correct. Choice F is incorrect because limestone isn't commonly found until the C horizon. Choice G is incorrect because shale isn't common until the final horizon. Choice H is incorrect because serpentine is commonly found in the B horizon.

3. B **Difficulty:** Medium

Category: Interpretation of Data

Getting to the Answer: Based on Diagram 1, you can see that the minerals are arranged in Table 1 so that the shallowest are at the top of the table and the deepest are at the bottom. However, as you move down the table, you'll notice that zinc content decreases, which indicates an inverse relationship between depth and zinc content. In other words, as zinc content *increases*, depth *decreases*. Choice (B) is thus correct.

4. H **Difficulty:** Low

Category: Interpretation of Data

Getting to the Answer: Based on Diagram 1, the only minerals geologists wouldn't commonly find at a depth of 30 feet or lower (to the bottom of the B Horizon)

are limestone and shale. You can eliminate F, G, and J because each contains one of these minerals. Choice (H), then, is correct.

5. A **Difficulty:** Medium

Category: Interpretation of Data

Getting to the Answer: The mineral content of granite is located in Table 2, so start there. Table 2 shows that granite is composed of feldspar, quartz, mica, and augite. If augite is found close to the other minerals in granite, then it should be located at roughly the same depth as feldspar, quartz, and mica. Now use Diagram 1 to find the depths at which those three minerals are most commonly found. Feldspar is found in the O horizon, at a depth of 2 feet or less, while quartz and mica are found in the A horizon, at a depth of 2 to 10 feet. So you should definitely expect to find augite at depths of less than 10 feet, as in (A).

6. G **Difficulty:** Low

Category: Interpretation of Data

Getting to the Answer: Zinc content percentage and calcium content percentage are found in Table 1, so examine it for an answer. Moving down the table, zinc content steadily decreases as calcium content steadily increases. The two quantities are inversely related, making (G) correct.

Passage II

7. D **Difficulty:** Medium

Category: Scientific Investigation

Getting to the Answer: To answer this question, examine the formula that is provided at the beginning of the passage: $\Delta T_b = K_b \times m \times i$. This equation indicates that the boiling point will increase more if K_b, m, or i is increased. Item I would increase K_b, item II would increase m, and item III would increase i (because $CaCl_2$ splits into 3 ions, while NaCl only splits into 2 ions). Because all three items would increase the boiling point of Solution 5, (D) is correct.

8. H **Difficulty:** Low

Category: Interpretation of Data

Getting to the Answer: The results for Study 1 are presented in Table 1. Table 1 shows that for 0.171 mol of NaCl, the boiling point is increased to 101.75°C. Choice (H) is thus correct.

9. C **Difficulty:** Medium

Category: Interpretation of Data

Getting to the Answer: This question asks about the melting point of Material 5. Table 3 provides data about when Material 5 melted, indicating that it did not melt in Solution 5, but that it did melt in Solution 6. Therefore, its melting point will be somewhere between the boiling points of those solutions. Table 1 shows that Solution 5 has a boiling point of 103.50°C and Table 2 shows that Solution 6 has a boiling point of 104.15°C, so Material 5's melting point must fall somewhere in between those values. Choice (C) is thus correct.

10. G **Difficulty:** Medium

Category: Interpretation of Data

Getting to the Answer: Table 2 provides the boiling points for solutions consisting of various amounts of $CaCl_2$ added to water. The trend seems linear: for each increase of roughly 0.9 mol $CaCl_2$, the boiling point increases by roughly 1.4°C. The highest amount of $CaCl_2$ on the table is 0.631 mol, roughly 0.9 less than the amount in the question stem. Therefore, the increase will be roughly 1.4° higher than 109.67°C, or 111.07°C. Choice (G) is thus correct. Choice F is between the boiling points for Solutions 9 and 10, which is too low. Choices H and J are too high.

11. A **Difficulty:** Medium

Category: Scientific Investigation

Getting to the Answer: Table 3 gives an indication of the points at which each material begins to melt. Based on the information from Tables 1 and 2, a higher-numbered solution corresponds to a higher boiling point. It would be highly implausible for a material to melt at a low temperature but not at a higher temperature, which is the trend depicted in (A). The other choices are incorrect because they are all possibilities already revealed in

Study 3's results: B corresponds to the results for Material 1, C to the results for Material 4, and D to the results for Materials 6, 7, and 8.

