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

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

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

- 1. Simulate test day as much as possible when proctoring tests.** Students will benefit from a testing experience that closely simulates what they will experience on test day. They will feel more confident if they know what to expect.
- 2. Follow up when you receive your data.** Use the reports you receive from Cambridge to cover the items your class struggled as a group to answer (see the Error Analysis report). Taking this step within two weeks of administering the test will ensure that your students haven't forgotten the items you cover and will be able to learn from their testing experiences.
- 3. Use the Pre-Assessment Item references in the *Victory* lesson to illustrate key points.** Your teacher's guide includes references to items on your pre-assessment that you can use as additional examples. Keep a copy of your pre-assessment test booklet handy so that you can cover these items with your students. Using pre-assessment items as additional examples helps students connect the concepts you are teaching with their test-day experiences.
- 4. Don't forget to review the wrong answers.** Many explanations in this Navigator packet include references to each wrong answer choice. Students will benefit from reviewing why each wrong answer is wrong so that they can recognize what makes the right answer correct and use the process of elimination to eliminate similar wrong answers in the future.
- 5. Pay attention to item categories.** Each item in this Navigator packet includes a category path that corresponds to the course concept outline in your *Victory* text as well as the categories listed in the Item Index of your *Victory* text. Use the Item Index to identify items students can use for further practice.

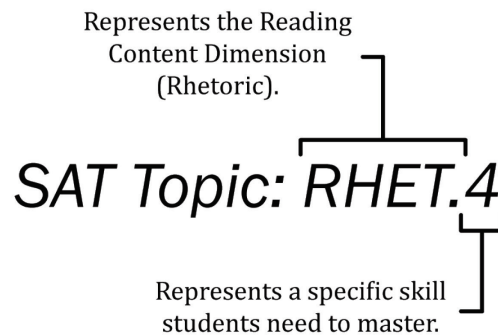
Category Paths and SAT Topics

Throughout these explanations, each item is categorized in two ways. First, each explanation includes a **Cambridge Category Path** which links the item to the Course Concept Outline in Cambridge's *Victory* series. For example:

Math: Multiple-Choice/Geometry/Triangles/Pythagorean Theorem

An item with this particular category path is found in the Math Test (these items have a Level 1 label of "Math: Multiple-Choice" or "Math: Student-Produced Response") and tests students' knowledge of geometry (Level 2 of the category path), more specifically of triangles (Level 3), and even more specifically of the Pythagorean theorem (Level 4). The *Victory* Math Lessons include a section on the Pythagorean theorem, which you can find by referencing the Course Concept Outline at the beginning of the mathematics section in the *Victory* book. Additionally, you can find items testing geometry, triangles, or the Pythagorean theorem using the Item Index at the end of the *Victory* Student Text and Teacher's Guide.

Second, each explanation includes an **SAT Topic** references a specific topic identified as tested on the SAT by the College Board. You can find items testing this SAT Topic using the searchable index available on the Teacher Resource Center (www.cambridgevictory.com). Here is an example of an SAT Topic reference:





Reading

- (C) Reading/Literary Fiction/Development. SAT Topic: RHET.2a.** In lines 9–10 of the passage, the narrator states that his “motives in this undertaking are not entirely clear.” He then goes on to question why he has chosen the North Pole, of all places, in his adventurous undertaking. By the end of the passage, however, he has come to an understanding as to why he’s venturing forth to the North Pole: he is not “on the brink of knowing . . . an ephemeral mathematical spot [the North Pole] but [himself]” (lines 56–57). So, over the course of the passage, he has moved from uncertainty about his motives for undertaking this journey to recognition of them, (C). As for the other choices, though the narrator does mention frightening aspects related to his journey (the likelihood of death, corpses, shipwrecks, etc.), he doesn’t seem afraid of them; he is merely recognizing that the journey is hazardous. So (A) is incorrect. As for (B), the narrator seems confident in his abilities throughout the passage; he states that he has “converted the machinery of [his] fate into the servant of [his] will” and that he knows exactly how to pilot the balloon (lines 24–25), which makes (B) incorrect as well. Finally, the narrator never shows disdain for the North Pole, (D). Instead, he is eagerly anticipating his travels, though he is initially not quite sure why.
- (D) Reading/Literary Fiction/Textual Evidence. SAT Topic: INFID.2.** As mentioned in the previous item, it is in lines 56–57, (D), that the narrator declares he finally knows his motives for traveling to the North Pole. None of the other choices are supported by the passage.
- (D) Reading/Literary Fiction/Vocabulary. SAT Topic: SUM.2.** When the narrator is talking about something being “not readily verifiable,” he is speaking about his emotions related to his trip. The narrator says that he feels “a yearning that is simultaneously a pleasure and a pain” (lines 2–3) but that he doesn’t yet know what this yearning means. So the correct answer to this item will be something that echoes that idea of confusion, and (D) fits nicely: the narrator doesn’t completely understand his emotions about going on this trip. The other choices don’t make sense in context.
- (C) Reading/Literary Fiction/Implied Idea. SAT Topic: INFID.1b.** “Destiny” (line 11) is a key word for this item. When a person believes in destiny, they believe that their lives have a predetermined course set by forces outside their control. This idea is echoed by (C): the narrator believes that these forces have set him on this course and have moved his life to make sure he is taking this particular journey. As for the other choices, though the narrator mentions destiny working in secret in lines 10–13, the secrecy refers to the “machinery of . . . destiny” (lines 10–11), not to the narrator himself, so (A) is incorrect. As for (B), believing in destiny would probably lend itself to the idea that the narrator doesn’t always think in a methodical and scientific manner. Finally, (D) is incorrect because though two lengths of time are mentioned (years and a lifetime), they are mentioned merely to emphasize that the narrator’s destiny has been guiding him throughout his whole life to this journey to the North Pole.
- (A) Reading/Literary Fiction/Explicit Detail. SAT Topic: INFID.1a.** The narrator states quite explicitly what the fates of other North Pole explorers have been in lines 20–21: no one has made it to the North Pole, and many have died in the attempt. No discoveries are mentioned, so (A) is incorrect. The exact location of the North Pole is, in fact, known (the narrator describes it as “an ephemeral mathematical spot” in line 57), so (C) is also incorrect. And the motivations of the previous explorers are never mentioned in the passage, so it would be impossible to know whether their motivations are different from the narrator’s, which makes (D) incorrect as well.
- (A) Reading/Literary Fiction/Textual Evidence. SAT Topic: INFID.2.** In lines 20–21 the narrator states that previous explorers have failed to reach the North Pole and have died, so (A) is correct. None of the other choices are supported by the passage.

7. **(B) Reading/Literary Fiction/Voice. SAT Topic: RHET.3.** Let's take the first half of each answer choice and see if we can eliminate any wrong answers just on the basis of the first half alone.
- (A) Immoral: Nothing in the passage suggests that the narrator views his expedition as an unethical one. In line 40, he does mention a "lust for knowledge," but "lust," as used in this case, doesn't mean something immoral or unethical. So (A) can be eliminated.
 - (B) Absurd: Something that is absurd is illogical or contrary to reason. And the narrator does seem to think his journey is somewhat illogical; after all, the narrator emphatically states that the North Pole lacks any real use—you can't eat it or travel on it like a railway (lines 28–31). (B), then, is a possible correct answer.
 - (C) Socially beneficial: In lines 31–34, the narrator does mention that some ministers have said that it's beneficial to the soul to travel to the poles, but that seems to be more of a personal benefit than a social one, so (C) can be eliminated, too.
 - (D) Scientifically important: The narrator states that "no one but a Swedish madman could take the slightest interest in [the North Pole]" (lines 48–49), so it seems he doesn't see the North Pole as worthy of scientific interest. (D) can be eliminated.

Only (B) is left as a possible correct answer. Does the second half work, too? Does the narrator view his expedition as necessary? Line 37 seems to support this: the North Pole is something hard to attain but that must "nevertheless be sought for."

TIP Voice items that have, essentially, two selections for each answer choice give students double the opportunities to eliminate wrong answers; if students can eliminate one selection within an answer choice as being definitely wrong, the whole answer choice can be eliminated.

8. **(D) Reading/Literary Fiction/Implied Idea. SAT Topic: INFID.1b.** In the explanation for (B) in the previous item, the lines in question show that the narrator thinks the North Pole lacks any real use. After all, it doesn't provide any sustenance to life (you can't eat it) or enable people to travel from place to place (you can't ride on it like you could a train). So it's inferable that the narrator doesn't think that reaching the North Pole will benefit humanity like food or a train do, (D). As for (A), though the narrator is traveling by balloon and that is, like a train, a mode of transportation, the narrator is not discussing balloons in the lines in question but the North Pole. As for (B), the distance to the North Pole is not the issue here but the North Pole's benefit to mankind. And as for (C), lines 30–31 don't have anything to do with what people consider as they travel from place to place.
9. **(D) Reading/Literary Fiction/Vocabulary. SAT Topic: SUM.2.** The thing which the narrator thinks no one but a madman would "take the slightest interest in" is the North Pole. He describes it as a "featureless wasteland" that stretches for "hundreds of miles" (lines 46–47). There is "exactly nothing" (line 44) there that would induce anyone in their right mind to go there. In other words, it is a place that most people would have no curiosity about visiting since there is nothing to see. That makes (D) the correct answer. None of the other choices work in context.
10. **(A) Reading/Literary Fiction/Vocabulary. SAT Topic: SUM.2.** When the narrator uses the word "bearing" in line 50, he uses it in reference to the wind. The wind, he says, is coming up from the south and "bearing" him toward the north. "Moving" would probably be a good choice, but "carrying," (A), works just as well. The wind is carrying him northward; it is not affecting, yielding, or enduring him northward.
- TIP** Another alternative way to solve some Vocabulary items is to plug each answer choice into the sentence in question and see if any don't make sense in context.
11. **(C) Reading/Social Studies/Main Idea. SAT Topic: INFID.3.** The first paragraph discusses some of the trends of demographic inversion in various areas of the country and points out at the end that demographic inversion does not equal population growth; the two are distinct. So which of the answers fits that description just right? (C) best illustrates this summary and is the correct answer. As for the



other choices, (A) contradicts the paragraph; lines 3–5 state that there was no “evidence of a middle-class stampede to the nation’s cities.” As for (B), the 2010 census is a good instrument for measuring *population growth* but not *demographic inversion* (see lines 11–13). As mentioned earlier, the two are different. Finally, as for (D), the author mentions that some cities and suburbs gained population while other lost it; there has not been an overall trend toward cities increasing and suburbs decreasing.

TIP The Goldilocks Rule is a good technique for answering many Main Idea items. The correct answer will be neither too big (more than the scope of the paragraph or passage) nor too small (a detail perhaps mentioned in the paragraph), but just right.

12. **(D) Reading/Social Studies/Explicit Detail. SAT Topic: INFID.1a.** In lines 15–17, the author mentions that a very powerful demographic event of the 2000s was the exodus of African Americans from cities, which makes (D) the right answer. (The movement of immigrants is also mentioned as an important demographic event, but they are mentioned in the context of settling in suburbs, not in having moved from inner cities to settle in suburbs, which is why (B) is incorrect.)
13. **(A) Reading/Social Studies/Vocabulary. SAT Topic: SUM.2.** When the author mentions the word “flat” in line 34, he is discussing three types of cities in which demographic inversion can occur: in cities whose population is increasing, in cities whose population is decreasing, and in cities whose population numbers are “flat.” Given this context, “flat” must mean something like “stays the same” or “doesn’t change,” and “static,” (A), most closely matches this meaning. As for the other choices, it doesn’t make sense to say that population numbers are deflated, (B); featureless, (C); or obscure, (D).
14. **(B) Reading/Social Studies/Explicit Detail. SAT Topic: INFID.1a.** The author mentions financial problems in the second paragraph (lines 36–47) of the passage. In fact, the very first sentence of this paragraph provides the answer for this item—major cities in the United States are experiencing financial problems because of “public pension obligations . . . incurred in the more prosperous years of the past two decades” (lines 37–39). (B) echoes this statement. None of the other choices are mentioned in the passage.
15. **(A) Reading/Social Studies/Textual Evidence. SAT Topic: INFID.2.** As mentioned in the previous item, the second paragraph (lines 36–47) discusses financial problems. That eliminates (D) as a possible right answer. And later in the explanation for the previous item, the first sentences (lines 36–39) are cited as specifically answering the question. So (A) is the correct answer.
16. **(C) Reading/Social Studies/Implied Idea. SAT Topic: INFID.1b.** The only place the author mentions the year 1974 is in line 65. Reading the entire sentence, it becomes clear that some characteristic described by Burgess of 1925’s urban America is the same for 1974’s urban America. This sentence doesn’t provide any other clues, so we’ll have to read a little more. In the preceding paragraph (lines 54–63), we learned that Burgess is a sociologist who said there were four urban and suburban zones that characterized America’s cities in 1925. And in lines 66–71, we learn that cities in 1974 had the same four districts Burgess mentioned. So (C) is the correct answer. As for the other choices, the flight of minorities to the suburbs is mentioned in the first paragraph (lines 14–19), and that is a demographic event that took place in the 2000s, not 1974, so (A) is incorrect. (B) is also mentioned as taking place in the last decade: in lines 80–84, the author describes cities that have no factory districts next to their commercial districts. Finally, demographic inversion is also mentioned as taking place recently; though it may have taken place in 1974, that is not supported by the passage, so (D) is incorrect as well.
17. **(C) Reading/Social Studies/Textual Evidence. SAT Topic: INFID.2.** The four zones of settlement mentioned in the previous item describe cities as Burgess saw them in 1925. It is not until paragraph five (lines 64–79) that the author shows that cities in 1974 had the same four zones of settlement, and that is mentioned most specifically in lines 66–71, (C).

18. (A) *Reading/Social Studies/Vocabulary. SAT Topic: SUM.2.* When the author uses the word “conducted” in line 68, he is discussing the fact that almost all cities in America in 1974 had a downtown area in which business took place. “Carried out,” (A), is a good synonym for “took place” or “conducted.” As for the other choices, though all could be used at some point to refer to commercial life and what that entails, none of them make sense in the context given.
19. (B) *Reading/Social Studies/Data Presentation. SAT Topic: SYN.2.* Since the two charts shown on page 5 will be used to answer the next three items, it would probably make sense to summarize quickly the information presented. Chart 1 simply shows how 2010 populations are allocated by metro size; the largest metropolitan areas had the largest percentage of the national population (65.6%), while the non-metro areas had the smallest percentage of the national population (16.4%). Chart 2 is a little more involved. It is once again divided by metropolitan size (large, small, and non), but it is also divided by years (1980–1990, 1990–2000, and 2000–2010). And it would seem that all types of metro areas experience a growth in population from 1990–2000 and then a decline from 2000–2010.

