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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.

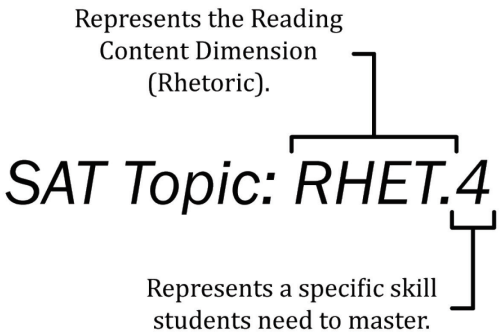
Category Paths and SAT Topics

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

1. (B) ***Reading/Literary Fiction/Main Idea.*** **SAT Topic: RHET.4**. In this passage, we are introduced to Lady Carlotta, who misses her train because she wants to assist a horse that is being poorly treated by its master. While waiting on the platform for the next train, she is "confronted by an imposingly attired lady" (lines 33–34) who says she must be Miss Hope, an expected governess. Lady Carlotta never contradicts Mrs. Quabarl about her true identity, so (B) is the best answer. As for the other choices, (A) is incorrect because Lady Carlotta never weighs the positive and negative aspects of accepting the position of governess; in fact, she was never actually offered that position. She's simply pretending to be a governess. (C) is incorrect because, though Lady Carlotta *is* impersonating someone else, she is not doing it to seek revenge on anyone. And (D) is incorrect because nothing in the passage suggests that Lady Carlotta doesn't like Mrs. Quabarl. To be even more specific, Mrs. Quabarl isn't even Lady Carlotta's employer—she is the employer of Miss Hope, whom Lady Carlotta was mistaken to be.

2. (C) ***Reading/Literary Fiction/Vocabulary.*** **SAT Topic: RHET.1.** At the beginning of the passage, Lady Carlotta disembarks from her train in order to "[take] a turn or two . . . to kill time" (lines 2–3) along the station platform. From this context, it's obvious that "turn" denotes some movement that takes up enough time to make the wait on the station platform somewhat less tedious; both (A), "slight movement," and (B), "change in rotation," would be quick actions, so they can be eliminated. As for the final two choices, (D), "course correction," does not make sense in context (Lady Carlotta took a course correction or two up and down), so that leaves (C), "short walk," as the correct answer. And, indeed, "turn" is an older expression for a brief walk.

   TIP For some Vocabulary items, it may be helpful to plug answer choices back into the passage in order to eliminate wrong answers.

3. (A) ***Reading/Literary Fiction/Implied Idea.*** **SAT Topic: INFID.1b.** The only point at which we get some idea of what other people think of Lady Carlotta takes places in the first paragraph. In lines 10–14, the author informs us that some of Lady Carlotta's friends frequently tell her that she needs to stop interfering with animals in distress and that the plight of those animals is really not her business. From this, it can be inferred that Lady Carlotta's friends think she is outspoken (too much so) in her defense of animals, so (A) is correct. None of the other choices are supported by the passage.

4. (A) ***Reading/Literary Fiction/Textual Evidence.*** **SAT Topic: INFID.2.** As mentioned in the previous item, in lines 10–14 we get really our only idea of what other people might think of Lady Carlotta. That makes (A) the correct answer. None of the other choices allude to other people's opinions of Lady Carlotta.

   TIP Some students may find it helpful to quickly skim the items after reading the passage but before answering the items themselves. For Textual Evidence items, this technique could prove particularly useful; students would then be aware of which items precede Textual Evidence items and could make a note in the margins of their test booklet to pay particular attention to where in the passage they found the correct answer to those preceding items. Then, voila! They have the correct answer for the Textual Evidence item as well.

5. (C) ***Reading/Literary Fiction/Implied Idea.*** **SAT Topic: INFID.1b.** In the first fourteen lines of the passage, we learn that Lady Carlotta is a woman who is not afraid to come to the aid of an animal she deems in need, despite her friends frequently telling her that it's really none of her business. Then, in lines 14–22, the author gives a brief description of the one time in which Lady Carlotta actually took this advice: one of the most vigorous proponents of minding your own

business was treed by an angry boar, and Lady Carlotta, instead of interfering, merely continued on with her watercolor painting. The story is a humorous one that lets us know a little bit more about Lady Carlotta, so (C) is the best answer. (A) is incorrect because Lady Carlotta is not being deceptive at all in the story told. As for (B), while some might view Lady Carlotta's actions (or lack thereof) in the story as somewhat cruel, the story is told with an emphasis on the humor of the situation, not the cruelty of it. As for (D), while Lady Carlotta's actions in the story might initially be seen as surprising, her behavior is entirely consistent with what we later learn in the passage about her sense of humor and does not illustrate any kind of change at all.

6. (A) ***Reading/Literary Fiction/Vocabulary.*** **SAT Topic: RHET.1.** In lines 53–61, the paragraph in which "charge" is used, Lady Carlotta learns about the children that she, as Miss Hope, is supposed to be teaching; in other words, she is learning about the responsibilities, (A), that she is taking upon herself as a governess. She is not learning about an attack, (B), and monetary matters are not discussed at all, so (C) and (D) are likewise incorrect.

7. (A) ***Reading/Literary Fiction/Explicit Detail.*** **SAT Topic: INFID.1a.** As discussed in the previous item, in lines 53–61, Lady Carlotta learns about the children she is supposed to be teaching. She learns that Claude and Wilfrid are "delicate, sensitive young people" (lines 56–57), that Irene is a highly developed artist, and that Violet is . . . well, like her siblings, equally as special as every other child "of that class and type" (line 60). In other words, Mrs. Quabarl's children are perfectly ordinary. The description in (A) best fits this idea. As for the other choices, (B) directly contradicts the idea presented in lines 59–61. The children's opinion of having a governess is never discussed (they could be extremely excited about it), so (C) is also incorrect. And as for (D), the children's level of education relative to their peers is also never addressed; in fact, given that the author emphasizes that they are nothing extraordinary, we could deduce that they are probably as educated as others of their age, and not more or less so.

8. (B) ***Reading/Literary Fiction/Implied Idea.*** **SAT Topic: INFID.1b.** Upon meeting Mrs. Quabarl, Lady Carlotta is informed in lines 62–68 that Mrs. Quabarl doesn't just want her children taught, she wants them to be thoroughly engaged and interested in what they're learning, to do more than just memorize a "mass of names and dates" (line 67). (B) is therefore the best answer. As for the other choices, Mrs. Quabarl never mentions values, traditional or otherwise, to be taught as part of her children's education, so (A) is incorrect. And although Mrs. Quabarl mentions that one of her children has an artistic bent, she says nothing to imply that she favors artistic experimentation as an educational style, so (C) is also incorrect. Finally, Mrs. Quabarl also clearly wants her children to do more than simply retain facts, so (D) is incorrect.

9. (B) ***Reading/Literary Fiction/Explicit Detail.*** **SAT Topic: INFID.1a**. Although most of the passage focuses on Lady Carlotta, the last paragraph of the passage gives us some insight into Mrs. Quabarl. Previously, the author has noted that she is an "imposingly attired lady" (line 34) who speaks in a way that leaves no room for argument. However, in the last paragraph, the author provides some further insight: although Mrs. Quabarl appears outwardly imposing and self-assured, that façade only extends "as long as [she is] not seriously opposed" (lines 79–80). Once she is opposed, she becomes "cowed and apologetic" (line 82). So the correct answer is (B). None of the other choices describe characteristics that are supported by the passage.

10. (D) ***Reading/Literary Fiction/Textual Evidence.*** **SAT Topic: INFID.2.** As mentioned in the previous item, the discussion of Mrs. Quabarl as a woman who appears imposing but can be easily defied takes place in the final paragraph of the selection. Lines 77–82, (D), are the only lines that adequately express this idea.

11. (A) ***Reading/Social Studies/Development.*** **SAT Topic: RHET.2b.** The author of this passage is very clearly advocating for a greater appreciation for, and wider use of, public transportation systems. Most of the passage deals with the positive aspects of public transportation, but the

third paragraph outlines a negative: at least in much of North America, using public transit is depressing, as well as "underfunded, ill-maintained, and ill-planned" (line 31). So while the author certainly favors public transit, he clearly acknowledges limitations, at least in North America, with the system, which makes (A) the correct answer. As for the other choices, (B) is incorrect because the third paragraph does not continue the arguments from the first two paragraphs. In fact, the words "and yet" at the beginning of the third paragraph signal that the third paragraph will contrast with, not illustrate, the ideas presented in the first two paragraphs. As for (C), the author does discuss a problem (why some people are opposed to using public transit), but with the exception of the demographers mentioned in line 58, there have been no experts mentioned at all in this passage. As for (D), while the passage does mostly provide favorable reports about the use of public transit, the third paragraph does not advocate abandoning this practice.

12. (C) ***Reading/Social Studies/Explicit Detail.*** **SAT Topic: INFID.1a**. The third paragraph, as discussed in item #11, is the one in which the author goes into detail about why automobile use, and not public transit, is favored in North America. The author gives a few reasons why people don't like using public transit in general, but the last sentence of the paragraph (lines 32–34) offers a reason why, specifically, automobile transit is preferred: using a car is almost always faster than using public transit. That makes (C) the correct answer.

13. (D) ***Reading/Social Studies/Textual Evidence.*** **SAT Topic: INFID.2.** As mentioned in the previous item, the last sentence of the third paragraph tells us why people in North America prefer using a car to using public transit. That sentence is lines 32–34, which means (D) is the correct answer.

14. (B) ***Reading/Social Studies/Main Idea.*** **SAT Topic: RHET.4.** The main idea of the fourth paragraph can be summed up by the second sentence of the paragraph (lines 35–37): "Done right, public transport can be faster, more comfortable, and cheaper than the private automobile." The author then gives some examples of places with excellent public transit systems. So (B) is the correct answer. As for the other choices, (A) is incorrect because the examples listed are not just from European countries; in line 48, the author also discusses public transit in Latin America, China, and India. As for (C), while the author no doubt thinks the transit systems mentioned in the fourth paragraph are good models to follow, nothing in the fourth paragraph suggests that he thinks Americans should mimic these systems. And as for (D), while the fourth paragraph mentions Wi-Fi–equipped trains designed to facilitate work for travelers, that is only one example used and does not imply that most public transportation is engineered to facilitate such work.

15. (B) ***Reading/Social Studies/Textual Evidence.*** **SAT Topic: INFID.2.** The previous item mentions that the main idea of the fourth paragraph is neatly summed up by the second sentence of that paragraph, or lines 35–37. That makes (B) the correct answer.

16. (C) ***Reading/Social Studies/Vocabulary. SAT Topic:*** **SUM.2.** Since the sentence in which "credit" is used is relatively short, plug in the answer choices to check for meaning:

(A): If you *endow* the demographers, this transit trend has legs.
(B): If you *attribute* the demographers, this transit trend has legs.
(C): If you *believe* the demographers, this transit trend has legs.
(D): If you *honor* the demographers, this transit trend has legs.

Of these choices, only "believe," (C), makes sense in context. To endow someone means to give them money, so (A) doesn't work. As for (B), "attribute" is usually followed by "to"; you attribute something to someone or something else. And though the demographers may be doing the attributing, there is no indication as to what exactly they're attributing. Therefore, (B) is

also incorrect. Finally, as for (D), "honor" also doesn't make sense in context; we are not commending the demographers.

17. (B) ***Reading/Social Studies/Vocabulary.*** **SAT Topic: SUM.2.** In the context in which "favor" (line 61) is used, the author is discussing millennials, who, he says, "tend to favor cities over suburbs" and who are "far more willing . . . to ride buses and subways" (lines 62–63). He then goes on to detail why millennials would be willing to ride public transit—not having to drive means they can stay more plugged in to their devices and to their texting, which is something they would rather do, or that they would *prefer* to do. "Prefer," (B), is thus the correct answer. None of the other choices make sense in context: it is impossible for a human being to indulge a city over a suburb, (A); to resemble a city over a suburb, (C); or to serve a city over a suburb, (D).

18. (B) ***Reading/Social Studies/Textual Evidence.*** **SAT Topic: INFID.2.** All of the answers to this item are included in the fourth paragraph of the passage, and a quick skim of that paragraph will show you that there is one point in the paragraph in which personal electronic devices are discussed. In line 64, the author mentions "iPads, MP3 players, Kindles, and smartphones." A further reading of lines 63–67, (B), confirms that this is indeed the correct answer: public transit is compatible with the use of personal electronic devices because it means that users can pay attention to texting instead of driving, and the use of headphones provides "effective insulation" (line 66) from most of the sounds of commuting. None of the other choices discuss personal electronic devices and their use with public transit.

19. (A) ***Reading/Social Studies/Data Presentations.*** **SAT Topic: SYN.2.** A quick look at the graph for understanding is in order, and then process of elimination (POE) would be a good technique for finding the correct answer to this item. The first figure, according to the title, breaks down US public transportation passengers by occupation and by percentage. Now, which choice is true according to the graph?

(A): The percentage of students using public transit is 10.7, while the percentage of retirees using public transit is only 6.7. So (A) is true and, therefore, the correct answer.

At this point, you could just fill in the bubble for (A) and move on so as to avoid wasting any time. However, we'll go through the other answer choices here just to confirm that (A) is correct.

(B): Percentage of employed people = 72. Percentage of unemployed people = 6.4. Not even close to the same, so (B) is incorrect.

