Answers and Explanations

English Test

1. **C.** You probably noticed a couple of problems with the underlined portion. Perhaps the most obvious is that *recently* and *current* have the same meaning, so having them both in the sentence is downright redundant. One of them has to go. They both still appear in Choice (B), which means you can ditch that answer. That leaves you with Choices (C) and (D). Choice (D) sounds awkward, and it makes the sentence a fragment with no verb. The answer has to be Choice (C) because it gets rid of the repetition and also takes care of the *it* in the original sentence that doesn't clearly refer to any particular noun.
2. **G.**Chapter 6 discusses the difference between *effect* and *affect.* An *effect* is a result, and you usually see it used as a noun. To *affect* is to concern or influence, and you usually see this word used as a verb.

   The use of *effect* is correct here. Take note: Your not knowing the distinction between these two words can adversely affect your ACT score.

   Knowing *effect* is correct enables you to narrow the answers down to Choices (F) and (G). Choice (F) is wrong because the phrase "obesity and heart disease" gives more information about the types of side effects (it sort of renames *side effects)* and, therefore, needs to be set off with commas or, in this case, a comma and a period.
3. **C.** In the sentence, the noun that the pronoun *it* renames is unclear. The reference could be fat or salt or both. Find the answer choice that clarifies the pronoun reference. Choice (B) doesn't eliminate *it.* It just changes "it is" to a contraction. With Choice (C), though, the plural pronoun *both* makes clear that both fat and salt are required. The rest of the paragraph is in present tense, so the past tense verb in Choice (D) is definitely out.

4. **J.** The sentence repeats the ideas conveyed in the first and second sentences of the paragraph without adding anything new, so it has no reason for being in the passage at all. Choice (J) allows you to put an end to the needless repetition. Besides, Choices (G) and (H) create new errors that you don't want to deal with. Choice (G) has a subject/verb agreement problem, and Choice (H) contains the dreaded passive voice.
5. **B.** Well, you can't stick with Choice (A) because it creates a sentence fragment; you need a subject and verb to go with the "such as" phrase. Check the answer choices to see what you can do about the problem. Cross out Choice (D). By now you know that you can't have two sentences combined as one without bringing in some form of punctuation. Choice (C) corrects the fragment, but it creates a new error with the comma before "my favorite." For the comma to work there, you'd have to see another comma after "my favorite" to show that the words are an aside. You have to go with Choice (B) because it fixes the fragment and properly punctuates the aside.
6. **G.** The author means to imply that restaurant food is getting progressively blander. Strangely, you don't use the word *lesser* to show a gradual lessening. (You usually use it to describe people: "a lesser man would have thrown his book out the window, but I held on to mine.") The phrase "less and less" shows a progressive reduction, so Choice (G) is right. Choice (J) is wrong because *least* implies a comparison of at least three items, not the two (flavor before and flavor now) referred to here.
7. **C.** From the context of the passage, you know that the verb needs to be in the past tense. Neither Choice (A) nor Choice (B) has a past tense verb. Choice (D) sets the action in the past but uses the past perfect tense, which indicates an action that was going on in the past while something else happened. The best verb for this simple sentence is the simple past tense, *discovered.*

8. **F.** The original version is fine. It compares the current chili to the previous chili: "This chili is better than that chili." Choices (G), (H), and (J) compare two different (and therefore incomparable) things. They all compare chili to flavor. You have to compare chili to chili and flavor to flavor. It's a subtle difference, but get used to it because the ACT likes to test you on impeccably proper comparisons.

9. **D.** The first comma in the underlined portion is okay because it comes after an introductory phrase. The comma after *experimented,* though, isn't right. The information that comes after *experimented* is essential to the meaning of the sentence. For the sentence to be relevant, you need to know what kind of experimenting the author conducted. You use commas to separate nonessential elements from the rest of the sentence, but don't get commas involved with essential parts of a sentence. Semicolons join independent clauses, so you can cross out the answers that contain semicolons — Choices (B) and (C). Choice (D) is the only one left.

10. **H.** You don't talk *at;* you talk *to* or *with.* Cross out Choice (F) and look at the other options. All of them correct the preposition problem, but Choice (J) has needless repetition with its addition of *afterwards.* Choice (G) changes *several* to the wordier and more awkward "any number." The best answer is Choice (H).

    Don't let *them* in Choice (H) scare you away. In this case, *them* clearly refers to the people because we're pretty sure the author didn't talk to the dishes, which is the only other possibility.

11. **D.** The underlined portion has two main problems. First, it has no verb, so the sentence is a fragment. Second, it uses *less* to describe the quantity of calories. Remember, you use *fewer* to describe plural nouns and *less* for singular concepts. All the choices fix the sentence fragment, but only Choice (D) changes *less* to *fewer.*

12. **G.** Before you try to place the sentence, notice that it talks only about salt and its effects on how people eat. Then use the answer choices to help you figure out the most logical position for it in the paragraph. Choice (F) suggests placement at the beginning of the paragraph. Sentence 1 already provides a nice transition from the previous paragraph, so you probably don't want to change it. Putting the sentence after Sentence 1, however, makes sense. Putting the new sentence, which makes the general statement that salt affects food intake, before Sentences 2 and 3 is logical because those sentences go on to give more detail about how salt actually affects food intake. You can eliminate Choice (H) pretty easily because you don't want to separate two sentences with specific information with a more general sentence. Putting the new sentence at the end of the paragraph seems redundant.

13. **C.** This question may have stumped you. You know that you use adverbs to describe how the action verb is carried out. At first glance, you may think the underlined portion uses the adverb *perfectly* correctly. However, *taste* isn't an action verb in this sentence. It's a linking verb. Therefore, you need to use the adjective *perfect* instead. "To taste perfectly" literally means to taste in a perfect way. Someone who tastes perfectly has perfect taste buds and an exquisite ability to taste. This sentence means to say that the food tastes perfect, and food doesn't have taste buds.
14. **G.** We're confident that you recognized that Choice (G) was the proper way to write the words in the underlined portion. The clause needs a subject and verb; "which is" satisfies this need. Choice (H) moves some words around and adds an ambiguous *too,* but it doesn't supply the clause with a subject and verb. Choice (J) comes through with a subject and verb — "that is" — but because it's worded so awkwardly, you can scratch it out.

15. **A.** The sentence just restates the information in the last two sentences of the passage. Because it doesn't add any relevant information, you should vote *no* on inserting it. Choices (A) and (B) give you that option. You can cross out Choice (B), though, because the problem isn't that the sentence is contradictory; the problem is that it's repetitive. Even if you weren't sure whether the sentence belonged, you could have eliminated Choice (C) because you know the information appears elsewhere in the passage. If the sentence says the same thing as the original ending sentence, it doesn't conclude the passage any better. So Choice (D) is also out.
16. **G.** The subject of the underlined clause is *who,* which means using the objective form *whom* is wrong and so is Choice (F). The other choices fix that problem, so the sentence must have other issues, too. Look carefully at Choice (J). This answer choice surrounds the phrase "who, governing themselves" with commas, so it shouldn't be essential to the sentence. In other words, the sentence should still make sense if you take it out. When you take it out, the question being asked is "how Native American tribes do so." Well, that's certainly confusing! Choose the construction that best identifies the real question being asked. Choice (G) gets the job done with "[how] tribes go about governing themselves." Choice (H) doesn't finish the thought and leaves you hanging, which is downright uncomfortable.

17. **B.** An adverb, which usually ends in *ly,* answers the question *how.* How are most tribal governments organized? Democratically. Choice (C) is grammatically correct, but it's unnecessarily awkward and prolix. (No, prolix isn't an expensive brand of watch. *Prolix* just means wordy.) Why say that a government is organized "in a democratic way" when you can say *democratically* instead? If you delete the underlined portion with Choice (D), you know that the government is organized but not how. The sentence would read, "Most tribal governments are organized, that is, with an elected leadership." That choice seems to say that the definition of organized is having an elected leadership, which isn't true.

18. **J.** The original is a comma splice, or two sentences (independent clauses) that are incorrectly joined. When you take out the subject of the second part of the sentence, that part of the sentence is no longer an independent clause; the simple conjunction *and* makes it part of the predicate of the main sentence. Choice (H) changes the meaning of the sentence and incorrectly puts a comma before the conjunction. The comma is only proper before the conjunction when an independent clause follows the conjunction. Choice (G) doesn't have any punctuation errors, but *however* indicates that the second sentence contradicts the first sentence, which isn't what the author is going for.
19. **A.** This question tests the distinction between *principal* and *principle. Principal* (with a *pal*) means main or primary. (You may have learned in about sixth grade that "the principal is your pal, your buddy.") *Principle* (with an *le*) is a rule. Knowing this distinction narrows your answers to Choices (A) and (B). You can cross out Choice (B) because you don't put a comma before the elements in a series.
20. **H.** If you missed this easy question, you probably read it too quickly. This sentence has a problem with subject/verb agreement. The subject of the sentence is *council. Council* is singular and requires the singular verb *has.* So Choice (H) is right.