With this basic understanding of the graphs, we can now consider the question. For this item, on a surface level, it would seem that the author of the passage would agree with (or at least not disagree with) the data presented in the first chart. The chart essentially provides census information, and the author does mention the 2010 census in lines 3–5. So (D) can be eliminated. However, later in the first paragraph, the author states that he considers “raw census number [to be] an ineffective blunt instrument” (lines 12–13). And the choice that best reflects this opinion is (B). It is unlikely that the author would consider the chart’s information to be either excellent, (A), or compelling, (C).

TIP Before answering any Data Presentations items, it’s important to understand, at least rudimentarily, what the data presentations mean. Have students take a moment to review the graphs, charts, and pictures for a quick understanding before moving on to the items.

20. (A) *Reading/Social Studies/Data Presentation. SAT Topic: SYN.2.* Process of elimination (POE) would be a good choice for answering this item. Which answer choice best supports the information in chart 2?

(A): As mentioned in the chart overview in #19, all types of metro areas experienced a growth in population in the 1990s and then a decline in the 2000s. So (A) is correct. (At this point in the test, just fill in (A) and move on, but for the purposes of this explanation, we’ll review all answer choices.)

(B): The small metropolitan areas actually experienced *less* growth than the large metropolitan areas during the 2000s. The large metro areas saw a growth of 10.9%, while small metro areas saw a growth of only 10.3%. So (B) is incorrect.

(C): (C) compares the growth of small metro areas in the 1980s and in the 2000s. Small metro areas experienced a growth of 8.8% in the 1980s and a growth of 10.3% in the 2000s. So those areas actually experienced an increase in population, not a decline, which makes (C) incorrect.

(D): Large metro areas experienced a growth of 10.9%, while non-metro areas experienced only 4.5% growth. Those numbers are nowhere close to each other, so (D) is incorrect as well.

That confirms that (A) is the correct answer.

TIP Process of elimination (POE) is one of the best tools for answering Reading items. If even one answer choice can be eliminated, that improves students’ chances of getting the right answer, even if it’s a guess.

21. (D) *Reading/Social Studies/Data Presentation. SAT Topic: SYN.2.* This Data Presentation item is a little trickier than the previous one, but once again, POE is a good choice for answering Data Presentation items. Let’s take each answer choice one at a time.

(A): “Metropolitan” generally means a city (or the urban area) and its surrounding areas (suburban areas). Chart 2 only groups areas by metropolitan size and doesn’t differentiate between urban and



suburban areas within those metropolitan areas. It's impossible to tell if people moved from suburban to urban areas, or vice versa, so (A) is incorrect.

(B): Growth rates actually rose in small metropolitan areas from the 1980s to the 1990s (8.8% to 13.1%), so (B) is incorrect.

(C): Although chart 2 shows total population growth rates in different metro areas, it doesn't show if people moved from one area to another. The population boom could well be from skyrocketing childbirth rates. There is not enough information in the graph to support (C), so it is incorrect as well.

(D): All of the metro areas showed growth from the 1980s to the 1990s. Large metro areas grew from 12.5% to 14.3%, small metro areas grew from 8.8% to 13.1%, and non-metro areas grew from 1.8% to 9.0%. So it would not be unreasonable to assume that the US population grew as a whole from the 1980s to the 1990s, which makes (D) the correct answer.

22. (A) *Reading/Natural Sciences/Main Idea*. SAT Topic: INFID.3. A quick summary of the passage can help determine the correct answer to this item. In the first paragraph, the author introduces the concept of “pharming,” in which scientists alter a few genes to turn animals into “living pharmaceutical factories” (lines 10–11). Then in the second paragraph, the author gives a little background into the creation of the first transgenic animals in the 1980s and the connection made between these animals and their potential for creating “healing human proteins in their milk” (lines 28–29). In the third and fourth paragraphs, the author describes a recent use of pharming by GTC Biotherapeutics to create an anticlotting drug from transgenic goats. And (A) best fits with this development: the author presents the background of pharming in the context of GTC’s goat drug. As for the other choices, the author briefly mentions some research done by scientists but doesn’t evaluate it or summarize it, so (B) and (C) are incorrect. And (D) is incorrect because although the author does discuss the development of pharming, that is only one small part of the passage and not its primary purpose.
23. (C) *Reading/Natural Sciences/Voice*. SAT Topic: RHET.3. Throughout the passage, there is a feeling of positivity toward pharming. The author mentions a company that is “delivering on [the] dream” of creating “genetically engineered animals that saved human lives” (lines 7–8); “dream” definitely has a positive connotation. The author also mentions “good medicine” (line 13), “healing human proteins” (line 28) that could be produced by genetically modified animals, and states, “*Et voila*—human medicine!” in reference to ATryn. “Appreciation,” (C), seems to fit best with this attitude. There is really nothing in the passage to suggest that she is apprehensive, (A), or ambivalent (having mixed feelings), (B). “Astonishment,” (D), is the second-best answer—you could perhaps argue that the author is astonished by how pharming creates medicine—but “appreciation” is a better choice. The author doesn’t use diction that would necessarily support the idea that she is astonished by pharming.
24. (C) *Reading/Natural Sciences/Vocabulary*. SAT Topic: SUM.2. The author uses the term “expert” to refer to dairy animals, saying that they are “expert protein producers.” This production of proteins is something these dairy animals do naturally and do well. “Capable,” (C), which means competent or efficient, fits nicely here. It doesn’t make sense to say a dairy animal is a knowledgeable, professional, or trained protein producer.
25. (B) *Reading/Natural Sciences/Implied Idea*. SAT Topic: INFID.1b. The author mentions the transgenic experiments of the 1980s and ‘90s in the third paragraph. She states that scientists created transgenic animals that were able to make milk with human proteins. However, these studies were “lab-bound thought experiments come true” (line 36), which meant that they never made it past the laboratory doors. They were merely intended to prove the scientists were able to create these proteins in transgenic animals and not to actually provide drugs useful to humans. This goes along with (B), which is the correct answer. (C) is perhaps the second-best choice; the author mentions GTC Biotherapeutics as the company that finally took the thought experiments out of the laboratory and into the real world. However, nothing in the passage suggests that after GTC’s identification of the anticoagulant compound, the research ceased. So (C) is also incorrect. As for (A), expense is never mentioned in the passage. And as for (D), the author mentions mice, pigs, and rabbits in line 33 in addition to cows, goats, and sheep as animals the scientists focused on in their studies.

26. (C) *Reading/Natural Sciences/Textual Evidence*. SAT Topic: INFID.2. As mentioned in the previous item, lines 35–36 state that the experiments were initially nothing more than “lab-bound thought experiments come true,” which makes (C) the correct answer. None of the other choices provide the necessary evidence.
27. (A) *Reading/Natural Sciences/Explicit Detail*. SAT Topic: INFID.1a. In lines 39–40, antithrombin is defined as an anticoagulant, or something that prevents blood clots. It acts this way by “escorting [clot-forming compounds] out of the bloodstream” (lines 43–44). So (A) is true. As for (B), the genetic mutation related to antithrombin is mentioned in lines 44–46 as a mutation that prevents some people from producing antithrombin; the antithrombin doesn’t stem from that genetic mutation. As for (C) and (D), promoters are mentioned in lines 63–65 as being separate from the antithrombin gene (though paired with it for the purposes of the experiment) and also as being naturally produced in goats’ mammary glands during milk production.
28. (B) *Reading/Natural Sciences/Textual Evidence*. SAT Topic: INFID.2. The place where antithrombin’s purpose is defined is in lines 42–44 of the passage (see previous explanation). That means (B) is the correct answer.
29. (B) *Reading/Natural Sciences/Explicit Detail*. SAT Topic: INFID.1a. During the discussion about the female goats, the author mentions that after their kids were born, only *some* of the kids were transgenic and had the necessary antithrombin gene. That means that some of the kids were not transgenic and *didn’t* have the antithrombin gene, (B). As for the other choices, (A) is incorrect because the goats’ kids were the ones with the antithrombin gene, not the female goats themselves. The promoter in the female goats’ milk reacted with the transgene within the kids; the female goats didn’t actually produce antithrombin when they lactated. (C) is incorrect because microinjection is mentioned in lines 55–56 as a technique already used to create GloFish and AquAdvantage salmon, so the goats were not the first to have it used on them. And (D) is incorrect because the only gene mentioned in the last paragraph is human antithrombin, and that is something that humans, and not goats, have.
30. (D) *Reading/Natural Sciences/Development*. SAT Topic: RHET.4. The parenthetical information in lines 63–64 is used after the word “promoter,” which in this context is not something most readers would be familiar with. The parenthetical material serves to define “promoter” to make its purpose clear to the reader. Thus, (D) is the correct answer. The parenthetical material does not illustrate an abstract concept, (A); describe a new hypothesis, (B); or clarify a claim, (C).
31. (D) *Reading/Natural Sciences/Vocabulary*. SAT Topic: RHET.1. When the phrase “liquid gold” is used in line 71, it is preceded by a brief discussion about how human medicine is extracted from goat’s milk and followed by a reference to ATryn, which is the name GTC gave to this drug. Since gold is a very valuable substance, it is inferable that ATryn has also proved very valuable to GTC, which means (D) is the correct answer. As for the other choices, “liquid gold” generally refers to something that makes money, not something that has cost someone a lot of money, so it’s unlikely that the author would use the phrase in reference to money GTC spent on microinjection, (A). As for (B), the author uses “liquid gold” to reference the drug made from the protein extracted from goat’s milk, not to reference the amount of goat’s milk produced. And as for (C), whether or not transgenic goats will be valuable to dairy farmers (as opposed to scientists or pharmaceutical companies) is not a point made anywhere in the passage.
32. (D) *Reading/Social Studies/Implied Idea*. SAT Topic: INFID.1b. It is in the second paragraph of Passage 1 that Burke discusses the idea of a person’s contract with society. He mentions that a societal contract is more than an agreement made between trade partners; it is something that “is to be looked on with . . . reverence” (lines 24–25). Later in the paragraph, he also mentions that this partnership is something that must exist between “those who are living, those who are dead, and those who are to be born” (lines 32–34). So this contract is both serious (reverence) and permanent (between everyone who existed, is existing, and will exist), (D). The idea of brevity goes directly against the idea of a contract between society and everyone who will ever live or has ever lived in that society, so (A) is incorrect. (B) could be

partly correct: societal contracts could be rigid, according to the author, since they are not “dissolved at pleasure” (line 19) or “by the fancy of the parties” (line 24). But complexity is not an idea mentioned with either societal or other sorts of contracts. As for (C), neither precision nor usefulness is ever mentioned in connection with societal or other contracts.

33. **(D) Reading/Social Studies/Vocabulary. SAT Topic: SUM.2.** It takes reading farther into Passage 1 to determine exactly what Burke means by “state,” and in lines 8–12 we are given the additional clues we need to find the correct answer: Burke likens the state to an aged parent and then goes on to lambast “children of their country who . . . hack that aged parent in pieces.” So the parent = a country = the state. And the nearest answer choice to that is that a state is a political entity, (D). None of the other choices are supported by the passage.
34. **(A) Reading/Social Studies/Vocabulary. SAT Topic: SUM.2.** The “low concern[s]” Burke discusses are trade partnerships, or contracts that deal with “objects of mere occasional interest” (line 18). So they are things that aren’t important and have no lasting value, and “petty,” (A), which means “of little or no importance or consequence,” best fits. Weak, inadequate, and depleted just don’t make sense in context.
35. **(D) Reading/Social Studies/Implied Idea. SAT Topic: INFID.1b.** In the final paragraph of Passage 2, Paine states that “[that] which may be thought right and found convenient in one age, may be thought wrong and found inconvenient in another” (lines 76–79). In other words, the important issues of yesteryear aren’t important today, and what we view as vital today may not be so fifty years down the road. (D) best reflects this point of view. As for the other choices, (A) goes mostly against the content of Passage 2; Paine seems very opposed to referencing historical precedents when determining current societal issues. (B) isn’t supported by the passage. Whether or not people comprehend historical precedents is not an issue Paine brings up. Finally, (C) is incorrect for much of the same reason as (A); Paine doesn’t seem to want people to use historical precedents since they are not relevant to today’s discussions and thus would probably hinder, and not help, human progress.
36. **(B) Reading/Social Studies/Application. SAT Topic: SYN.1.** As mentioned in the explanation to #35, Paine’s view of the political relationship between “those who are living, those who are dead, and those who are to be born” (lines 32–34) is that there aren’t, or shouldn’t be, any real political links between them. In fact, he even asks what “obligation . . . can exist between them” (lines 67–68) when some are dead and the others are not yet living that “the one should control the other to the end of time” (lines 71–72). (B) best fits this response. As for the other choices, (A) is incorrect because Paine thinks that partnerships across generations are implausible to *all* people of *all* eras. (C) is incorrect because Paine never questions whether things can be accomplished in a single generation. His only gripe with generations is that one generation can’t expect to govern a future generation. And (D) is incorrect because, according to Paine, the opinions of the dead are irrelevant about current political decisions.
37. **(D) Reading/Social Studies/Textual Evidence. SAT Topic: INFID.2.** As mentioned in the previous item, lines 67–72 provide the best guess as to how Paine might respond to Burke. That makes (D) the correct answer.
38. **(D) Reading/Social Studies/Application. SAT Topic: SYN.1.** Burke states that people do not have the right to change their government and society any time they please. That, he says, would “tear asunder the bands of their . . . community” (lines 37–38) and render it an “unsocial, uncivil, unconnected chaos” (lines 39–40). So he would disapprove of Paine’s remarks, (D). (A) is incorrect because it is too positive; after solving previous items, it has become clear that Paine and Burke would most likely disagree with each other, not approve. (B) is incorrect because Burke thinks that changing circumstances are not a part of life. He states that we want to avoid the “evils of inconstancy and versatility” (lines 1–2)—in other words, avoid change. Finally, (C) is incorrect because it is likely that, regardless of whether Paine provided examples or not, Burke would disagree with the fundamental idea behind Paine’s claims.