(C): This answer choice is a little bit tricky. Although on first glance, it seems obvious that this is incorrect from sheer numbers (72% of employed people versus 2% of homemakers should mean homemakers obviously are less likely to use public transit), there's more to the incorrectness than that. The numbers lean one way, but they say nothing about how more or less likely a certain group of people is to use public transit. For example, though only 2% of the passengers are homemakers, who's to say that that 2% doesn't represent a large proportion of homemakers who use public transportation?

(D): This has the same trickiness seen in (C). Though the numbers clearly show that a smaller percentage of those who ride the train are unemployed vs. employed (6.4% vs. 72%), the graph tells us nothing about the frequency with which both groups ride public transportation. So (D) is also incorrect.

Process of elimination should be one of the first tools students turn to when solving most Data Presentations items. Often, two or more answer choices can be eliminated by a careful reading of the graph, leaving students with the correct answer—or at least a chance to make a very good guess.

20. (**A**) ***Reading/Social Studies/Data Presentations.*** **SAT Topic: SYN.2.** Once again, POE would be the best way to solve this item. So, once again, we'll go answer by answer to determine the correct answer choice.

(A): In Figure 1, 72% of people who use transit are employed outside the home; in Figure 2, 59.1% of people who use transit are using it to go to work. (A) is, therefore, something that could be logically deduced from the two figures and is probably the correct answer.

(B): In Figure 1, 72% of people who use transit are employed outside the home, but the percentage of people who are running errands is very small (8.5%) comparatively, so it is unlikely that those who are employed outside the home use public transit primarily to run errands.

(C): Nothing in either of the graphs states when people use public transit (weekdays vs. weekends), so (C) goes far beyond the scopes of the graphs presented.

(D): (D), like (C), goes beyond what is suggested in the graphs. No information is presented on when or if the participants are planning to purchase cars.

21. (**D**) ***Reading/Natural Sciences/Development. SAT Topic:*** **RHET.2a.** (A) cannot be correct because, though an experiment is proposed (new data on ground-up vs. tree-down), nothing about it proves unworkable, and the data of the study in the passage actually gives rise to potential answers, not new questions. As for (B), though a new discovery *is* made (the way Chukar partridges climb hay bales), this discovery does not lead to the adapting of a classic study. As for (C), no anomaly is observed at any point in the proceedings. The way the Chukar partridges climb the hay bales could be seen as an anomaly, but a careful review of the passage reveals it is not: the rancher was well aware of the climbing, and the Dials observed WAIR in many other species of birds, so it couldn't be an anomaly. That leaves (D): the Chukar partridges climbing the hay bales was unexpected, and it led to Ken Dial modifying his study to observe the climbing. Then, at the end of the passage, the results are indeed interpreted and evaluated. So (D) is the correct answer.

22. (**A**) ***Reading/Natural Sciences/Vocabulary.*** **SAT Topic: SUM.2.** When "challenged" is used, the author is discussing the initial motivation that spurred Ken Dial to construct a project for studying how baby game birds were learning to fly. The author writes that a group of graduate students "challenged" Ken to produce new data on the subject of flying evolution. "Dared," (A), best fits the context of this sentence. As for the other choices, there is nothing in the paragraph to suggest that Ken's project was anything but voluntary, so it is unlikely that the graduate students *required* him to find new data, (B). As for (C), it doesn't make sense that the students would dispute with Ken about the data before it was even discovered. And as for (D), though it could be that the students did compete with Ken in the finding of new data, there is nothing in the passage to suggest that this would be the case—at least, the graduate students are never mentioned again.

23. (**A**) ***Reading/Natural Sciences/Main Idea.*** **SAT Topic: RHET.5.** As mentioned in item #21, the first paragraph of the passage deals with *why* Ken Dial set up his experiment, so it's probably safe to start there to find the answer to this item. In lines 6–11, the author writes that Ken was challenged to find new evidence relating to the "age-old ground-up–tree-down debate" (lines 8–9) of bird evolution and that he selected baby game birds as the basis of his study for finding new evidence. So Ken must have thought that baby game birds learning to fly have something in common with ancestral birds learning to fly, and that makes (A) the correct answer choice. (B) is incorrect because if Ken believed that young game birds jumping erratically (such as the Chukar Partridge) was a recently evolved behavior, he probably wouldn't have chosen birds that displayed that characteristic as the spotlight for his study. (C) directly contradicts the

information from the passage. The third paragraph discusses how birds used hay bales (their perches) even within the controlled setting of the study; they seemed just as likely as their wild counterparts to use those perches. As for (D), if Ken had assumed that ground-up and tree-down birds evolved in parallel, it is unlikely he would have undertaken this project at all. Why would he need to propose an answer to this debate if he assumed both sides were correct?

24. (B) ***Reading/Natural Sciences/Textual Evidence.*** **SAT Topic: INFID.2.** The previous item discusses the fact that lines 6–11 provide the best evidence for Ken Dial's assumption in setting up his experiment. Thus, the correct answer is (B).

25. (C) ***Reading/Natural Sciences/Development.*** **SAT Topic: RHET.2b.** Without the rancher's observation that the birds needed something to climb on, it's unlikely that Ken would have supplied the hay bales and, therefore, made his important discovery about how baby game birds climbed those bales while learning to fly. After all, the author says, it would seem "unnatural" (line 24) for ground birds to not like the ground and to prefer resting above the ground. So the rancher's observation provided an important but unanticipated piece of information that drastically changed the rest of Ken Dial's project, which makes (C) the correct answer. (A) is incorrect because Ken's motivation is explained prior to the incident with the rancher—he is motivated by a group of students challenging him to undertake a project. (B) is incorrect because field and laboratory research aren't compared in this part of the passage. And (D) is incorrect because the local rancher doesn't ascribe to a certain theory, be it tree-down or ground-up. He merely was making an observation based on his own experience.

26. (C) ***Reading/Natural Sciences/Explicit Detail.*** **SAT Topic: INFID.1a.** The answer to what happened after Ken Dial had the "'aha' moment" mentioned in line 41 can be found in the fourth paragraph of the passage, specifically in lines 46–48: he set up a series of experiments that had the birds running up ramps at increasing angles. That answer is best reflected by (C). None of the other choices are mentioned in the passage.

27. (B) ***Reading/Natural Sciences/Explicit Detail.*** **SAT Topic: INFID.1a.** The fourth paragraph details Ken Dial's ramp experiment with the baby Chukars, so that would be a good place to start to find the correct answer for this item. And, indeed, the correct answer can be found in line 49—the angles, or positions, of the birds' wings enabled them to "scramble up otherwise impossible slopes" (lines 58–59), so (B) is the correct answer. As for the other choices, neither alternation of wings and feet, (C), nor continual hopping, (D), are mentioned in the fourth paragraph as assisting the baby Chukars in gaining traction on steep ramps. (A) is perhaps the second-best choice (the author does mention that the partridges race up the ramps in line 47), but speed is not the main factor in the baby Chukars' ability to climb steep ramps.

28. (B) ***Reading/Natural Sciences/Vocabulary.*** **SAT Topic: SUM.2.** As in item #16, plugging in the answer choices for the word in question is a good technique here:

(A): Ken called the technique WAIR . . . and went on to *portray* it in a wide range of species.
(B): Ken called the technique WAIR . . . and went on to *record* it in a wide range of species.
(C): Ken called the technique WAIR . . . and went on to *publish* it in a wide range of species.
(D): Ken called the technique WAIR . . . and went on to *process* it in a wide range of species.

Now onto POE. "Portray," (A), which means to create a likeness of something, doesn't make sense. How could Ken Dial create a likeness of WAIR in bird species? "Record," (B), *does* make sense, however. Ken Dial observed WAIR in other species and recorded his observations. "Publish," (C), and "process," (D), also don't make sense. Ken couldn't have published WAIR *in* a wide range of species, though he could have published *about* how WAIR was observable in many species. And "process," which as a verb means to treat, prepare, or handle, completely misses the mark here.

29. (D) ***Reading/Natural Sciences/Implied Idea.*** **SAT Topic: INFID.1b.** The only place where gliding animals are mentioned is in the final paragraph (lines 69–76). There, the author states that gliding animals don't have a flapping flight stroke, and that fits perfectly with (D). As for the other choices, none of them are mentioned in the final paragraph in connection with gliding animals.

30. (D) ***Reading/Natural Sciences/Textual Evidence.*** **SAT Topic: INFID.2.** As mentioned in the previous item, the final paragraph contains a mention of gliding animals. Only (D), lines 72–74, is in the final paragraph and is, therefore, the best answer.

31. (B) ***Reading/Social Studies/Vocabulary.*** **SAT Topic: SUM.2.** In the first sentence of the third paragraph (lines 21–24), Talleyrand states that everyone's happiness, particularly women's, requires that women stay removed from politics. So the correct definition for "common" must be something that conveys a universal experience. "Shared," (B), best fits here. None of the other choices make sense in context.

32. (C) ***Reading/Social Studies/Implied Idea.*** **SAT Topic: INFID.1b.** It is in the third paragraph of Passage 1 that Talleyrand goes into some detail about why women should not exercise "political rights or functions" (lines 23–24). One of the reasons he gives is that he believes the delicate nature of women means they should be "set . . . apart from strenuous habits and onerous duties" (lines 27–28) and limit themselves to the "gentle occupations and . . . cares of the home" (lines 29–30). The contrast between strenuous/onerous and gentle lends itself to the belief Talleyrand might have that staying at home is neither burdensome nor unpleasant, as opposed to life in the public sphere. And (C) best conveys this idea. As for (A), Talleyrand clearly thinks that women will derive the greatest pleasure from staying at home and men from being out in political society, so it is unlikely that he would think men would derive pleasure from being at home. As for (B), the authors of Passage 1 state that the roles of women and men represent "a source of harmony" (line 32), "life's companions" (line 37), and a union that should not be torn asunder. So it would not be farfetched to say that the authors probably believe that men's and women's roles are at least equal and not that women's provide less value. Finally, as for (D), the authors never state that the skills required to run a home are similar to those required to run a country or business.

33. (C) ***Reading/Social Studies/Textual Evidence.*** **SAT Topic: INFID.2.** As mentioned in the previous item, the sentence contained in lines 25–30 best summarizes why the authors of Passage 1 think running a home and raising children are mostly pleasant and easy activities. So (C) is the right answer.

34. (D) ***Reading/Social Studies/Explicit Detail.*** **SAT Topic: INFID.1a.** The answer for this item can be found in the very first sentence of Passage 2: Wollstonecraft argues that women must be "prepared by education to become the companion of men" (lines 43–44), (D). (A) is incorrect because while Wollstonecraft no doubt thinks the education of women will contribute to their personal happiness, she makes no mention of financial security as a precursor to societal progress. (B) goes directly against the ideas presented in Passage 2; Wollstonecraft wants women to gain more of an education than what is currently prescribed socially. And (C) contradicts the idea presented in lines 43–44. Wollstonecraft wants women to become men's companions, not to replace them.

35. (C) ***Reading/Social Studies/Vocabulary.*** **SAT Topic: SUM.2.** There are a few key words in lines 47–50 that provide clues as to what "reason" means: "know," "comprehend," and even "see." These words, and the fact that the whole argument of the first paragraph deals with the education of women, lends itself to the idea that "reason," as used in line 50, most nearly means "intellect." None of the other choices provide an appropriate meaning.

36. (A) ***Reading/Social Studies/Explicit Detail.*** **SAT Topic: INFID.1a.** In the third paragraph of Passage 2, Wollstonecraft brings up freedom; in particular, she addresses the disparity between how society's leaders respond to men vying for freedoms versus women vying for the same freedoms. According to Wollstonecraft, legislators allow men to "contend for their freedom" (line 73) but neglect to allow women the same right. Society's leaders, therefore, privilege men over women, which makes (A) the correct answer. As for the other choices, though Wollstonecraft argues that educating women will serve to increase virtue, she never says anything about a current reduction in virtue, so (B) is incorrect. As for (C), though Wollstonecraft mentions happiness in the third paragraph of Passage 2, it is not in the context of an argument about happiness. And (D) completely contradicts Passage 2 entirely: the whole point is that men and women are *not* equal.

37. (D) ***Reading/Social Studies/Textual Evidence.*** **SAT Topic: INFID.2.** The third paragraph discusses freedom and leaders (see explanation for #36 for more details), and only (D), lines 72–75, is found in the third paragraph.

38. (C) ***Reading/Social Studies/Development.*** **SAT Topic: RHET.5.** When Wollstonecraft cites the statement from Passage 1 in lines 61–65, she focuses on the idea that the authors of Passage 1 won't bother trying to explain why women aren't involved in government because that discussion relies on "abstract principles" (line 64). Why then, Wollstonecraft argues, can people discuss the abstract rights of men? Aren't the same principles at work? This, according to Wollstonecraft, is a serious flaw in the argument in Passage 1, so (C) is the correct choice. As for the other choices, (A) is incorrect because Wollstonecraft never calls into question any qualifications of the authors of Passage 1. (B) is incorrect because Wollstonecraft mentions that within the first sentence of Passage 1 is a grain of truth, and she does not dispute it. Finally, (D) is incorrect because, though Wollstonecraft agrees with the first statement, she disagrees with the remainder of the arguments presented in Passage 1 and doesn't want to validate the authors' opinions of gender roles.

