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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.



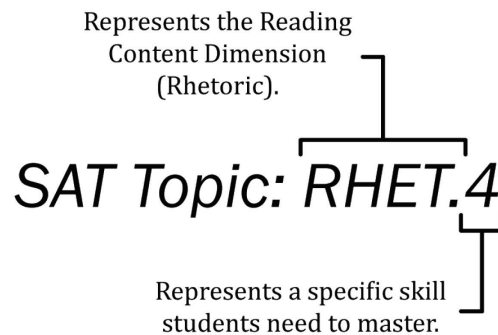
## Category Paths and SAT Topics

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](http://www.cambridgevictory.com)). Here is an example of an SAT Topic reference:







## Reading

- (B) Reading/Literary Fiction/Main Idea. SAT Topic: SUM.1.** This item asks you to describe what happens in the passage. A young man by the name of Akira comes to the home of a woman by the name of Chie to ask her for permission to marry her daughter Naomi. This request comes as a surprise to Chie, as she was unaware as to how Akira's opportunity in America involved her and "had no idea" (line 47) that such a proposition was in the works even after noticing Naomi go breathless for a moment upon hearing Akira's name announced. Additionally, the narrator mentions that "Chie had made no effort to find [Naomi] a husband" (lines 55–56), which indicates that such an idea was not present in her mind. So, (B) is the correct answer choice. As for (A), Chie does not argue with Akira as he makes his proposal and certainly does not consider him to be an intruder; Chie finds Akira's sincerity endearing and congratulates him on his opportunity in America. (C) is wrong because none of the three characters reminisce about the past; instead, the passage focuses on the present lives of Akira and Naomi as well as their potential future together as a married couple. Finally, as for (D), none of the characters are critical of each other in their exchanges: Akira is very respectful of Chie; Chie is amused by Akira's appearance and both surprised by and mildly dismissive of his request; and Naomi remains cool in response to Chie's dismissiveness.
- (B) Reading/Literary Fiction/Development. SAT Topic: RHET.2a.** This item is similar to the previous item, asking you to capture the overall developmental pattern of the passage. As already indicated in the previous explanation, the passage describes an encounter between Akira and Chie. The encounter is certainly meaningful, as it involves Akira asking Chie for permission to marry her daughter; and the depiction of the encounter is detailed in lines 58–76, as it takes the form of literary fiction in its descriptions of setting and character as well as its use of dialogue to move the story forward. So, (B) is the correct answer choice. As for (A), Akira's proposal is not performed in a traditional manner; in lines 39–40, he tells Chie that "[n]ormally [he] would approach [her] more properly"; and in lines 63–66, he asks Chie not to "judge [his] candidacy by the unseemliness of [the] proposal" and says that "the use of a go-between takes much time." As for (C), the passage does not focus on a series of questions but instead on one question; and that one question certainly does not receive a definitive response. Finally, (D) is wrong because the passage is neither a cheerful recounting nor an amusing anecdote; do not be distracted by the fact that Chie is amused upon hearing the news of Akira's opportunity in America.
- (C) Reading/Literary Fiction/Vocabulary. SAT Topic: SUM.2.** In lines 1 and 65, "directly" is used to refer to how Akira approaches Chie in asking her for permission to marry her daughter. Akira is "breaking all tradition" (line 1) by not using a go-between, or intermediary, to make the proposal, saying that it would take too much time to do so. In this context, then, "directly" means "without mediation." So, (C) is the correct answer choice. As for (A) and (B), while Akira's demeanor in making the proposal might be described as both frank and confident, respectively, neither of these meanings captures how "directly" is used in either of the two instances. And (D) is wrong because "with precision" simply misses the mark.



Notice that this Vocabulary item presents you with two instances of the word in question, signaling that its meaning has a very particular relation to what is described in the passage.

- (A) Reading/Literary Fiction/Implied Idea. SAT Topic: INFID.1b.** As already discussed in the explanation for item #2, Akira shows concern for the fact that he is not performing the proposal in a traditional manner, recognizing that coming to Chie directly is inappropriate (without a go-between) and unseemly. So, (A) is the correct answer choice. As for (B) and (D), there is nothing in the exchange between Akira and Chie to indicate that he fears she doubts his sincerity or earnestness with regard to the proposal. And as for (C), while Akira does realize that his unorthodox visit is a "disruption" (line 31) and startling, his overarching concern is that it is improper.