39. (D) *Reading/Social Studies/Textual Evidence*. SAT Topic: INFID.2. In lines 34–38, Burke discusses what he thinks would happen if people think of government as something only for the living and not for the dead or unborn: society would descend into chaos. So (D) is the correct answer. None of the other choices provide the best evidence.
40. (A) *Reading/Social Studies/Main Idea*. SAT Topic: RHET.4. Burke (Passage 1) thinks society should be left as it is, a sublime partnership between society, those who have lived in it, are living in it, and will live in it. Paine (Passage 2) believes that society’s current members should be at liberty to do whatever they want that they believe will better society, with no obligation to past or future generations. The two points of view thoroughly disagree, and that is best reflected in (A). As for the other choices, (B) is incorrect because Passage 2 never presents an alternative approach to a problem mentioned in Passage 1. In fact, it would probably not be too farfetched to say that Passage 2 thinks that the main idea of Passage 1 is the problem. (C) and (D) are both incorrect because these choices essentially say that Passage 2 supports Passage 1, and that is definitely not the case.
41. (B) *Reading/Social Studies/Main Idea*. SAT Topic: RHET.4. In Passage 1, Burke discusses the contract people inherently enter into as part of society and what he views as their obligations toward society and the other people within it. In Passage 2, Paine discusses the fact that he believes people have no right to create laws to control future generations. Both discuss the relationship between people and their government, (B). As for the other choices, neither mention particular political struggles, (A); rapid political change, (C); or governments’ duties toward their citizens, (D).
42. (C) *Reading/Natural Sciences/Main Idea*. SAT Topic: RHET.4. The passage begins by stating that approximately 750 years ago, a massive volcano erupted and triggered the Little Ice Age. However, scientists have had trouble “identifying the volcano responsible” (lines 3–4). The next two paragraphs discuss some of the features of the volcano and its eruption, and paragraphs 3–6 detail why scientists think Samalas, an Indonesian volcano, was the culprit. The final paragraph lists another possible volcano—Quilotoa—but concludes that the evidence more strongly points toward Samalas. (C) best follows this development. (A), (B), and (D) are all incorrect because they are details mentioned in the passage and not the main purpose of the passage as a whole.
43. (B) *Reading/Natural Sciences/Development*. SAT Topic: RHET.2a. The explanation for #42 details the passage’s development. The passage begins by indicating that a large unknown volcano caused a Little Ice Age. It then gives some clues about the volcano and evidence of its eruption and continues by naming Samalas as the most likely cause, which fits with (B): a description of a recorded event (Little Ice Age) to its likely cause (Simalas erupting). As for the other choices, (A) is incorrect because a scientific model is not mentioned in the passage. (C) is incorrect because, though ice core samples and measuring sulfates are both mentioned in the passage, they are details, not the focus of the passage—and there is nothing to suggest that the scientists used a new method to measure the sulfates. Finally, (D) is incorrect for much the same reason as (C)—radiocarbon dating and the examination of volcanic glass are both details in the passage and not the focus.
44. (A) *Reading/Natural Sciences/Textual Evidence*. SAT Topic: INFID.2. Lines 17–25 are the only lines in which the recorded event (the Little Ice Age) and its cause (“the mystery eruption”) are mentioned. Those lines state that Gifford Miller “strengthened the link” between the two and pinpointed a date range in which the mystery eruption occurred. All of the other choices just mention details relating to the procedure of figuring out that Samalas was a likely culprit.
45. (D) *Reading/Natural Sciences/Vocabulary*. SAT Topic: SUM.2. When the author uses the phrase “is written in” in line 6, she is discussing that evidence for the eruption of a powerful volcano is contained within the polar ice cores. So the evidence is there, and it is just waiting to be interpreted by scientists, (D). None of the other choices make sense in context.



46. (A) *Reading/Natural Sciences/Explicit Detail. SAT Topic: INFID.1a.* It is in the seventh paragraph that the author mentions a possible location for the medieval volcanic eruption; she quotes Gifford Miller, who states that “an Indonesian volcano might be the source of the eruption” since “[an] equatorial eruption is more consistent with the apparent climate impacts” (lines 61–64). That means (A) is the correct answer. As for the other choices, the author never mentions that it is probable the volcano erupted in the Arctic, (B), or in the Antarctic, (C). (D) is perhaps the next-best choice; the author mentions Quilotoa, an equatorial volcano in Ecuador, as “another possible candidate” (line 68). However, the remainder of paragraph 8 (lines 68–78) details why Samalas, the Indonesian volcano, is a better candidate than Quilotoa, so (D) is also incorrect.
47. (D) *Reading/Natural Sciences/Textual Evidence. SAT Topic: INFID.2.* As mentioned in the previous item, lines 61–64 state that the medieval volcanic eruption probably occurred in equatorial Indonesia, which makes (D) the correct answer. None of the other choices provide the necessary support.
48. (C) *Reading/Natural Sciences/Implied Idea. SAT Topic: INFID.1b.* The main point of the passage is to provide evidence for a specific volcano (Samalas) that scientists believe started the Little Ice Age. One of the reasons Samalas is a good possibility is there is proof that it erupted within the time frame required to have started the Little Ice Age (see lines 24–25 and 58–60). However, in line 68, the author mentions “another possible candidate” for the volcanic eruption: Quilotoa, which is “estimated to have last erupted between 1147 and 1320 C.E.” (lines 70–71). So scientists know of at least one other volcano that erupted during the necessary time frame that make it a good candidate, and it’s possible they know of others, (C). As for the other choices, the frequency of powerful volcanic eruptions really has no bearing on the candidacy of other volcanoes; scientists are looking for an eruption that occurred at a specific time, so (A) is incorrect. As for (B), though it is certainly true (the Little Ice Age lasted for centuries), that also has no bearing on why other volcanoes may be candidates for the eruption. Finally, as for (D), though the author does mention calderas in the fifth paragraph (lines 43–54), it is the date in which Quilotoa erupted, and not the size of its caldera, that make that volcano another possible candidate.
49. (D) *Reading/Natural Sciences/Textual Evidence. SAT Topic: INFID.2.* In the last paragraph of the passage, the author mentions Quilotoa as another possible candidate as the cause of the Little Ice Age but then goes on to give a reason why Samalas is a much better choice: the shards of volcanic glass in Quilotoa “didn’t match the chemical composition of the glass found in polar ice cores” (lines 73–74). That makes (D) the correct answer. None of the other choices provide the necessary support; indeed, none of the other choices even mention Quilotoa.
50. (C) *Reading/Natural Sciences/Data Presentation. SAT Topic: SYN.2.* This item requires us to find the point in the graph with the greatest below-average temperature variation. “Greatest” is a key word; the correct answer will be either the lowest or highest point in the graph. And since we are looking for a below-average temperature variation and the graph has negative temperature variations listed below the average of 0, the lowest point of the graph line will be the place with the greatest below-average temperature variation. That takes place around 1675 CE, (C).
51. (B) *Reading/Natural Sciences/Data Presentation. SAT Topic: SYN.2.* In lines 22–24 of the passage, the author states that “the cold summers and ice growth [of the Little Ice Age] began abruptly between 1275 and 1300 C.E.” And in the graph, the drastic decline in temperatures began a little bit before 1300 CE. So the passage and the figure both state that the onset of the Little Ice Age began just before 1300 CE, (B). None of the other choices are supported by both the passage and the figure.
52. (A) *Reading/Natural Sciences/Data Presentation. SAT Topic: SYN.2.* POE would be a good choice for this item; we can examine each answer choice and see whether the data in the figure supports it and eliminate the ones without the necessary support.

(A): The greatest cooling period (or the point in the graph with the lowest temperatures) occurred about 1675 CE, and the temperature spikes of the Medieval Warm Period occurred about 1150 and 1275. So

(A) is indeed true—the greatest cooling of the Little Ice Age occurred hundreds of years after the Warm Period’s temperature peaks.

(B): There are a few sharp temperature declines shown in the figure; however, nothing in the figure mentions or even alludes to equatorial volcanic eruptions. That is simply beyond the scope of the figure. So (B) is incorrect.

(C): (C) is wrong for much of the same reason as (B)—nothing about the data supports anything about pyroclastic flows, even though this statement may very well be true. So (C) is also incorrect.

(D): (D) is also incorrect for the same reason as (B) and (C). Radiocarbon analysis is mentioned in the passage, but we are just looking at the data in the figure. And that data does not mention or support any conclusions about radiocarbon analysis. So (D) can also be eliminated.

That means (A) is the correct answer.



Writing and Language

Passage 1

- (B) Writing and Language/Standard English Conventions/Sentence Structure/Comma Splices. SAT Topic: SEC.1a.i.** The original is wrong because it results in a comma splice. The comma immediately preceding the underlined portion cannot join together the two independent clauses in the existing construction. Since the offending comma is not part of the underlined portion, however, the second part of the sentence must be made into a dependent clause. So, (B) is the correct answer choice. The relative pronoun “which” introduces the relative clause that provides the title of the mural Siqueiros painted to celebrate tropical America (“América Tropical”). (C) fails to address the issue of the comma splice. And (D) not only fails to address the issue of the comma splice, but the phrase “titled accordingly” is not grammatically correct when used in this context; the adverb “accordingly” cannot be used to modify “América Tropical.”
- (B) Writing and Language/Expression of Ideas/Strategy/Effective Transitional Sentence. SAT Topic: EXPID.2b.** This item asks for the introductory adverb that will provide an effective transition between the third and fourth sentences of this paragraph. The third sentence states that Siqueiros painted the first two sections of the mural during the day, and the fourth sentence says that he painted the mural’s final section at night to avoid scrutiny. The adverb “however,” (B), best expresses the contradiction between these two sentences. (A) and (D) are wrong because the adverbs “also” and “moreover,” respectively, are thought-extenders and therefore fail to set up the necessary contrast between day and night. And as for (C), the adverb “although” does not express the intended contradiction but instead incorrectly suggests that Siqueiros painted at night *even though* he painted during the day.
- (B) Writing and Language/Standard English Conventions/Punctuation/Commas. SAT Topic: SEC.3e.** Remember that either a pair of commas or a pair of dashes can be used to set off an appositive. In this case, without a comma immediately following “centerpiece,” the result is an appositive that does not accurately describe the final section of the mural (“the centerpiece at night”) and a sentence that fails to express the intended contradiction established in the previous explanation. Without the comma, the sentence incorrectly suggests that Siqueiros painted the final section of the mural to avoid scrutiny. So, (B) is the correct answer choice. The section of the mural that Siqueiros painted at night is the centerpiece. As for (C), the semicolon does not close the appositive and disrupts the logical flow of the sentence. And (D) is wrong because the appositive requires two instances of the same punctuation, in this case another comma.
- (A) Writing and Language/Expression of Ideas/No Change. SAT Topic: EXPID.2b.** This item asks for the sentence that would enable the second paragraph to effectively transition from the first paragraph. The original is correct because a description of the “reason for Siqueiros’s secrecy” logically follows from mentioning that he painted the centerpiece at night to avoid scrutiny. As for the remaining answer choices, none of them demonstrate any connection to why Siqueiros painted the centerpiece at night. Additionally, as for (B), to say that “all three sections of the mural were displayed” is somewhat redundant of the fact that the mural, assumingly in its entirety, was displayed. And also, (D) makes an unsupported assumption: Siqueiros was not present when his mural was displayed.
- (D) Writing and Language/Expression of Ideas/Style/Precision. SAT Topic: EXPID.3a.** This item deals with recognizing whether the writer uses a word with a meaning that precisely fits the sentence. The original is wrong because the verb “confided” would not be used to describe the public presentation of a mural. Do not be distracted by the idea of revealing a secret; a person might confide a secret but would not confide a mural. In this context, the verb “unveiled” should be used. So, (D) is the correct answer choice. As for (B) and (C), while the verbs “promulgated” and “imparted,” respectively, both have

meanings related to the idea of making something known, they are inappropriate in this context; ideas, not physical objects, are promulgated or imparted.

6. **(B) Writing and Language/Standard English Conventions/Grammar and Usage/Verb Tense. SAT Topic: SEC.1b.i.** The original is wrong because the present participle verb “including” is inconsistent with the past tense “was dominated” used earlier in the sentence. Instead, the past tense “included” is required. So, (B) is the correct answer choice. As for (C) and (D), the present tense (“includes”) and the past perfect tense (“had included”), respectively, are inconsistent with the already established past tense.
7. **(D) Writing and Language/Standard English Conventions/Grammar and Usage/Pronoun Usage. SAT Topic: SEC.2a.i.** Remember that pronouns must have antecedents. The original is wrong because it is unclear as to what the singular pronoun “this” refers. (D) solves the problem by including the noun “movement,” which refers back to its earlier mention in the previous sentence (“civil rights movement”). As for (B), the singular pronoun “it” does nothing to address the issue of the antecedent. And as for (C), not only does the plural pronoun “them” *seem* to refer to “Mexican Americans,” which would not be the writer’s intention, but the connection between the pronoun and its antecedent is as unclear as it is in the original.
8. **(B) Writing and Language/Expression of Ideas/Organization/Sentence-Level Structure. SAT Topic: EXPID.2a.** This item asks for the best way to combine the two underlined sentences at the beginning of the fourth paragraph. The third paragraph concludes with the statement that a “new generation of artists strove to emulate the old mural masters.” In the fourth paragraph, the writer continues with a description of the art movement that resulted from this inspiration. Of the four options, (B) provides the best transition between the paragraphs. This sentence begins with an independent clause stating the name of the movement (“Chicano mural movement”) and then concludes with a dependent clause set off by a comma that describes the movement. (A) is wrong because it results in a meaning not intended by the writer; the Chicano mural movement was not an explosion but was more specifically an explosion of mural painting. As for (C), by giving priority to the description of the movement rather than to the fact that the movement resulted from a new generation of inspired artists, it does not effectively transition between the two paragraphs; additionally, the construction is passive and awkward. Finally, as for (D), while it addresses the issue of combining the two sentences, it does little else to address the awkward logic of those original two sentences.
9. **(C) Writing and Language/Standard English Conventions/Sentence Structure/Faulty Parallelism. SAT Topic: SEC.1a.iii.** This item deals with faulty parallelism. The original is wrong because the verb “painted” disrupts the series of phrases describing where the murals appeared. (C) is the correct answer choice because it results in a parallel series consisting of three prepositional phrases (“in ... lots,” “on ... buildings,” and “on infrastructure”). (B) not only fails to address the issue of faulty parallelism but also inappropriately changes the third element in the series to an independent clause. And (D) is wrong because it eliminates the prepositional phrase necessary in maintaining parallelism.

TIP When the underlined portion consists of all or a part of a series of elements, it is more than likely that the item deals with faulty parallelism.