12. H **Difficulty:** High

Category: Scientific Investigation

Getting to the Answer: The equation for boiling point elevation given in the passage indicates that the increase in temperature depends upon the molality of the solution. As noted in the explanation of the equation, molality is defined as moles (mol) of solute over kilograms (kg) of solvent. Thus, the students recorded the moles of a solute, rather than its mass, in order to make the calculation of molality—and the subsequent calculation of change in boiling point—easier. Choice (H) is correct. Choice F makes little sense; measuring the solvent's mass does nothing to prevent measuring the solute's mass. Choice G is a false statement; moles are usually calculated on the basis of mass, so if anything mass measurements are more accurate. Choice J is true but irrelevant to the question.

13. A **Difficulty:** Medium

Category: Evaluation of Models, Inferences, and Results

Getting to the Answer: Table 3 shows that Material 7 melted in Solution 10, whereas Material 8 did not. That means that Material 7 must have a melting point of no more than 109.67°C (the boiling point of Solution 10), while Material 8 must have a melting point higher than that temperature. Thus, the results do support the claim that Material 7 has the lower melting point, making (A) correct. Choice B is incorrect because it reverses the results for the materials. Choice C is incorrect because the exact melting point of Material 8 does not need to be determined to support the claim—it only has to be shown to have a higher melting point than Material 7. Choice D is incorrect because the approximate melting point of Material 7 can be determined: it must be between the boiling point temperatures of Solutions 9 and 10.

Passage III

14. G **Difficulty:** Medium

Category: Evaluation of Models, Inferences, and Results

Getting to the Answer: According to Table 1, the concentrations of nitrogen, phosphorus oxide, and zinc all tend to increase as humidity level increases, regardless of which of the three data sources is considered. For potassium oxide, however, the trend is reversed: the concentration decreases as humidity increases. Choice (G) is thus correct.

15. A **Difficulty:** Low

Category: Interpretation of Data

Getting to the Answer: To answer this question, compare the System B data to the USGS data at 25% humidity for the 4 compounds given as answer choices. For nitrogen (N), the USGS concentration is 236 mg/L, while System B measures it as 408 mg/L, which is close to double. For calcium (Ca), USGS has 24.7 mg/L and System B has 23.2 mg/L, a much smaller difference, meaning B can be eliminated. For potassium oxide (K_2O), USGS has 9.2 mg/L and System B has 9.1 mg/L, a very small difference, allowing you to eliminate C too. Finally, for phosphorus oxide (P_2O_5), USGS has 71.2 mg/L and System B has 75.6 mg/L, still smaller than the difference seen in nitrogen, meaning D can also be eliminated. Nitrogen shows by far the biggest difference, whether this is calculated in absolute or relative terms, so (A) is correct.

16. J **Difficulty:** Low

Category: Evaluation of Models, Inferences, and Results

Getting to the Answer: From Table 1, you can see that the potassium oxide concentration continually decreases from 9.4 mg/L to 8.2 mg/L as humidity increases from 10% to 80% in the USGS data, continually decreases from 9.4 to 8.0 in System A, and continually decreases from 9.5 to 8.3 in System B. Because the data from all 3 sources support the hypothesis that potassium oxide levels decrease with increasing humidity, (J) is correct.

17. D **Difficulty:** Medium

Category: Evaluation of Models, Inferences, and Results

Getting to the Answer: The question asks you to determine which system is more accurate, so ultimately you're trying to find the one that is closer to the USGS data, which is described in the passage as "extremely accurate." Looking at the data for zinc, you can see that the measurements from System B are always closer to the data from the USGS than are the measurements from System A. Therefore, you know the answer to the question is yes,

allowing you to eliminate A and B. Choice C, though, is incorrect because it gives the wrong reasoning: System B does give lower measurements than System A, but that alone doesn't make it more accurate. The measurements from System B are more accurate because they are closer to the data from the USGS than are the measurements from System A. Choice (D) is thus correct.

18. H **Difficulty:** Medium

Category: Interpretation of Data

Getting to the Answer: To answer this question, look at the row in the table that represents calcium concentrations for System B. You can see that the numbers gradually decrease from 10% humidity to 65% humidity, then increase quickly from 65% to 85% humidity. The only graph that shows values decreasing and then rapidly increasing is (H).