**TIP** Remember to watch for signal words like “most” in item stems. Even though Akira does realize his visit is disruptive, and may fear Chie will consider it an imposition (C), he is “most” concerned that she will consider it inappropriate (A).

5. **(C) Reading/Literary Fiction/Textual Evidence. SAT Topic: INFID.2.** As already mentioned in the previous explanation (and more specifically identified in the explanation for item #2), Akira most fears that Chie would consider his behavior to be inappropriate and unseemly. Akira mentions the unseemliness of not using a go-between in lines 63–66. So, (C) is the correct answer choice. As for (A), line 33 refers to the tone of Akira’s voice when first addressing Chie. As for (B), lines 49–51 refer to Chie’s description of Akira’s childlike manner. And as for (D), lines 71–72 refer to Akira’s eagerness and focus in making his proposal to Chie. None of these options describe what Akira would fear as a reaction from Chie.

**TIP** Note that the correct answers to Textual Evidence items should match up with the passage quotations that are used to determine the answers to the items to which they refer. So, the best approach to solving Textual Evidence items is to make a note of such quotations when solving those corresponding items.

6. **(D) Reading/Literary Fiction/Implied Idea. SAT Topic: INFID.1b.** As already mentioned at the end of the explanation for item #1, Akira is very respectful of Chie. For example, he addresses her as Madame, presents his proposal to her as a formal speech, and bows to her before leaving. He does not address Chie with utter deference, however, since he very consciously makes a non-traditional proposal and recognizes that it comes across as both disruptive and startling. So, (D) is the best answer choice. As for (A), while it could be inferred that Akira has some measure of affection for Naomi, he does not address Chie with affection. (B) is wrong because Akira’s tone in speaking to Chie is not one of objectivity or impartiality but instead is one of urgency out of a desire to satisfy personal interest. As for (C), while Chie congratulates Akira “with amusement” (line 43) and is “filled ... with maternal amusement” (lines 48–49) at Akira’s formality, Akira does not address Chie with that same expression of feeling.
7. **(D) Reading/Literary Fiction/Main Idea. SAT Topic: RHET.4.** The main purpose of the first paragraph is to analyze Chie’s reaction to Akira’s proposal. The narrator begins the passage, lines 1–4, by asking whether Akira’s non-traditional way of approaching Chie was the cause of her reaction and whether she would have been more receptive to him had he followed custom by using a go-between: “Akira came directly, breaking all tradition. Was that it? Had he followed form—had he asked his mother to speak to his father to approach a go-between—would Chie have been more receptive?” So, (D) is the correct answer choice. As for (A), the description of using a go-between for a marriage proposal offers an example of a single cultural custom, not the entire Japanese culture. As for (B), the first paragraph does not criticize the tradition of using a go-between but instead criticizes Akira’s decision to abandon that tradition. And as for (C), while the first paragraph questions Akira’s method, it does not question a suggestion.
8. **(B) Reading/Literary Fiction/Vocabulary. SAT Topic: SUM.2.** The word “form” (line 2) is immediately followed by its description: “ask[ing] his mother to speak to his father to approach a go-between.” And since not following this form would be described as “breaking all tradition” (line 1), it can be inferred that following form is to follow tradition, or custom. So, (B) is the correct answer choice. As for (A) and (C), while “appearance” and “structure,” respectively, are definitions for the word “form,” they do not satisfy the narrator’s intended meaning in this context. And as for (D), “nature,” or “essence,” means the opposite of “form.”

**TIP** Note that the correct answers to Vocabulary items are not always the most obvious meanings to the words in question. So, while it is not recommended that you eliminate the most obvious meanings, you should not be distracted by them.

9. **(C) Reading/Literary Fiction/Implied Idea. SAT Topic: INFID.1b.** Akira says that his meeting with Chie is “a matter of urgency” (line 32) because he just “received word of a position ... as dentist for Seattle’s





Japanese community” (lines 40–42). Akira foregoes using a go-between so that he can talk to Chie directly, as her decision on the matter will determine whether he goes to America or stays in Japan. So, (C) is the correct answer choice. As for (A), while the narrator mentions Akira’s parents in the opening paragraph, Akira does not indicate whether they would or would not approve of Naomi. (B) is wrong because Akira mentions to Chie that he and Naomi “have an understanding” (line 63). And as for (D), while it is likely that Akira knows that Chie is unaware of his feelings for Naomi, this fact would not be cause for his urgency.