21. **A.***Tribe* is singular. (*Tribe* is a collective noun. Collective nouns look plural, but they're usually singular.) Because *tribe* is singular, it requires the singular pronoun *it* rather than *them.* So Choices (C) and (D) can't be right. Choice (B) avoids the pronoun agreement problem, but it creates a new error with its lack of parallel structure. Verbs in a series must be in the same grammatical form: to speak, act, and represent.
22. **F.** Giving the names for the presiding official of the council before you even mention the council and the presiding official doesn't make sense, so you know that Sentence 4 has to come after Sentence 3. Go ahead and cross out Choices (G) and (H). Sentence 3 mentions the presiding official. Talking about the various names for the presiding official right after the paragraph mentions the council itself makes

more sense than waiting to do so a sentence or two later. Therefore, Choice (F) is the best option.

23. **C.** No need to break into a cerebral sweat for this pretty simple question. Verbs in a series must be in parallel form. This very long sentence has a number of verbs, and all are in the simple present: define, regulate, prescribe, levy, regulate, and control. The last verb must be in the same form as well — administer — so you can eliminate Choices (B) and (D) immediately. The original unnecessarily makes the last entry in the list a clause by adding the subject *they.*

24. **J.** The original sentence is a comma splice. You can't use a comma to join two sentences into one. You can't change the punctuation, so you have to do something to the underlined portion to change the first part of the sentence into an incomplete sentence (one that can't stand alone). Choices (G) and (H) don't cut it because both of them still contain a subject and a verb ("they did" and "it has"). The only choice that doesn't contain a verb and that, therefore, eliminates the independent clause is Choice (J).

25. **C.** You don't have to think too hard about Choice (A) because it doesn't form the possessive correctly. The sentence refers to more than one Native American, so you have to form a plural by putting the apostrophe after the *s.* Choice (B) sets up a nonrestrictive clause, "who demonstrated patriotism," but it doesn't have a comma after *patriotism,* so it doesn't work. The *when* in Choice (D) leaves you with an incomplete thought. You don't know what happened when the patriotism moved Congress. The correct answer needs to complete the proper construction of "it was not until … that … ." Choice (C) fits the bill and uses the proper possessive form.

26. **G.** The original sentence improperly contains both third and second person. One reads in one's history books or you read in your history books, but one doesn't read in your history books. Choices (H) and (J) change second person to third person but introduce a number problem in the process. *Their* is plural, and *one* is singular. So those answers don't work. Choice (G) has to be right.

27. **B**. Choice (A) makes no sense. It sounds like the Navajo Marines — rather than their language — were used as code. You have to find another option. Choice (C) is tempting, but it changes the meaning of the sentence. The Navajos didn't use the Marine language; they used the Navajo language. Choice (D) doesn't work either. The Navajo Marines' language didn't make up the code; the Navajo language did. Besides, *Marines* needs to be in possessive form. Even though it's in passive voice, Choice (B) is the best answer.

28. **F.** In the original sentence, *such* is an adjective that correctly describes the noun *code.* Switching *code* and *such* in Choice (G) gives you "the only code such that the enemy could not break." In that construction, "such that" should describe how a verb acts. But the sentence doesn't have a verb for the phrase to describe. Cross out Choice (G) and the similar construction in Choice (H). As a general rule, eliminate any answer choices like Choice (J) that put a comma before *that. That* introduces a restrictive or essential clause that commas shouldn't set apart.

29. **C.***Percent* is plural because it refers to *leaders,* which is a plural noun. So you need a plural verb, *are,* and a plural predicate noun, *veterans.*
    And speaking of termites, here's a quick joke: What did the termite say when he walked into the saloon?
    "Is the bar tender here?"

30. **G.** The passage talks about what tribal governments do and what role Native Americans play in the political system, including their contributions to past wars, but nowhere does it predict the future. So you need to choose a *no* answer, either Choice (F) or (G). Between the two, Choice (G) is a better answer. (Notice how we used *between* and *better* to compare two choices?) Choice (F) isn't true. The passage doesn't focus mainly on tribal government; it talks equally as much about Native American contributions to military service.

31. **C**. The underlined portion contains a possessive form error. The great national parks belong to the country, so it should be "country's great national parks." The sentence refers to only one country (ours), so you can't choose the plural possessive form in Choice (B). Although both Choices (C) and (D) correct the possessive form of *country,* Choice (D) creates another possessive error by adding an apostrophe to *parks.* Nothing belongs to the park. The word was fine in plural form just the way it was.

32. **H.** The *as* in the sentence probably sounded strange to you when you first read it. It should have because it's not idiomatically correct to say "as we were there." You use *as* to indicate two events that happen at exactly the same time. The park ranger didn't give them information at the precise moment they got to the park. It happened at an indeterminate time during their stay or *while* they were there. Saying *whenever* seems to imply that the family had visited the park several times and that the park ranger gave them information whenever they were there. Choice (J) is redundant; the phrase "during our time" and the word *while* mean the same thing. Choice (H) is best.

33. **D.** The subject of the sentence is *theory,* not "plate tectonics." *Theory* is singular and needs a singular verb, *claims.* So you can narrow down the answers to Choices (C) and (D). You can eliminate Choice (C), though, because *whichever* makes no sense in the context of the sentence.

34. **J.** When you compare two things, you use the *er* form rather than the *est* form. Cross out Choices (F) and (G). Choice (H) can't be right because it doesn't have commas on either side of the nonrestrictive clause that begins with *which.*

35. **B.** You can't use a semicolon to join a dependent clause ("as the expanding oceanic crust … plate margins") and an independent clause ("it pierces deeply … to liquefy again"). So you know Choices (A) and (C) are out. Instead, you use a comma like the one in Choice (B) to separate a beginning dependent clause from the independent clause. Choice (D) takes away the independent clause at the end and creates an incomplete sentence that leaves you confused and frustrated. You don't need that kind of stress in the middle of a test!

36. **F.** The sentence is fine the way it is. The subject of the sentence is *components,* which is plural, so the sentence requires a plural verb, *result.* If you thought the subject was *rock,* you fell for the trap answer, Choice (H). If you picked Choice (G), your answer created a sentence fragment with no verb. Choice (J) unnecessarily changes the verb to past tense. Insert your answer into the original sentence to make sure it fits. *Result* fits because the rest of the paragraph is in the present tense.

37. **D.** The original is a fragment with no verb. Without the assistance of a helping verb, *building* isn't a verb. Alter the *ing* verb (which is often an indication of an error) to *built* to change the sentence to the simple past tense. Choice (B) is wordy and awkward and makes it sound like the mountain was built like you'd build a house.

    We hope you didn't fall for Choice (C). The English language has no such word as *builded.* The past tense of *build* is *built.* (Come, come now, don't leave in a huff over that cheesy answer. As Groucho Marx would say, "Wait a minute and a huff!")

38. **F.***Like* compares similar objects. That is, *like* usually connects two nouns. *As* compares situations or actions. So you can eliminate Choices (G) and (H). Choice (J) changes the meaning entirely. *Likely* means probably; *like* means similar to.

39. **B.** The possessive form of *it* is *its,* not *it's.* Choice (B) corrects the problem without changing the meaning of the sentence.

40. **G.** Sentence 4 begins with "These become the feeding chambers … ." So the sentence that comes before it must deal with something that could become feeding chambers. Sentence 3 ends with *eruptions,* but eruptions most likely don't become feeding chambers; therefore, you can cross out Choice (F). Look for another location for Sentence 4. Most paragraphs don't begin with an ambiguous concept like *these,* so you can eliminate Choice (H). By process of elimination, you know Sentence 4 comes after either Sentence 2 or Sentence 5. Sentence 5 just refers to a lake. A singular lake wouldn't become plural feeding chambers. Cross out Choice (J) and pick Choice (G). You don't even have to examine Sentence 2, but if you did you'd see that it refers to compartments of molten rock, which could become chambers.

41. **B.** You probably got a sense that something was wrong with this sentence when you read it, but exactly what was wrong may not have been obvious. Instead of spending a bunch of time trying to figure it out, just plug in answer choices to see which one works best. Say that the flora is a mix of species from the Sierra Nevadas *and* varieties from the Cascades. The other answer choices don't fit. So Choice (B) is your winner.

42. **H.** The subject is *park,* which is singular and requires a singular verb, like *boasts.* Therefore, you can eliminate Choices (F) and (J). Choice (J) changes *boast* to *have,* but *have* isn't singular either. *Boast* must be the verb that belongs in the sentence. Choice (G) doesn't cut it because it sounds as though the park is doing some boasting and also has 700 plant species. "To boast" simply means "to be proud to have" — as in you and your friends can boast some of the highest ACT scores around if you learn the tricks and the traps of the exam. Choice (H) is the right answer.

43. **A.** What do you think? Is a description of the types of plants that grow on Mount Shasta appropriate? Probably not. Besides being a little boring, a description of Mount Shasta's flora isn't really relevant to a passage about Mount Tehama in Lassen Park. Cross out Choices (C) and (D). Although Mount Shasta does have fewer plant types than Lassen Park, the smaller number of plant types isn't the reason that a description of them is inappropriate. You wouldn't want to see that description even if Mount Shasta had more plants than Lassen Park. The best answer is Choice (A).