19. B **Difficulty:** High

Category: Scientific Investigation

Getting to the Answer: Examine the System B data in Table 1 to answer this question. According to the table, a potassium oxide level of 9.1 mg/L falls between the values for 25% humidity (9.2) and 45% humidity (9.0), a calcium level of 17.3 mg/L also falls between the values for 25% (23.2) and 45% (11.6), and a zinc level of 0.57 mg/L likewise falls between the values for 25% (0.48) and 45% (0.62). Therefore, the level of humidity for this sample should almost certainly be some value between 25% and 45%. Only (B) falls within this range.

Passage IV

20. G **Difficulty:** Low

Category: Evaluation of Models, Inferences, and Results

Getting to the Answer: What are Scientist 1's and Scientist 2's viewpoints? Scientist 1 believes that type 2 diabetes is caused by excess sugar consumption, and Scientist 2 says that type 2 diabetes is caused by obesity as a result of a high-fat diet and lack of exercise. If new research suggested that 80% of people with diabetes have buildup of fat in the liver, this information would support the view of Scientist 2 only. The correct answer is (G).

21. B **Difficulty:** Low

Category: Evaluation of Models, Inferences, and Results

Getting to the Answer: Scientist 1 states that "the cause of type 2 diabetes is an overconsumption of sugar," while Scientist 2 states that "diets high in fat but not high in sugar are associated with an increased risk of type 2 diabetes." Thus, both scientists would mostly likely agree that the occurrence of type 2 diabetes in an individual is associated with the patient's diet. The correct answer is (B). Choice A is only mentioned by Scientist 2, and C is only mentioned by Scientist 3. Age is mentioned in the introductory text, but even though type 2 diabetes is more prevalent in adults, the passage does not suggest that age causes type 2 diabetes, so D is also incorrect.

22. H **Difficulty:** Medium

Category: Evaluation of Models, Inferences, and Results

Getting to the Answer: The passage states that type 2 diabetes occurs "when the body does not produce enough insulin," and explains that "Insulin is a hormone produced in the pancreas that helps regulate blood glucose levels." If the pancreas is removed, the body would not produce insulin, and would thus be unable to regulate blood glucose levels, thereby causing type 2 diabetes to develop. None of the answer choices state this explicitly, but (H) gives the major symptom of diabetes that was stated in the introductory paragraph: elevated blood glucose levels (hyperglycemia). Choices F and G are incorrect because they state the opposite of what you should expect. You can also eliminate J because you're given no reason to suspect a link between the pancreas and body fat content.

23. C **Difficulty:** Medium

Category: Evaluation of Models, Inferences, and Results

Getting to the Answer: According to Scientist 3, type 2 diabetes is inherited. Eliminate A and B, which correspond to the hypotheses of Scientists 1 and 2, respectively. Scientist 3 states "individuals have about a 15–20% chance of developing type 2 diabetes if one of their parents has it and a roughly 50% chance if both parents have it." 18% falls within the 15–20% range. Therefore, Scientist 3 would probably predict that an individual with an 18% chance of developing type 2 diabetes has one parent with type 2 diabetes. The correct answer is (C).

24. J **Difficulty:** Medium

Category: Evaluation of Models, Inferences, and Results

Getting to the Answer: Remember to keep straight who said what. If a 50-year-old developed type 2 diabetes, Scientist 1 would likely conclude the patient has a high-sugar diet, Scientist 2 would likely conclude the patient has a high-fat diet and/or lacks exercise, and Scientist 3 would likely conclude the patient inherited it from one or both parents. The only answer choice that correctly matches one of these predictions is (J).

25. A **Difficulty:** High

Category: Evaluation of Models, Inferences, and Results

Getting to the Answer: According to Scientist 1, the elevated blood glucose levels in individuals with normal insulin levels did not return to normal when they received small injections of supplemental insulin. It can thus be inferred that although insulin levels were normal, the body had a lowered response to insulin, indicating insulin resistance. Look for a choice that supports the idea that a high-sugar diet causes or is otherwise related to lowered response to insulin. Choice (A) does just that. Choices B and D are incorrect because they mention fat intake and free radical production, respectively, which were only discussed by Scientist 2. Choice C is incorrect because Scientist 1 discussed the effects of a high-sugar diet, not a low-sugar one.