10. **(B) Reading/Literary Fiction/Textual Evidence. SAT Topic: INFID.2.** The first thing that Akira says to Chie after telling her that he has come to see her at her home on “a matter of urgency” (line 32) is that he just “received word of ... an opportunity to go to America, as dentist for Seattle’s Japanese community” (lines 40–42). And, as mentioned in the previous explanation, Chie’s response will determine whether he stays or goes. So, (B) is the correct answer choice. As for (A), in line 39 Akira merely tells Chie that he does not want to trouble her. Do not be distracted by (C); while lines 58–59 express the significance of Akira’s request as well as of Chie’s response regarding that request, they do not explain why his request is a matter of urgency. Finally, (D) is wrong for a reason similar to that of (A); in lines 72–73 Akira simply acknowledges that he has startled Chie with his proposal.



Remember the tip included with the explanation for item #5 regarding Textual Evidence items; in this case, look to those passage quotations that you used to determine the answer to item #9.

11. **(A) Reading/Social Studies/Development. SAT Topic: SUM.1.** In lines 1–9, the authors provide examples of gift-giving occasions (“holiday[s] ... weddings, birthdays, anniversaries, graduations, and baby showers”) in order to reinforce their opening statement that “[e]very day, millions of shoppers hit the stores in full force ... searching frantically for the perfect gift.” Notice, too, that the authors end line 9 with a reference to the “frequent experience of gift-giving.” So, (A) is the correct answer choice. As for (B), while the authors do mention that “Americans spent over \$30 billion at retail stores” (lines 3–4), the amount of money spent on gifts is not the reason why the authors list the examples of occasions. As for (C), while the authors do use the term “frantically,” this is the only reference to anxiety, and the author goes on to focus in the next sentence on the volume of gifts purchased rather than the anxiety that gift shopping causes. Finally, do not be distracted by (D); while the list of examples does highlight the number of gift-giving occasions throughout the year, the authors’ intention is a bit more subtle than that.
12. **(B) Reading/Social Studies/Vocabulary. SAT Topic: SUM.2.** For this Vocabulary item, notice that the meaning of the word “ambivalent” in line 10 can be understood by reading the second half of the first paragraph (lines 10–16). There, the authors set up a contrast between those who “relish the opportunity to buy presents” and those who “dread the thought of buying gifts.” Overall, gift-givers are conflicted about frequent gift-giving. So, (B) is the correct answer choice. As for the remaining answer choices, none of these options satisfy the authors’ intended meaning.



For certain Vocabulary items, you can expedite the problem-solving process by recognizing certain roots that appear in other words with which you may be familiar. In this case, the root “ambi,” which means “both” (e.g., “ambidextrous” means “able to use both the left and right hands”), might serve as the necessary clue to determining the meaning of “ambivalent.” Someone who is ambivalent would have mixed feelings about something.

13. **(D) Reading/Social Studies/Implied Idea. SAT Topic: INFID.1b.** In lines 12–13, the authors say that “gift-giving offers a powerful means to build stronger bonds with one’s closest peers.” Additionally, in lines 55–60, the authors cite experts who say that “gift-giving represents a symbolic ritual, whereby gift-givers attempt to signal their positive attitudes toward the intended recipient and their willingness to invest resources in a future relationship.” So, (D) is the correct answer choice. As for (A), while gift-givers may unwittingly express their own likes and dislikes in choosing a gift for someone else because “their insights are subject to egocentrism” (line 33), they do not value gift-giving as a way to express themselves. (B) is wrong because the authors state that “givers are likely to spend \$100 to purchase a

gift that receivers would spend only \$80 to buy themselves” (lines 25–27) and generally “tend[ing] to overspend” (line 37). As for (C), throughout the passage the authors talk about gift-givers and recipients but do not address the issue of reciprocation.

14. (A) *Reading/Social Studies/Textual Evidence. SAT Topic: INFID.2.* As mentioned in the previous explanation, the authors say that “gift-giving offers a powerful means to build stronger bonds with one’s closest peers” (lines 12–13). So, (A) is the correct answer choice. As for (B) and (C), both of these quotations suggest that gift-givers generally fail to take the true desires of their recipients into consideration; such a failure does not provide evidence that people give gifts to others in order to strengthen their relationships with them. As for (D), lines 44–47 state that assuming there to be a direct relationship between gift price and feelings of appreciation may be unfounded; this idea does not support the argument for strengthening relationships.