39. (A) ***Reading/Social Studies/Main Idea.*** **SAT Topic: SYN.1**. Finding the correct answer to this item essentially boils down to understanding the main ideas of each passage. What is the main idea of the first passage? That society should stay as it is, with women not venturing out into the political realm—or beyond their hearths. And what is the idea of the second passage? That women need to be educated politically, that they need to be involved. Clearly, there is a disagreement between these two positions, so that rules out (C) and (D). And (B) can also be eliminated since no evidence is presented in Passage 1 with which Passage 2 can present alternative conclusions. That leaves (A), and "strongly challenges" certainly summarizes the relationship between the two passages.

40. (D) ***Reading/Social Studies/Implied Idea.*** **SAT Topic: INFID.1b.** POE could be a good choice for answering this item.

    (A): The authors of Passage 1 would probably disagree with this statement. In the third paragraph of Passage 1, they argue that women have "delicate constitutions" and "peaceful inclinations" (line 26), natural inclinations that point them toward the home and away from public life. Wollstonecraft, however, would probably agree with (A): women, in her view, are not that different from men in their desires for education, "the moral and civil interest of mankind" (lines 56–57), and love toward the human race.

    (B): Wollstonecraft definitely agrees with this (it's the whole point of her essay!), but the authors of Passage 1 don't. They think women don't need anything and that they should stay how and where they are.

(C): The authors of Passage 1 would probably agree with this; they state that women's natures make them more fitted for the home front and thus they would probably be happy as they were. Wollstonecraft would probably disagree with this statement, however. She thinks women need more education in order to achieve a higher level of happiness.

(D): The authors of Passage 1 would probably agree with (D); in the first two lines of Passage 1, they acknowledge that women are excluded by men "from any participation in government" (line 2). And Wollstonecraft would also agree with (D); in line 86, she states point-blank that women are "den[ied] civil and political rights." So (D) is the correct answer.

TIP For double passages items that require comparison of the two passages, POE is a very helpful technique. If an answer choice doesn't apply to one of the passages, then it can be immediately eliminated.

41. (A) ***Reading/Social Studies/Application***. **SAT Topic: SYN.1.** In the last paragraph of Passage 2, Wollstonecraft argues passionately that denying women civil rights is tantamount to tyranny on the part of men. The authors of Passage 1 would no doubt disagree with the sentiment on the grounds that women are ill suited to politics: their "delicate constitutions" and "peaceful inclinations" (line 26) mean they are better fitted naturally to "gentle occupations and the cares of the home" (lines 29–30) than to the unpleasant world of politics. (A) best fits this response. As for the other choices, the idea that men and women can reason similarly is an idea presented in Passage 2 and is never an idea supported by Passage 1, so (B) is incorrect. (C) and (D) go explicitly against the idea presented in Passage 1 that is mentioned earlier in this explanation, so they are incorrect as well.

42. (C) ***Reading/Natural Sciences/Voice.*** **SAT Topic: RHET.1.** The first part of each of the answer choices can be condensed down into a single word: optimistic, (A); dubious, (B); tentative, (C); and critical, (D). What word most describes the passage's tone? It isn't necessarily critical or optimistic; it seems to be solidly neutral, so both (A) and (D) can be eliminated. That leaves (B) and (C), which are fairly similar, so let's examine the second part of each. Do words like "can," "may," and "could" show the authors' lack of confidence in their research's usefulness? Possibly, but taken within the scope of the passage as a whole, it becomes apparent that the authors believe their research could be extremely useful if proven correct. That leaves (C), which definitely fits more in line with the passage: the authors suspect (they also use the word "postulate" a few times) that what they are proposing is correct but haven't yet done the research to prove it.

TIP For Voice items, it's often helpful to rank the answer choices from most positive to most negative (with more neutral choices in the middle). Then, if students can determine the general tone of the passage, they can eliminate at least one and possibly more answer choices.

43. (C) ***Reading/Natural Sciences/Explicit Detail.*** **SAT Topic: INFID.1a.** The trial the authors mention in line 42 involves two honey bee populations. One is given the chance to feed from clover plus pyrethrum-producing plants while the other is only offered clover. The scientists would then introduce mites to both populations. Why? Because, as mentioned in lines 24–28, bees need to feed at least occasionally on pyrethrum-producing plants or they become "susceptible to [potentially fatal] mite infestations," and the scientists postulate that these mite infestations are the reason so many bees are dying. (C) best fits with this hypothesis and the reason for the trial. None of the other choices fit. Though the authors do mention that bees may develop secondary infections as a result of the mites, that is not something that will be tested by the trial, so (A) is incorrect. As for (B), the authors mention in lines 31–35 that increasing the use of insecticides will actually harm the bees more than help them. Finally, (D) is incorrect because the

susceptibility of humans to varroa mites is never mentioned in the passage and neither is it going to be tested by the trial mentioned.

44. (D) ***Reading/Natural Sciences/Textual Evidence.*** **SAT Topic: INFID.2.** As mentioned in the previous item, lines 24–28 are when the discussion takes place as to the hypothesis that will be tested by the trial, so (D) is the correct answer.

45. (D) ***Reading/Natural Sciences/Explicit Detail.*** **SAT Topic: INFID.1a.** Lines 31–35 discuss the effects insecticides used by beekeepers have on already sick bees: the bees are "further weakened" (line 32) beyond what the mite infestations have done to them already. So (D) is the correct answer. As discussed in the passage, the insecticides beekeepers use do not increase certain mite populations, (A); kill some beneficial forms of bacteria, (B); or destroy the bees' primary food source, (C).

46. (C) ***Reading/Natural Sciences/Textual Evidence.*** **SAT Topic: INFID.2.** Lines 31–35, as discussed in the previous item, contain the best evidence for the correct answer to the previous question. (A), (B), and (D) are not good choices since none of them mention beekeepers or the effects on the honeybees of the insecticides the beekeepers use.

47. (B) ***Reading/Natural Sciences/Vocabulary.*** **SAT Topic: SUM.2.** POE would be a good choice for this item. So which answer makes the most sense in context? Let's start with (A). It's clear from the passage that the authors are *not* making unfounded assumptions anywhere; they back up their hypotheses with facts and research. So (A) can be eliminated. What about (B)? The authors are indeed making claims about what they believe or suspect (line 19) will happen to bees who do not feed of pyrethrum-producing plants. So (B) is a possible right answer. What about (C)? The authors present a theory but don't appear to question an existing theory or belief, so (C) can be eliminated as well. And what about (D)? The whole paragraph only talks about suspicions the authors have as to what might happen to bees; the hypothesis they are putting forth has not yet been proven, so they don't have firm evidence yet. Thus, (D) can be eliminated as well. That leaves (B), which is the correct answer.

48. (B) ***Reading/Natural Sciences/Main Idea.*** **SAT Topic: RHET.2b.** In the fourth paragraph, the authors lay out an idea for a trial that could prove or disprove their hypothesis. The experiment has not taken place yet, so that instantly eliminates (A), which discusses the results of a finished experiment, and (D), which mentions an unfinished and ongoing experiment. No nutritional information is provided in the fourth paragraph, beyond what the bees will eat during the trials, so (C) can be eliminated as well. That leaves (B), which fits nicely with the summary mentioned earlier: the fourth paragraph proposes an experiment about the diet of honeybees and how it affects mite infestations.

49. (A) ***Reading/Natural Sciences/Implied Idea.*** **SAT Topic: INFID.1b.** As mentioned in the previous item, the fourth paragraph is the one in which the authors discuss their idea for an experiment. This experiment would involve two groups of bees and the food sources the scientists would make available to them: one group of bees (the experimental group) would be fed clover and "a number of pyrethrum producing plants" (lines 44–45) while the other group, the control group, would only be offered clover. The scientists would then measure the effects of the mites on both groups. Since the scientists hypothesize earlier that lack of pyrethrum is causing fatal mite infestations in bees, it would make sense for their trial to include one group to which pyrethrum is available (the experimental group) and one group to which it is not (the control group, or the one with only clover). Therefore, it is probable that the authors assume that clover does not include pyrethrum, (A). None of the other choices are supported by the passage.

50. (B) ***Reading/Natural Sciences/Data Presentations.*** **SAT Topic: SYN.2.** There are a few key words in the item stem to pay attention to as we look at the graph: colony collapse disorder, percent,

and four pathogens. At the bottom of the table, there is a row that lists "All four pathogens," and only two numbers are listed: 77 and 0. That immediately eliminates (C) and (D). And one of the titles of the columns is "Colonies with colony collapse disorder (%)," which fits into our other key words. So how many colonies had colony collapse disorder and all four pathogens? Seventy-seven percent, (B).

51. (**D**) ***Reading/Natural Sciences/Data Presentations.*** **SAT Topic: SYN.2.** For this item, we'll be looking at the column for bee colonies *without* colony collapse disorder (farthest column on the right) and seeing which of the listed pathogens has the highest percentage. A quick look down the column reveals that 81 is the highest percent listed, and that number belongs to *Nosema ceranae*, (D). All of the other choices have lower percentages than 81.

52. (**D**) ***Reading/Natural Sciences/Data Presentations.*** **SAT Topic: SYN.2.** As Data Presentations items go, this one is tricky. It requires more than simply reading the graph; it requires a synthesis of information in the graph with information in the passage. So let's take it one step at a time.

First of all, does the data support the authors' claim? Well, though the data does show that colonies that have higher percentages of pathogens are far more likely to undergo colony collapse disorder, nothing in the table mentions mite infestations in those colonies. So the data does *not* support the authors' claim. That eliminates (A) and (B).

Now, a comparison of (C) and (D) is in order. (C) is incorrect because bacteria as a cause of colony collapse is irrelevant as it relates to the authors' claim. Bacterial infection is mentioned in the first paragraph, but it, like the viral and fungal infections, is secondary to the mite infestation. That leaves (D), which is the correct answer: the data never indicates if the honeybees had been infected with mites.

Writing and Language

Passage 1

1. (A) ***Writing and Language/Standard English Conventions/No Change.*** **SAT Topic: SEC.1a.iii.** This item deals with faulty parallelism. The original is correct because it results in a parallel series consisting of three comparative adjectives ("happier," "healthier," and "more productive"). (B) is wrong because the adjective "healthy" is not of the comparative form and therefore disrupts the series. As for (C), inserting the plural pronoun "they" with its plural verb "are" not only disrupts the intended series of elements but also results in a comma splice. And (D) is wrong because the coordinating conjunction "and" is required to join together the series of elements; additionally, the verb "being" disrupts the parallel series of comparative adjectives.

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

2. (B) ***Writing and Language/Expression of Ideas/Strategy/Effective Opening Sentence.*** **SAT Topic: EXPID.2b.** This item deals with recognizing the most effective opening sentence for the passage, as the question asks for the material that would provide the "most appropriate introduction to the passage." Remember that the introduction to a passage typically presents the main idea of that passage. As immediately indicated in the title ("Shed Some Light on the Workplace") and then subsequently discussed throughout the passage, the writer addresses the health issue of not having sufficient amounts of natural light in the workplace. So, (B) is the correct answer choice. As for the (A), a temperature-controlled environment is irrelevant to the issue of having natural light. (C) is wrong because a thoroughly sealed environment is the exact opposite of what is needed for employees to be happier, healthier, and more productive in the workplace. And as for (D), while natural light might be considered a special accommodation by some employers, the passage does not discuss whether employees feel comfortable asking for access to natural light.

3. (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 how inadequate natural light could interfere with the body's circadian rhythms, and the sentence immediately following continues the discussion by describing the role of circadian rhythms. To add the sentence under consideration (which provides a fact about the relationship between working with or without windows and duration of sleep at night) at this point in the passage would interrupt the discussion of circadian rhythms. So, (C) is the correct answer choice. Setting aside for the moment the fact that the proposed sentence disrupts the flow of the paragraph, (A) and (B) are wrong for additional reasons. As for (A), while the sentence in question does supply quantitative information, it is not examined in the rest of the paragraph. And (B) is wrong because the relationship between offices with windows and sleep does not explain the nature of bodily functions. Finally, (D) is wrong because it entertains the idea that the sentence in question would be appropriate had it taken into account additional information.

4. (C) ***Writing and Language/Standard English Conventions/Punctuation/Apostrophes.*** **SAT Topic: SEC.3c.** This item deals with apostrophes, specifically in understanding when to use them to indicate possession. In this case, the writer intends to say that circadian rhythms are controlled by the biological clock of the human body. So, the singular possessive noun "body's" is required, which means that (A) and (B) can be eliminated. As for (C) and (D), the latter incorrectly includes the singular possessive noun "biological clock's." So, (C) is the correct answer choice.

   TIP Use the process of elimination to help narrow down the choices. (B) and (D) can immediately be eliminated since using a possessive noun to modify another possessive noun ("bodies' … clocks'"

and "body's … clock's," respectively) results in an awkward construction. Now, there is a 50/50 chance at guessing the correct answer. By recognizing at this point that the context demands a singular possessive, it becomes apparent that (C) must be the correct answer choice.

5. (A) ***Writing and Language/Standard English Conventions/No Change.*** **SAT Topic: SEC.2c.ii.** This item deals primarily with subject-verb agreement. The original is correct because the singular verb "is" agrees with its subject ("absenteeism"). Additionally, the present tense verb "is" is consistent with "increase." (B) is wrong because the plural verb "are" does not agree with the singular noun "absenteeism." Do not be distracted by the plural noun "health problems"; it is the absenteeism that results from these problems that is costly for employers. As for (C), the verb phrase "is being" is redundant and results in an awkward construction. And (D) is wrong because the present perfect verb phrase "have been" inappropriately suggests an event that occurred at an unspecified time before the present; additionally its plural number does not agree with the singular noun "absenteeism."