26. F **Difficulty:** High

Category: Evaluation of Models, Inferences, and Results

Getting to the Answer: Scientist 3 believes that "type 2 diabetes is not caused by lifestyle or diet but inherited." To challenge Scientist 2's claim that the lack of exercise causes 7% of type 2 diabetes cases, Scientist 3 would have to explain how the actual cause of the occurrence of type 2 diabetes in these individuals is due to inheritance, rather than lifestyle. Choice (F) does precisely that: if the individuals who didn't exercise also had family histories of diabetes, then Scientist 3 could claim that the patients actually developed diabetes because of their genetics, not their lifestyles. Even though Scientist 3 actually states the information in G, it does not directly address Scientist 2's claim from the question stem. Choice H is incorrect because insulin injections are only discussed by Scientist 1. Choice J is incorrect because Scientist 2 does not suggest that type 2 diabetes solely results from lack of exercise, but also blames diets high in fat.

Passage V

27. A **Difficulty:** Low

Category: Interpretation of Data

Getting to the Answer: To answer this question, turn to the results of the studies in Table 1. According to the table, the lowest-density blood sample is 1.050 g/mL, that of Patient C. Looking at each column, you can see that Patient C has more platelets than Patient A but fewer than Patient B, fewer white blood cells than Patient A, the fewest red blood cells, but the most plasma. Choice (A), then, is correct.

28. H **Difficulty:** Medium

Category: Scientific Investigation

Getting to the Answer: According to the passage, the purpose of the studies was "to determine the composition and mass of blood samples." Thus, the phlebotomist has an interest in avoiding anything that could alter the composition or mass of the blood on a temporary basis because it would skew the results of the studies. The passage also states that diet can affect the composition of blood, so it would make sense that the phlebotomist would try to control this factor by requiring the patients to fast. Choice (H) is thus correct. Choice F is incorrect because you're given no reason to suspect that taking blood is easier if a patient has fasted. Choice G is incorrect because if fasting could greatly change the composition of blood, then the phlebotomist would likely have made sure the patients avoided it by eating something beforehand. Choice J is incorrect because you're given no indication in the passage that anything the patient does can affect the ability of blood to separate in a centrifuge.

29. D **Difficulty:** High

Category: Scientific Investigation

Getting to the Answer: According to Table 1, Patient C had a density of 1.050 g/mL, which amounts to a 10.50 g mass for a 10-mL sample. However, if you add up the masses of the components listed in Table 1, you get

a total of less than 10.50 g (9.71 g, to be specific). The question is asking you to explain this discrepancy. To find the best explanation, consider each of the possibilities offered in the answer choices. Choice A does not offer an adequate explanation, because if some red blood cells remained in the plasma, then they would have been weighed along with the plasma, which means their mass would have been included. Choice B also falls short; the mass of the platelets would have been included when the white blood cells were weighed. Choice C suffers from a similar problem: if some of the formed elements remained in the plasma, their masses would simply be included when the plasma was weighed. By process of elimination, (D) must be correct. And this makes sense because the only components that were weighed were plasma, red blood cells, white blood cells, and platelets. If there were additional components, their masses would not be included in Table 1. This is also consistent with the opening of the passage, which claims that blood is 45% formed elements and 50% plasma, leaving 5% of the blood unaccounted for.

30. F **Difficulty:** Low

Category: Interpretation of Data

Getting to the Answer: Go back to Table 1 and look at the columns for total density and red blood cell mass. (Circle each column if you tend to get distracted by the other information.) Reading the table from the bottom up, you can see that, as total density increases, the mass of the red blood cells also increases, (F).

31. B **Difficulty:** Medium

Category: Interpretation of Data

Getting to the Answer: The introduction to the passage states that "formed elements weigh approximately 1.10 grams per milliliter (g/mL) and plasma approximately 1.02 g/mL." Here, you have about 5 mL of plasma, so the total mass of plasma is roughly 5 mL × 1.02 g/mL = 5.1 g. You also have about 5 mL of formed elements, so the total mass of formed elements is about 5 mL × 1.10 g/mL = 5.5 g. The total mass of the sample would then be around 5.1 g + 5.5 g = 10.6 g. It may be a bit higher due to elements other than the plasma and formed elements, but the total mass is still likely to be between 10.0 and 12.0 g, as in (B).