44. **G.** You don't use a semicolon to introduce a series; instead, you use a colon or perhaps a dash. The punctuation marks in both Choices (G) and (J) work in the sentence, but Choice (J) replaces *of* with the wordy and unnecessary phrase "that are comprised by." Choice (G) is better. If you selected Choice (H), you created a comma splice, which is the result of joining independent clauses with a comma and no conjunction.

45. **C.** This last paragraph presents an entirely new topic about Lassen Park. So cross out Choice (A) and pick Choice (C). Previously, the passage gave a physical description of the land and discussed its plant life. This paragraph introduces you to the humans who inhabited the area. The paragraph doesn't contradict anything in the rest of the passage, and thinking that the author would say that the park only sustains life in the snowy winter months is just plain silly.

46. **G.** You may be surprised to find out that "having dreamed" doesn't function as a verb. It actually functions as a noun but looks like a verb. Therefore, the original sentence is a fragment and needs a change. Choice (J) doesn't help because *dreaming* is a noun, too. Because the writer is no longer a young boy, you're looking for a past tense verb. You find it in Choice (G).

47. **A.** This question brings up the whole *who* versus *whom* dilemma. Use *who* for subjects and *whom* for objects. In this sentence, *who* is the subject of the clause "who has been my hero." So you know that *who* is the proper form. Cross out Choice (B). The objective form *whom* is okay in Choice (D) because it's the object of the preposition *of,* but if you change *who* to "of whom," the clause loses its subject and the sentence makes no sense. Choice (C) tries to separate "it's fair to say" as a nonessential clause, which would be fine except that the answer choice doesn't put a comma after *say.* You have to stick with Choice (A) here.

48. **F**. If you picked Choice (J), you answered too quickly. The simple subject and verb in Choice (J) may seem better than the original, but Choice (J) also puts a comma after *dream* and separates the verb from its object, which is a no-no in the grammar world. Choice (H) creates a sentence fragment, and Choice (G) incorrectly turns *boys* into a possessive.

49. **A.** This question tests the use of prepositions. You can't be fascinated at or captivated about something. "Apprehended with" in Choice (D) is an awkward word choice for the sentence. Going with Choice (A) is best here.
50. **G.** This question is an interesting one because all the answer choices are pretty bad. Your job is to choose the least awful among them. (Hmm, sounds rather like a mixer dance, doesn't it?) The original is in passive voice and is missing the comma after *Italy.* At first glance, Choice (H) may seem promising. It's in active voice and properly puts commas before and after *Italy.* Look at it carefully, though. A beginning phrase always describes the subject of the sentence. This answer literally states that *you* (not the city) are located a few miles past Naples. You probably wish you were in Naples rather than taking practice ACT tests, but, unfortunately, that's not the point of this sentence. Choice (J) has a whole mess of comma problems. You have to separate the country name (Italy) from the city name (Naples) with commas on either side. Choice (G) is in the passive voice (is found) rather than the active voice, but it doesn't have the punctuation or modifier errors that the other choices have, and passive voice isn't that big a problem in this sentence. It's really not important who exactly finds the city. The point is that it's found or located near Naples. Choice (G)'s the best of four rather lackluster choices.

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Reading Test

1. **D.** To answer this question, focus on the first paragraph. The paragraph implies Choice (A) and comes right out and states Choice (B), but neither of these points is what the paragraph is all about. The answer that best summarizes the paragraph is Choice (D) because it includes all the paragraph's elements. The first paragraph doesn't compare Max's thought process with other people's thought processes, so you can eliminate Choice (C).

2. **G.** You may know that *tangible* means capable of being perceived with the senses. If you don't, though, you can still answer this question correctly. Examine the sentence. *Tangible* describes something that Max's understanding is *not*. The next sentence elaborates. Max's understanding has come from "a voice in his head," but the voice seems to convey colors and vibrations rather than words. Sounds pretty fuzzy, doesn't it? Start plugging in the answer choices to see which one fits. Eliminate Choice (F) because it has an opposite meaning. It's not that his understanding *wasn't* vague. Choice (G) sounds good. Colors and vibrations don't provide

   something concrete. Check Choices (H) and (J) just to be sure. Neither works. The understanding did affirm Max's sense of purpose, and understanding that comes from something nebulous, such as inner voices without words, is probably able to change. Stick with Choice (G).

3. **C.** Cross out all the answers that appear in the passage. The second paragraph is all about Max's mathematical talent; Lines 88–89 tell you that he excelled in the 50-yard dash, which is a track event; and you read about his aptitude for football in Line 93. No part of the passage references gymnastics. Eliminate Choices (A), (B), and (D), and fill in the bubble for Choice (C).

4. **F.** Answers that aren't accurate or that cover only one part of the passage have to be wrong. The second-to-last paragraph says that Max expected to be perfect in everything and achieved perfection without being anxious about it. In other words, he didn't feel inadequate. Cross out Choice (G). Choice (H) implies a cause-and-effect relationship between Max's ability to hide his trauma and his academic and athletic successes. The passage doesn't say that Max tried to hide the trauma, so it definitely doesn't link his trauma to his successes. Nothing in the passage tells you that Max suffered socially. In fact, it tells you that he was student council president and captain of three athletic teams. Eliminate Choice (J). Choice (F) provides the best summary of the passage.
5. **B.** When you read the passage, you may have marked Lines 68–75 as Max's suicide thoughts. Go there to answer this question. The author clearly states that Max "seriously considered ending his life in order to escape his tormentor." Choice (C) contains no mention of Louis, Max's tormentor, so it has to be wrong. The paragraphs that discuss Max's suicide attempt don't mention his parents, so you'd have to assume too much to pick Choice (A). You're down to Choices (B) and (D). Both seem pretty good, but Choice (B) is better. It includes both his fear of his brother and his understanding of his purpose in life, the two elements the author gives in the 10th through 13th paragraphs. Choice (D) requires you to assume information that isn't stated in the passage about Max's reasons for considering suicide.

6. **F.** The author's use of the word *such* before *exercises* means that he's referring to a previous thought. The prior paragraph talks about Max's ability to position imaginary shapes, not his ability to do physical exercises, so you can mark your pencil through Choice (G). Choice (J) is out because the author hasn't even mentioned Louis before this paragraph. The author mentions Max's ability to multiply large numbers when he was a baby, but he specifically states that the numbers were three-digit numbers rather than six-digit ones, so Choice (H) is out. Choice (F) correctly equates exercises with Max's mental movements of imaginary shapes.
7. **D.** Lines 91–94 tell you that Max displayed leadership skills even as a toddler by taking charge of any group. Choice (D) says exactly that. The other answer choices provide true statements about Max's attributes, but these characteristics aren't ones that the author specifically says provide proof of Max's early leadership tendencies.
8. **F.** Eliminate the answer choices that make true statements about Max and that describe qualities that aren't true of most other children. Choice (J) is an excellent paraphrase of Lines 34–37; Max did think he was exactly where he was supposed to be in life. Cross out (J). Most children don't go through the majority of their childhood without speaking, but Lines 52–53 and Lines 82–83 suggest that Max couldn't express himself verbally. Cross out Choice (G). Lines 100–102 say that, unlike other children, Max didn't get anxious about the expectations he had for himself. Choice (H) is out. By process of elimination, Choice (F) is the best answer. Nowhere in the passage does the author indicate that Max experienced a yearning for approval. On the contrary, it implies that Max wasn't worried about what other people thought of him.

9. **A.** This one should've been pretty easy. The question refers you directly to a line in the passage, so you know exactly where to go to find the answer. The paragraph before the one that mentions Max's obstacle says that Max considered ending his life to escape his tormenter. The tormenter is his obstacle. From the passage, you know that his tormenter is his brother, Louis. Fill in the bubble for Choice (A). If you want to be sure you're right, look at the other choices. Max recognizes that his intelligence is beneficial, and his lack of verbal communication doesn't seem to bother him. He seems to have no problem with general society, only his brother.
10. **J.** If you picked Choice (F), you probably did so because you didn't read the whole answer; the passage doesn't say that Max ever instilled fear in others. You can cross out Choice (H) because the author never suggests that Max lacked self-esteem or was self-absorbed. Choice (G) focuses just on social situations, and the passage covers more than Max's social development. The best answer is Choice (J) because it takes into consideration Max's overall life success and the cause of his early struggles.
11. **D.** You should have dumped Choice (C) right away. The ACT isn't going to write a passage whose primary purpose is to trash (*denounce* means to put down or to bad-mouth) someone, especially a professional such as a child psychologist. Main-idea, primary-purpose, or best-title answers are almost always positive or neutral, not negative.

    Choice (B) is tempting. The passage does mention self-esteem (and if you're smart enough to look at the attribution, you'll see that the excerpt, in fact, comes from a book on self-esteem), but it never mentions anything about *low* self-esteem.

    Choice (A) is also tricky. It just sounds so pompous and correct: "provides the foundation for life." La-di-da. However, the passage discusses children up to the age of 16, which is well beyond "early childhood." So by process of elimination, you know Choice (D) is the winner.

12. **G.** This question is a gift to you. The answer is right there in the second sentence of the passage — selfhood.