10. **(A) Writing and Language/Expression of Ideas/No Change. SAT Topic: EXPID.2b.** This item deals with recognizing the appropriate material for an effective transitional sentence, as the question refers to the choice that “most effectively sets up the information that follows.”

TIP Use additional verbal clues, when available, to help understand the logical connection between sentences. In this case, the phrase “once again,” which suggests that the correct answer describes something that has already occurred with regard to Siqueiros’s “América Tropical,” should make clear that (B) can be eliminated.

As described by the writer, “América Tropical” *led the way* in two regards:



1. It provided “an example of how art in public spaces could be used to celebrate Mexican heritage while at the same time making a political statement.”
2. It underwent “a lengthy and complex restoration process” as part of a new group of artists’ effort to “clean, restore, and repaint” the murals.

So, (B) is wrong because “América Tropical” was not *once before* cleaned and restored; and even if it had been, it would be redundant of what is stated in the previous sentence to say so. As for (C) and (D), while “América Tropical” was *once before* “at risk of destruction” (it was “whitewashed, or painted over with white paint”) because it was unappreciated by those who commissioned the work, the sentence in question must support that the mural has undergone restoration and is receiving the appreciation that it deserves (“now a tourist attraction”). Therefore, the original must be correct. The writer says that Siqueiros’s “América Tropical” is leading the way in an effort to clean, restore, and repaint the murals; and then the writer supports that statement by saying that “América Tropical” has undergone a lengthy and complex restoration process.

11. (C) *Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material*. SAT Topic: EXPID.1b. This item asks whether the writer should add the sentence in question at the given location in the passage. The sentence immediately preceding this location mentions that the restored mural is now a tourist attraction, and the sentence immediately following says that advocates of the work hope that it will serve as an inspiration. Do not let the seemingly effective transition between the sentence under consideration (which mentions the mural’s present acclaim) and the idea of advocacy that would follow distract you. Instead, notice that this item also deals with conciseness: the year in which the mural was painted (1932), that it was once considered offensive, and that it is now appreciated are facts mentioned earlier in the passage. So, (C) is the correct answer choice. As for (A) and (B), arguments for providing historical context and a description of the initial reaction to the mural, respectively, *support* the unnecessary repetition of information. As for (D), the claim is *already* supported by the passage.

Passage 2

12. (D) *Writing and Language/Standard English Conventions/Grammar and Usage/Faulty or Illogical Comparisons*. SAT Topic: SEC.2e. The original is wrong because it illogically compares organically grown crops to the people who purchase conventionally grown crops. Instead, the writer intends to compare organically grown crops to conventionally grown crops. (D) solves the problem by deleting the underlined portion. As a result, the sentence states that “organically grown crops are more nutritious and safer for consumption than their conventionally grown counterparts.” As for (B) and (C), they both result in sentences that illogically compare organically grown crops to a money transaction.
13. (B) *Writing and Language/Standard English Conventions/Sentence Structure/Fragments*. SAT Topic: SEC.1a.i. The original is wrong because it results in a sentence fragment lacking both the subject and main verb that are necessary to have an independent clause. Who is spending this additional money in the name of health? As the sentence is written, the plural pronoun “they” does not have an antecedent. (B) solves the problem of the original by providing a subject (“consumers”) that agrees with the plural pronoun and a main verb (“spend”) that is consistent with the present tense used in the paragraph. As for (C) and (D), they both fail to address either the issue of the subject or the main verb.
14. (D) *Writing and Language/Expression of Ideas/Style/Conciseness*. SAT Topic: EXPID.3b. This item deals with conciseness, specifically wordiness.

TIP When an item deals with conciseness and the underlined portion does not seem to have any obvious errors, read through each of the four options aloud, paying attention to whether there is awkwardness, redundancy, or inefficiency.

In this case, notice that the writer used the phrases “organically grown” and “conventionally grown” earlier in the paragraph. So, (D) must be the correct answer choice. (A) is wrong because it is unnecessarily awkward and wordy. (B) is wrong because it is redundant of the description of

conventional methods that appears in the previous sentence. And (C) is wrong because it is implied that conventional growing is not organic growing.

15. **(C) Writing and Language/Expression of Ideas/Strategy/Effective Transitional Sentence. SAT Topic: EXPID.2b.** This item asks for the adverb that will provide an effective transition between what is stated in the first part of the first paragraph and what is stated in the last sentence of that paragraph. The writer establishes at the beginning of the paragraph that people believe that organically grown crops are safer and more nutritious than conventionally grown crops. The sentence in question states that scientific evidence suggests otherwise. In this context, then, an adverb is required that signals a reversal of thought. The adverb “however,” (C), expresses the appropriate transition. (A) is wrong because the adverb “therefore” incorrectly suggests a causal connection between ideas. As for (B), the adverb “furthermore,” which means “in addition,” fails to set up the necessary contrast. And (D) is wrong because the adverb “subsequently” inappropriately suggests a sequence of events.
16. **(C) Writing and Language/Expression of Ideas/Style/Precision. SAT Topic: EXPID.3a.** Just as with item #5, this item deals with recognizing whether the writer uses a word with a meaning that precisely fits the sentence. The original is wrong because the verb “preserve” would not be used to describe those advocating a particular argument. Instead, the verb “maintain” should be used. So, (C) is the correct answer choice. As for (B), while “carry on that” is idiomatic, it neither provides the precise meaning intended by the writer nor is consistent with the tone of the passage. And (D) is wrong for the same reason as is the original.

TIP Use additional verbal clues, when available, to help solve the item. In this case, notice that the phrases “preserve that” and “sustain that” are not instances of idiomatic usage.

17. **(A) Writing and Language/Expression of Ideas/No Change. SAT Topic: EXPID.2b.** Just as with item #2, this item asks for the introductory adverb that will provide an effective transition between two sentences, in this case the first and second of the second paragraph. The first sentence states that the assertion that organically grown food is healthier than conventionally grown food is not supported by scientific research, and the second sentence mentions comparative studies that support this statement. In this context, an adverb that extends the thought from sentence to sentence is required. The conjunctive adverb “for instance,” which signals an example, best accomplishes this. So, the original is correct. (B) is wrong because the adverb “however” would be used to signal a contrast. And as for (C) and (D), while the adverbs “in addition” and “likewise,” respectively, do express an extension of thought, they incorrectly suggest that the second sentence will provide a second example.

TIP With regard to the logical relationship expressed by “in addition” and “likewise,” notice that the paragraph does in fact include two examples of studies (from *The American Journal of Clinical Nutrition* and Stanford University), the second of which is introduced by an adverb that is synonymous with “likewise” (“similarly”).

18. **(C) Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material. SAT Topic: EXPID.1b.** The sentence that the writer is considering adding makes reference to the number of markets, according to the USDA, in which organic agricultural products are available. The second paragraph of the passage, though, is concerned with mentioning different scientific studies. So, (C) must be the correct answer choice: the information about the availability of organic agricultural products is irrelevant to the discussion of scientific evidence. As for (A), while the sentence under consideration does provide a research finding from a government agency, it is not, as just established, relevant to the discussion. As for (B), the fact that organic agricultural products are widely available in the marketplace is irrelevant to an argument concerning the nutritional value of organic food. Finally, (D) is wrong because the sentence in question does not introduce or define any special terms.
19. **(A) Writing and Language/Standard English Conventions/No Change. SAT Topic: SEC.2c.ii.** This item deals with subject-verb agreement. The original is correct because the plural verb “have” agrees with the plural subject “amounts.” Do not be diverted by the singular noun “residue”; the subject consists of



the noun phrase “amounts of residue.” As for the remaining answer choices, they all provide singular verbs and therefore do not agree with the subject of the sentence.

20. **(C) Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material. SAT Topic: EXPID.1b.** This item asks for material that will most effectively reinforce the claim that nonorganic food is safe to eat. In the previous sentence, the writer says that minute amounts of pesticide residue found on nonorganic food have no negative effects to the health of the consumer. (C) effectively transitions from this idea with the statement that such pesticide residue can be eliminated by washing or peeling before ingesting these nonorganic food. As for (A) and (B), these statements would support a claim about the safety of organic food, not nonorganic food. And (D) is wrong because where the United States stands in the context of the rest of the world with regard to pesticide use has no relationship to the claim that nonorganic food is safe.
21. **(B) Writing and Language/Standard English Conventions/Grammar and Usage/Pronoun Usage. SAT Topic: SEC.2b.** This item deals with pronoun usage. Do not be distracted by the phrase “theirs are”; while this phrase is a grammatically correct construction, the phrase “their are” is not grammatically correct. Additionally, notice that the use of possession is inappropriate in this context. Instead, the plural pronoun “there” in conjunction with the plural verb “are” is needed to refer to the plural noun “reasons.” So, (B) is the correct answer choice. As for (C), while it addresses the issue of pronoun usage, the use of the singular verb “is” results in subject-verb disagreement. And (D) uses both the incorrect pronoun and the incorrect verb.
22. **(D) Writing and Language/Standard English Conventions/Punctuation/Commas. SAT Topic: SEC.3f.** The original is wrong because the second comma disrupts the logical flow of the sentence. Two commas are used to set off a non-essential element. The phrase “such as,” however, is not such an element but is instead used to introduce one or more examples of what is described earlier in the sentence. In this case, “such as” is used to introduce two examples of reasons to buy organic food: to protect the environment and for the taste. And whenever this phrase is used in a sentence, it is only preceded by a comma. So, (D) is the correct answer choice. As for (B), while a colon can be used to introduce a list of examples, it cannot be used in conjunction with the phrase “such as”; either one or the other is sufficient. And (C) is wrong because it removes the necessary comma preceding the phrase and leaves the offending comma.

Passage 3

23. **(C) Writing and Language/Expression of Ideas/Style/Tone. SAT Topic: EXPID.3c.** This item asks for the term that best conveys an attitude of interest that is sincere and not mocking towards the question of how people in different parts of the country refer to carbonated beverages. To describe such an innocent curiosity as “life-altering,” (A), or “galvanizing” (“exciting”), (B), would be sarcastic; and to describe the question as “weird” would be minimizing or even insulting. So, (C) must be the correct answer choice. “Intriguing” is synonymous with “interesting” and does not have any negative connotations.
24. **(C) Writing and Language/Standard English Conventions/Sentence Structure/Run-On Sentences. SAT Topic: SEC.1a.i.** The original is wrong because it results in a run-on sentence. The material preceding the underlined portion is an independent clause, and the remainder of the sentence including the underlined portion is also an independent clause. Notice, however, that the writer intends to make parallel these two clauses by means of the correlative conjunction “not only ... but also”: “Research ... *not only* yielded answers ... *but also* illustrates” So, (C) is the correct answer choice. (B) is wrong because the correlative conjunction intended here requires the use of the coordinating conjunction “but.” And (D) is wrong because it results in a sentence fragment; it also incorrectly suggests that the answers to how different regions of the country refer to carbonated beverages illustrate how technology can change the nature of research.
25. **(B) Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material. SAT Topic: EXPID.1b.** This item asks for the option that satisfies two conditions. First, it asks for the material that most effectively sets up the contrast between “traditional, human-intensive data collection” and

investigation by means of “social media.” (C) can immediately be eliminated because it does not make sense to say that the traditional approach to data collection is the only option while there are new approaches to investigation using social media. Second, the item asks for the choice that is consistent with the information in the rest of the passage. As for the remaining answer choices, while they might all make logical sense in a different context, only (B) satisfies this second condition. That the traditional approach *still* has an important place in language studies is supported by the writer’s mention in the second paragraph of “the veritable army of trained volunteers traveling the country conducting face-to-face interviews.” (A) is wrong because, as already established, the traditional approach is still used (e.g., face-to-face interviews). As for (D), to say that the traditional approach yields questionable results is not consistent with the writer’s description of “the epitome of traditional methodology” (*Dictionary of American Regional English*) as a “signal achievement in linguistics.”

26. (D) **Writing and Language/Expression of Ideas/Style/Conciseness. SAT Topic: EXPID.3b.** This item deals with conciseness, specifically in recognizing awkwardness and redundancy. The original is wrong because to finish a sentence with the plural noun “scholars” and then begin the following sentence with that same noun *intending* to refer to those same scholars results in an awkward pair of sentences. (D) is the only answer choice that addresses this issue, and it does so by changing the second sentence to a dependent clause introduced by the relative pronoun “who” to refer to “scholars.” (B) and (C) are wrong because they fail to address the issues of awkwardness and redundancy. Additionally, as for (C), the use of the coordinating conjunction “but,” which indicates a reversal of thought, results in an illogical relationship between ideas. That the scholars’ enthusiasm was not dampened by how long they had to wait for the completion of the dictionary *extends* from the idea that they consider the work to be an achievement.

TIP Just as suggested in the tip corresponding to item #14, read through each of the four options aloud, paying attention to whether there is awkwardness, redundancy, or inefficiency.

27. (C) **Writing and Language/Expression of Ideas/Organization/Paragraph-Level Structure. SAT Topic: EXPID.2a.** This item asks for where a given sentence would logically be placed in the second paragraph in order to improve that paragraph’s cohesion and flow. The given sentence makes reference to how data gathering was the quick part of the dictionary project. Notice that sentences 3 and 4 describe the process of data-gathering involved in the project. Then, sentence 5 states that dictionary founder Frederic G. Cassidy died before the project was completed. So, the given sentence would most logically be placed after sentence 4, (C). Do not let (A) distract you. While it might seem as though the given sentence would serve as a good transition between the reference to “decades of arduous work” and the reference to the “six-year period” of data-gathering, to say that data-gathering *proved* to be the quick part of the project suggests that this remark should be located *after* the description of the data-gathering process and *before* the implication that there were parts of the project that were very time-consuming: Cassidy died before it was finished. (B) is wrong because, as already indicated, sentences 3 and 4 together describe the process of data-gathering. Finally, do not be distracted by (D), either. While placing the given sentence after sentence 5 might seem like a logical placement (since there it would be seen as a comparison between the previously mentioned length of time it took to complete the data-gathering process and the fact that the dictionary was not completed in Cassidy’s lifetime), it clearly interferes with the flow of ideas expressed from sentence 5 to sentence 6.
28. (A) **Writing and Language/Standard English Conventions/No Change. SAT Topic: SEC.2c.ii.** Just as with item #19, this item deals with subject-verb agreement. The original is correct because the singular verb “requires” agrees with the singular subject “research.” Do not let yourself be distracted by the plural noun “varieties”; it is part of the prepositional phrase modifying “research” (“into regional English varieties”). As for the remaining answer choices, they all provide plural verbs and therefore do not agree with the subject of the sentence.
29. (D) **Writing and Language/Standard English Conventions/Punctuation/Colons. SAT Topic: SEC.3b.** The original is wrong because it does not include the punctuation necessary to introduce the second part of



the sentence, which is a clause describing that other army that sometimes replaces the army of face-to-face interviewers: the vast array of individuals using social media. Remember that a colon may be used to call attention to an elaboration or explanation. So, (D) is the correct answer choice. (B) is wrong because the dash separates the verb “replaced” from its prepositional phrase complement (“by another army”); additionally, the comma is the wrong choice of punctuation for introducing the explanatory material that follows. As for (C), not only is the semicolon not used to introduce material, but it also cannot be used to join an independent clause with a dependent clause.