32. J **Difficulty:** Low

Category: Scientific Investigation

Getting to the Answer: The passage explains that the phlebotomist placed the blood samples in a centrifuge for 20 minutes in Study 2 and at a slower speed for 45 minutes in Study 3. Only (J) captures any element of this difference. Choice F is incorrect because you're told at the beginning of the passage that 10 mL of blood were taken from each patient. Choice G is incorrect because, while the mass of the blood samples did vary from patient to patient, the masses weren't intentionally varied by the phlebotomist from Study 2 to Study 3. Choice H is incorrect because a centrifuge was used in both Studies 2 and 3.

33. A **Difficulty:** Low

Category: Interpretation of Data

Getting to the Answer: To answer this question, simply compare the masses in the red blood cell column of Table 1. According to the table, Patient A has a red blood cell mass of 2.75 g, Patient B a mass of 2.70 g, and Patient C a mass of 2.65 g. Because Patient A has the greatest mass of red blood cells, (A) is correct.

Passage VI

34. G **Difficulty:** Medium

Category: Interpretation of Data

Getting to the Answer: Since the question asks about length and temperature, the simplest data set to consider is Table 1, because Table 2 includes another variable, type of material. Comparing the odd-numbered trials (all conducted at 80°C) or the even-numbered trials (all conducted at 20°C) shows that the shorter the rod, the higher the current, which is an inverse relationship. Choices F and J can be eliminated. Comparing any trials which hold length of the rod constant while changing the temperature, such as Trials 1 and 2, show that as temperature goes down, current through the rod goes up, which is another inverse relationship. Because both length and temperature are inversely related to current, (G) is correct.

35. C **Difficulty:** Medium

Category: Interpretation of Data

Getting to the Answer: The passage states that voltage, current, and resistance are related through Ohm's law, $V = A \times \Omega$, where Ω stands for resistance in ohms and A stands for current in amperes. In the circuit used for these experiments, the voltage is held constant at 5 V, as indicated by the battery in Diagram 1. This means that if current goes up, resistance must have gone down. Conversely, the lowest current will result from the highest resistance. Because each of the rods featured in the answer choices was tested in Experiment 2, to find the rod with the highest resistance, you merely need to find the one with the lowest recorded current in Table 2. The rod in Trial 9 conducted a current of only 20 mA, less than any of the others, so it must have the highest resistance. Choice (C) is thus correct.

36. H **Difficulty:** High

Category: Interpretation of Data

Getting to the Answer: According to the question stem, conductivity uses the units of siemens per meter (σ = S/m) and siemens are equal to inverse ohms (S = 1/Ω). Putting these two equations together, you can see that the units of conductivity are equivalent to inverse ohms divided by meters ($\sigma = [1/\Omega]/m$), which simplifies to $\sigma = 1/(\Omega \times m)$. Choice (H) is thus correct.

37. B **Difficulty:** Low

Category: Interpretation of Data

Getting to the Answer: According to Table 1, the rod in Trial 4 conducted 53 mA of electricity at 20°C. A rod of the same length was used in Trial 3, but it was heated to 80°C and conducted only 27 mA. Because 50°C is in between these two values, it is reasonable to assume that the current conducted will fall somewhere between 27 and 53 mA. Choice (B) is therefore correct.

38. F **Difficulty:** Medium

Category: Scientific Investigation

Getting to the Answer: The introduction to the passage mentions Ohm's law, $V = I \times R$, which shows that voltage and current are directly related. Because the resistance values wouldn't change (the same rods would be used), the increase in voltage with the 10-V battery would lead to higher recorded values for current, regardless of the material of the rods. Thus, since both the copper and iron rods would conduct larger currents with a 10-V battery, (F) is correct.

39. C **Difficulty:** Medium

Category: Interpretation of Data

Getting to the Answer: According to the results of Experiment 2, copper conducts electricity more effectively than iron. Thus, a 16-cm composite rod that was half-copper and half-iron would be expected to conduct electricity better than a 16-cm iron rod but worse than a 16-cm copper rod. According to Table 2, a 16-cm iron rod at 20°C conducts 40 mA, while a 16-cm copper rod at that temperature conducts 200 mA. Thus, the composite rod should conduct a current of somewhere between 40 and 200 mA, as in (C).