    If you chose Choice (J), you fell for the trap. Yes, children work to achieve competence at various tasks throughout the stages of childhood, but all the tasks lead to the ultimate goal of selfhood. Don't choose an answer simply because the passage mentions it. Be sure that the answer you choose refers to the specific question being asked.

13. **C.** The third paragraph mentions this cry of a child to make the point that he needs feedback and recognition of his achievements. So Choice (C) is right.Choice (B) is tempting, but the passage discusses parent-pleasing behavior later in the fourth paragraph, not in conjunction with the given quotation.

14. **J.** This question traps rushed students who don't go back to see how the passage uses the statement in context. Lines 33–34 say that "the mother is the center of the child's world." True, the other answers mention games, but the phrase "the name of the game" was used metaphorically in this instance. To say that something is the "name of the game" means that it's the main idea, the point of the whole activity. For example, getting into college is the name of the game when you're studying for the ACT. If you didn't need a good ACT score to get into school, would you really go through all this mind-numbing studying? (You would? Just for our jokes? We're flattered, but whoa — get a life!)

15. **D.** The author states that this separateness is an important milestone in children's development, indicating that this separateness is vital. (A *milestone* is an event marking a significant stage in life. For example, getting a driver's license is a milestone to teenagers.)

16. **G.** The theme of the passage is the confusion between wanting two opposite things, such as demanding to have freedom from parents but being afraid to let go of them.

    Obviously, every answer comes right from the passage itself, so they all look familiar and "sound right." For a question like this one, ignore the answer choices at first. Reread the passage and identify its main idea in your own words. Then go back and find which answer best expresses that idea. If you look at the answer choices first, they'll all look good. Try to predict the answer first.

17. **D.** This question should have been a pretty easy one. But you do need to examine more than just the indicated sentence; read the few sentences surrounding it. The next sentence says, "A child needs to ask what he is going to do with his life." Choice (D) is your answer.

    You didn't fall for the cheap trick in Choice (A), did you? A *vocation* is not the same thing as a *vacation.* If you fell for Choice (B), you confused a *vocation* with a *location.*

18. **J.** The author talks about self-dependence in the last paragraph, so focus your attention there. The paragraph mentions three tasks a child has to accomplish to achieve self-dependence. If you were paying attention as you read through the passage, you probably underlined these tasks with your pencil.As you read each task in the paragraph, cross out the corresponding answer choice because you're looking for the answer choice that doesn't show up in the passage. The first task is to determine vocation, which is the same as figuring out what to do. Eliminate Choice (F). Next, the author mentions establishing values. As you continue to read through the paragraph, you see that the author equates values with moral concepts. You can cross out Choice (G). Choice (H) is a word-for-word copy of the third task, so you can mark through that answer. The remaining option is Choice (J). The passage suggests that the child needs to work through conflicts with his beliefs rather than avoid conflicts.

19. **C.** The passage discusses the various stages of children by their ages. *Chronological* means in order of time. If you didn't get this question right, you outsmarted yourself and tried to make matters more difficult than they really were. Believe it or not, not every single question on the ACT is out to get you.

20. **H.** You could answer this question based on either the last paragraph or the first paragraph. The final paragraph discusses how the final stage of development is establishing total independence. If total independence is the final stage, then the ultimate goal is that independence. The first paragraph also discusses how the purpose of childhood development is to achieve selfhood or self-knowledge.

21. **D.** Focus on the last two paragraphs in Passage A, which describe the Orgaz painting. All the choices are part of the picture except Choice (D). Tintoretto only appears in the first paragraph as one of the artists under whom El Greco apprenticed.

22. **F.** Get your pencil moving and mark straight through Choice (G). Beuys, not El Greco, studied at the Dusseldorf Academy. The first paragraph of Passage A says that El Greco received diverse artistic training, but it doesn't compare the level of diversity to other artists of his day. Choice (J) requires you to assume too much. You're down to Choices (F) and (H). Studying with Michelangelo gave El Greco the background for his unique style, but he continued to develop his style in Toledo. You don't have enough information to say that El Greco's training didn't go further after he apprenticed under Michelangelo. Process of elimination leaves you with Choice (F). The first two paragraphs in Passage A indicate that El Greco's training resulted from a combination of formal art studies and a variety of intellectual influences.

23. **C.** Passage A's third paragraph states that El Greco painted his masterworks in Spain, which is Choice (C). Although he trained in Italy, Choice (A), and Crete, Choice (B), he didn't paint his masterworks there. Passage B mentions that German artists influenced Beuys, but Passage A never makes a connection between El Greco and Germany. So cross out Choice (D).

24. **G.** The answer to this question is in the final sentence of Passage A, where the author states that the connections suggest that "the division between heaven and earth, spiritual and material, can only be transcended by the Spirit, symbolized by the flames." The paragraph mentions Saint Peter, the torches of the noblemen, and the petitions of the endless line of souls — Choices (F), (H), and (J) — but the author specifically designates Choice (G), the flame representing the Holy Spirit, as the thing that has the power to overcome the separation between the spiritual and material worlds.

25. **C.** You know Choice (A) is wrong because Byzantine mysticism and Italian Mannerism were El Greco's influences. The second paragraph of Passage B states that Beuys's art developed from his having to deal with the effects of World War II on the small German town where he grew up. That statement makes a good case for Choice (C). The passage touches on a few similarities between El Greco and Beuys, but it never suggests that El Greco influenced Beuys, which is what Choice (B) says. The fourth paragraph refutes Choice (D). Passage A discusses the religious factors that heavily influenced El Greco, but Passage B doesn't indicate the same influences on Beuys. Just because Beuys came from a predominantly Catholic town doesn't mean he had a Catholic upbringing.

26. **J.** The sentence states that the devastation of the war caused *schisms,* so it can't be a particularly positive word. So Choices (F) and (H) are out. When you replace the word with "religious beliefs," you say that the devastation of war created "political religious beliefs," which doesn't make sense. So Choice (G) doesn't work. The clear answer is Choice (J): Personal and political divisions are often a result of a devastating war.

27. **B.** If you're an artist or know anything about art, this question probably wasn't too hard for you. "Mixed media" refers to artworks that artists create using a mixture of techniques. If you don't know much about art, though, don't worry. Just use Passage B to answer the question. In the first paragraph, the author says that Beuys used pencil, colored ink, watercolor, and creased paper to create a work, which tells you that "mixed media" involves using more than one kind of artistic medium or technique. The paragraph describes original artwork rather than reproductions, so Choices (A) and (C) don't fit. Choice (D) is in there to catch test-takers who associate *media* only with journalism. The passage doesn't ever mention the way critics viewed the artists' works, so Choice (D) is irrelevant.

28. **F.** The third paragraph of Passage A tells you that El Greco painted mostly religious themes because churches commissioned his work. Passage B's second paragraph reveals that Beuys wasn't limited by church sponsorship. Choice (F) seems likely. The first part of Choice (G) works, but the second part doesn't. The wishes of the churches he painted for — not his own passions — determined El Greco's subjects. The passage doesn't discuss the particular religious views of either painter, so you can cross out Choice (H). Likewise, the passage doesn't go into the socioeconomic backgrounds of the artists. Eliminate Choice (J). The best answer is Choice (F).

29. **B.** Passage B specifically states in the first paragraph that the artists painted different subjects with different media, so Choices (A) and (D) are out. Both passages indicate the two artists were influenced by earlier artists, but Passage A claims that El Greco was influenced by Cretan monks and Italian artists; Passage B indicates that Beuys had German influences. Cross out Choice (C). You can justify Choice (B) from both passages. Passage A in the second paragraph states that El Greco's paintings "portray the interplay between the spiritual world and the material world." It goes on to specify that *The Burial of the Count of Orgaz* illustrates these two worlds. Similarly, Passage B's last sentence clearly states that *Kadmon* portrays Beuys' "fascination with the relationship between the mystical and the tangible." Both paintings explore a similar theme, and Choice (B) is correct.

30. **F.** Keep in mind as you examine the answer choices that you're answering the question about Passage A. Passage A doesn't mention Beuys or *Kadmon*, so Choice (G) is unlikely. Both passages give a good amount of information about the artists' influences, but Passage A doesn't talk much about El Greco's materials, at least not more than Passage B does. Choice (J) is wrong. Although Passage A discusses the influences behind *The Burial of the Count of Orgaz,* it doesn't include the effect of El Greco's personal experiences. Rather, personal influences are emphasized in Passage B. Choice (H) is wrong. That leaves Choice (F). Passage A goes into great detail describing the way El Greco's painting shows the interchange between the spiritual and material. Passage B mentions the connection but doesn't describe *Kadmon* in a way that shows how the painting expresses the theme of the relationship between the two worlds. Choice (F) is best.

31. **B.** The first paragraph simply introduces blood clots, mentioning fixed and migratory clots. So Choice (B) is your answer.

32. **H.** The first paragraph tells you that a *thrombus* is a clot; an *embolus* is simply a migratory clot. Choice (H) is the winner here. The other answers may or may not be true. The passage doesn't give you enough information to decide.

33. **A.** Lines 33–35 state that, among pulmonary embolism patients, "the great majority suffer no serious symptoms or complications, and the disorder clears up without significant aftereffects." So Choice (A) is right. As for Choices (C) and (D), the passage doesn't discuss either children or diet.