30. **(B) Writing and Language/Standard English Conventions/Grammar and Usage/Diction. SAT Topic: SEC.2d.** Notice immediately that this item deals with recognizing the correct word to use in context chosen from a group of words that are commonly confused with each other (“cite,” “site,” and “sight”). Since “social media” functions as a modifier, a noun is required. But while it is true that “cite” is typically used as a verb, it can also be used as a noun. Of the three homonyms, only “site” provides the intended meaning: “social media [web]site.” So, (B) is the correct answer choice. As for the remaining answer choices, the noun “cite” means “citation,” and “sight” means “the ability to see.”

TIP If one or more of the meanings of these three words is not immediately apparent, remember that only certain prepositions can be used with certain words. With this in mind, use the process of elimination to help narrow down the choices. Since the phrase “in search for” is not correct diction, (C) and (D) can be eliminated. There would then be a 50/50 chance at guessing the correct answer.

31. **(C) Writing and Language/Expression of Ideas/Strategy/Data Presentation. SAT Topic: EXPID.1d.** This is a data presentation item that deals with recognizing whether the information in the map corresponds to the information provided in the previous sentence. Do not let the wordiness of the item stem lead you astray; simply match up the three regions described in the sentence with the three shaded regions on the map to determine the correct sequence of terms in the sentence. The first reference in the sentence is to “the middle and western portions of the United States.” On the map, this area is shaded in dark gray, representing the term “pop.” The second reference is to the “southern states.” This area is shaded in dotted lines, representing the term “coke.” And the third reference is to “the northeastern and southwest regions.” This area is shaded in light gray, representing the term “soda.” So, (C) is the correct answer choice.

TIP Notice that the legend presents the three terms in the correct sequence. This may be a coincidence or even a vestige from before the language in the passage was altered for the sake of creating a test problem. Either way, do not let it guide the reasoning process.

32. **(B) Writing and Language/Standard English Conventions/Punctuation/Apostrophes. SAT Topic: SEC.3f.** This item is similar to item #21 in that they both deal with the commonly confused words “their,” “there,” and “they’re.” The original is wrong because “they’re,” which is the contraction of the phrase “they are,” is inappropriate in this context. To say “they are true value lies” does not make sense. Instead, the plural possessive pronoun “their” is needed to refer to the plural noun “findings.” Notice, too, that the pronoun “their” is parallel to the very same pronoun located at the end of the underlined portion, both of which refer to “findings.” So, (B) is the correct answer choice. As for (C), not only is the contraction inappropriate in this context, but the adverb “there” is also incorrect. And as for (D), while it replaces the contraction with the correct pronoun, it unnecessarily replaces the parallel pronoun with the adverb.

33. **(A) Writing and Language/Expression of Ideas/No Change. SAT Topic: EXPID.2b.** This item deals with recognizing the appropriate material for concluding the last sentence and paragraph of the passage. In this last sentence of the passage, the writer once again intends to make parallel two clauses by means of the correlative conjunction “not only ... but ... also.” Essentially, the sentence says that the Internet is not only a tool for collecting data but is also something else. That something else is what can be known from the fact that Brice Russ (refers to Item #30) was able to access data by using search software on a particular social media site. From this fact, what can be known is that the Internet is a rich source of

data, (A). Notice the meaningful parallel between the ideas that the Internet can be used to *collect* data and that it is a *source* of data. As for (B), while Russ did learn the regional terms for soft drinks by using the Internet, this is much too specific an example for conveying the significance of the Internet with regard to gathering data. As for (C), while Russ did use a social media site to gather data, that the Internet is a useful way to stay connected to people is irrelevant to how it serves as a tool and repository for the purpose of research. As for (D), that the Internet is helpful to researchers is not only vague but is also already made clear by the fact that it functions as a sophisticated tool for collecting data.

Passage 4

34. **(C) Writing and Language/Standard English Conventions/Grammar and Usage/Verb Tense. SAT Topic: SEC.1b.i.** Just as with item #6, this item deals with verb tense. The original is wrong because the past tense verb “were” is inconsistent with the present tense used later in the sentence: “... you *can* take ... *is* the right field” Instead, the present tense “are” is required. So, (C) is the correct answer choice. As for (B) and (D), not only are the present perfect tense (“has been”) and the past tense (“was”), respectively, inconsistent with the present tense used later in the sentence, but they are singular verbs and therefore do not agree with the plural expression “a number of.”
35. **(C) Writing and Language/Standard English Conventions/Punctuation/Colons. SAT Topic: SEC.3b.** Just as with item #29, this item deals with colons. While the colon can be used to introduce a series, do not let the original sidetrack you. In this context, the writer intends for the series of elements to be set off by a pair of punctuation marks. Read the sentence without the series of elements to confirm that this is the case: “The designer envisions the game’s fundamental elements ... and is thus a primary creative force behind a video game.” Remember that either a pair of commas or a pair of dashes could be used to set off a group of explanatory words. While the underlined portion does end with a comma, not only do none of the answer choices provide a pair of commas but to use commas in this situation would be awkward since the elements in the series are already separated by commas. So, (C), which provides a pair of dashes, is the correct answer choice. As for (B), it fails to address the issue of the offending colon. And (D) is wrong because two semicolons cannot be used to set off a group of explanatory words.
36. **(B) Writing and Language/Standard English Conventions/Sentence Structure/Comma Splices. SAT Topic: SEC.1a.i.** The original is wrong because it results in a comma splice. The part of the sentence immediately preceding the second underlined comma is an independent clause, and the remainder of the sentence that follows that underlined comma is also an independent clause. In the former clause, the writer intends to use the adverb “however” to set up a contrast between the conceptualization of a game and the effective communication of that concept. (B) solves the problem of the comma splice by replacing the second comma with a period, thereby breaking the original construction apart into two sentences. (C) fails to address the issue of the comma splice. Additionally, it replaces the first of the two underlined commas with a dash, but a dash cannot be used to introduce the adverb “however.” As for (D), it not only lacks the comma needed to introduce “however,” but it also results in a run-on sentence.
37. **(D) Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material. SAT Topic: EXPID.1b.** Just as with item #11, this item asks whether the writer should add the sentence in question at the given location in the passage. The sentence immediately preceding this location states that a concept for a game must be effectively communicated to those on the development team if it is to be translated into an actual game. The sentence immediately following this location says that a designer must generate documentation and provide a clear explanation of the concept. Do not be distracted by the seemingly effective transition between the sentence under consideration (which refers to successful communication) and the ideas of documentation and clarity that would follow. Instead, notice that this item also deals with conciseness: the sentence in question is in fact redundant of what is stated in the previous sentence. So, (D) is the correct answer choice. As for (A), the sentence under consideration *does* support the conclusion drawn in the following sentence, but it should not be added because it repeats what has already been said. As for (B), the idea of successful communication is the general principle discussed in the paragraph, and the examples of such communication provided throughout the



- paragraph illustrate this principle. Finally, (D) is wrong because the information provided in the sentence would indeed be relevant had it not already been mentioned.
38. (A) *Writing and Language/Expression of Ideas/No Change*. SAT Topic: EXPID.1b. This item deals with recognizing the appropriate supporting material for the third paragraph. The original is correct. As already suggested in the previous explanation, that the game developer is clear in expressing his or her ideas illustrates the principle of successful communication. As for the remaining answer choices, while they all describe qualities that would certainly be advantageous for a game developer to possess, they do not support the point developed in the paragraph regarding successful communication.
39. (C) *Writing and Language/Expression of Ideas/Strategy/Effective Transitional Sentence*. SAT Topic: EXPID.2b. Just as with items #2 and #17, this item asks for the introductory adverb that will provide an effective transition between two sentences, in this case between the third and fourth of the third paragraph. The third sentence refers to the idea that a game developer should be able to explain his or her ideas clearly, and the fourth sentence mentions how a developer must be skilled at writing and speaking. The adverb “consequently,” (C), best expresses the intended relationship between ideas: in order for a developer to express his or her ideas clearly, he or she should be skilled at writing and speaking. Do not be diverted by (A); while it may seem that clear expression and strong communication skills are qualities of a similar (“likewise”) nature, the writer intends to say that the former comes as a result of having the latter. As for (B) and (D), “nevertheless” and “however,” respectively, inappropriately signal a contrast between the ideas of clear expression and having strong communication skills.
40. (B) *Writing and Language/Standard English Conventions/Grammar and Usage/Pronoun Usage*. SAT Topic: SEC.2c.i. This item deals with pronoun usage, specifically in pronoun-antecedent agreement. The original is wrong because the plural nouns “writers” and “speakers” do not agree in number with the singular pronoun “anyone.” Instead, the singular nouns “writer” and “speaker” are needed. (B) is the only answer choices that satisfies this condition. As for (C) and (D), while the adverb “both” adds emphasis to the two things that a video game designer must be, both of these options fail to address the issue of pronoun-antecedent disagreement.
41. (D) *Writing and Language/Expression of Ideas/Style/Conciseness*. SAT Topic: EXPID.3b. Just as with item #26, this item deals with conciseness, specifically in recognizing redundancy. The original is wrong because it is redundant to use the adverb “initially,” which means “at the beginning,” to modify the verb “begin.” Additionally, the plural noun “pursuits” is not the most precise word choice in this context. (D) solves the problems of the original by eliminating the redundancy and using the more accurate term “careers” to refer to how designers were once programmers. As for (B), the verbs “start” and “begin” are redundant of each other, and “work” is not the best word choice. Finally, (C) is wrong because it is stilted, awkward, and confusing.
42. (D) *Writing and Language/Expression of Ideas/Style/Precision*. SAT Topic: EXPID.3a. This item deals with recognizing whether the writer uses a word with a meaning that precisely fits the sentence. The original is wrong because the adjective “emphatic,” which means “expressed with force and clarity,” would not be used to describe skills. Of the remaining answer choices, only “important,” (D), would be used to describe skills. As for (B) and (C), while the adjectives “paramount” and “eminent,” respectively, may be considered synonymous with “important,” they simply miss the mark as words to describe skills.
43. (A) *Writing and Language/Standard English Conventions/No Change*. SAT Topic: SEC.1. The original is correct because the phrase “demanding and deadline driven” clearly modifies the subject “video game design.” As for (B) and (D), they result in a meaning unintended by the writer; it is not making the career choice that is demanding and deadline driven or lucrative and rewarding but is instead the career choice itself (video game design) that can be described in these ways. (C), too, is wrong because it results in a meaning unintended by the writer; it is not the reader (“you”) who is demanding and deadline driven.

44. (B) *Writing and Language/Expression of Ideas/Organization/Paragraph-Level Structure*. SAT Topic: EXPID.2a. This item asks for where a particular sentence should be placed to make the paragraph in which it appears most logical. Since sentence 5 states that a designer needs education preparation, and all of the other sentences in the paragraph either provide examples of or make reference to this education, (B) must be the correct answer choice. Sentence 1 refers to computer programming as an essential part of a designer's education. As for (A) and (C), placing sentence 5 anywhere after sentence 1 would fail to make this paragraph most logical. And as for (D), deleting sentence 5 from the paragraph results in a paragraph without an effective opening sentence.

Math, No Calculator

1. (A) **Math: Multiple-Choice/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Equations Involving Absolute Value. SAT Topic: ALG.6.** Test each answer choice by setting the expression equal to zero and isolate the absolute value term. Only the correct choice will be possible for some value of x :

$$\text{A) } |x-1|-1=0 \Rightarrow |x-1|=1, \text{ which is true if } x=2 \text{ or } x=0 \checkmark$$

This is enough to answer the question—(A) must be the correct choice. Indeed, the remaining choices are all impossible because the absolute value of any value cannot be negative.

$$\text{B) } |x+1|+1=0 \Rightarrow |x+1|=-1 \times$$

$$\text{C) } |1-x|+1=0 \Rightarrow |1-x|=-1 \times$$

$$\text{D) } |x-1|+1=0 \Rightarrow |x-1|=-1 \times$$

2. (A) **Math: Multiple-Choice/Algebra/Expressing and Evaluating Algebraic Functions/Function Notation. SAT Topic: ALG.6.** First, determine the value of b . Since $f(6)=7$, substitute 6 for x in the given function,

set it equal to 7, and solve for b : $f(x) = \frac{3}{2}x + b \Rightarrow \frac{3}{2}(6) + b = 7 \Rightarrow b = 7 - 9 = -2$. Therefore, $f(x) = \frac{3}{2}x - 2$.

Now, substitute -2 for x and evaluate: $f(-2) = \frac{3}{2}(-2) - 2 = -5$.

3. (A) **Math: Multiple-Choice/Algebra/Solving Simultaneous Equations. SAT Topic: ALG.5.** Solve the first equation for x : $\frac{x}{y} = 6 \Rightarrow x = 6y$. Substitute $6y$ for x in the second equation and solve for y :

$$4(y+1) = x \Rightarrow 4y+4 = 6y \Rightarrow 2y = 4 \Rightarrow y = 2.$$

4. (B) **Math: Multiple-Choice/Algebra/Expressing and Evaluating Algebraic Functions/Function Notation. SAT Topic: PAM.13.** Substitute $-3x$ for x in the given function and simplify:

$$f(x) = -2x + 5 \Rightarrow f(-3x) = -2(-3x) + 5 = 6x + 5.$$

5. (C) **Math: Multiple-Choice/Algebra/Manipulating Algebraic Expressions/Basic Algebraic Manipulations. SAT Topic: PAM.6.** Use the FOIL method for multiplying polynomials and simplify:

$$3(2x+1)(4x+1) = (6x+3)(4x+1) = 24x^2 + 6x + 12x + 3 = 24x^2 + 18x + 3.$$

6. (B) **Math: Multiple-Choice/Algebra/Manipulating Algebraic Expressions/Basic Algebraic Manipulations.**

SAT Topic: PAM.4. Cross multiply like solving a proportion and perform operations until $\frac{a}{b}$ is isolated:

$$\frac{a-b}{b} = \frac{3}{7} \Rightarrow 7(a-b) = 3b \Rightarrow 7a - 7b = 3b \Rightarrow 7a = 10b \Rightarrow \frac{a}{b} = \frac{10}{7}.$$



Alternatively, use the “Plug-and-Chug” method. Choose a value for b , solve for a , and check each answer choice to see which one is true. Each answer choice has b and 7 in the denominator, so it is

convenient to set $b = 7$. Solve for the corresponding a : $\frac{a-b}{b} = \frac{3}{7} \Rightarrow \frac{a-7}{7} = \frac{3}{7} \Rightarrow a-7 = 3 \Rightarrow a = 10$.