40. J **Difficulty:** Low

Category: Scientific Investigation

Getting to the Answer: The variables that are directly manipulated in an experiment are the independent variables, so this question is asking for the one variable that is not an independent variable. In both experiments, the dependent variable—in other words, the variable that was observed and measured—was the current recorded by the ammeter. Thus, current was not directly manipulated by the student, so (J) is correct.

WRITING TEST

LEVEL 6 ESSAY

I fully agree that pure scientific research is vital to increase our understanding of ourselves and our world, and that this research, even without specific goals, can result in important benefits to society. To fund this research, a consortium of government, pharmaceutical companies, and nonprofit agencies should be formed, pooling money but giving no one group entire oversight or responsibility.

Many life-changing discoveries have been found without purposely looking for them. Alexander Fleming did not set out to discover penicilin, but in doing so accidentally saved millions of people from death. Putting a man on the moon did not help people on Earth, but it certainly taught us a lot about our universe. This kind of pure research must continue, and the cost should be shared by the government, drug companies, and nonprofit groups. This type of research can be prohibitively expensive; thus, monies must be drawn from various sources, each contributing as much as possible. No single organization can completely fund ongoing research, especially if there is no stated goal other than to hopefully discover something beneficial. Tax payers, pharmaceutical company investors, and nonprofit group members expect results, which may be long in coming, or, indeed, continually elusive. However, efforts must continue. As Thomas Edison said, "Just because something doesn't do what you planned it to do doesn't mean it's useless."

Consider also that pharmaceutical companies are always searching for new therapeutic drugs. They send scientists out into the field to come back with anything interesting, which is then researched and, if promising, developed into a new drug. Such is the relation between blood sugar and diabetes, leading to the insulin that my diabetic cousin takes; without insulin, he would not survive. If a drug company develops an important drug, it can make millions of dollars from the sale of it, leading to funding more research. Nonprofit organizations also have a stake in pure research, since another accidental discovery could prove to be financially beneficial. Finally, if the government shares the burden of underwriting research, it is not at risk for being fully blamed if the research does not produce positive results. Taxpayers would be more liable to accept a minimal loss in a good cause rather than a major loss in an unsure endeavor. A partnership would ensure continued funding and the funders, as well as all citizens, would benefit from discoveries.

On the other hand, people who say the government should fund only research which has demonstrated its worth do not understand the function of pure research. It is not possible for researchers to say with certainty that they are going to find a cure for cancer. Researchers have to be able to say they are searching for something as yet unknown with the hope that it will be beneficial. And what is a clear and acceptable outcome? If cancer researchers find a cure for diabetes, but not cancer, is that acceptable if it is not the stated intention? A great deal of science is luck and perserverance. According to this perspective, if a researcher wanted government funding to work in the Amazonian rain forest with the general intent of exploring indigenous plants, the government would be unable to fund the project because there is no clearly beneficial objective. But that is exactly how quinine, a now widely used treatment for malaria, was found,

and the general exploration was certainly worth funding. Finally, it is unlikely that pure research, no matter who funds it, will result in disaster. Researchers are very careful to prevent this, and even if a disaster did happen, it would not be the fault of whom is funding the research.

It is quite clear that pure research is invaluable, as the examples of penicilin, quinine, and insulin support. It cannot be dependent on the whims, finances, and oversight of any one group but must be a concerted effort among all and for all who may benefit.

SCORE EXPLANATION (6666)

This essay is clearly focused on the prompt, shows complete understanding of the issue, logically assesses the implications of all three perspectives, and puts forth the author's point of view in both the first and fifth paragraphs. This is a cohesive, critical analysis of the perspectives, with a solid, well-supported thesis.

Ideas and Analysis (6)

The argument is driven by strong and clear analysis of each perspective, with good examination of implications. The writer's consistent focus on the benefits of pure research makes the essay cohesive and precise: pure research is worth pursuing and, for economic and oversight reasons, must be funded by a consortium of groups. Keeping this focus, the writer is able to explore each perspective, identify pros and cons, and provide strong support for her point of view. Critical, logical thinking is clearly displayed.