Remember the tip included with the explanation for item #5 regarding Textual Evidence items; in this case, look to those passage quotations that you used to determine the answer to item #13.

15. (A) *Reading/Social Studies/Application. SAT Topic: INFID.1c.* According to the authors, the “deadweight loss” phenomenon “suggests that gift-givers are not very good at predicting what gifts others will appreciate” (lines 28–30). The authors go on to say that this “is not surprising to social psychologists ... [because] [r]esearch has found that people often struggle to take account of others’ perspectives” (lines 30–32). So, if social psychologists are not surprised by this phenomenon because it is supported by research, then they would likely describe it as predictable, (A). As for (B) and (D), since research supports this phenomenon, social psychologists would not likely describe it as questionable and would certainly not describe it as unprecedented, respectively. As for (C), there is nothing in the passage to indicate that the social psychologists would find the phenomenon to be disturbing.
16. (C) *Reading/Social Studies/Implied Idea. SAT Topic: INFID.1b.* In lines 44–47, the authors say that assuming there to be a direct relationship between gift price and feelings of appreciation may be unfounded, which means that the claim is without basis. The authors continue their argument by “propos[ing] that gift-recipients will be less inclined to base their feelings of appreciation on the magnitude of a gift than givers assume” (lines 47–50). It is in the subsequent paragraph, though, where the authors suggest that the unfounded assumption is incorrect: “gift-recipients ... may not construe smaller and larger gifts as representing smaller and larger signals of thoughtfulness and consideration” (lines 63–65). So, (C) is the correct answer choice. (A) and (B) are wrong because the authors question neither the sincerity nor the reasonableness of the gift-givers’ assumptions. Finally, (D) is wrong because “substantiated” provides the opposite of the authors’ intended meaning; in fact, the idea that an assumption is unfounded means that it is *unsubstantiated*.
17. (C) *Reading/Social Studies/Textual Evidence. SAT Topic: INFID.2.* What is important to recognize is that the perspective of the gift-recipients is what proves or disproves the assumption made by gift-givers. The authors suggest that the unfounded assumption that there is a direct relationship between gift price and feelings of appreciation on the part of the recipient is incorrect because “gift-recipients ... may not construe smaller and larger gifts as representing smaller and larger signals of thoughtfulness and consideration” (lines 63–65). So, (C) is the correct answer choice. As for (A), lines 53–55 simply explain why gift-givers assume what they do: “givers believe that bigger ... gifts convey stronger signals of thoughtfulness and consideration.” As for (B), lines 55–60 focus on the motives for gift-giving, citing experts who say that “gift-giving represents a symbolic ritual, whereby gift-givers attempt to signal their positive attitudes toward the intended recipient and their willingness to invest resources in a future relationship.” And as for (D), lines 75–78 offer an assessment of the situation in theoretical terms. In summary, gift-givers make faulty assumptions because they fail to be reflective and use “personal insight” (line 81) when making decisions about what to purchase.



**TIP** Remember the tip included with the explanation for item #5 regarding Textual Evidence items; in this case, look to those passage quotations that you used to determine the answer to item #16.