6. (B) ***Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material.*** **SAT Topic: EXPID.1b.** This item asks for the material that best supports the statement made in the previous sentence. In that sentence, the writer draws a connection between the health concerns that come from lack of exposure to natural light (e.g., sleep deprivation) and lowered productivity in employees. Then, the writer continues by mentioning a company in California that moved from artificial to natural light. Such a change in conditions would undoubtedly result in an increase in productivity. So, (B) is the correct answer choice. As for (A), while employee morale might be affected positively by the change from artificial to natural light, the issue mentioned in the previous sentence is one of productivity. As for (C), while a company would save a great deal on its operational costs by making such a change ("annual electricity cost reductions of $500,000"), this idea does not support the statement made in the previous sentence. Finally, (D) is wrong because the time and money spent on making the change from artificial to natural light have nothing to do with employee productivity.

7. (A) ***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 in context, which is at the beginning of the third paragraph. As already established, the second paragraph concludes with the explanation that artificial light lowers worker productivity. In the third paragraph, the writer continues with a description of how much costlier it is to sustain artificial illumination than it is to use natural light. Of the four options, (A) provides the best transition between the paragraphs, beginning with the mention of lowered productivity and then concluding with the description of high operational costs. (B) is wrong because it results in a meaning not intended by the writer; it is not the cost of artificial light sources but artificial light itself that lowers worker productivity. (C) is wrong because it begins with the mention of cost rather than productivity and seems to incorrectly suggest that the high energy use is the reason for both lowered worker productivity and costliness. Finally, (D) is wrong. This sentence juxtaposes incompatible concepts. The first part of the sentence seems to incorrectly render the ideas of lowered worker productivity and costliness as non-essential. The second part describes the reason for that costliness (high energy use); this juxtaposition results in a very awkward sentence that somehow severs the connection between energy use and costliness.

8. (D) ***Writing and Language/Expression of Ideas/Style/Conciseness.*** **SAT Topic: EXPID.3b**. This item deals with conciseness, specifically in recognizing redundancy. The original is wrong because the phrase "each year" is redundant of the adjective "annual." Since "each year" makes up the underlined portion, the phrase should simply be deleted. So, (D) is the correct answer choice. As for (B) and (C), these phrases are used synonymously with "each year" and therefore fail to address the issue of redundancy.

9. (C) ***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 first and second sentences of this paragraph. The first sentence mentions that the installation of full-pane windows is one way to reconfigure a building's lighting from artificial to natural, and the second sentence describes the installation of light tubes as a different option. The adverb "alternatively," (C),

best expresses the transition from one option to a different option. (A) is wrong because the adverb "thus" incorrectly suggests a causal connection between using full-pane windows and using light tubes. As for (B), the adverb "nevertheless" inappropriately places the two approaches to lighting configuration in opposition to each other; the writer intends simply to list some of these different approaches from "among the possibilities." And (D) is wrong because the adverb "finally" not only is ineffective at introducing the second of two different approaches but is also premature; the writer mentions a third approach (glass walls and dividers) in the very next sentence of the paragraph.

10. (C) *Writing and Language/Standard English Conventions/Sentence Structure/Comma Splices.* SAT Topic: SEC.1a.i. By itself, the underlined portion is grammatically correct. When read in the context of the complete construction in which it appears, however, it results in a structural error: 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, (C) is the correct answer choice. The relative pronoun "which" introduces the relative clause that provides a definition for "light tubes." (B) fails to address the issue of the comma splice. And (D) attempts to address the problem but fails to use the necessary relative pronoun to introduce the clause; additionally, the phrase "those being" is awkward.

11. (B) *Writing and Language/Standard English Conventions/Grammar and Usage/Diction.* SAT Topic: SEC.2.f. This item deals with diction, specifically in prepositional use. The original is wrong because the preposition "through" is inappropriate in this context. Don't let the phrase "means through which," which would be acceptable in other contexts, distract you. The correct idiomatic expression in this context is "means of," so (B) is the correct answer choice. This phrase is typically used in conjunction with a present participle verb, which in this case is the verb "distributing." As for (C), the phrase "means from" is not idiomatic. And (D) is wrong because the appropriate preposition ("of") is needed to express the intended idiom.

Passage 2

12. (A) *Writing and Language/Standard English Conventions/No Change.* SAT Topic: SEC.2c.i. This item deals with pronoun usage, specifically in pronoun-antecedent agreement. The original is correct because the plural possessive pronoun "themselves" agrees in number with the plural noun to which it refers ("settlers"). As for (B) and (D), the possessive pronouns "himself," "herself," and "oneself," respectively, are singular and therefore do not agree in number with the subject of the sentence. As for (C), while "theirselves" is a plural possessive pronoun (albeit a dialect-specific and rarely-used form of "themselves,"), the phrase "their selves" is neither grammatically correct nor meaningful in this context.

13. (C) *Writing and Language/Expression of Ideas/Strategy/Effective Transitional Sentence.* SAT Topic: EXPID.2b. This item asks for the most logical introduction to the sentence in question, which means that the best option will effectively transition from the idea expressed in the previous sentence to the idea expressed in the remainder of the sentence in question. The previous sentence states that "food available on rail lines was generally of terrible quality," and the material that follows the underlined portion mentions that Fred Harvey "decided to open his own restaurant business to serve rail customers." (C) is the only answer choice that speaks to the topic of food. As for (A) and (B), neither of these options makes a connection between the relevant facts: that the food was of terrible quality and that Harvey was an entrepreneur who opened his own restaurant. (B) is meant to distract you; while New York and New Orleans are known for their cuisine, the fact that Harvey once lived there does not explain why he opened his restaurant. And (D) is wrong because deleting the underlined portion provides no introduction to the sentence and thereby fails to transition between the previous sentence and the sentence in question. There was a culinary need on the rail lines, and Harvey was an entrepreneur who saw an opportunity to capitalize on this need by opening a restaurant.

14. (D) *Writing and Language/Standard English Conventions/Sentence Structure/Fragments.* SAT Topic: SEC.1a.i. The original is wrong because to use a period at this point in the construction results in a

sentence fragment lacking a main verb: "To capitalize on the demand for good food, Fred Harvey, an English-born entrepreneur." This problem can be solved by replacing the period with a comma and deleting the pronoun "he"; by doing so, the non-essential element describing Harvey ("an English-born entrepreneur") is correctly set off with two commas, and the new sentence has a main verb ("decided"). So, (D) is the correct answer choice. As for (B) and (C), the colon and the semicolon, respectively, separate the subject of the sentence ("Fred Harvey") from its verb ("decided").

15. (B) ***Writing and Language/Standard English Conventions/Grammar and Usage/Subject-Verb Agreement.*** **SAT Topic: SEC.2c.ii.** The original is wrong because the plural subject of the sentence ("Harvey Houses") does not agree with the singular verb "was." Additionally, the plural subject does not agree with the singular possessive pronoun "its." (B) is the only answer choice that addresses both of these issues, replacing "was" with the plural verb "were" and "its" with the plural possessive pronoun "their." (C) only replaces the possessive pronoun, and (D) only replaces the verb.

16. (C) ***Writing and Language/Expression of Ideas/Style/Tone.*** **SAT Topic: EXPID.3c**. This item asks for the choice that best maintains the tone of the passage. The adjective in question must accurately modify the fare to which the travelers were accustomed, which was described earlier as being of terrible quality. All of the answer choices are adjectives expressing a negative quality; but only "abysmal," which is synonymous with "terrible," expresses the appropriate meaning and tone for this context. (A) is wrong because "sinister," which means "evil," is both too extreme a word in this context and illogically suggests that the food itself has ill intentions. As for (B), "surly" is an adjective used to describe a person's behavior, not the quality of food. As for (D), while "icky" is certainly a word used to describe unpleasant food, its tone is too informal for this passage.

17. (C) ***Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material.*** **SAT Topic: EXPID.1b.** This item asks whether the writer should delete the first sentence of the second paragraph. The sentence in question mentions that Harvey's restaurants were successful and that he did not follow conventional business practices. The remainder of the paragraph goes on to describe one such unconventional business practice at that period in time that Harvey implemented: hiring women to work in his restaurants. Mentioning Harvey's proclivity for flouting convention at the beginning of the paragraph serves as a logical introduction to the writer's description of Harvey hiring women to work in his restaurants in the rest of the paragraph. So, (C) is the correct answer choice. As for (A), the relevance of the sentence in question has been established; it serves as a logical introduction to the paragraph. (B) is wrong because the first paragraph concludes with a description of Harvey's restaurants as having high standards of service and quality, and the second paragraph begins by saying that his restaurants were immediately successful. Finally, (D) is wrong because the sentence in question does not provide a specific example but instead introduces an example of Harvey's unconventionality that is then developed throughout the paragraph.

18. (B) ***Writing and Language/Expression of Ideas/Style/Conciseness.*** **SAT Topic: EXPID.3b**. This item deals with conciseness, specifically in recognizing redundancy. The original is wrong because the phrase "even tremendous" is redundant of the adjective "overwhelming." (B) is the only answer choice that addresses the redundancy, deleting both the phrase "even tremendous" and the subsequent comma used to set it off. As for the remaining answer choices, they both fail to address the issue of redundancy, retaining both the adjective "overwhelming" and the phrase "even tremendous."

19. (D) ***Writing and Language/Standard English Conventions/Sentence Structure/Fragments.*** **SAT Topic: SEC.1a.i.** Just as with item #10, the original should be read in the context of the complete construction in which it appears. In this case, without a plural noun or pronoun in the second part of the sentence to refer back to the plural subject located in the first clause ("regulations"), the result is an overall construction without an independent clause. So, (D) is the correct answer choice. As for (B) and (C), they fail to provide the necessary referent and therefore fail to address the issue of the resulting fragment.

20. (C) ***Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material.*** **SAT Topic: EXPID.1b.** This item asks for the sentence that would most logically follow from the previous sentence.

The second paragraph concludes with a description of the pay and benefits that Fred Harvey provided the female servers he employed at his restaurants. (C) is the best answer choice because it states that the benefits enabled these women to save money and build new lives for themselves. Do not be distracted by (D); while this sentence does refer to their compensation, it is redundant of the previous sentence and therefore results in a lack of conciseness. As for (A) and (B), at what time Harvey's business grew and the number of establishments that he owned throughout his career, respectively, do not flow logically from the detailed description of his women servers' benefits.

21. (D) *Writing and Language/Standard English Conventions/Punctuation/Semicolons.* **SAT Topic: SEC.3b.** This item deals with punctuation, specifically in recognizing the functional difference between semicolons and commas. Remember that semicolons are used to join together two independent clauses. In this case, since the first part of the sentence is a dependent clause used to describe "the Harvey Girls," the semicolon should be replaced with a comma. So, (D) is the correct answer choice. As for (B) and (C), they both demand that the first part of the sentence be an independent clause. Additionally, with (B), the colon incorrectly suggests that what follows is an elaboration or explanation of the preceding material in the sentence.

22. (A) *Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material.* **SAT Topic: EXPID.1b.** This item asks whether the writer's intended revision would be beneficial at this point in the passage. The proposed addition provides examples of how "the Harvey Girls [were] a transformative force in the American West": they inspired books, documentaries, and a musical. So, (A) is the correct answer choice. As for (B), the additional material would not serve as a transition because the remainder of the paragraph does not offer further description of these achievements. (C) is wrong because the sentence in which the additional material would be included is the only place in the passage where it would make sense. And (D) is wrong because the ways in which the Harvey Girls transformed the American West do not contradict the idea that the American West was transformed through food and hospitality.

Passage 3

23. (A) *Writing and Language/Expression of Ideas/Organization/Sentence-Level Structure.* **SAT Topic: EXPID.2a.** Just as with item #7, this item asks for the best way to combine the two underlined sentences. The most effective combination would describe what the writer intends in the given sentences: how 1-MCP affects the storage life of apples and that this allows producers to sell their apples during the off-season. (A) best captures these ideas, with 1-MCP as the subject of the sentence and the use of correctly constructed clauses that clearly express the logical flow of ideas intended by the writer. As for the remaining answer choices, these combinations are awkward and unclear with regard to the writer's intended meaning. In (B) and (D), for example, 1-MCP is no longer the subject of the sentence, resulting in awkward transitions into the immediate discussion of apple producers and the harvesting of apples. Additionally, with (B), the use of punctuation makes it ambiguous as to whether the producers' storage life or the apples' storage life is lengthened. And (D) seems to say that 1-MCP is applied to apples three to four times. Finally, (C) incorrectly suggests that the apples are harvested during the off-season.

24. (D) *Writing and Language/Standard English Conventions/Sentence Structure/Comma Splices.* **SAT Topic: SEC.1a.i.** Just as with item #10, when read in the context of the complete construction in which it appears, the underlined portion results in a structural error: 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, (D) is the correct answer choice. By deleting the underlined portion, the material following the comma becomes a dependent clause describing the nature of ethylene. As for (B), "being" is unnecessary and results in an awkward construction. And (C) fails to address the issue of the comma splice.