- A) $\frac{10}{7} \neq -\frac{4}{7}$ ✗
- B) $\frac{10}{7} = \frac{10}{7}$ ✓
- C) $\frac{10+7}{7} = \frac{17}{7} \neq \frac{10}{7}$ ✗
- D) $\frac{10-2(7)}{7} = -\frac{4}{7} \neq -\frac{11}{7}$ ✗

7. **(D) Math: Multiple-Choice/Coordinate Geometry/Slope of a Line. SAT Topic: ALG.3.** The item stem asks for how the distance of Amelia's longest run changes between weeks 4 and 16—that is, the rate of change. In a graph of distance as a function of time, the rate of change corresponds to the slope, or rise over run: $\frac{\Delta y}{\Delta x} = \frac{\text{change in distance}}{\text{change in time}} = \frac{26 \text{ miles} - 8 \text{ miles}}{16 \text{ weeks} - 4 \text{ weeks}} = \frac{18 \text{ miles}}{12 \text{ week}} = 1.5 \text{ miles/week}$. In other words, the distance of Amelia's longest run increases by 1.5 miles each week.
8. **(A) Math: Multiple-Choice/Coordinate Geometry/Graphs of Linear Equations. SAT Topic: ALG.9.** For two lines to be parallel, the slopes of the lines must be equal. Rewrite each of the equations given in the answer choices in slope-intercept form ($y = mx + b$, where m is the slope of the line and b is the y -intercept.) The correct choice will have the same slope as the given equation: $y = -3x + 4$, so $m = -3$.

A) $6x + 2y = 15 \Rightarrow y = \frac{-6x + 15}{2} = -3x + \frac{15}{2}$

This is enough to answer the question: the equation in (A) has a slope of -3 so it must be the correct choice. Indeed, none of the remaining choices have a slope of -3 :

B) $3x - y = 7 \Rightarrow y = 3x - 7$

C) $2x - 3y = 6 \Rightarrow y = \frac{2x - 6}{3} = \frac{2}{3}x - 2$

D) $x + 3y = 1 \Rightarrow y = \frac{1-x}{3} = -\frac{1}{3}x + \frac{1}{3}$

9. **(D) Math: Multiple-Choice/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Equations Involving Radical Expressions and Solving Quadratic Equations and Relations/Working with Roots. SAT Topic: PAM.3.** Substitute 2 for a in the given equation and solve for x : $\sqrt{x-a} = x-4 \Rightarrow x-2 = (x-4)(x-4) = x^2 - 8x + 16 \Rightarrow x^2 - 9x + 18 = 0$. Factor the left side of the equality: $x^2 - 9x + 18 = (x-6)(x-3)$. The possible solutions to the quadratic equation are $x = 6$ and $x = 3$. Since the derivation of the quadratic equation involved squaring a polynomial, it's important to check for extraneous solutions. Substitute both values for x in the original equation—only real solutions will hold true:

$x = 6$: $\sqrt{6-2} = 6-4 \Rightarrow \sqrt{4} = 2 \Rightarrow 2 = 2$ ✓

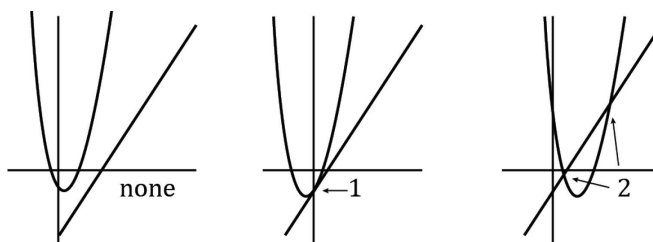
$$x = 3: \sqrt{3-2} = 3-4 \Rightarrow \sqrt{1} = -1 \Rightarrow 1 \neq -1 \times$$

Therefore, only $x = 6$ returns a real solution—the complete solution set is $\{6\}$.

10. (D) *Math: Multiple-Choice/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Equations Involving Rational Expressions. SAT Topic: PAM.9.* Solve the given equation for t by transposing $t - 5$ to the right side of the equality, and perform the indicated operations:

$$\frac{t+5}{t-5} = 10 \Rightarrow t+5 = (t-5)10 = 10t-50 \Rightarrow 9t = 55 \Rightarrow t = \frac{55}{9}.$$

11. (C) *Math: Multiple-Choice/Algebra/Solving Simultaneous Equations and Solving Quadratic Equations. SAT Topic: PAM.8.* The given system of equations is a quadratic-linear system. The linear equation is a straight line and the quadratic equation is a parabola. A straight line and a parabola either do not intersect (no solutions), intersect once (one solution), or intersect twice (two solutions). For example:



The item stem asks for the number of ordered pairs in the xy -coordinate plane—i.e., real solutions. Solve the system of equations using the substitution method. First, use the FOIL method for multiplying polynomials to rewrite the second equation for y in standard form: $y = (2x - 3)(x + 9) =$

$$2x^2 + 18x - 3x - 27 = 2x^2 + 15x - 27. \text{ Substitute } 2x^2 + 15x - 27 \text{ for } y \text{ in the first equation and solve for } x:$$

$$x = 2y + 5 = 2(2x^2 + 15x - 27) + 5 = 4x^2 + 30x - 54 + 5 \Rightarrow 4x^2 + 29x - 49 = 0. \text{ This is not factorable, so use}$$

the quadratic formula to find the roots (if $ax^2 + bx + c = 0$, then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$):

$$x = \frac{-29 \pm \sqrt{29^2 - 4(4)(-49)}}{2(4)}. \text{ The fact that this expression is so complicated and that this is the non-}$$

calculator section of the exam should tip you off that it isn't necessary to calculate the roots. Indeed, the roots are only real if the discriminant (the expression inside the radical, $b^2 - 4ac$) is positive:

$29^2 - 4(4)(-49)$ is positive, so the two roots are real. Therefore, two ordered pairs satisfy the quadratic-linear system of equations.

12. (C) *Math: Multiple-Choice/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions. SAT Topic: ALG.1.* According to the item stem, the total cost of the two sandwiches is

$$x + x + 1 = 2x + 1. \text{ Ken and Paul each pay half the bill } \left(\frac{2x+1}{2} = x + 0.5\right) \text{ plus 20\% of half the bill}$$

$$(0.2(x + 0.5) = 0.2x + 0.1). \text{ Therefore, each pays, in total, } x + 0.5 + 0.2x + 0.1 = 1.2x + 0.6.$$

13. (B) *Math: Multiple-Choice/Coordinate Geometry/Graphs of Quadratic Equations and Relations. SAT Topic: PAM.12.* According to the given information, the two functions intersect at the x -intercepts, $-k$ and k . At each of these points, the function equals zero. Set either function equal to zero, substitute k for

x , and solve for k : $f(x) = 8x^2 - 2 \Rightarrow f(k) = 0 = 8(k)^2 - 2 \Rightarrow k^2 = \frac{2}{8} \Rightarrow k = \pm\sqrt{\frac{1}{4}} = \pm\frac{1}{2}$. One value of k is given in the choices: $\frac{1}{2}$, (B).

Alternatively, set the functions equal to each other and solve for x :

$$8x^2 - 2 = -8x^2 + 2 \Rightarrow 16x^2 - 4 = 0 \Rightarrow 4(4x^2 - 1) = 0, \text{ so } x = \pm\sqrt{\frac{1}{4}} = \pm\frac{1}{2}. \text{ Thus, } k = \frac{1}{2}.$$

14. (A) *Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Advanced Arithmetic Items/Complex Numbers and Algebra/Manipulating Algebraic Expressions/Basic Algebraic Manipulations. SAT Topic: ATM.3.* Rationalize the denominator by multiplying the numerator and denominator by the conjugate of denominator, and use the FOIL method for multiplying polynomials:

$$\frac{8-i}{3-2i} = \frac{8-i}{3-2i} \times \frac{3+2i}{3+2i} = \frac{24+16i-3i-2i^2}{9+6i-6i-4i^2} = \frac{24+13i-2i^2}{9-4i^2}. \text{ Substitute } -1 \text{ for } i^2 \text{ in the expression and simplify: } \frac{24+13i-2i^2}{9-4i^2} = \frac{24+13i-2(-1)}{9-4(-1)} = \frac{26+13i}{13} = 2+i. \text{ Therefore, } a=2 \text{ (and } b=1).$$

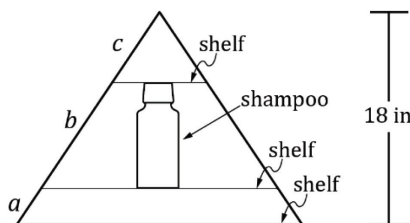
15. (B) *Math: Multiple-Choice/Algebra/Solving Quadratic Equations. SAT Topic: PAM.5.* A glance at the answer choices is enough to suggest using the quadratic formula to solve for x ; the format of the expressions parallel the quadratic formula (if $ax^2 + bx + c = 0$, then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$). Rewrite the

given equation in standard quadratic form: $x^2 - \frac{k}{2}x = 2p \Rightarrow x^2 - \frac{k}{2}x - 2p = 0$. Multiply by 2 to simplify:

$2x^2 - kx - 4p = 0$. Therefore, $a = 2$, $b = -k$, and $c = -4p$. Plug in a , b , and c into the quadratic formula:

$$x = \frac{-(-k) \pm \sqrt{(-k)^2 - 4(2)(-4p)}}{2(2)} = \frac{k \pm \sqrt{k^2 + 32p}}{4}.$$

16. (9) *Math: Student-Produced Responses/Geometry/Triangles/Properties of Triangles and Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions and Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Ratios. SAT Topic: ATM.6.* The three triangles in the figure have parallel sides, so the triangles are similar and the ratio of their corresponding sides are in proportion. The ratio of the left sides of the three triangles is $(x + 3x + 2x) : (3x + 2x) : 2x \Rightarrow 6x : 5x : 2x$. The ratio of the heights of the three triangles is $a + b + c : b + c : c$, where b is the height of the middle shelf:

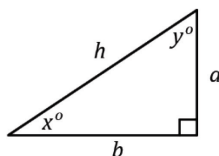


Since the total height is 18 inches, $a + b + c = 18$, and the ratio of the heights reduces to $18 : b + c : c$. The proportions of similar sides are equal between the three triangles, so $\frac{6x}{18} = \frac{5x}{b+c} = \frac{2x}{c}$. Solve $\frac{6x}{18} = \frac{5x}{b+c}$

for $b + c$, the height of the middle triangle: $b + c = \frac{5x(18)}{6x} = 15$. Solve $\frac{6x}{18} = \frac{2x}{c}$ for c , the height of the top triangle: $c = \frac{2x(18)}{6x} = 6$. Therefore, the maximum height of the middle shelf is $b = 15 - 6 = 9$ inches.

17. (.6, 3/5) **Math: Student-Produced Responses/Trigonometry/Definitions of the Six Trigonometric Functions/Complimentary Angles. SAT Topic: ATM.7.** Two angles are complementary if the sum of the two angles is 90° . The sine of an acute angle is equal to the cosine of its complement, and vice versa. In this case, $x^\circ + y^\circ = 90^\circ$, so x and y are complementary angles. Therefore, $\cos y^\circ = \sin x^\circ = 0.6$, or $3/5$.

Note that the properties of similar triangles and the definitions of the trigonometric functions lead to the three sets of "co-function" identities for complementary angles (the other two are tangent-cotangent and secant-cosecant). Recall the mnemonic for the trigonometry functions: SOH-CAH-TOA. The sine of x° is equal to the ratio of the length of the side opposite x° to the length of the hypotenuse:



Therefore, $\sin x^\circ = \frac{a}{h} = 0.6$. And the cosine of y° is equal to the ratio of the length of the side adjacent y° to the length of the hypotenuse: $\cos y^\circ = \frac{a}{h} = \sin x^\circ = 0.6$.

18. (5) **Math: Student-Produced Responses/Algebra/Manipulating Algebraic Expressions/Factoring Expressions. SAT Topic: PAM.6.** To determine the values of x for which the equation holds true, rewrite the terms using common factors:
 $0 = x^3 - 5x^2 + 2x - 10 = (x)x^2 - (5)x^2 + 2x - 2(5) = x^2(x - 5) + 2(x - 5) = (x - 5)(x^2 + 2) = 0$. Thus, $x - 5 = 0$ and $x^2 + 2 = 0$. Since there is no real value that, when squared, equals -2 , the only real solution to the equation is $x = 5$.
19. (0) **Math: Student-Produced Responses/Algebra/Solving Simultaneous Equations. SAT Topic: ALG.7.** The item stem asks for the value of x , so use the elimination method for solving simultaneous equations: multiply the first equation by 3 and multiply the second equation by -4 before combining the equations to eliminate the y -variable:

$$\begin{array}{r} 3(-3x + 4y = 20) \\ -4(6x + 3y = 15) \\ \hline -9x - 24x = 60 - 60 \Rightarrow -33x = 0 \Rightarrow x = 0 \end{array}$$

20. (25) **Math: Student-Produced Responses/Coordinate Geometry/Slope of a Line. SAT Topic: ALG.3.** To determine the rate of change in the temperature of the mesosphere as a function of distance, calculate the slope, or rise over run: $\frac{\Delta y}{\Delta x} = \frac{\text{change in temperature}}{\text{change in distance}} = \frac{-80 - (-5)}{80 - 50} = \frac{-75}{30} = -2.5^\circ$ degrees Celsius per kilometer. The item stem asks about the decrease in temperature for a change in distance of 10 kilometers, so $\frac{-2.5^\circ \text{ Celsius}}{1 \text{ kilometer}} \times 10 \text{ kilometers} = -25^\circ$ Celsius. Since k is defined as the number of degrees that the temperature decreases as the distance from the Earth's surface increases, $k = 25$.