34. **H.** Lines 13–14 state that the site of a pulmonary embolism is often a deep vein of the leg or pelvis. So you know Choice (H) is your answer.

35. **B.** Although you may have been able to answer this question based on common sense, the theme of the first half of the passage is that thrombosis may turn into an embolism. Choice (A) is out in left field; the passage doesn't say anything about aiding others. Obviously, this is the cheap-trick answer, playing on the word *attendant.*

    You have no information about the degree of risk, although the list of disorders is pretty daunting. So Choice (C) is out. And although women are classified according to childbirth status, the passage never contrasts women and men, so Choice (D) is wrong.

36. **J.** By citing a high percentage of patients who have venous thrombosis after recuperating from hip fractures, the passage implies that the risk of thrombosis worsens.

    This passage uses *exacerbate* in its normal, everyday sense. (The ACT *exacerbates,* or makes worse, your tension headache.) This isn't always the case. A word may have a dozen meanings. Don't be surprised if the ACT uses the least common of those meanings in a passage.

Science Test

1. **B.** The answer to this question follows from the major relationship noted in the second-to-last paragraph of the analysis of this passage. Remember that the harder a spring is to stretch, the faster it will snap back to its regular position after it's released. Look at the two tables: Pole 3 requires the most force to bend but the least amount of time to snap back; Pole 1 requires the least force to bend but the greatest amount of time to snap back; Pole 2 is intermediate for both force and snap-back time. Choice (B) follows very cleanly from the numerical relationship shown in the two tables. The more force/less time relationship holds for all three poles, so you can't justify Choice (D).
2. **G.** As you see in Table 1, you have to use more force to bend a stiffer pole. In the introductory material before the tables, you find out that Poles 1 and 3 have the same mass (no, you don't have to calculate mass; the passage gives it to you right out, as a gift) and that Pole 2 has the greatest mass. Therefore, Pole 3, the carbon fiber pole, which is one of the least massive poles, is the stiffest. Eliminate Choice (F). On the other hand, when you compare fiberglass to carbon fiber, this smaller-mass-equals-stiffer-pole relationship doesn't hold. Eliminate Choice (H) because with Poles 1 and 2, the more massive pole is stiffer. To choose between Choices (G) and (J), look at Poles 1 and 2, the two fiberglass poles. Because the table indicates that the most massive pole is the stiffest, Choice (G) is the right answer.

3. **A.** This type of question is common in research-summary passages. This question requires you to understand some fundamentals of experimental design. A *controlled variable* (also known as an *independent variable*) is a factor that the experimenter can directly control (duh!). Because ACT questions often ask about controlled variables, you may want to identify those variables as you read through the experimental data upfront. In other words, as you read the problem, say to yourself, "Okay, what's different here?" In Passage 1, the experimenters are fiddling with two factors: the size of the pole and the material it's made of. Those factors are the controlled variables.

   In this study, pole dimensions and material (fiberglass or carbon fiber) are controlled variables. The experimenter can easily change the diameter or length of a pole to a specific value, or he can change the pole's material. Choices (B), (C), and (D) mention factors that result from the experiment, not factors that the experimenters can change as part of the experiment.

4. **G.** Don't despair; this question isn't as tough as the terminology initially suggests. In fact, you can answer this question pretty much by using your common sense. What does *potential* mean? *Potential* is something that can happen but hasn't happened yet. (You have the potential to enjoy these questions … but that hasn't happened yet!)

   The pole acts to transfer the energy produced while the vaulter runs into energy that lifts the vaulter upward. When bent, the pole has stored the energy gained from the running, but has not yet moved upward. At this point, the pole has the potential to move with much

energy, but it isn't moving yet. Therefore, the pole has a lot of potential energy but no kinetic energy.

5. **D.** The question tells you that the vaulter needs a pole that isn't too massive when it's long. Focus on Choices (B) and (D) because they concern mass. Because low mass is the objective, Choice (D) is correct.
6. **G.** This passage's introduction tells you that beginning vaulters need poles that are relatively easy to bend. That means that Pole 1 is best for beginners.
7. **C.** The data suggests that a pole with a smaller diameter requires less force to bend into an 85-degree angle and more time to snap back from that angle. So this smaller carbon fiber pole will require less than the 6.3 N required to bend the 1.5 diameter carbon fiber pole and more than 591 msec to snap back from the 85-degree bend. Choice (C) is the answer that properly reflects the information in the tables.
8. **J.** Both tables reveal that as time in hours increases, the disintegration rate decreases. The only answer choice that conveys that relationship is Choice (J).
9. **C.** You can dump Choice (D) immediately. If the substance is down to 125 millicuries after 16 hours, how can it be up to 200 millicuries after 20 hours? Use your common sense to eliminate illogical answers.

   Choice (B) penalizes the careless reader who looks at Substance A rather than Substance B.

   The most important thing to notice is that the disintegration rate is cut in half every 4 hours. After 20 hours (which is only one 4-hour segment after 16 hours), you can expect that the rate will be half of what it was at 16 hours. Half of 125 is 62.5.
10. **G.** The disintegration rate goes down because the number of radioactive atoms goes down as the substance disintegrates. When fewer atoms are available to disintegrate, the disintegration rate naturally decreases.

So what does all this information mean to you? The number of atoms decreases in the same way that the disintegration rate decreases. At 15 hours, the disintegration rate is only $\frac{25}{200}$ or $\frac{1}{8}$ of what the rate was when the measuring began. The number of atoms must be only $\frac{1}{8}$ of the original 10,000,000. You don't have a calculator, so apply some estimation: $\frac{1}{8}$ is close to $\frac{1}{10}$. And $\frac{1}{10}$ of 10,000,000 is 1,000,000. The closest answer is Choice (G).

11. **A.** Because wimpy or wishy-washy answers usually are better than dramatic or precise answers, eliminate Choices (B) and (D). Think about the choices as follows: If (B) is correct, the test maker also has to accept Choice (A), which really wouldn't be wrong. However, Choice (A) can be correct without Choice (B) being correct. The same thing is true for Choices (C) and (D). If you're going to make a guess, guess Choice (A) or (C), the safer answers.

    Just because 1,500 is halfway between 2,000 and 1,000 doesn't mean that the time has to be halfway between the times that are associated with 2,000 and 1,000. Take a look at Table 2. Notice that for every 4-hour interval, the decrease in millicuries is less. For example, the millicuries decrease 1,000 during the first 4 hours but decrease only 500 during the next 4 hours and decrease only 250 during the next 4 hours. You can conclude that more of a decrease occurs during the first 2 hours than during the second 2 hours. At 2 hours, the number of millicuries will be closer to 1,000 than to 2,000. You can conclude that the disintegration rate reached 1,500 a little before 2 hours, making Choice (A) the safe bet.

12. **H.** The key is to look for which substance took less time for the disintegration rate (which is directly related to the number of radioactive atoms) to fall to one-half of the original value. Substance A went from 200 to 100 in 5 hours, while Substance B went from 2,000 to 1,000 in only 4 hours. Therefore, Substance B has a shorter half-life, which narrows the field to Choices (H) and (J). Choice (J) is full of irrelevant garbage (the fact that the scientists decided to go home after 16 hours doesn't affect the half-life). Choice (H), on the other hand, actually reinforces the definition of half-life.

    Choice (F) is misleading because the key isn't the absolute amount of substance present but the amount of substance present relative to the starting amount. Choice (G) is simply wrong. The amount present after 25 hours is half the amount after 20 hours; the amount doesn't completely disappear.

13. **B.** Hey, don't work too hard on this question. All you have to do is look at both tables and find the substance that has the lowest disintegration rate (which means a lower emission rate). You don't have to worry about the rate relative to the starting rate.

    Because the disintegration rate is always lower after more time, knock out Choices (A) and (C) right away. Table 1 shows that the rate for Substance A after 20 hours is only 12.5 millicuries, and Table 2 shows 125 millicuries for Substance B after 16 hours.

14. **J.** Look at the first two sentences of Scientist 1's argument. She mentions a match between carbon dioxide and temperature variations and then uses the recent large change in carbon dioxide levels as evidence that significant changes in temperature will occur. Scientist 1 goes on to discuss how continued sharp increases in atmospheric carbon dioxide will lead to similar dramatic temperature increases. Scientist 1 implies that the recent carbon dioxide changes have been unprecedented. The data during the past 160,000 years show a correspondence between temperature and carbon dioxide fluctuations, but this correspondence has occurred in the absence of the dramatic changes the earth is now and soon will be experiencing. For Scientist 1 to use the fluctuation correspondence as evidence for

what will soon happen, she must assume that the correspondence will continue in light of current and near-future sharp changes. So Choice (J) is right.

Scientist 2 discusses feedback factors in light of the computer models, which is a good reason to eliminate Choice (F) because the question asks about Scientist 1. You may infer from Scientist 2's discussion that the main difference between the two scientists regarding feedback factors is that Scientist 1 thinks that they'll increase the carbon dioxide-related warming and that Scientist 2 thinks that they'll minimize it.