25. (B) *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 "tight" would not be used to describe the surface of an apple. Instead, the adjective "firm" should be used. So, (B) is the correct answer choice. As for (C) and (D), while the adjectives "stiff" and "taut," respectively, may be considered synonymous with either "tight" or "firm," "firm" is the only adjective that is appropriate in this context.

26. (A) ***Writing and Language/Standard English Conventions/No Change.*** **SAT Topic: SEC.2c.i.** This item deals with pronoun usage, specifically in pronoun-antecedent agreement. The original is correct because the plural possessive pronoun "their" is used to refer to the plural noun "apples": 1-MCP limits the apples' scent production. Do not be diverted by (B); the adverb "there" and the pronoun "their" are homonyms and commonly confused with one another. (C) is wrong because the singular possessive pronoun "its" cannot be used to refer to the plural noun "apples." And as for (D), just as with "there" and "their," the contraction "it's" (a shortened form of the phrase "it is") and the possessive pronoun "its" are commonly confused with one another.

27. (D) ***Writing and Language/Standard English Conventions/Grammar and Usage/Pronoun Usage.*** **SAT Topic: SEC.2c.i.** The original is wrong because the pronoun "that" cannot be used to refer to "consumers." Instead, the relative clause describing the behavior of consumers should be introduced with the pronoun "who." So, (D) is the correct answer choice. As for (B), using the plural pronoun "they" changes the last part of the sentence into an independent clause and therefore results in a comma splice. And (C) is wrong for the same reason as is the original; the pronoun "which" cannot be used to refer to "consumers."

28. (B) ***Writing and Language/Standard English Conventions/Grammar and Usage/Verb Tense.*** **SAT Topic: SEC.1b.i.** The original is wrong because the past tense verb "did" is inconsistent with the present tense used earlier in the sentence: "But some fruits *do* not respond as well to …." Instead, the present tense "do" is required. So, (B) is the correct answer choice. As for (C) and (D), the present perfect tense ("have [responded]") and the future tense ("will [respond]"), respectively, are inconsistent with the already established present tense.

29. (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. Since the writer intends for the latter of those clauses to be an explanation of how Bartlett pears "do not respond as well to 1-MCP treatment," a colon should be used to introduce that explanation. So, (B) is the correct answer choice. (C) fails to address the issue of the comma splice. Additionally, it removes the first of the two underlined commas, which is necessary to introduce the phrase "for instance." And (D) is wrong because the phrase "for instance" is not intended as a transition between two sentences.

30. (B) ***Writing and Language/Expression of Ideas/Organization/Paragraph-Level Structure.*** **SAT Topic: EXPID.2a.** This item asks where sentence 4 should be placed to make the paragraph most logical.

> **TIP** The conjunction "but" used at the beginning of sentence 4 suggests that what is stated in this sentence contradicts what is stated in the immediately preceding sentence. With this information, use the process of elimination to determine where sentence 4 should be located.

Sentence 4 says that 1-MCP does not always have positive effects on some fruits, but sentence 3 discusses a consumer concern that comes from one of these negative effects (the limiting of scent production). From this, it can be inferred that sentence 4 should be located *before* sentence 3. (A) and (D) can therefore be eliminated. As for (B) and (C), while sentence 1 describes how 1-MCP works, sentence 2 mentions the negative effect that the chemical has on scent production. Sentence 4, therefore, would most logically be placed between these two sentences since it introduces the idea that 1-MCP has negative effects. So, (B) is the correct answer choice.

31. (D) ***Writing and Language/Expression of Ideas/Strategy/Data Presentation.*** **SAT Topic: EXPID.1d.** This item requires an accurate interpretation of the data provided in the corresponding graph at the end of the passage. Read in the context of the sentence as a whole, the underlined portion must provide a description of the browning that occurs to "untreated Empire apples that are first stored in the open air" when compared to the browning that occurs to "untreated Empire apples that are immediately put into storage in a controlled environment." According to the graph, the bar representing the percentage of browning that occurs to the former is approximately 7, and the bar representing the percentage of browning that occurs to the latter is right at 50. And on a graph representing percentages from 0 to 60, this represents quite a difference. So, (D) is the correct answer choice. As for (A), the difference in browning between these two apples is greater than 40 percent. And as for (B) and (C), 7 percent is less than 50 percent.

32. (B) ***Writing and Language/Expression of Ideas/Strategy/Data Presentation.*** **SAT Topic: EXPID.1d.** Just as with the previous item, this item requires an accurate interpretation of the data on the graph. In this case, however, the focus is on comparing *treated* Empire apples that are first stored in the open air with *treated* Empire apples that are immediately put into storage in a controlled environment. According to the graph, the percentage of flesh browning in the former category is a little greater than 50 percent, and the percentage of flesh browning in the latter category is a little less than 50 percent. Of the four answer choices, (B) best captures this interpretation: "when Empire apples are treated …, roughly half [50%] of their flesh turns brown, regardless of whether the apples are first stored in the open air." As for (A) and (C), the treated apples brown under both conditions. And (D) is wrong because the graph does not provide information as to how quickly apple flesh browns under different conditions.

33. (C) ***Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material***. **SAT Topic: EXPID.1b.** This item asks for material that will appropriately convey an idea that satisfies the writer's intended conclusion.

Since this item asks for a conclusion that captures how "the actions of the people in the fruit industry" are affected by the shortcoming of 1-MCP, the correct answer should focus on the behavior of those persons in that industry. So, with this in mind, use the process of elimination to determine the most appropriate conclusion.

(A) can be eliminated since this choice focuses on the behavior of the consumers, not the sellers. (B) can be eliminated since it focuses on the properties of fruit, not the actions of people. As for (C) and (D), while the former is concerned with "fruit sellers" and the latter with "the fruit industry," only the former accomplishes the writer's goal: it describes how fruit sellers weigh the relative values of certain qualities of the apples in response to the chemical's inadequacies. (D), on the other hand, explains what people in the fruit industry have been able to do *despite* the chemical's inadequacies.

Passage 4

34. (D) ***Writing and Language/Standard English Conventions/Sentence Structure/Fragments.*** **SAT Topic: SEC.1a.i.** Just as with item #14, the original is wrong because to use a period at this point in the construction results in a sentence fragment lacking a main verb: "From Michelangelo's *David* … a farming couple in *American Gothic*." This problem can be solved by replacing the period with a comma and deleting the pronoun "these." The fragment then becomes the intended dependent clause modifying "works by human artists." So, (D) is the correct answer choice. (B) is wrong for the same reasons as is the original. As for (C), replacing the period with a semicolon fails to address the issue of the fragment.

35. (B) ***Writing and Language/Standard English Conventions/Punctuation/Commas.*** **SAT Topic: SEC.3e.** The original is wrong because a comma cannot be used to close an aside that is initially set off with a dash. Remember that either a pair of commas or a pair of dashes must be used to set off such material. So, (B) is the correct answer choice. As for (C), the semicolon does not close the aside and disrupts the logical flow of the sentence. And (D) is wrong because the aside requires two instances of the same punctuation, in this case another dash.

36. (C) ***Writing and Language/Standard English Conventions/Grammar and Usage/Subject-Verb Agreement.*** **SAT Topic: SEC.2c.ii.** The original is wrong because the singular verb "portrays" does not agree with the plural subject "works." Instead, the plural verb "portray" is needed. So, (C) is the correct answer choice. Do not be distracted by the singular noun "art"; the subject consists of the noun phrase "works of art." (B) is wrong because it results in an incomplete sentence; the present participle form "portraying" cannot function as the main verb. And (D) is wrong because the singular "has portrayed" does not agree with the plural subject.

37. (D) ***Writing and Language/Expression of Ideas/Strategy/Effective Concluding Sentence.*** **SAT Topic: EXPID.2b.** This item asks for the material that would enable the concluding sentence of the first paragraph to transition into the beginning of the second paragraph. The first part of the sentence in question states that the artistic homage to animals has continued since tens of thousands of years ago, and the second paragraph describes how the State Hermitage Museum in Russia, in particular, has long had such a relationship with the cat. (D) is the best answer choice, as it makes the clear reference to an "example of one museum in Russia." As for (A), it results in a vague and somewhat redundant construction, essentially saying that artistic homage has not died out over many years despite the many years that have passed. As for (B), it makes the inappropriate generalization that all such artistic homage to animals has been paid to those of the domestic kind. And (C) is wrong because the idea that there are more paintings in museums of people than there are of animals is irrelevant.

38. (C) ***Writing and Language/Standard English Conventions/Sentence Structure/Faulty Parallelism.*** **SAT Topic: SEC.1a.iii.** This is a difficult item that deals with faulty parallelism. Since the writer intends to say that scaring off visitors is something that rodents are capable of doing in addition to damaging art, the verb in question must be parallel with the present tense verb "damage": "could damage … not to mention [could] scare." So, (C) is the correct answer choice. Don't let the remaining answer choices distract you. As for (A) and (D), while either "scared" or "have scared," respectively, would be parallel with "have guarded," this is a misreading of the logical structure of the sentence. And as for (B), while "scaring" would be parallel with "ridding," this is also a misreading of the sentence structure.

39. (C) ***Writing and Language/Expression of Ideas/Organization/Paragraph-Level Structure.*** **SAT Topic: EXPID.2a.** Just as with item #30, this item asks where a particular sentence should be placed to make the paragraph in which it appears most logical. The clues in sentence 5 that help place it in the context of the other sentences in the paragraph are the phrases "continuing the tradition" and "Peter's daughter." Since sentence 3 mentions that Peter the Great introduced the first cat to the Hermitage, the idea that Peter's daughter continued the tradition should immediately follow. So, (C) is the correct answer choice. As for the remaining answer choices, they all disrupt the chronological flow intended by the writer.

40. (B) ***Writing and Language/Expression of Ideas/Style/Precision.*** **SAT Topic: EXPID.3a.** Just as with item #25, 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 "decreed," which means "ordered" or "commanded," is inappropriate in this context. Instead, it is more precise to say that the officials "commissioned," or "requested the production of," the paintings to be made. So, (B) is the correct answer choice. As for (C), the verb "forced" is too strong in tone, and there is nothing to support its use in this context. And (D) is wrong because the verb "licensed" inaccurately suggests that the officials allowed the paintings to be made.

41. (D) ***Writing and Language/Standard English Conventions/Punctuation/Commas.*** **SAT Topic: SEC.3e.** The original is wrong because the second comma is misplaced, disrupting the noun phrase "digital artist Eldar Zakirov." Since the noun phrase functions as an appositive describing "[t]he person chosen for this task," it should be set off with commas. The second comma, therefore, should be placed immediately after "Eldar Zakirov." So, (D) is the correct answer choice. (B) fails to address the disruption of the noun phrase. And (C) unnecessarily removes the first comma, which disrupts the logical flow of the sentence.

42. (A) ***Writing and Language/Expression of Ideas/No Change.*** **SAT Topic: EXPID.1b.** 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 examples that follow." The examples that follow are of a portrait of a cat with an "aristocratic tilt of feline ears" and a "stately sweep of tail" (*The Hermitage Court Chamber Herald Cat*) and of another portrait of a cat whose eyes "mimic those of a trusted royal advisor" (*The Hermitage Court Outrunner Cat*). The original is correct, as it refers to cats presented "as noble individuals worthy of respect." (B) is wrong because the anthropomorphizing of the cats (the attributing of human qualities to the cats) in the portraits does not set out to capture their unique characteristics. (C) is wrong because there is no discussion as to the absurdity of the characterizations in the portraits. As for (D), the idea that cats are talented mouse catchers is not mentioned until the end of the passage.

43. (D) ***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 buildings that make up the museum, in particular to the Winter Palace. As already discussed in the previous explanation, however, the third paragraph of the passage focuses on how cats are portrayed in certain portraits found in the museum. So, (D) must be the correct answer choice: the information about the buildings that make up the museum is irrelevant to the paragraph. As for (A) and (B), that the museum occupies six historic buildings says nothing about Russians and their relationship to animals through art. And as for (C), since a discussion of the Winter Palace is irrelevant, understanding why it became an art museum is equally so.

44. (D) ***Writing and Language/Expression of Ideas/Style/Tone.*** **SAT Topic: EXPID.3c.** The original is wrong because to discuss "the art of killing" is inconsistent with the overall neutral tone of the passage. In fact, cats are not benefactors of the museum because they are masters at killing rodents but more specifically because they are able to keep the museum's valuable artworks safe from rodents. So, (D) is the correct answer choice. As for (B), it is not only awkward but inaccurate to refer to those creatures that may inhabit a museum as making up an ecosystem consisting of a hierarchy of predators and prey. As for (C), it does nothing to address the issue of the original; and more specifically, the cats' predatory methods are irrelevant.

TIP Sometimes very particular verbal clues can be isolated in order to help solve Tone items more quickly. In this case, the words "mastering" and "killing," (A); "predator," (B); and "hunting" and "killing," (C) are simply too extreme to be used in this context.

Math, No Calculator

1. (C) ***Math: Multiple-Choice/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions. SAT Topic: PAM.10.*** Rewrite the given expression with the known units: $(n \text{ walls})\left(\frac{K \text{ dollars}}{\text{feet-squared}}\right)(l \text{ feet})(h \text{ feet})$. The only factor that involves cost is the K constant, so K is the only term that can change if a more expensive brand of paint is used.

2. (D) ***Math: Multiple-Choice/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Simple Equations. SAT Topic: ALG.6.*** Since the expression in question contains the term $6r$, and the given equation contains the term $3r$, this should make you think of multiplying the equation by 2: $2(3r = 18) \Rightarrow 6r = 36$. To solve for $6r + 3$, add 3 to both sides of the equality: $6r + 3 = 39$.