Math, Calculator

1. (B) **Math: Multiple-Choice/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions. SAT Topic: ALG.1.** Translate the given information into an expression for the total cost of the television and movie service. Include units so "like" units cancel, leaving the expression with units of "dollars":

$$\$12.80 = \frac{\$9.80}{\text{month}} \times 1 \text{ month} + \frac{\$1.50}{\text{movie}} \times m \text{ movies} \Rightarrow 12.8 = 9.8 + 1.5m \Rightarrow m = \frac{12.8 - 9.8}{1.5} = 2.$$
2. (C) **Math: Multiple-Choice/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions. SAT Topic: ALG.1.** Translate the given information into an equation for the typing speed. Include units so "like" units cancel, leaving each term of the equation with units of "words per minute":

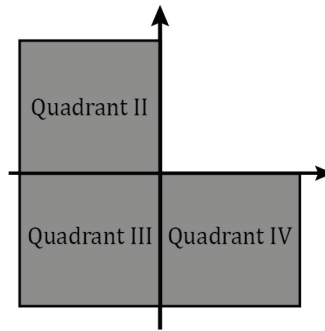
$$\frac{\text{words}}{\text{minute}} = \frac{180 \text{ words}}{\text{minute}} + \frac{5 \text{ words}}{\text{minute}} \times m \text{ months} = 180 + 5m.$$
3. (C) **Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Complicated Problem Solving Items. SAT Topic: PSD.3.** Convert the 3-pound pizza to ounces: $3 \text{ pounds} \times \frac{16 \text{ ounces}}{\text{pound}} = 48 \text{ ounces}$.
 Divide in half, and then divide again into thirds: $\frac{48}{2} = 24 \Rightarrow \frac{24}{3} = 8$ ounces per slice.
4. (B) **Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Percents. SAT Topic: PSD.2.** Of 90 students, 25.6% preferred October, so the same percentage applies to the estimate for the entire 225-person class: $0.256(225) \approx 58$. The answer choice closest to this value is (B), 60.
5. (B) **Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Proportions and Direct-Inverse Variation. SAT Topic: PSD.3.** According to the item stem,

$$\text{density} = \frac{\text{mass}}{\text{volume}}. \text{ Therefore, volume} = \frac{\text{mass}}{\text{density}} = \frac{24 \text{ grams}}{3 \text{ grams/milliliter}} = 8 \text{ milliliters}.$$

6. (A) *Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Complicated Problem Solving Items and Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions. SAT Topic: ALG.1.* Translate the given information into a system of linear equations, where R and A represent the hours worked by Raul and Angelica, respectively: $R = A + 11 \Rightarrow -A + R = 11$ and $A + R = 59$. The item stem asks for the value of A , so multiply the second equation by -1 before combining the equations to eliminate the R variable:

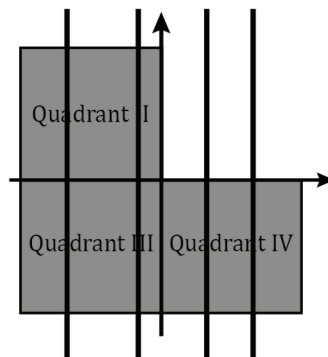
$$\begin{array}{r} -A + R = 11 \\ -(A + R = 59) \\ \hline -2A = 11 - 59 \Rightarrow A = \frac{-48}{-2} = 24 \end{array}$$

7. (A) *Math: Multiple-Choice/Probability/Arithmetic Probability. SAT Topic: PSD.7.* According to the table, 4 movies were comedies with a PG-13 rating, and the total number of movies was 50. Therefore, the probability of a movie being a comedy with a PG-13 rating is $\frac{4}{50} = \frac{2}{25}$.
8. (D) *Math: Multiple-Choice/Coordinate Geometry/Slope of a Line and The Coordinate System. SAT Topic: ALG.9.* The item stem states that the solution set to the equation of the line l includes points from Quadrants II, III, and IV, but not I:

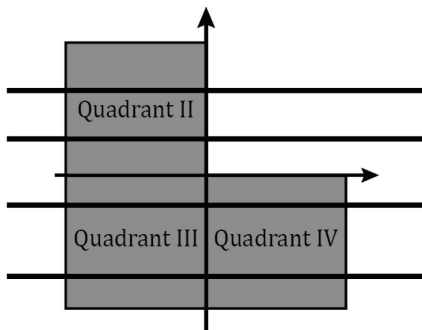


Now, check each of the scenarios given in the answer choices: the correct choice will allow the line to pass through all three quadrants:

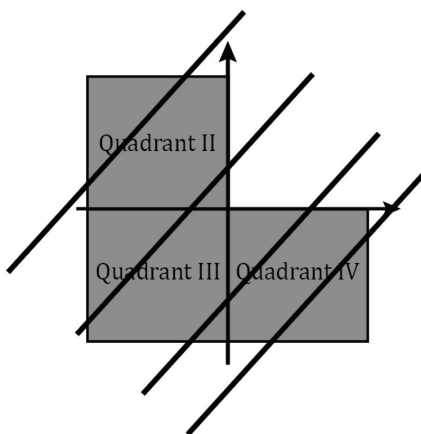
- A) A line with an undefined slope is a vertical line and, at most, can be drawn through only two quadrants:



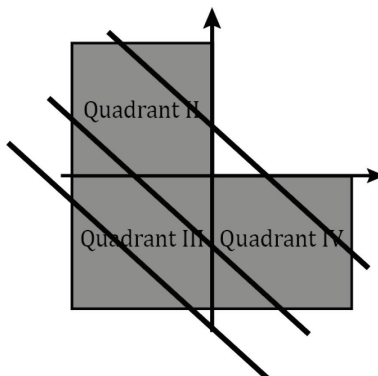
- B) A line with zero slope is a horizontal line and, at most, can be drawn through only two quadrants:



C) A line with positive slope can be drawn, at most, through only two quadrants:

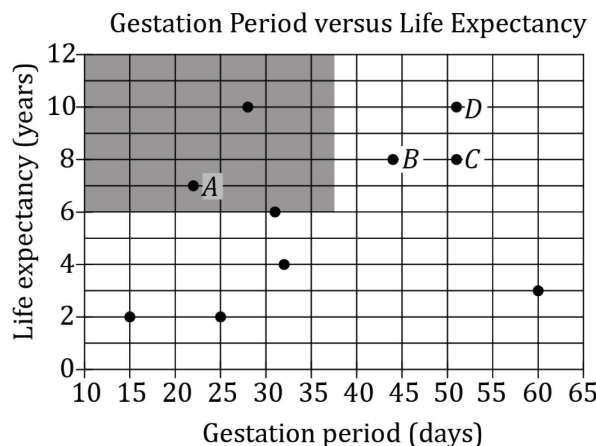


Therefore, by the process of elimination, the correct choice must be (D). Indeed, a line with a negative slope can be drawn through the three quadrants:



9. (B) *Math: Multiple-Choice/Probability/Arithmetic Probability and Data Interpretation/Tables (Matrices).*
SAT Topic: PSD.7. According to the table, the total number of Midwest registered voters age 18 to 44 years is approximately $3,500 + 11,200 = 14,700$, and the total number of registered voters age 18 to 44 years is approximately $15,000 + 48,000 = 63,000$. Therefore, the probability of a registered voter age 18 to 44 years being from the Midwest is $\frac{14,700}{63,000} \approx \frac{15}{60} = \frac{1}{4} = 0.25$.

10. (A) **Math: Multiple-Choice/Data Interpretation/Scatterplots. SAT Topic: PSD.5.** According to the graph, the data point with the longest gestation period has an x -value of 60 days and a y -value (life expectancy) of 3 years. Do not be confused that some data points are labeled; this question refers to all data points.
11. (A) **Math: Multiple-Choice/Data Interpretation/Scatterplots. SAT Topic: PSD.1.** The ratio of life expectancy to gestation period can be expressed as $\frac{\text{life expectancy}}{\text{gestation period}}$. This value will be greatest for a large value of life expectancy (the numerator) and a small value of gestation (the denominator). This corresponds to the following area of the graph:



Therefore, A is the data point with the greatest ratio of life expectancy to gestation period.

12. (C) **Math: Multiple-Choice/Algebra/Expressing and Evaluating Algebraic Functions/Function Notation and Coordinate Geometry/Qualitative Behavior of Graphs of Functions. SAT Topic: PAM.13.** The x -intercepts correspond to $f(x) = y = 0$. Since the x -intercepts occur for $x = -3$, $x = -1$, and $x = 1$, the factors of $f(x)$ must be $x + 3$, $x + 1$, and $x - 1$. Therefore, the correct choice is (C): $f(x) = (x - 1)(x + 1)(x + 3)$.
13. (C) **Math: Multiple-Choice/Algebra/Evaluating Sequences Involving Exponential Growth. SAT Topic: PSD.6.** For every constant increase in time (5 weeks), the population increases by a factor of 10—immediately eliminate (B) and (D), as these represent decreasing relationships. The increase in population increases at a greater rate as time goes on, so the growth is not constant—eliminate (A). Therefore, by the process of elimination, (C) must be correct. Indeed, the growth is exponential—the longer the time, the greater the increase in population.
14. (D) **Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Percents. SAT Topic: PSD.2.** The item stem asks for the difference between the amount of money earned at 3% and at 5%. According to the given formula, the amount earned at 5% is $1,000\left(1 + \frac{5}{1,200}\right)^{12}$ and the amount earned at 3% is $1,000\left(1 + \frac{3}{1,200}\right)^{12}$. Therefore, the difference is $1,000\left(1 + \frac{5}{1,200}\right)^{12} - 1,000\left(1 + \frac{3}{1,200}\right)^{12}$.
15. (B) **Math: Multiple-Choice/Data Interpretation/Scatterplots. SAT Topic: PSD.4.** The equation $y = ax^b$ represents exponential growth or decay—if b is positive, it's growth; if b is negative, it's decay. According to the item stem, b is negative, so the equation represents negative exponential correlation

(exponential decay), as shown in (B). (A) represents negative linear correlation; (C) represents positive exponential correlation; and (D) does not represent any correlation.



Alternatively, use the “Plug-and-Chug” method. If $a = 10$ and $b = -1$, $y = \frac{10}{x}$, and data points

would be $(10, 1)$, $(20, \frac{1}{2})$, and $(30, \frac{1}{3})$. The scatterplot in answer choice (B) has the same shape.

16. (A) **Math: Multiple-Choice/Data Interpretation/Tables (Matrices) and Algebra/Solving Algebraic Equations or Inequalities with One Variable/Simple Inequalities. SAT Topic: ALG.8.** The item stem asks for the number of days, x , for which the total cost at Store B is less than or equal to the total cost at Store A: $y_B \leq y_A \Rightarrow M_B + (W_B + K_B)x \leq M_A + (W_A + K_A)x$. Substitute the required values from the table and

$$\text{solve for } x: 600 + (25 + 80)x \leq 750 + (15 + 65)x \Rightarrow 105x - 80x \leq 750 - 600 \Rightarrow x \leq \frac{150}{25} \Rightarrow x \leq 6.$$

17. (D) **Math: Multiple-Choice/Coordinate Geometry/Slope of a Line. SAT Topic: ALG.9.** According to the given information, the total cost, y , of buying materials and renting tools (regardless of store), where W is the rental cost of a wheelbarrow per day and K is the cost of renting a concrete mixer, is

$$y \text{ dollars} = \left(\frac{W \text{ dollars}}{\text{day}} + \frac{K \text{ dollars}}{\text{day}} \right) x \text{ days} + M \text{ dollars. This equation parallels the slope-intercept form}$$

of a linear equation: $y = mx + b$, where m is the slope of the line and b is the y -intercept ($x = 0$).

Therefore, the slope of the line is $W + K$, which represents the total cost of renting the tools per day.

18. (C) **Math: Multiple-Choice/Geometry/Volume. SAT Topic: ATM.1.** The volume of a cylinder is $\pi r^2 h$, where r is the radius of the base and h is the height. The diameter of each glass is 3 inches and the height is 6 inches, so the volume is $\pi \left(\frac{3}{2} \text{ inches} \right)^2 (6 \text{ inches}) \approx 42$ cubic inches per glass. Translate the volume using the given information into an expression for the number of glasses. Include units so “like” units cancel,

$$\text{leaving the expression with units of “glasses”}: \frac{\text{glass}}{42 \text{ cubic inches}} \times \frac{231 \text{ cubic inches}}{\text{gallon}} \times 1 \text{ gallon} = 5.5$$

glasses. Therefore, the number of whole glasses of milk that Jim can pour from one gallon of milk is 5.

19. (A) **Math: Multiple-Choice/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Simple Inequalities. SAT Topic: ALG.6.** Add 4 to each side of the inequality to get $3p + 2$ on the left side:

$$3p - 2 \geq 1 \Rightarrow 3p - 2 + 4 \geq 1 + 4 \Rightarrow 3p + 2 \geq 5. \text{ Therefore, the least possible value of } 3p + 2 \text{ is } 5.$$

Alternatively, solve for p directly: $3p - 2 \geq 1 \Rightarrow 3p \geq 3 \Rightarrow p \geq 1$. The least possible value of the given equation occurs when $p = 1$: $3(1) + 2 = 5$.

20. (C) **Math: Multiple-Choice/Coordinate Geometry/Graphs of Quadratic Equations and Relations. SAT Topic: PSD.6.** If the biomass of the lake doubles each year, the amount of increase each year depends on the current amount that year—the growth rate is proportional to the amount already present—that is, the greater the quantity of biomass, the greater the increase in quantity. This is the definition of exponential growth, as illustrated in the graph in (C).

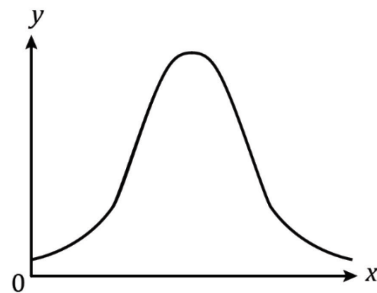
21. (C) **Math: Multiple-Choice/Data Interpretation/Bar, Cumulative, and Line Graphs. SAT Topic: PSD.5.** A scatterplot of energy consumption in 2010 (y -axis) versus energy consumption in 2000 (x -axis) would have data points above the line $y = x$ for $y > x$. According to the bar graph, the energy consumption in 2010 was greater than that in 2000 for three energy sources: biofuels, geothermal, and wind.