Scientist 1 explains that the climate has changed, but she doesn't mention the exact causes of the climate changes. If she doesn't specify that there's a human contribution to the climate changes, you can't say that she assumes that humans can't limit their contribution. Eliminate Choice (G). Scientist 1 contradicts Choice (H) because she mentions that a $0.5°C$ rise is significant.

15. **C.** Choice (B) is tempting in that only Scientist 2 questions the models currently being used. He claims that a model that appropriately incorporates feedback factors will show that global surface temperatures won't rise as high as models currently predict. The problem with Choice (B) isn't that Scientist 2's viewpoint is inconsistent with the article but that Scientist 1's viewpoint is also consistent. Scientist 1 relies on computer models, so an updated model could very well make Scientist 1's case even stronger. You don't know exactly how those feedback factors will contribute to global warming. Don't take as fact Scientist 2's opinion that the feedback factors will minimize warming. Although either scientist could turn out to be wrong in the face of a new model, both viewpoints are now consistent with the statement in the question. So Choice (C) is the right answer.

16. **F.** As mentioned in the analysis of the passage, the discrepancy in the temperature figures suggests that calculating global temperatures isn't a clear-cut process. Mean global temperature over 100 years entails gathering data from many sites for a long period of time.

Some of these sites could have changed. You can also easily assume that scientists around the world don't agree on one accepted way to average all these sites together so they can represent what has happened around the entire world.

Choice (G) is wrong because a temperature measure is just that, a measure of temperature. The carbon dioxide is important only in that a change in carbon dioxide levels may account for why the temperature levels change. They're not included when numbers for temperature are taken and calculated.

Choice (H) is wrong because it's relevant only when the change in temperature occurred. Scientist 2 could very well also know about the hot years after 1980. The issue is simply how the present numbers compare to the numbers 100 years ago.

Choice (J) has to do with the consequences of increasing temperatures, not with the extent to which temperatures have risen.

17. **D.** The breakup of the ice sheet is indicative of global warming. Scientist 1 predicts greater global warming in the next hundred years, so she would expect there to be additional breaking up of Antarctic ice sheets. More breakup should lead to higher water levels and greater vulnerability to flooding.

    Choice (A) is something that Scientist 2, who predicts minimal global warming in part because of feedback factors, would predict. Choice (B) is too exact. The passage discusses some numbers regarding the relationship between carbon dioxide and temperature, but it doesn't indicate that the relationship between the two is specifically that when one doubles, the other doubles. Choice (C) may tempt you if you think that ice means cooling, but remember that the ice is melting and melting involves heat. The main problem with Choice (C) is that, even if it were true, you'd have to have some specific science knowledge to say so.

18. **F.** Choice (F) is a nice, noncontroversial statement with which both scientists would agree. Scientist 1 stresses that rising carbon dioxide is linked to higher temperature (another factor), while Scientist 2 discusses *feedback factors,* which are factors that respond to carbon dioxide changes and will, in turn, affect the carbon dioxide. Scientist 2, who refers to improved energy technology, clearly disagrees with Choice (G), but so does Scientist 1, who mentions the possibility that carbon dioxide levels will stabilize. Choice (H) is out because Scientist 2 discusses a slowing down in the rate of carbon dioxide level increase. Choice (J) is also out because *directly* is too extreme. Plus, by discussing feedback factors, Scientist 2 certainly doesn't think any direct link exists.

19. **C.** Scientist 1 asserts that a rise is significant because a change affected crop growth in the past. What if the change were a drop in temperature? Perhaps increased temperatures will do nothing to the crops because the crops will do fine as long as temperatures stay above a certain level.

    Eliminate Choice (A) because carbon dioxide has to do with what may cause global warming. It determines what significance increased temperatures will have. In addition, the 150-year figure in this choice doesn't challenge the 100-year figure Scientist 1 presents about temperatures. The time periods still overlap, and the passage discusses a general acceptance that both carbon dioxide and temperature are increasing. The big questions are to what extent the two are related and what the consequences will be.

    Choice (B) isn't very important because higher temperatures have clearly occurred toward the end of the 100-year period. Exactly which years had these higher temperatures isn't important. Because relatively few years have passed since 1980, there isn't too much

room for variation, anyway. So don't think less of Scientist 1 for omitting the exact years.

Choice (D) is out primarily because this choice has to do with the future, not the past hundred years. Also, Scientist 1 is free to predict a greater increase during the next hundred years because conditions are changing.

20. **G.** Scientist 2 mentions that water vapor and clouds make up 98 percent of the greenhouse effect, so it's reasonable to say that a change in water vapor will affect the greenhouse effect, which, in turn, will affect temperatures. In addition, Scientist 2 discusses how water vapor serves as a feedback factor, which contributes to temperature.

21. **A.** The explanation for Experiment 4 states that the conditions of the two experiments were the same except that in Experiment 4 daytime temperatures were kept the same and nighttime temperatures varied. The only answer that conveys this distinction is Choice (A).
22. **J.** Experiments 1 and 2 show that only interruptions that occur during the night affect the flowering response. Eliminate Choices (F) and (H), which mention daytime hours. Choice (J) makes more sense than Choice (G) because, if the total number of hours were critical, a brief interruption would have very little effect. On the other hand, if the plants were somehow measuring the number of continuous nighttime hours, a brief interruption would affect the plant.
23. **C.** One major point of this passage is that SD and LD plants show opposite responses. This difference makes Choices (A) and (D) unlikely. You can make a good guess at this point by choosing between Choices (B) and (C). Remember, the ACT doesn't subtract points for wrong answers, so guessing is always justified. Having a 50-50 choice is a real treat.

    When the experimenter presents light in the middle of the 16-hour night, the plants are exposed to only eight hours of uninterrupted night hours. The plant that flowers when nights are short will start flowering. Which plant meets this criterion? The LD plant, which is spinach in this passage, flowers when days are long and nights are short.

24. **G.** The experimenter can easily choose different plants, keep the lights on or off at a certain time, or change the temperature. Whether the chosen plants flower, on the other hand, has to do with how the plants respond to the conditions presented in the experiment. Flowering depends on what happens to the other variables. Such dependent variables are a step removed from the direct control of the experimenter.

25. **C.** In both sets of experiments, changing the day conditions has no effect on the plants' responses, but changing the night conditions does affect the plants' responses. Choice (D) acknowledges this consistency, but the reason focuses on how the experiments are set up, not on the results. In many biological experiments, experimenters use the same organisms, but doing so doesn't guarantee similar results. (Imagine, for example, that you and your friend both have colds and are both given aspirin. No one can guarantee that both of you would have the same response to the medication just because you're both humans.)

    Choices (A) and (B), besides being flat-out wrong from the start, also provide reasons that focus on the experimental conditions rather than the results. In addition, Choice (A) may not be correct because you have no information regarding the variety of plants used in Experiments 1 and 2. Choice (B) points out a key way that the sets of experiments differ, but the results are similar.

26. **G.** On the horizontal axes, day length increases to the right. The LD plant flowers during long days. This information means that high vertical values are associated with the right side of the graph. Eliminate Choices (H) and (J) because flowering doesn't increase with the increasing day length.

    Choice (G) is better than Choice (F) because with LD plants, no flowering occurs until a critical day length is reached. (The

experiments actually show that the LD plant responds when the length of night falls below a certain value, but associating an LD plant's flowering with long days is still okay.) In Choice (F), the graph continually rises, implying that flowering increases as day length increases from 0 hours. Choice (G) correctly shows that flowering doesn't occur when the day length is less than 15 hours.

27. **C.** So many questions are about SD and LD plants that you may have forgotten the third actor in this play, the DN plant. Look at the passage's introduction, which defines a DN plant as one that isn't sensitive to changes in day length. This type of plant should flower in any environment, including near the equator. (So you shouldn't be surprised that some weeds are DN plants.)

    You can eliminate the other choices because the question tells you that around the equator the daylight and nondaylight hours are pretty much equal, which means the plants that require very long or very short days probably won't flower near the equator because the day length stays close to 12 hours and doesn't approach the number of hours necessary for flowering.

28. **G.** This straightforward question simply tests your ability to read a graph. Look at Figure 2, which deals with water. Locate $60°C$ on the horizontal axis and then go straight up until you're even with 1.00 atm (on the vertical axis). You're in the liquid region.

29. **A.** Look for a point on one of the figures where a solid is next to a gas. Choice (A) looks good. In Figure 1 (bromine), $-20°C$ and 0.05 atm is near the lower-left corner, where a solid and a gas are next to each other. Liquid is out of the way, up and to the right.

    Choice (B) is wrong because at $0°C$ and 0.80 atm, bromine is near the solid-liquid boundary. Water is also near that boundary at $0°C$ and 0.80 atm, so Choice (C) is also out. Choice (D) is way off because water is nowhere near a solid at $80°C$ and 0.50 atm.

30. **G.** The easiest way to answer this question is to use a straightedge (your answer sheet works great) to draw a vertical line from the $30°C$ mark on each figure. Now, for each figure, mark 0.6 atm and 0.3 atm on the line. On the bromine graph, 0.6 atm is in the liquid region and

0.3 atm is in the gas region when the temperature is $30°C$, so Choice (G) is the answer. Don't be careless and pick Choice (F). The pressure is going down, so you're moving from a liquid to a gas, not from a gas to a liquid. The liquid region is generally higher than the gas region. On the water graph, you can see that both of your marks are in the liquid region, eliminating Choices (H) and (J).