   Alternatively, solve for r directly: $3r = 18 \Rightarrow r = 6$. Substitute r into the given equation: $6(6) + 3 = 39$.

3. (D) ***Math: Multiple-Choice/Algebra/Manipulating Algebraic Expressions/Manipulating Expressions Involving Exponents. SAT Topic: PAM.3.*** Use the rules for working with exponents to rewrite the given expression; specifically, $x^{a \times b} = (x^a)^b$. Therefore, $a^{\frac{2}{3}} = a^{2 \times \frac{1}{3}} = \left(a^2\right)^{\frac{1}{3}} = \sqrt[3]{a^2}$.

4. (B) ***Math: Multiple-Choice/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions. SAT Topic: ALG.1.*** According to the item stem, the number of states joining between 1776 and 1849 is 30, which is twice the number joining between 1850 and 1900, x. Therefore, $30 = 2x$, which is (B).

5. (C) ***Math: Multiple-Choice/Solving Algebraic Equations or Inequalities with One Variable/Equations Involving Rational Expressions. SAT Topic: PAM.7.*** Solve the given equation for x: $\frac{5}{x} = \frac{15}{x + 20} \Rightarrow 5(x + 20) = 15x \Rightarrow 100 = 10x \Rightarrow x = 10$. Therefore, $\frac{x}{5} = \frac{10}{5} = 2$.

6. (C) ***Math: Multiple-Choice/Algebra/Solving Simultaneous Equations. SAT Topic: ALG.7.*** To solve the system of simultaneous equations, use either the elimination method or the substitution method (graphing the equations isn't really a viable option). Using the elimination method, multiply the first equation by -3, multiply the second equation by 2, and combine the equations to eliminate the x-variable:

$$\begin{array}{l} -3(2x - 3y = -14) \\ +\ 2(3x - 2y = -6) \\ \hline 9y - 4y = 42 - 12 \Rightarrow 5y = 30 \Rightarrow y = 6 \end{array}$$

   Substitute 6 for y in either equation and solve for x: $2x - 3(6) = -14 \Rightarrow 2x = -14 + 18 = 4 \Rightarrow x = 2$. So $x - y = 2 - 6 = -4$.

7. (C) ***Math: Multiple-Choice/Algebra/Expressing and Evaluating Algebraic Functions/Concepts of Domain and Range*** and ***Manipulating Algebraic Expressions/Factoring Expressions. SAT Topic: PAM.11.*** Any polynomial can be factored into a product of its factors, so if any factor is equal to zero, the polynomial is equal to zero. If $x - a$ is a factor of $f(x)$, $f(x)$ is equal to zero when $x = a$. According to the table, $f(x) = 0$ for $x = 4$. Therefore, $x - 4$ must be a factor of $f(x)$.

8. (A) ***Math: Multiple-Choice/Coordinate Geometry/Slope of a Line*** and ***Slope-Intercept Form of a Linear Equation. SAT Topic: ALG.9.*** The equation $y = kx + 4$ is given in slope-intercept form, in which *k* is the slope and 4 is the *y*-intercept. Use the *y*-intercept point $(0,4)$ and the given point (c,d) to determine the slope of the line, *k*: $k = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{d-4}{c-0} = \frac{d-4}{c}$.

Alternatively, plug in (c,d) and solve for *k*: $d = kc + 4 \Rightarrow k = \frac{d-4}{c}$.

9. (A) ***Math: Multiple-Choice/Algebra/Solving Simultaneous Equations. SAT Topic: ALG.7.*** A system of simultaneous linear equations can have zero solutions (the lines do not intersect), one solution (the lines intersect once), or infinitely many solutions (the two lines are identical). In order for two lines never to intersect, they must be parallel. And parallel lines have identical slope. Rewrite both line equations in slope-intercept form: $kx - 3y = 4 \Rightarrow y = \frac{4-kx}{-3} = \frac{k}{3}x - \frac{4}{3}$ and $4x - 5y = 7 \Rightarrow y = \frac{7-4x}{-5} = \frac{4}{5}x - \frac{7}{5}$. For the two slopes to be equal, $\frac{k}{3} = \frac{4}{5} \Rightarrow k = \frac{4(3)}{5} = \frac{12}{5}$.

10. (A) ***Math: Multiple-Choice/Coordinate Geometry/Graphs of Quadratic Equations and Relations. SAT Topic: PAM.12.*** In order for the parabola $y = (x-11)^2$ to intersect the line $y = 25$ at two points, the parabola equation must be equal to 25. Substitute 25 for *y* in the equation and solve for *x*: $25 = (x-11)^2 \Rightarrow \pm 5 = x - 11 \Rightarrow x = 11 \pm 5$. Therefore, the ordered pairs for the two intersection points are $(6,25)$ and $(16,25)$. The distance between these two points is the difference between the *x*-values: $16 - 6 = 10$.

11. (B) ***Math: Multiple-Choice/Geometry/Lines and Angles. SAT Topic: ATM.6.*** Vertical angles are equal, so $y = u$, which means $x + y = u + w$ reduces to $x = w$. Since *w* and *z* are vertical angles, $x = w = z$. So (I) must be true. Furthermore, both $x + y + z$ and $w + u + t$ are straight lines and so equal 180. So, $x + y + z = w + u + t$, which reduces to $z = t$. Therefore, (III) must also be true. However, (II) need not be true—the only case for which *y* must equal *w* is if $x = y$ and $w = u$, which isn't a stated condition.

12. (A) ***Math: Multiple-Choice/Coordinate Geometry/Graphs of Quadratic Equations and Relations. SAT Topic: PAM.12.*** The quickest solution to this item is to recognize that the *x*-value for the vertex of the parabola, *c*, is halfway between the *x*-intercepts ($y = 0$). Since the given equation $y = a(x-2)(x+4)$ equals zero for $x = -4$ and $x = 2$, $c = -1$. To find the *y*-value of the vertex, *d*, substitute -1 for *x* in the given equation and solve for *y*: $y = a(x-2)(x+4) = a(-1-2)(-1+4) = a(-3)(3) = -9a$.

Alternatively, recall the vertex form of a parabola equation: $y = a(x-c)^2 + d$, where (*c*,*d*) is the vertex. To convert the given equation into vertex form, either complete the square or multiply the polynomials in both the given equation and the vertex form of a parabola equation, and set the two equal to one another. We proceed with the latter. For the given parabola equation, $y = a(x-2)(x+4) = a(x^2 + 2x - 8) = ax^2 + 2ax - 8a$. For the vertex form, $y = a(x-c)^2 + d = a(x-c)(x-c) + d = a(x^2 - 2cx + c^2) + d = ax^2 - 2acx + ac^2 + d$. So, $ax^2 + 2ax - 8a = ax^2 - 2acx + ac^2 + d$, which means $2a = -2ac \Rightarrow c = -1$ and $-8a = ac^2 + d \Rightarrow d = -8a - ac^2 = -9a$.

13. (B) ***Math: Multiple-Choice/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Equations Involving Rational Expressions*** **and** ***Manipulating Algebraic Expressions/Factoring Expressions. SAT Topic: PAM.7.*** Multiply each term in the given equation by $ax-2$ to eliminate the denominators of the rational terms and simplify:

$\frac{24x^2+25x-47}{ax-2}=-8x-3-\frac{53}{ax-2}\Rightarrow 24x^2+25x-47=(-8x-3)(ax-2)-53=$

$-8ax^2+16x-3ax+6-53=-8ax^2+x(16-3a)-47$. Since the coefficients of the terms must be equal, $-8a=24\Rightarrow a=-3$.

14. (A) ***Math: Multiple-Choice/Algebra/Solving Quadratic Equations/The Quadratic Formula (Equation). SAT Topic: PAM.5.*** First, simplify the given quadratic by dividing each term by 3:

$3x^2+12x+6=0\Rightarrow x^2+4x+2=0$. To solve for *x*, complete the square by adding 2 to both sides of the equation: $x^2+4x+2+2=2\Rightarrow (x+2)(x+2)=2\Rightarrow (x+2)^2=2\Rightarrow x+2=\pm\sqrt{2}\Rightarrow x=-2\pm\sqrt{2}$.

Alternatively, use the quadratic formula (for $ax^2+bx+c=0$, $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$). For $x^2+4x+2=0$,

$x=\frac{-4\pm\sqrt{16-4(2)}}{2}=-2\pm\frac{\sqrt{8}}{2}=-2\pm\sqrt{2}$.

As a last resort, you can use the "Plug-and-Chug" method. Substitute the values for *x* given in the answer choices into the simplified quadratic equation—only the correct choice will hold true for both values of *x*.

15. (D) ***Math: Multiple-Choice/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions*** **and** ***Expressing and Evaluating Algebraic Functions/Functions as Models. SAT Topic: ALG.8.*** Rewrite the given equation in slope-intercept form: $C=\frac{5}{9}F-\frac{5(32)}{9}$. Therefore, a graph of *C* (output *y*-values) as a function of *F* (input *x*-values) has a slope of $\frac{5}{9}$. Since slope is the rise over run, or $\frac{\Delta y}{\Delta x}=\frac{\Delta C}{\Delta F}$, a slope of $\frac{5}{9}$ indicates an increase of $\frac{5}{9}$ degree Celsius for every increase of 1 degree Fahrenheit. Therefore, (I) must be true, while (III) must be false. As for (II), $\frac{\Delta C}{\Delta F}=\frac{5}{9}=\frac{1}{\frac{9}{5}}=\frac{1}{1.8}$, which indicates an increase of 1 degree Celsius for every increase of 1.8 degrees Fahrenheit, so (II) must be true. Thus, the correct choice includes statements (I) and (II) only.

16. (1, 2) ***Math: Student-Produced Responses/Algebra/Solving Quadratic Equations and Relations. SAT Topic: PAM.5.*** Rewrite the given equation in standard form: $x^3(x^2-5)=-4x\Rightarrow x^5-5x^3+4x=0$. To determine the solutions to this equation, factor the left side:

$x^5-5x^3+4x=x(x^4-5x^2+4)=x(x^2-4)(x^2-1)=x(x-2)(x+2)(x-1)(x+1)$. For the left side of the equation to equal zero, *x* must equal 0, ±1, and ±2. Since the item stem states that $x>0$, the remaining possible solutions are 1 and 2.

Alternatively, simple inspection of the given equation is enough to come up with one obvious solution. Since 1 to any power equals 1, 1 makes a good guess for *x* in the equation: $x^3(x^2-5)=-4x\Rightarrow$

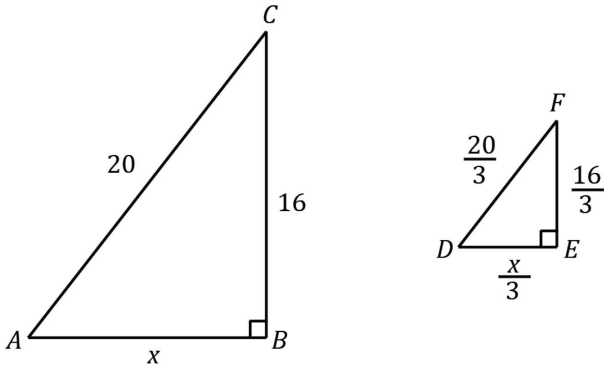
$1^3(1^2-5)\stackrel{?}{=}-4(1)\Rightarrow -4=-4$. Since only one possible choice for *x* is needed, this is enough to answer the question.

17. (2) ***Math: Student-Produced Responses/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Simple Equations. SAT Topic: ALG.6.*** Solve the given equation for *x*:
$\frac{7}{9}x-\frac{4}{9}x=\frac{1}{4}+\frac{5}{12}\Rightarrow\frac{3}{9}x=\frac{8}{12}\Rightarrow x=\frac{8(9)}{12(3)}=\frac{2(3)}{3(1)}=2$.

18. (105) ***Math: Student-Produced Responses/Geometry/Triangles/Properties of Triangles*** and ***Lines and Angles. SAT Topic: ATM.6.*** The angles adjacent to the similar sides of an isosceles triangle are equivalent and the sum of the interior angles of a triangle is 180°. We plug in the given information, $y=75$, and solve for z: $180-z=2(75)\Rightarrow z=30$. Since $z=30$, the two base angles equal 75 (base angles are equal and all three angles in a triangle sum to 180). The base angle is supplementary to *x*, so $x=180-75=105$.

19. (370) ***Math: Student-Produced Responses/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions*** and ***Solving Simultaneous Equations. SAT Topic: ALG.5.*** According to the item stem, the number of calories in one hamburger, *h*, is equal to 50 more calories than one order of fries, *f*: $\frac{h\text{ calories}}{\text{hamburger}}=50+\frac{f\text{ calories}}{\text{fries}}\Rightarrow h=50+f$. Furthermore, the total number of calories in 2 hamburgers and 3 orders of fries is 1,700: $1{,}700\text{ calories}=\frac{h\text{ calories}}{\cancel{\text{hamburger}}}\times 2\ \cancel{\text{hamburgers}}+\frac{f\text{ calories}}{\cancel{\text{fries}}}\times 3\ \cancel{\text{fries}}\Rightarrow 1{,}700=2h+3f$. Substitute $h-50$ for *f* in the second equation and solve for *h*:
$1{,}700=2h+3f=2h+3(h-50)=5h-150\Rightarrow h=\frac{1{,}700+150}{5}=370$.