Development and Support (6)

The writer introduces her argument with a strong statement supporting pure research in general, and she immediately follows up with her perspective. That perspective is developed through reference to "life-changing discoveries," the cost of research, specific discussion of drug company research and benefits and what may constitute acceptable risk. Support is strong, referencing Alexander Fleming, penicillin, space exploration, quinine, and insulin, and it includes a relevant quote from Thomas Edison. Reasoning and support are well integrated, and the author never loses sight of the thesis. Both alternatives are discussed. One alternative is discussed in detail, while the other is given only passing, but still with strong consideration ("And what is a clear and acceptable outcome?" "Finally, it is unlikely that pure research, no matter who funds it, will result in disaster"). Development moves from the general to the specific, with excellent support for each point, and a clear and consistent perspective.

Organization (6)

There is a clear and strong introduction and a summary conclusion, both of which expand the specifics of the prompt to the larger issues involved. Each paragraph begins with a topic sentence, and the contrasting view is signaled with the phrase "On the other hand," while the third paragraph is introduced with a creative transition phrase "Consider also." The essay is cohesive and flows well, ideas are well connected, and support is explicit, relevant, and well positioned to enhance the argument.

Language Use (6)

The writing is mostly high-level, with the use of a rhetorical question and words such as *perseverance, accountable, consortium,* and *pharmaceutical.* Several sentences are varied and complex. The grammar and punctuation are mostly correct, though there are some spelling errors (*penicilin, perserverance*). The writer's style is appropriately formal, even with a personal example, and her word choice is effective in characterizing the perspectives and writing a persuasive argument.

LEVEL 4 ESSAY

Pure research is done for the purpose of discovery without a specific goal in mind. Even so, it has produced important breakthroughs such as treatment for Alzheimer's disease, and even the development of the GPS. Though scientific research is vitally important, people disagree about who should pay for it. Some people think that the government should fund the research if the goal is a good one. Others think that the government should only give money to research that can be shown will be helpful. Still others believe that the government and private companies should work together to give scientists the money they need, which is the best way to do it, and the perspective I agree with.

I know the importance of research because my little brother has asthma and requires daily medication. Though I don't know who paid for the research that helped make his meds, I'm quite sure that the research behind it took a long time and cost a great deal of money. Though the government may have enough money to fully fund research like this, it has other responsibilities as well and can't afford to fund research alone, especially if the outcome is unsure. However, with other money from drug companies and nonprofit agencies, research can continue to be funded without any one entity eating into their finances earmarked for other purposes. Even if the research doesn't show results for many years, a group of funders can provide enough money so that scientists can keep working until they discover something helpful and then continue to develop it.

The government can't do everything on its own and companies shouldn't have to work by themselves either. If they team up, lots of research can get done. Asthma is now manageable, but there are plenty of other illnesses that are very deadly. Everybody is hoping for a cure for cancer one day, and scientists need time and money to find one. Groups working together can give those scientists the time and money they need, since no one group is responsible for an immediate, beneifical result from the research it funds. The government and companies should pick an amount of money they want to spend each year on scientific research and give it to a variety of research groups. Then, if any of the groups make a major discovery, they can earn more money and invest it back into ongoing research.

On the other hand, some people think that scientists should have to show the government that their projects will be helpful in order to get money. That would exclude a lot of past and future research that was done purely in the hopes of discovery but without assurances. Louis Pasture wouldn't have gotten money from his government to make penicillin since it was a total accident. Being able to pinpoint the exact purpose and result of pure research is precisely the opposite of what pure research aims to do. Like all important things, research requires time, effort and money. The best way to fund it is to gather a group of government, private, and nonprofit agencies who can pool their resources to let scientists keep working. Some research may fail miserably, but some may change the course of the world. That possibility is surely worth funding.

SCORE EXPLANATION(4444)

The writer provides a minimal discussion of all three perspectives, but fails to fully consider the implications of the other perspectives. She doesn't fully consider counterarguments, but she does provide relevant support for her opinion.

Ideas and Analysis (4)

Ideas are clearly stated, if redundant. The argument centers around "time, effort, and money," with discussion of each taking up most of the essay. Her perspective is analyzed primarily through a personal anecdote about her brother, which is more related to research in general than to pure research. However, the author is consistent in her argument and able to critique another perspective while returning to her own point of view.