31. **D.** Your gut instinct should attract you to Choices (B) and (D) because higher temperatures move particles farther apart. If you're running out of time, go ahead and make a guess. (50/50 odds aren't bad on this test because the ACT has no penalty for wrong answers.) Choice (D) is correct because water at $100°C$ and 0.60 atm is a gas, while bromine at $50°C$ and 0.80 atm — Choice (B) — is a liquid. Just to be certain, check Choices (A) and (C). In Choice (A), bromine is a solid. In Choice (C), water is also a solid.

32. **H.** You can probably eliminate Choice (F) by using common sense: Higher altitudes don't necessarily mean your pasta freezes! When an answer seems illogical or even amusing, put it aside for a moment. If none of the other answer choices are correct, you can always come back to it. (For those of you who love Sherlock Holmes, you'll recognize this strategy as a variation on his famous saying, which roughly goes, "When you have eliminated the impossible, whatever remains, however improbable, must be true.")

    Go through the rest of the choices without wasting any time on Choice (F). Choice (G) is out because the water temperature, not the air temperature, is important (because the spaghetti is in the water). A look at Figure 2 confirms the first part of Choice (H): At 1.00 atm, water becomes a gas at about $100°C$. At 0.80 atm, water becomes a gas at about $90°C$. With the water boiling at a lower temperature, less heat is available to soften the spaghetti. The answer is probably Choice (H), but double-check Choice (J) just to be sure. Figure 2 contradicts Choice (J); think of how you analyzed Choice (H). Besides, in this problem, the water is already boiling, so the length of time required to boil water is irrelevant.

33. **C.** Neither of the two figures displays time, so you can eliminate Choices (A) and (B). When you compare the two figures, it's clear that at all points right of the curve defining the transition from liquid to gas, water is at a higher temperature. Choice (C) is correct.
34. **H.** Neither Choice (F) nor (G) is correct. The figures don't represent a clear direct relationship between magnitude and average differential. The earthquake with the lowest magnitude has the lowest average differential, but the site with the greatest magnitude doesn't have the greatest average differential. Choice (J) relates magnitude to wells and doesn't address the question's topic. Choice (H) is the best answer.
35. **B.** Choice (A) doesn't look right. All four sites had radon emissions that were greater than the normal amount found over the earth, making Choice (B) look good.

36. **H.** The results of the studies indicate some association between earthquakes and radon emissions. Results that go along with the trend found in the studies strengthen the results and any claims derived from the results. You probably crossed out Choice (F) right away. Readings from earthquake sites in another location that aren't much different from average radon emission readings wouldn't

provide more evidence for the claim that earthquakes and higher radon emissions are associated. In fact, the information may serve to weaken the claim. Likewise, Choice (G) tends to weaken the claim rather than strengthen it. Similar radon readings from 500 miles away from the earthquake site may indicate that something other than earthquakes is contributing to the high radon readings.

The finding cited in Choice (H) is more helpful. It produces a point that falls in line with the points from the other three sites, so it provides additional support for the claim. Choice (J) doesn't provide enough information. You need to see more earthquakes associated with high radon emissions. Simply having more earthquakes doesn't shed any light on the association between earthquakes and radon emissions.

37. **A.** You have to be careful when dealing with data that show an association (or *correlation,* in more mathematical terms). Just because two things go together doesn't imply that one causes the other. For example, the number of skyscrapers in a city and the number of children who live in that city have a correlation. That is, in general, cities that have more skyscrapers also have more young people. Does this correlation mean that young people are building the skyscrapers? Of course not. A more reasonable explanation is that when a city is large, it has many skyscrapers and youngsters. An underlying cause, namely overall city size, exists. Children don't cause skyscrapers, or vice versa.

    This study simply measured a correlation. It wasn't designed to investigate any possible mechanism that would convert radon emissions into earthquakes, which knocks out Choices (C) and (D). Choice (B) is out because nothing in the study points to 4 percent as a magic number. (This particular point isn't true, anyway, but even if it were, you wouldn't have to know this information from some specialized outside study. You only have to know the info that the Science Test passages present.)

38. **J.** When scientists obtain a set of experimental results, the responsible factor is often difficult to isolate. For example, if a

scientist wanted to study whether a new drug could increase ACT scores, he could give the drug to a group of students and then look at the scores. If the scores were high, the scientist could conclude that the drug had an effect. But what if the group studied included many people who had a history of scoring well on tests similar to the ACT? What if the students did better simply because they believed the drug would help them? By including a control condition, experimenters could rule out these possibilities. Experimenters could find a group that was equal to the drug group on previous test scores and then give these control students a *placebo* (a fake pill) but tell them that this pill is supposed to help raise ACT scores. If the drug group scored higher, experimenters could be more confident that the high scores aren't simply the result of using a high-achieving group or a psychological belief in the drug because the experimenters matched the two groups in terms of these factors. In this case, the chemicals in the drug more likely had something to do with the higher scores. The control condition helped rule out other possible factors.

In the earthquake studies, scientists measured radon emissions after earthquakes. They obtained high values, but such values could occur even in the absence of an earthquake. Scientists would need to know the radon emission level that normally occurs in the sites studied.

In a sense, Choices (F) and (H) mention conditions that are included in the studies. The studies compared the wells near the epicenters to worldwide values. Studying more wells from the same areas won't add anything new to the study, and the worldwide averages include virtually earthquake-free areas.

All Choice (G) would do is add more data to what has already been found. Clearing up the graph in Figure 5 would be particularly helpful, but the condition isn't a control condition.

39. **A.** Approach this question with good old common sense. If you want to predict an earthquake, you have to measure something *before* the earthquake occurs. The problem with the current studies is that scientists measured emissions after the earthquakes. Maybe the earthquakes caused the emissions, making radon pretty useless as a

predictor. Choices (B), (C), and (D) wouldn't help unless researchers took measurements before the earthquake.

40. **H.** Reading through the studies, you don't get a sense of any findings that are *conclusive.* The inclusion of this debatable word in Choice (F) is a big clue that the answer is wrong. Choice (G) is contrary to the findings of Study 2, which show a definite association between earthquake sites and higher radon emission readings. That leaves Choices (H) and (J). The scatter plot in Study 2 graphs the results of Study 1. The graph shows that, generally, as the magnitude of the earthquake increases so does the average differential of the radon emission readings. So Choice (H) is right. You can cross out Choice (J) because the graph shows a positive correlation rather than a negative one. A negative relationship would be if the differential went down as the magnitude increased.

Writing Test

Sample response

Whether ads promoting unhealthy foods should be allowed in a school setting is the issue at hand. With $200,000 in funding at stake for the school, the opinions vary. Those who argue that ads promoting poor eating habits are inappropriate for school property make a good point. Schools are supposed to educate students, whether that be about algebra and geometry or healthy choices. However, in the absence of other forms of funding, schools will have a better chance to provide a good education if they take advantage of the significant revenue available from advertisers.

No one will argue that soft drinks and chips are healthy substances for teens, and in an ideal world, schools should take the high road and prohibit the advertisement of junk food on their campuses. Our world is not ideal, though. Public schools are dependent on funds allocated by state governments. Many are funded by property taxes, and when tax revenues fall, schools suffer. Without proper funding, schools are unable to update their technology and pay quality teachers. Receiving payments from private companies allows schools to invest in resources that benefit students and enhance their future opportunities. Additionally, high school students don't live in a vacuum. Ads promoting all kinds of unhealthy options bombard them daily through TV ads, pop-ups in social media, and billboards along the roads and at bus stops. It isn't as though a lack of advertising at school will keep them from indoctrination. While soft drinks are indeed unhealthy, students will consume what they want to, whether they see an ad posted at school or somewhere else, so the school may as well reap the monetary benefits.

Ideally, schools should find advertisers that promote healthy living, but unless such companies are willing to pay the same fee as junk food promoters, schools should choose the companies that provide the most

revenue. Until an alternative advertiser comes along, schools shouldn't suffer because some people fear their kids will be encouraged to drink soda. Parents with these concerns are able to choose to keep soda out of their homes, and schools can use some of the ad revenue to integrate programs that encourage healthy eating into the curriculum.

In short, allowing the ads to be posted isn't an ideal solution, but it may well be "the lesser of two evils." And at least this "evil" comes with an added benefit in the form of increased funding for the school.

Mathematics Test

1. B. Substitute $x = -3$ into the expression $2x^2 - 5x + 1$. First calculate $(-3)^2$ which equals 9. Then substitute: $2(9) - 5(-3) + 1 = 18 + 15 + 1 = 34$.

2. G. To find 40% of 250, convert the percentage to a decimal (0.40) and multiply: $0.40 \times 250 = 100$.

3. C. Solve the equation $3y - 7 = 14$ by first adding 7 to both sides to get $3y = 21$, then dividing both sides by 3 to get $y = 7$.

4. J. A 60% markup means adding 60% of the wholesale cost to the original price. Calculate $0.60 \times \$25 = \$15$ as the markup amount. The retail price is $\$25 + \$15 = \$40$.