20. (3/5, .6) ***Math: Student-Produced Responses/Geometry/Triangles/Pythagorean Theorem*** and ***Properties of Triangles*** and ***Trigonometry/Definitions of the Six Trigonometric Functions. SAT Topic: ATM.7.*** The lengths of corresponding sides of similar triangles are proportional. Draw a figure illustrating the given information:



The item stem asks for the value of $\sin F$. Recall the mnemonic SOH-CAH-TOA: the sine of an angle is equal to the ratio of the side opposite the angle to the hypotenuse. So, $\sin F=\frac{\overline{DE}}{\overline{DF}}=\frac{\frac{x}{3}}{\frac{20}{3}}=\frac{x}{20}$. To

determine the value of *x*, apply the Pythagorean theorem to ΔABC:

$20^2 = 16^2 + x^2 \Rightarrow 400 = 256 + x^2 \Rightarrow x^2 = 144 \Rightarrow x = 12$. Therefore, $\sin F = \frac{x}{20} = \frac{12}{20} = \frac{3}{5}$, or .6.

TIP Triangle ΔABC is a 3-4-5 Pythagorean Triple, which, when multiplied by 4, yields a 12-16-20 Pythagorean Triple.

Math, Calculator

1. (C) ***Math: Multiple-Choice/Data Interpretation/Bar, Cumulative, and Line Graphs. SAT Topic: PSD.5.*** According to the item stem, Marilyn stops hiking for 30 minutes. During this time, her distance from the campsite (the *y*-coordinate) will not change. The only interval on the graph for which the *y*-coordinate remains constant is from approximately 1:15 p.m. to 1:45 p.m., at which point, the distance increases. Therefore, Marilyn begins hiking again at approximately 1:45 p.m. The answer choice closest to 1:45 p.m. is (C), 1:40 p.m.

2. (B) ***Math: Multiple-Choice/Data Interpretation/Tables (Matrices)*** and ***Probability/Arithmetic Probability. SAT Topic: PSD.7.*** The item stem asks for the probability that the winner will be a female under the age of 40 (8 contestants) or a male age 40 or older (2 contestants). Thus, a total of $8 + 2 = 10$ contestants meet the stated conditions, out of a total of 25 contestants, or 10 out of 25: $\frac{10}{25}$.

3. (C) ***Math: Multiple-Choice/Data Interpretation/Scatterplots. SAT Topic: PSD.4.*** The item stem asks for a general description of the data. A quick glance at the graph is enough to see that the sales increases to a peak and then generally decreases. Only (C) describes the data as first increasing and then decreasing. Don't waste time figuring out the year that corresponds to the sales peak—this information is not necessary to answer the question.

4. (C) ***Math: Multiple-Choice/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions*** and ***Expressing and Evaluating Algebraic Functions/Concepts of Domain and Range*** and ***Function Notation. SAT Topic: ALG.3.*** Rather than using the table values to determine the equation for the function $f(n)$, substitute one of the given values for *n* in the equations given in the answer choices—the correct choice will return the corresponding value for $f(n)$. Choose a value for *n* likely to differentiate between the choices (since *n*=1 works in every answer choice); i.e., don't pick $n = 1$. Instead, let's use $n = 2$—the correct choice will return the value 1:

   A) $f(2) = n - 3 = 2 - 3 = -1 \neq 1$ ✗

   B) $f(2) = 2n - 4 = 2(2) - 4 = 0 \neq 1$ ✗

   C) $f(2) = 3n - 5 = 3(2) - 5 = 1$ ✓

   Double-check the remaining choice—it is possible that the equation in (D) also returns the value 1, in which case you will need to check both (C) and (D) again with another value for *n*. In this case, (D) does not equal 1, so the answer must be (C):

   D) $f(2) = 4(2) - 6 = 2 \neq 1$ ✗

5. (B) ***Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Percents. SAT Topic: ALG.2.*** Let *j* and *s* represent the number of juniors and seniors inducted into the National Honor Society, respectively. Thus, $j = 0.07(562)$ and $s = 0.05(602)$, so the total is $0.07(562) + 0.05(602) \approx 39 + 30 = 69$.

6. (A) ***Math: Multiple-Choice/Algebra/Manipulating Algebraic Expressions/Basic Algebraic Manipulations. SAT Topic: PAM.6.*** To add polynomials, combine "like" terms:

$$\begin{array}{r} 3x^2 - 5x + 2 \\ +\ 5x^2 - 2x - 6 \\ \hline 8x^2 - 7x - 4 \end{array}$$

7. (D) ***Math: Multiple-Choice/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Simple Equations. SAT Topic: ALG.6.*** Solve the given equation for w: $\frac{3}{5}w = \frac{4}{3} \Rightarrow w = \frac{4(5)}{3(3)} = \frac{20}{9}$.

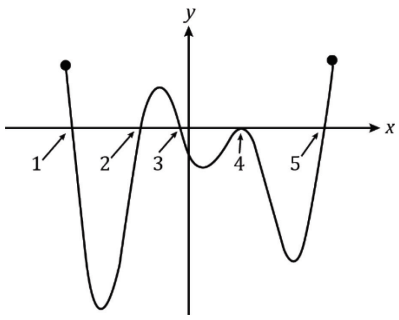
8. (C) ***Math: Multiple-Choice/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions. SAT Topic: ALG.8.*** Rewrite the given equation to include the known units: $y\left(\frac{\text{average \# students}}{\text{classroom}}\right) = 0.56(x \text{ years}) + 27.2$. Each term on the right side of the equation must have units of average number of students per classroom, so the units of the 0.56 must be "average number of students per classroom per year": $0.56x\left(\frac{\text{average \# students}}{\text{classroom}}\right) = \frac{0.56 \text{ average \# students}}{\text{classroom-}\cancel{\text{year}}} \times x \ \cancel{\text{years}}$. Therefore, the 0.56 refers to the increase in the average number of students per classroom each year.

9. (B) ***Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Proportions and Direct-Inverse Variation. SAT Topic: PSD.1.*** Create an expression for the distance, including units so "like" units cancel, leaving the value with units of "meters": $\frac{25 \text{ meters}}{13.7 \ \cancel{\text{seconds}}} \times \frac{60 \ \cancel{\text{seconds}}}{\cancel{\text{minute}}} \times 4 \ \cancel{\text{minutes}} \approx 438$ meters. The closest answer choice to this value is (B), 450 meters.

10. (D) ***Math: Multiple-Choice/Algebra/Expressing and Evaluating Algebraic Functions/Functions as Models*** and ***Data Interpretation/Tables (Matrices). SAT Topic: ALG.1.*** According to the table, the acceleration due to gravity, g, on Mercury is 3.6 m/sec^2. Therefore, the weight of a 90-kilogram mass on Mercury is $W = mg = 90 \times 3.6 = 324$ newtons.

11. (B) ***Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Proportions and Direct-Inverse Variation*** and ***Data Interpretation/Tables (Matrices). SAT Topic: PSD.1.*** To translate between weights on different planets, the mass of the object must be determined. If on Earth ($g = 9.8$ m/sec^2), the weight of the object is 150 newtons, the object's mass is $m = \frac{W}{g} = \frac{150}{9.8} \approx 15.3$ kilograms. Substitute this mass and a weight of 170 newtons in the equation and solve for g: $g = \frac{W}{m} = \frac{170}{15.3} \approx 11.1$ m/sec^2. According to the table, the planet with an acceleration due to gravity of 11.1 m/sec^2 is Saturn.

12. (D) ***Math: Multiple-Choice/Coordinate Geometry/Qualitative Behavior of Graphs of Functions. SAT Topic: PAM.12.*** The zeros of a function correspond to the *x*-intercepts ($y = 0$). Count the number of times in each graph that the function crosses the *x*-axis. The function crosses the *x*-axis four times each in (A) and (B) and six times in (C). Therefore, by the process of elimination, (D) must be correct. Indeed, the function crosses the *x*-axis five times in (D):



13. (D) ***Math: Multiple-Choice/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Simple Equations*** and ***Manipulating Algebraic Expressions/Basic Algebraic Manipulations. SAT Topic: PAM.14.*** Unlike most items based on real world scenarios, skip rewriting the equation with units—they aren't necessary for the solution. The item stem simply asks for *v* in terms of the other variables. Solve the given equation for *v*: $h = -16t^2 + vt + k \Rightarrow v = \dfrac{h + 16t^2 - k}{t} = \dfrac{h - k}{t} + 16t$.

14. (A) ***Math: Multiple-Choice/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions. SAT Topic: ALG.1.*** Translate the given information into an expression for cost, including units so "like" units cancel, leaving the expression in units of "dollars":
$c \text{ dollars} = \dfrac{\$0.20}{\cancel{\text{minute}}} \times \dfrac{60 \ \cancel{\text{minutes}}}{\text{hour}} \times h \ \cancel{\text{hours}} \Rightarrow c = 0.20(60h)$.

15. (A) ***Math: Multiple-Choice/Statistics/Data Interpretation in Statistics*** and ***Drawing Inferences. SAT Topic: PSD.10.*** Of the 300 participants with poor eyesight selected at random, one-half received Treatment X and one-half did not. The half that did receive Treatment X experienced improved eyesight. Therefore, the only conclusion that can be drawn is that Treatment X is likely to improve the eyesight of people with poor eyesight, (A). (B) is false because Treatment X was not compared with other treatments in the study. (C) is false because the study only involved participants with poor eyesight—whether or not Treatment X would improve the eyesight of people with good eyesight cannot be inferred from the study results. (D) is false for a reason similar to (C) (the study only involved participants with poor eyesight), plus nothing is stated about the degree of improvement in the eyesight of participants.

16. (B) ***Math: Multiple-Choice/Coordinate Geometry/Graphs of Quadratic Equations and Relations. SAT Topic: PAM.12.*** For $f(x) + g(x) = 0$ to be true, the output *y*-values for the two functions for a given input *x*-value must sum to zero. A quick glance at the graphs is enough to see that the vertices of the two functions correspond to these points. The *y*-value is 2 for $g(x)$ and -2 for $f(x)$: $-2 + 2 = 0$. The corresponding *x*-value in the graph is -2.

17. (B) ***Math: Multiple-Choice/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions*** and ***Expressing and Evaluating Algebraic Functions/Functions as Models. SAT Topic: PAM.13.*** $S(P)$ is the product supplied: $S(P) = \dfrac{1}{2}P + 40$, where *P* is the product price. If the product price increases by \$10,

the new product price is $P+10$, and the new quantity of product supplied is $\frac{1}{2}(P+10)+40=\frac{1}{2}P+40+5$, which is the original quantity, $\frac{1}{2}P+40$, plus an additional 5 units.

TIP Alternatively, use the "Plug-and-Chug" method. Plug in two simple values for P and subtract to find the difference. Suppose $P=10$: $\frac{1}{2}(10)+40=45$. Now, let $P=20$: $\frac{1}{2}(20)+40=50$. The difference is 5.

18. (B) ***Math: Multiple-Choice/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Simple Equations. SAT Topic: ALG.6.*** To determine the price, *P*, at which the quantity supplied equals the quantity demanded, set the two equations equal to one another and solve for *P*:
$\frac{1}{2}P+40=220-P\Rightarrow\frac{3}{2}P=180\Rightarrow P=\frac{180(2)}{3}=120$.

19. (C) ***Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Proportions and Direct-Inverse Variation. SAT Topic: PSD.1.*** Set up a proportion between the ratios of ounces of graphene per area of football fields and solve for the unknown:
$\frac{1\text{ ounce}}{7\ \cancel{\text{fields}}\times\frac{\frac{4}{3}\text{ acres}}{\cancel{\text{field}}}}=\frac{48\text{ ounces}}{x\text{ acres}}\Rightarrow x=48\times7\times\frac{4}{3}=448$. (C) is closest to this value: 450 acres.

20. (B) ***Math: Multiple-Choice/Data Interpretation/Scatterplots. SAT Topic: PSD.4.*** According to the graph, for a swimming time of 34 minutes ($x=34$), the corresponding *y*-value from the line of best fit is 150 beats per minute and the corresponding *y*-value for the data point is 148 beats per minute. The difference is $150-148=2$.

21. (C) ***Math: Multiple-Choice/Algebra/Evaluating Sequences Involving Exponential Growth. SAT Topic: PAM.1.*** Exponential growth is growth that increases (or decreases) with time. (A) is wrong because adding 2% of the initial savings each year represents a constant addition, not one that changes with time. (B) and (D) are wrong for the same reason—each represents an addition of a constant value each year. Only (C) represents a change that depends on time: 1% of the current value means the amount added each year increases as the account value increases—this demonstrates exponential growth.

22. (B) ***Math: Multiple-Choice/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions*** and ***Solving Simultaneous Equations. SAT Topic: ALG.5.*** Translate the given information into two equations, where *x*, *y*, and *z* represent the three numbers: $x+y+z=855$ and
$x=1.5(y+z)\Rightarrow y+z=\frac{x}{1.5}=\frac{2}{3}x$. Substitute $\frac{2}{3}x$ for $y+z$ in the first equation and solve for *x*:
$x+y+z=855\Rightarrow x+\frac{2}{3}x=855\Rightarrow\frac{5}{3}x=855\Rightarrow x=\frac{855(3)}{5}=513$.