Development and Support (4)

The writer begins with a good statement defining pure research, immediately bringing in the examples of Alzheimer's and the GPS, though a brief explanation of their relevance would enhance the support. The first paragraph also introduces all perspectives. However, when the writer states her own opinion at the end of the introduction, she does not do so forcefully. The argument is developed with a personal statement about her brother's asthma, which leads into further discussion of funding. The writer continues this argument in the next paragraph, again referencing asthma and mentioning cancer, though both statements are fleeting and do not offer strong support. One other alternative is discussed in the fourth paragraph, nicely harking back to the definition of pure research (the incorrect reference to Pasteur and penicillin does not affect the support).

Organization (4)

The writer provides a clear introductory paragraph and a good conclusion, and she is able to tie the essay together by returning to the initial definition of pure research at the end of the fourth paragraph with "Being able to pinpoint the exact purpose and result of pure research is precisely the opposite of what pure research aims to do." The first paragraph shows good connection words between perspectives (*Some, Others, Still others*). However, there are few transitions other than the one introducing paragraph 4; better use of transitions would make the essay flow more smoothly. The essay is nonetheless cohesive in its perspective.

Language Use (4)

The writing style is adequate, with some spelling and grammar errors. Word choice could be improved by avoiding very informal words and phrases ("eating into their finances," "total accident," "meds," "plenty of other diseases") and expressing ideas with more high-level vocabulary and complex sentence structure. Less use of contractions would also raise the language to a more appropriately formal essay level.

LEVEL 2 ESSAY

Working with a real goal in mind is the best way to do a project and the goverment has lots of money, so I think the government should pay for research projects but only those which will succeed. I did a school sience project with too other kids but we ended up fighting and not finishing it, which is what would happen if lots of groups got together to fund something.

When my teacher assigns a sience project even though I get to choose which one to do she expects results. The goverment should think the same way because if they don't they will be spending money for something which could be useless. Just like my teacher does when she decides what grade to give my project, the goverment should think about how successful the research might be and save their money for research that will really come up with something important.

Like it says, "to many cooks spoil the broth" which means that when theres a whole group of people, chances are the end result is bad. That goes for the govement partnering with other groups also they should pay for research by themselves but only if it looks like the research will come up with something good.

SCORE EXPLANATION (2222)

Though the author addresses the prompt and takes a side, this essay is very poorly written and supported, and ideas and analysis are weak with little clarity.

Ideas and Analysis (2)

This essay indicates a lack of understanding of the prompt and task, and poor reasoning and writing skills. The author has focused primarily on the issues of money and the negative effects of working with partners, likening the latter to working with others on a science project. She has not analyzed any perspective in depth; instead, ideas are repetitive, with shallow support. The author has not looked beyond her own school experience, thus her argument is weak and analysis of the prompt is superficial.

Development and Support (2)

The author fails to develop her thesis beyond general, poorly supported statements, which repeat her two ideas that working together is detrimental to a project and government money should be spent on projects with demonstrated success. Her support is weak and irrelevant, focusing on a school project, equating it with pure research, and suggesting that the government should determine its funding in the same way that a teacher determines a grade. The saying that opens the third paragraph is a trite platitude, lacking any real analysis. The author's reasoning is inadequate and confused, and she fails to examine the argument logically.

Organization (2)

Though there are three separate paragraphs and the conclusion echoes the first paragraph's perspective, each paragraph is weak and disjointed, with no transition phrases to tie the essay together. Ideas are poorly grouped together; the author repeatedly compares a school project to governmental pure research funding.

Language Use (2)

There are numerous spelling and punctuation errors, word choice is simplistic, and the writing fails to be persuasive. *Government* and *science* are consistently misspelled, and there are several instances of improper pronoun/antecedent agreement. The author misuses the word *too*, omits the apostrophe from *there's*, and follows the missed apostrophe with a run-on sentence. Word choice and sentence structure are rudimentary, and the essay lacks the strength and style of writing which would make it persuasive and engaging.

You can evaluate your essay and the model essay based on the following criteria:

- Is the author's own perspective clearly stated?
- Does the body of the essay assess and analyze an additional perspective?
- Is the relevance of each paragraph clear?
- Does the author start a new paragraph for each new idea?
- Is each sentence in a paragraph relevant to the point made in that paragraph?
- Are transitions clear?
- Is the essay easy to read?
- Is it engaging?
- Are sentences varied?
- Is vocabulary used effectively?
- Is college-level vocabulary used?