5. A. Use the slope formula $m = (y_2 - y_1)/(x_2 - x_1)$ with points (-2, 5) and (4, 17). Substituting gives $m = (17 - 5)/(4 - (-2)) = 12/6 = 2$.

6. H. To solve $3x + 2 = 5x - 8$, subtract $3x$ from both sides to get $2 = 2x - 8$. Add 8 to both sides to get $10 = 2x$. Divide by 2 to get $x = 5$.

7. D. The area of a triangle is calculated using the formula $A = (1/2) \times \text{base} \times \text{height}$. Substituting the given values: $A = (1/2) \times 12 \times 8 = 48$ cm^2.

8. F. Distribute 3 through $(x - 4)$ to get $3x - 12$, and distribute 2 through $(x + 1)$ to get $2x + 2$. Combining these gives $3x - 12 + 2x + 2 = 5x - 10$.

9. B. Substitute $x = 4$ into the function $f(x) = x^2 - 3x + 2$. This gives $f(4) = (4)^2 - 3(4) + 2 = 16 - 12 + 2 = 6$.

10. G. First evaluate the expression inside the absolute value: $7 - 12 = -5$. The absolute value of -5 is 5, since absolute value converts any number to its positive equivalent.

11. C. Using the inclusion-exclusion principle, the number of students playing at least one sport is $15 + 25 - 8 = 32$ (we subtract 8 because those students were counted twice). Therefore, the number playing neither sport is $40 - 32 = 8$.

12. H. The circumference of a circle is given by $C = 2\pi r$. Substituting $r = 9$ and $\pi \approx 3.14$ gives $C = 2 \times 3.14 \times 9 = 56.52$ inches.

13. A. If 2/3 of a number equals 18, set up the equation $(2/3)n = 18$. Multiply both sides by 3/2 to isolate n: $n = 18 \times (3/2) = 27$.

14. J. The expression $x^2 - 16$ is a difference of squares that factors as $(x + 4)(x - 4)$. Both $(x + 4)$ and $(x - 4)$ are factors, making $(x + 4)$ the correct answer from the choices given.

15. D. The perimeter of a rectangle is $P = 2(\text{length} + \text{width})$. Substituting the given dimensions: $P = 2(15 + 8) = 2(23) = 46$.

16. F. For direct variation, $y = kx$ where k is the constant of variation. Using $y = 12$ when $x = 4$, we get $12 = k(4)$, so $k = 3$. When $x = 7$, $y = 3(7) = 21$.

17. B. Evaluate each square root separately: $\sqrt{81} = 9$ and $\sqrt{49} = 7$. Therefore $\sqrt{81} - \sqrt{49} = 9 - 7 = 2$.

18. G. In the expression $5x^2 - 3x + 7$, the coefficient is the number multiplied by the variable. The coefficient of x is -3.

19. C. Average speed equals distance divided by time. The car traveled 180 miles in 3 hours, so the average speed is $180 \div 3 = 60$ miles per hour.

20. H. Calculate 3^4 by multiplying 3 by itself four times: $3 \times 3 \times 3 \times 3 = 81$.

21. A. Let the three consecutive integers be n, n+1, and n+2. Their sum is $n + (n+1) + (n+2) = 60$. Simplifying: $3n + 3 = 60$, so $3n = 57$, and $n = 19$.

22. F. The two points (3, 7) and (3, -2) have the same x-coordinate, so they lie on a vertical line. The distance between them is the difference in y-coordinates: $|7 - (-2)| = |9| = 9$.

23. D. Use FOIL to expand $(x + 5)(x - 3)$: First: $x \cdot x = x^2$; Outer: $x \cdot (-3) = -3x$; Inner: $5 \cdot x = 5x$; Last: $5 \cdot (-3) = -15$. Combining gives $x^2 - 3x + 5x - 15 = x^2 + 2x - 15$.

24. H. The shaded area equals the area of the square minus the area of the inscribed circle. If the square has side s, the circle has radius s/2 (since it's inscribed). So $144 - 36\pi = s^2 - \pi(s/2)^2 = s^2 - \pi s^2/4$. Testing $s = 12$: $144 - \pi(36) = 144 - 36\pi$ ✓. The diagonal of a square with side 12 is $12\sqrt{2}$.

25. D. In the original triangle, the angles are 20°, 40°, and the third angle which must be $180° - 20° - 40° = 120°$. The geometric configuration shows internal divisions where angle x appears three times. Using angle relationships in the subdivided triangles and the fact that angles around a point sum appropriately, $3x = 120°$, so $x = 40°$.

26. G. If $\log_3(x) = 4$, then by the definition of logarithm, $3^4 = x$. Calculate $3^4 = 3 \times 3 \times 3 \times 3 = 81$.

27. B. First arrange the numbers in order: 3, 5, 7, 8, 9, 12, 15. The median is the middle value (the 4th value out of 7 values), which is 8.

28. J. The total number of marbles is $6 + 4 + 5 = 15$. The probability of selecting a blue marble is the number of blue marbles divided by the total: 4/15.

29. C. For a right triangle, $\sin^2(\theta) + \cos^2(\theta) = 1$. If $\sin(\theta) = 0.6$, then $(0.6)^2 + \cos^2(\theta) = 1$, so $0.36 + \cos^2(\theta) = 1$. Therefore $\cos^2(\theta) = 0.64$, and $\cos(\theta) = 0.8$ (positive since θ is acute).

30. F. Solve the inequality $3x - 7 > 8$ by adding 7 to both sides: $3x > 15$. Divide both sides by 3: $x > 5$.

31. B. First verify this is a right triangle using the Pythagorean theorem: $7^2 + 24^2 = 49 + 576 = 625 = 25^2$. The right angle is at Y. For angle Z, $\tan Z$ = opposite/adjacent = XY/YZ = 7/24.

32. H. To add matrices, add corresponding elements. A + B = [3+2 2+1; 1+3 4+2] = [5 3; 4 6].

33. A. This is an arithmetic sequence with first term 5 and common difference 3. The nth term is given by $a_n = a_1 + (n-1)d$. For the 8th term: $a_8 = 5 + (8-1)(3) = 5 + 21 = 26$.

34. G. The volume of a cylinder is $V = \pi r^2 h$. Substituting r = 4 and h = 10: $V = 3.14 \times (4)^2 \times 10 = 3.14 \times 16 \times 10 = 502.4$ cm³.

35. D. Substitute x = 5 into $(2x - 3)^2$. First calculate 2(5) - 3 = 10 - 3 = 7. Then square: $7^2 = 49$.

36. F. The expression $(x - 3)/(x^2 - 9)$ is undefined when the denominator equals zero. Factor the denominator: $x^2 - 9 = (x + 3)(x - 3)$. This equals zero when x = 3 or x = -3.

37. C. If the angles are in ratio 2:3:5, let them be 2k, 3k, and 5k. Their sum is 180°: 2k + 3k + 5k = 180°, so 10k = 180° and k = 18°. The largest angle is 5k = 5(18°) = 90°.

38. J. For $f(x) = x^2 + 1$, since $x^2 \geq 0$ for all real x, we have $x^2 + 1 \geq 1$. Therefore, the range is $y \geq 1$.

39. A. If 5^(2x) = 125, recognize that $125 = 5^3$. So $5^{(2x)} = 5^3$, which means 2x = 3, and therefore x = 3/2.

40. H. The volume of a cone is $V = (1/3)\pi r^2 h$. Substituting r = 6 and h = 8: $V = (1/3) \times 3.14 \times (6)^2 \times 8 = (1/3) \times 3.14 \times 36 \times 8 = 301.44$ cm³.

41. B. Simplify √50 by finding perfect square factors. Since 50 = 25 × 2, we have $\sqrt{50} = \sqrt{(25 \times 2)} = \sqrt{25} \times \sqrt{2} = 5\sqrt{2}$.

42. G. For three points to be collinear, they must have the same slope between any two pairs. The slope between (5, 7) and (8, 13) is (13-7)/(8-5) = 6/3 = 2. The slope between (2, k) and (5, 7) must also equal 2: (7-k)/(5-2) = 2, so 7-k = 6, and k = 1.

43. D. The sum of interior angles of a polygon with n sides is (n-2) × 180°. For a pentagon (n = 5): (5-2) × 180° = 3 × 180° = 540°.

44. F. First evaluate $g(2) = 2^2 = 4$. Then evaluate f(4) = 3(4) - 2 = 12 - 2 = 10.

45. C. Point X is the center where diagonals intersect. Since GX = 4, the full diagonal GC = 2 × 4 = 8. The 30° angle at G is between the base and the diagonal. Using the 30° angle: tan(30°) = width/length = $1/\sqrt{3}$, so width = length/√3. The diagonal satisfies $\text{width}^2 + \text{length}^2 = 64$. Substituting: $(\text{length}/\sqrt{3})^2 + \text{length}^2 = 64$, which gives $\text{length}^2/3 + \text{length}^2 = 64$, so $4\text{length}^2/3 = 64$, and $\text{length}^2 = 48$. Therefore length = 4√3 and width = 4. The area is 4√3 × 4 = 16√3.