23. (C) ***Math: Multiple-Choice/Trigonometry/Definitions of the Six Trigonometric Functions/Complimentary Angles*** and ***Geometry/Lines and Angles. SAT Topic: ATM.7.*** The properties of similar triangles and the definitions of the trigonometric functions lead to the three sets of "co-function" identities for complementary angles. 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: $\sin(90°-x°)=\cos(x°)$ and

$\cos(90° - x) = \sin(x°)$. In this item, $\sin(a°) = \cos(b°)$, so $a + b = 90$. Therefore, $(4k - 22) + (6k - 13) = 90 \Rightarrow 10k = 90 + 35 \Rightarrow k = 12.5$.

24. (D) ***Math: Multiple-Choice/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions*** and ***Solving Simultaneous Equations. SAT Topic: ALG.5.*** Translate the given information into two equations for the total number of milliliters distributed. Include units so "like" units cancel, leaving both equations in units of "milliliters." In the first case, 5 milliliters are left over after distribution, and in the second case, 21 milliliters must be added before distribution. Let *m* equal the number of students:

$n \text{ millimeters} = \frac{3 \text{ milliliters}}{\cancel{\text{student}}} \times m \ \cancel{\text{students}} + 5 \text{ milliliters} \Rightarrow n = 3m + 5$ and

$n \text{ milliliters} + 21 \text{ milliliters} = \frac{4 \text{ milliliters}}{\cancel{\text{student}}} \times m \ \cancel{\text{students}} \Rightarrow n + 21 = 4m \Rightarrow n = 4m - 21$. Use the process of elimination to solve the system of simultaneous equations:

$$\begin{array}{r} n = 3m + 5 \\ -\ (n = 4m - 21) \\ \hline 0 = -m + 26 \Rightarrow m = 26 \end{array}$$

25. (D) ***Math: Multiple-Choice/Geometry/Volume. SAT Topic: ATM.1.*** The volume of the entire grain silo is equal to the volume of the cone at the top, plus the volume of the cylinder in the middle, plus the volume of the cone at the bottom (which is the same volume as the cone at the top). The formula page gives equations for both the volume of a cone and the volume of a cylinder: $V_{\text{cone}} = \frac{1}{3}\pi r^2 h$ and $V_{\text{cylinder}} = \pi r^2 h$, where *r* is the radius and *h* is the height. Therefore, $V_{\text{silo}} = 2V_{\text{cone}} + V_{\text{cylinder}} =$

$2\left(\frac{1}{3}\pi(5)^2(5)\right) + \pi(5)^2(10) \approx 262 + 785 = 1047$.

26. (C) ***Math: Multiple-Choice/Coordinate Geometry/Graphs of Linear Equations*** and ***Slope of a Line. SAT Topic: ALG.9.*** The line passes through the origin, $(0,0)$, so use this ordered pair with each of the given ordered pairs—$(2,k)$ and $(k,32)$—to create two expressions for slope ($\frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x}$), which must be equal, and solve for *k*: $\frac{k-0}{2-0} = \frac{32-0}{k-0} \Rightarrow \frac{k}{2} = \frac{32}{k} \Rightarrow k^2 = 64 \Rightarrow k = \pm 8$.

27. (C) ***Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Percents*** and ***Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions. SAT Topic: PSD.2.*** Before the alterations, the area of the rectangle is $A = lw$, where *l* and *w* are the original length and width; after the alterations, the area is $A' = l'w'$, where $l' = 1.1l$ and $w' = (1 - p)w$. Furthermore, the area after the alterations is 12% less than the alterations, so $A' = 0.88A$. Therefore, $l'w' = 0.88lw \Rightarrow$

$(1.1l)(1 - p)w = 0.88lw \Rightarrow 1.1lw - 1.1lwp = 0.88lw \Rightarrow 1.1 - 1.1p = 0.88 \Rightarrow p = \frac{1.1 - 0.88}{1.1} = 0.2 = 20\%$.

28. (D) ***Math: Multiple-Choice/Algebra Evaluating Sequences Involving Exponential Growth*** and ***Creating, Solving, and Interpreting Algebraic Equations and Functions. SAT Topic: PSD.8.*** If the population, *P*, decreases by 10%, the new population is equal to $0.9P$. Since the current population of 50,000 is estimated to decrease 10% every twenty years, after *x* 20-year periods, the population estimate is $50{,}000(0.9)^x$. Rewrite *x* in terms of number of years, *t*: x (# of 20-year periods) =

$\frac{\text{20-year period}}{20\ \cancel{\text{years}}} \times t\ \cancel{\text{years}} \Rightarrow x = \frac{t}{20}$. Therefore, the population estimate as a function of years, *t*, is $50{,}000(0.9)^{\frac{t}{20}}$.

TIP Alternatively, use the "Plug-and-Chug" method to determine the correct answer choice. After the first 20 years, the population will be $50{,}000 - 0.10(50{,}000) = 50{,}000 - 5{,}000 = 45{,}000$. Plug $t = 20$ into each answer choice to see which yields 45,000.

A) $50{,}000(0.1)^{20(20)} \approx 0$ ✗

B) $50{,}000(0.1)^{\frac{20}{20}} = 5{,}000$ ✗

C) $50{,}000(0.9)^{(20(20))} \approx 0$ ✗

D) $50{,}000(0.9)^{\frac{20}{20}} = 45{,}000$ ✓

29. (**A**) ***Math: Multiple-Choice/Data Interpretation/Tables (Matrices)*** **and** ***Probability/Arithmetic Probability*** **and** ***Algebra/Solving Simultaneous Equations. SAT Topic: PSD.7.*** Let *x* equal the number of left-handed females, so the number of right-handed females is 5*x*; let *y* equal the number of left-handed males, so the number of right-handed males if 9*y*. Fill in the given table with this information:

	Handedness	
Gender	Left	Right
Female	*x*	5*x*
Male	*y*	9*y*
Total	18	122

Now, create two simultaneous equations from the information in the table: $x + y = 18$ and $5x + 9y = 122$. Use the method of elimination to solve for *x*:

$$\begin{array}{l} -9(x + y = 18) \\ +\ \ 5x + 9y = 122 \\ \hline -4x = 122 - 162 \Rightarrow x = \frac{40}{4} = 10 \end{array}$$

So, the number of right-handed females, 5*x*, is $5(10) = 50$. Therefore, the probability of a right-handed student being female is $\frac{50}{122} \approx 0.41$.

30. (**A**) ***Math: Multiple-Choice/Algebra/Solving Simultaneous Equations. SAT Topic: ALG.7.*** Substitute $c - \frac{1}{2}$ for *b* in the first equation and solve for *x*: $3x + b = 5x - 7 \Rightarrow 3x + c - \frac{1}{2} = 5x - 7 \Rightarrow 2x = c + \frac{13}{2} \Rightarrow x = \frac{c}{2} + \frac{13}{4}$.

Solve the second equation for y: $3y + c = 5y - 7 \Rightarrow y = \frac{c+7}{2} = \frac{c}{2} + \frac{7}{2} = \frac{c}{2} + \frac{14}{4}$. Therefore, x is $\frac{1}{4}$ less than y.

31. (**4, 5**) ***Math: Student-Produced Responses/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions*** and ***Solving Algebraic Equations or Inequalities with One Variable/Simple Inequalities*** and ***Solving Simultaneous Equations. SAT Topic: ALG.4.*** Let C represent the total cost of the tickets, in dollars and s represent the number of students: $C(\$) =$ $\frac{\$2}{\cancel{\text{student}}} \times s \ \cancel{\text{students}} + \frac{\$3}{\cancel{\text{adult}}} \times 1 \ \cancel{\text{adult}} \Rightarrow C = 2s + 3$. The item stem states that C is at least \$11 but no more than \$14, so $11 \le C \le 14$. Substitute $2s + 3$ for C in the inequality and solve for s: $11 \le 2s + 3 \le 14 \Rightarrow 8 \le 2s < 11 \Rightarrow 4 \le s \le 5.5$. Since s must be a whole number, s can be 4 or 5.

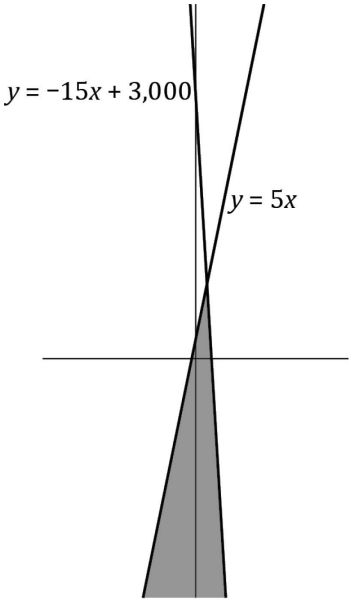
32. (**58.6**) ***Math: Student-Produced Responses/Statistics/Averages. SAT Topic: PSD.9.*** The average is the sum of the values divided by the total number of values: average age $=$ $\frac{57+62+58+58+59+58+62+55+68+51+50+65}{12} = \frac{703}{12} \approx 58.6$ years (the item stem specifies rounding to the nearest tenth). Note that the last step is necessary because the fraction "703/12" does not fit in the grid.

33. (**9**) ***Math: Student-Produced Responses/Algebra/Manipulating Algebraic Expressions/Basic Algebraic Manipulations. SAT Topic: PAM.2.*** Combine "like" terms in the given expression so that it parallels the $ax^2 + bx + c$ form: $(-3x^2 + 5x - 2) - 2(x^2 - 2x - 1) = -5x^2 + 9x$. Therefore, $b = 9$ ($a = -5$ and $c = 0$).

34. (**5/8, .625**) ***Math: Student-Produced Responses/Geometry/Circles*** and ***Trigonometry/Additional Topics in Trigonometry/Degrees and Radians*** and ***Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Proportions and Direct-Inverse Variation. SAT Topic: ATM.4.*** The area of a sector of a circle is proportional to the angle that forms the sector. So, set up a proportion between the ratio of the area of the sector formed by central angle AOB to the total area of the circle and the ratio of the radian measure of $\angle AOB$ to the radian measure of a circle: $\frac{A_{\text{sector}}}{A_{\text{circle}}} = \frac{\angle AOB}{2\pi} = \frac{\frac{5\pi}{4}}{2\pi} = \frac{5}{8}$, or .625.

35. (**50**) ***Math: Student-Produced Responses/Statistics/Averages. SAT Topic: PSD.9.*** The average of the first 10 ratings is 75, so $\frac{\text{sum}_{1-10}}{10} = 75 \Rightarrow \text{sum}_{1-10} = 750$. The average for the first 20 ratings needs to be 85, so $\frac{\text{sum}_{1-10} + n_{11} + \text{sum}_{12-20}}{20} = 85 \Rightarrow n_{11} + \text{sum}_{12-20} = 85(20) - 750 = 950$. Now, the item stem asks for the least possible value for the 11th rating, n_{11}, so the least possible value occurs for the maximum values for the 12th through 20th ratings, which is 100 each. Therefore, the least possible value for n_{11} is $950 - 9(100) = 50$.

36. (750) ***Math: Student-Produced Responses/Algebra/Solving Simultaneous Equations*** **and** ***Solving Algebraic Equations or Inequalities with One Variable/Simple Inequalities. SAT Topic: ALG.4.*** A sketch of the lines corresponding to $y = -15x + 3{,}000$ and $y = 5x$ will help clarify the situation in question:



The shaded area corresponds to the solution set to the system of inequalities—that area common to the solutions of both inequalities. The maximum possible value of *b* corresponds to the point of intersection of the two lines, so set the equations for *y* as equal and solve for *x*: $-15x + 3{,}000 = 5x \Rightarrow x = \frac{3{,}000}{20} = 150$.

Now, substitute 150 for *x* in the second *y*-equation and solve for *y*: $y = 5x = 5(150) = 750$.

37. (7) ***Math: Student-Produced Responses/Problem Solving and Advanced Arithmetic/Complicated Problem Solving Items*** **and** ***Algebra/Solving Algebraic Equations or Inequalities with One Variable/Simple Equations. SAT Topic: PSD.1.*** Apply the given formula, $N = rT$, to the new scenario, in which *r* is 84 shoppers per hour and *T* is 5 minutes: $N = rT = \frac{84 \text{ shoppers}}{\cancel{\text{hour}}} \times \frac{\cancel{\text{hour}}}{60 \cancel{\text{ minutes}}} \times 5 \cancel{\text{ minutes}} = 7$ shoppers waiting in line.

38. (60) ***Math: Student-Produced Responses/Problem Solving and Advanced Arithmetic/Complicated Problem Solving Items*** **and** ***Common Problem Solving Items/Percents. SAT Topic: PSD.2.*** Determine the estimated average number of shoppers for the two stores using the given formula:

New store: $N = rT = \frac{90 \text{ shoppers}}{\cancel{\text{hour}}} \times \frac{\cancel{\text{hour}}}{60 \cancel{\text{ minutes}}} \times 12 \cancel{\text{ minutes}} = 18 \text{ shoppers}$

Original store: $N = rT = \frac{3 \text{ shoppers}}{\cancel{\text{minutes}}} \times 15 \cancel{\text{ minutes}} = 45 \text{ shoppers}$

The average number of shoppers at the new store is $\frac{18}{45} = 0.4 = 40\%$ of the average number of shoppers at the original store. Therefore, the average number of shoppers at the new store represents a decrease of 60% when compared with the average number of shoppers at the original store.