22. (B) **Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Percents. SAT Topic: PSD.2.** According to the graph, the consumption of wood power was 2.00 (quadrillion Btu) in 2010 and 2.25 (quadrillion Btu) in 2000: $\frac{2.00}{2.25} \approx 0.89 = 89\%$. Therefore, the consumption of wood power in 2010 was 89% of what it was in 2000—a decrease of $100\% - 89\% = 11\%$.

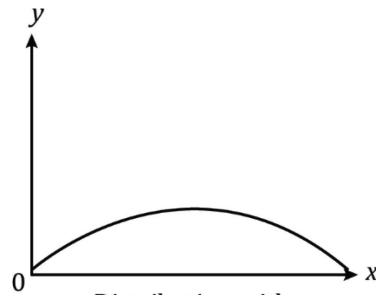
Alternatively, you can compute percent decrease using the $\frac{\text{change}}{\text{original amount}}$ formula:

$$\frac{2.25 - 2.00}{2.25} = \frac{.25}{2.25} \approx .11 = 11\%.$$

23. (B) **Math: Multiple-Choice/Statistics/Standard Deviation. SAT Topic: ALG.9.** A glance at the answer choices indicates the question is testing comprehension of standard deviation. Standard deviation is a measure of the variation in a distribution or data set—it tells how tightly the data are clustered around the average. In a normal distribution, most of the data are close to the average: the data are bunched and the distribution bell-shaped curve is steep. If the data set are spread apart, the bell curve is relatively flat, and the standard deviation is large.



Distribution with
Small Standard Deviation



Distribution with
Large Standard Deviation

In City A, the data distribution is clustered around a temperature of 79°F; in City B, the data distribution is more spread out, actually peaking at both ends of the data range (80°F and 76°F). Therefore, the standard deviation of temperature in City B is larger than that of City A.

24. (C) **Math: Multiple-Choice/Geometry/Circles. SAT Topic: ATM.5.** The diameter of the circle is \overline{AB} , so \widehat{ADB} is a semicircle and equal to one-half the circumference. The circumference of a circle is $2\pi r$, where r is the radius. Therefore, $8\pi = \frac{1}{2}(2\pi r) \Rightarrow r = 8$.

25. (B) **Math: Multiple-Choice/Algebra/Manipulating Algebraic Expressions/Factoring Expressions. SAT Topic: PAM.9.** The item stem asks about polynomials divisible by $2x + 3$, which is another polynomial, so begin by factoring the two functions: $f(x) = 2x^3 + 6x^2 + 4x = 2x(x^2 + 3x + 2) = 2x(x + 2)(x + 1)$ and $g(x) = x^2 + 3x + 2 = (x + 2)(x + 1)$. Note that both $f(x)$ and $g(x)$ have the factors $(x + 2)$ and $(x + 1)$. $f(x)$ also has the factor $2x$. Therefore, $f(x) = 2x(g(x))$. Substitute $2x(g(x))$ for $f(x)$ in the answer choices and simplify—the correct choice will be a multiple of $2x + 3$ (i.e., divisible by $2x + 3$):

A) $h(x) = f(x) + g(x) = 2x(g(x)) + g(x) = g(x)(2x + 1)$, which is not a multiple of $2x + 3$.

B) $p(x) = f(x) + 3g(x) = 2x(g(x)) + 3g(x) = g(x)(2x + 3)$, which is a multiple of $2x + 3$.

Therefore, (B) must be the correct choice. Indeed, the remaining choices are not multiples of $2x + 3$:

C) $r(x) = 2f(x) + 3g(x) = 2(2x(g(x))) + 3g(x) = g(x)(4x + 3)$

D) $s(x) = 3f(x) + 2g(x) = 3(2x(g(x))) + 2g(x) = g(x)(6x + 2) = 2g(x)(3x + 1)$

Alternatively, you can divide each answer choice by $2x + 3$ using long division. If the division yields a remainder, then $2x + 3$ does not divide the polynomial evenly.

26. (C) **Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Advanced Arithmetic Items/Properties of Numbers and Absolute Value. SAT Topic: ALG.4.** Use the “Plug-and-Chug” method to solve this problem. Choose values for x and y such that $-y < x < y$. For example, let $y = 1$ and $x = 0$: $-1 < 0 < 1$. Substitute these values in the given statements and evaluate:

I. $|x| < y$: $|0| < 1$ ✓

II. $x > 0$: $0 > 0$ ✗

III. $y > 0$: $1 > 0$ ✓

Therefore, the correct choice includes statements (I) and (III) only.

27. (D) **Math: Multiple-Choice/Statistics/Standard Deviation and Data Interpretation/Scatterplots and Coordinate Geometry/Slope-Intercept Form of a Linear Equation. SAT Topic: PSD.4.** The line of best fit for the data corresponds to the slope-intercept form of a linear equation: $y = mx + b$, where m is the slope of the line and b is the y -intercept ($x = 0$). Based on the given equation, $y = 0.0125x + 61$, the y -intercept of the line of best fit is 61. This means, as the population density of a city approaches zero (i.e., cities with very low population densities), the average housing cost for the city, as a percentage of the national average housing cost, is 61%. (C) is wrong because the equation of the line is a best fit to the data. It is possible for a city to have housing costs below 61% of the national average.

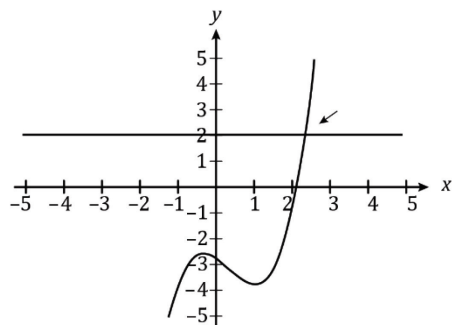
28. (D) **Math: Multiple-Choice/Coordinate Geometry/Graphs of Quadratic Equations and Relations. SAT Topic: PSD.4.** The given function is a quadratic equation and so represents a parabola. The minimum y -value for a parabola corresponds to the vertex, (h, k) , where k is the y -value. The vertex form of a quadratic equation is $y = a(x - h)^2 + k$. Therefore, translate the given equation to vertex form by completing the square: $f(x) = (x + 6)(x - 4) = x^2 + 2x - 24 = x^2 + 2x + 1 - 1 - 24 = (x + 1)(x + 1) - 25 = (x + 1)^2 - 25$, so $k = -25$. Only (D) gives this vertex form of the equation, in which the constant term is -25 .

29. (B) **Math: Multiple-Choice/Statistics/Averages. SAT Topic: PSD.9.** An average is the sum of the values divided by the total number of values in the set. Use this definition to translate the given information into equations: $x = \frac{m+9}{2}$, $y = \frac{2m+15}{2}$, and $z = \frac{3m+18}{2}$. The item stem asks for the average of x, y , and z , in terms of m , so $\frac{x+y+z}{3} = \frac{\frac{m+9}{2} + \frac{2m+15}{2} + \frac{3m+18}{2}}{3} = \frac{m+9+2m+15+3m+18}{6} = \frac{6m+42}{6} = m+7$.

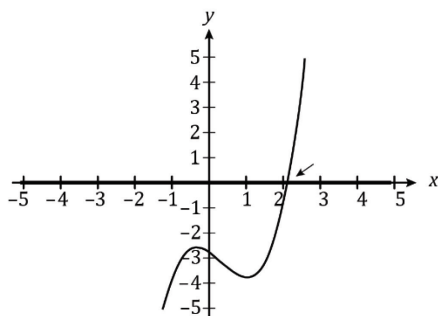
30. (D) **Math: Multiple-Choice/Coordinate Geometry/Qualitative Behavior of Graphs of Functions. SAT Topic: PAM.12.** This item is much simpler than it appears at first glance. The item asks for the number of

intersections between the given cubic equation, $f(x) = x^3 - x^2 - x - \frac{11}{4}$, and the linear equation, $f(x) = k$. Note that $f(x) = k$ is a horizontal line since k is a constant. Therefore, simply test each answer choice value for k by drawing it in the given graph—the correct choice will intersect the function three times:

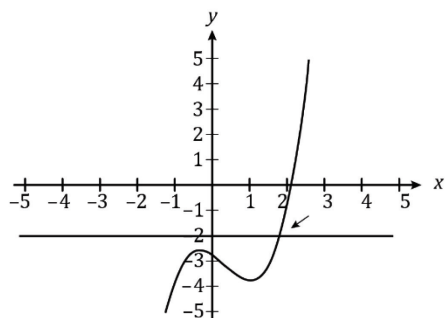
A)



B)

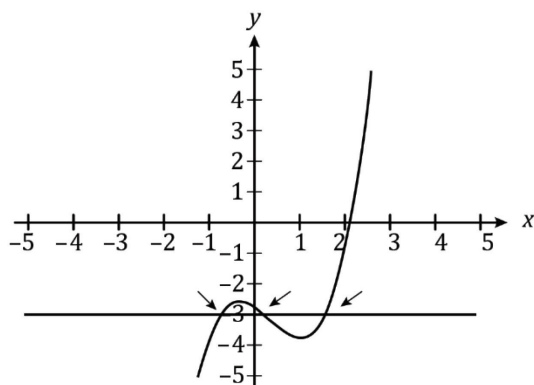


C)



(A), (B), and (C) are all wrong because, in each of these graphs, the functions intersect only once. Therefore, by the process of elimination, (D) must be correct. Indeed, the functions intersect three times for $f(x) = k = -3$:

D)



31. (1160) *Math: Student-Produced Responses/Problem Solving and Advanced Arithmetic/Complicated Problem Solving Items. SAT Topic: PSD.1.* According to the given information, the pool contains 600 gallons of water initially, and the water flows in at a rate of 8 gallons per minute. Therefore, after 70 minutes, the amount of water in the pool is 600 gallons + $\frac{8 \text{ gallons}}{\text{minute}} \times 70 \text{ minutes} = 1,160$ gallons.

32. (1/2, 0.5) *Math: Student-Produced Responses/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions. SAT Topic: ALG.1.* Rewrite the given equation in slope-intercept form, including the known real world units: P millimeters of mercury = $\frac{1}{2}(x \text{ years}) + 110$. The question asks for the increase in millimeters of mercury (mmHg) per year. This is a slope question. For each term in the equation to have units of mmHg, the slope must have units of mmHg (and the 110 value has units of mmHg): $P \text{ mmHg} = \frac{1}{2} \frac{\text{mmHg}}{\text{year}}(x \text{ years}) + 110 \text{ mmHg}$. Therefore, for every increase of 1 year in age, the blood pressure increases $\frac{1}{2}$ (or 0.5) millimeters of mercury.

Alternatively, use the “Plug-and-Chug” method. Pick simple values for x and compute the difference.

When $x = 1$: $P = \frac{1+220}{2} = \frac{221}{2} = 110.5$. When $x = 2$: $P = \frac{2+220}{2} = \frac{222}{2} = 111$. For an increase of 1 year in age, the blood pressure increases $\frac{1}{2}$ (or 0.5) millimeters of mercury.

33. (4.55) *Math: Student-Produced Responses/Problem Solving and Advanced Arithmetic/Proportions and Direct-Inverse Variation. SAT Topic: PSD.3.* Translate the given information into an expression for length, including units so “like” units cancel, leaving the length in units of “feet,” to the nearest hundredth:

$$75 \text{ Roman digits} \times \frac{\cancel{\text{pes}}}{16 \text{ Roman digits}} \times \frac{11.65 \cancel{\text{ inches}}}{\cancel{\text{pes}}} \times \frac{\text{foot}}{12 \cancel{\text{ inches}}} \approx 4.55 \text{ feet.}$$

34. (150) *Math: Student-Produced Responses/Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Ratios and Algebra/Solving Simultaneous Equations. SAT Topic: PSD.1.* The total number of bats is the sum of the males, $240 + m$, where m is the additional number of male bats to be tagged, and the females, $160 + 100 = 260$: total = $240 + m + 260$. Also, $\frac{3}{5}$ of the total number of bats must be male, so

$$\frac{3}{5}(240 + m + 260) = 240 + m. \text{ Solve the equation for } m: \frac{3}{5}m + \frac{3}{5}(500) = 240 + m \Rightarrow$$

$$\frac{2}{5}m = 300 - 240 \Rightarrow m = \frac{60(5)}{2} = 150.$$

35. (2.25, 9/4) **Math: Student-Produced Responses/Algebra/Expressing and Evaluating Algebraic Functions/Functions as Models. SAT Topic: PAM.2.** The item stem asks for the ratio of the dynamic pressure, q , of the fluid moving at a velocity of $1.5v$ to the dynamic pressure of the same fluid moving at a velocity of v (since $1.5v > v$). Note that n is constant for a given fluid. Therefore,

$$\frac{q_{1.5v}}{q_v} = \frac{\frac{1}{2}n(1.5v)^2}{\frac{1}{2}n(v)^2} = (1.5)^2 = 2.25, \text{ or } \frac{9}{4}.$$

36. (29 → 34) **Math: Student-Produced Responses/Geometry/Circles. SAT Topic: ATM.4.** The ratio of an arc of a circle to the circumference ($C = 2\pi r$, where r is the radius) is equal to the ratio of the angle subtended by the arc of the circle to the total degree measure of a circle, 360° . Therefore,

$$\frac{\widehat{AB}}{2\pi r} = \frac{x^\circ}{360^\circ} \Rightarrow x = \frac{\widehat{AB}(360)}{2\pi r}. \text{ Since } \widehat{AB} \text{ is between 5 and 6, use these values to find the range of possible values for } x^\circ:$$

$$\widehat{AB} = 5: x = \frac{(5)(360)}{2\pi(10)} \approx 28.6^\circ$$

$$\widehat{AB} = 6: x = \frac{(6)(360)}{2\pi(10)} \approx 34.4^\circ$$

Therefore, for a value of \widehat{AB} between 5 and 6, the corresponding possible integer values of x are 29, 30, 31, 32, 33, and 34.

37. (.72) **Math: Student-Produced Responses/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions. SAT Topic: PAM.10.** If the stock loses 28% of its value each week, each week its value is equal to 72% of the value the previous week:

t (weeks)	0	1	2	3	t
V (dollars)	360	$0.72(360)$	$0.72(0.72)(360)$	$0.72(0.72)(0.72)(360)$	$360(0.72)^t$

Therefore, in the given equation ($V = 360(r)^t$), the value of r is 0.72.

38. (134) **Math: Student-Produced Responses/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions. SAT Topic: PSD.10.** Simply substitute 3 for t in the given equation, where $r = 0.72$, as determined in the previous item, and round off to the nearest dollar:

$$V = 360(r)^t = 360(0.72)^3 \approx 134.$$