18. **(D) Reading/Social Studies/Vocabulary. SAT Topic: SUM.2.** In lines 53–55, the authors explain why gift-givers assume what they do: “givers believe that bigger ... gifts convey stronger signals of thoughtfulness and consideration.” Gift-givers mean to convey, or communicate, their intentions by purchasing more extravagant gifts. So, (D) is the correct answer choice. As for (A), while “convey” can be used to mean “transport” (“to move something from one place to another”), this is not the author’s intended meaning. As for (B) and (C), neither “counteract” nor “exchange,” respectively, is an appropriate meaning in this context.
19. **(A) Reading/Social Studies/Development. SAT Topic: RHET.4.** In lines 55–60, the authors cite experts in order to provide an explanation for why gift-givers seek to convey signals of thoughtfulness and consideration with their purchases, saying that “gift-giving represents a symbolic ritual, whereby gift-givers attempt to signal their positive attitudes toward the intended recipient and their willingness to invest resources in a future relationship.” So, (A) is the correct answer choice. As for (B), the analysis made by Camerer and others does not introduce an argument but instead provides an explanation for why the gift-givers do what they do. (C) is wrong because the authors are not *questioning* the motives of gift-givers but instead are trying to *understand* their motives. And (D) is wrong because the authors do not make the reference to support a conclusion; they are examining how gift-givers think, asking questions (“Why do gift-givers ... appreciation?”), and proposing theories (“Perhaps givers believe that ... consideration.”) along the way.
20. **(B) Reading/Social Studies/Data Presentations. SAT Topic: SYN.2.** According to the graph, the difference between the level of actual appreciation shown by gift-recipients when they receive less expensive gifts and the level of actual appreciation shown by gift-recipients when they receive more expensive gifts is negligible. As for the gift-givers, however, there is a noticeable difference between what they perceive will be the gift-recipients’ appreciation-level at receiving a less expensive gift and what they perceive will be the gift-recipients’ appreciation-level at receiving a more expensive gift. The highest bar on the graph indicates that gift-givers believe gift-recipients will appreciate more expensive gifts. So, the graph offers evidence that gift-givers base their predictions of how much a gift will be appreciated on the monetary value of the gift, (B). As for (A), there is nothing in the graph to suggest that the gift-givers know let alone take into consideration the appreciation level of the gift-recipients. And as for (C) and (D), the gift-givers’ desires and the relationship that they have with the gift-recipients, respectively, are not variables measured on the graph.

**TIP** Alternatively, the answer to this particular item can be inferred quite quickly from what has already been discussed in previous explanations. The assumption that the authors believe to be unfounded is described in lines 41–44: “gift-givers equate how much they spend with how much recipients will appreciate the gift (the more expensive the gift, the stronger a gift-recipient’s feelings of appreciation).” Since this is a Data Presentations item, however, you should confirm this answer with the reasoning outlined above.

21. **(A) Reading/Social Studies/Application. SAT Topic: INFID.1c.** In the last paragraph, the authors state that “givers and receivers ... often struggle to transfer information gained from one role (e.g., as a giver) and apply it in another, complementary role (e.g., as a receiver)” (lines 71–75); and that “people fail to utilize information about their own preferences and experiences” (lines 75–77). And according to the graph, gift-recipients actually appreciate less expensive gifts more than gift-givers perceive that they will, and gift-recipients actually appreciate more expensive gifts less than gift-givers perceive that they will. So, the authors would likely attribute the differences in the graph to an inability to shift perspective, (A). As for (B) and (C), there is no indication that the authors consider either materialism or an opposition to gift-giving, respectively, to be relevant. Do not be distracted by (D); the authors suggest that gift-givers and gift-recipients misunderstand each other’s perspectives, not each other’s intentions. In fact, the idea of intentions seems to focus only on the gift-giver and not the gift-recipient.

**22. (B) Reading/Natural Science/Development. SAT Topic: SUM.1.** This is a fairly straightforward Development item, asking you why the authors use the word “backbone” in lines 3 and 39. In lines 2–4, the authors describe the DNA molecule as “a very long chain, the backbone of which consists of a regular alternation of sugar and phosphate groups.” In lines 39–40, the authors mention that the “phosphate-sugar backbone of our model is completely regular.” So, the term “backbone” must indicate that the main structure of a chain in a DNA molecule is composed of repeating (regularly alternating) units, (B). Do not be distracted by (A); while the term “backbone” is typically associated with the spinal column of an organism, it is used in this context to refer to the structure of a DNA molecule. As for (C), since the backbone mentioned in the passage refers to “a regular alternation of sugar and phosphate groups,” the chain in the DNA molecule cannot consist entirely of one or the other group. And (D) is wrong because nitrogenous bases attach themselves to sugars only and therefore do not form the main structural unit of DNA.

**23. (D) Reading/Natural Science/Textual Evidence. SAT Topic: INFID.2.** In the second paragraph, the authors discuss how the DNA structure “consists not of one chain, but of two” (lines 13–14). Then, in the third paragraph, they state that “the two chains are held together ... by hydrogen bonds between the [nitrogenous] bases” (lines 21–22) and “that only certain pairs of bases will fit into the structure” (lines 25–26). The authors go on to say that “[o]ne member of a pair must be a purine and the other a pyrimidine in order to bridge between the two chains” (lines 27–29). The fact, then, that not any pair of bases will fit into the DNA structure contradicts the claim that nitrogenous bases pair *randomly* with one another. So, (D) is the correct answer choice. As for (A), lines 5–6 indicate that the nitrogenous bases consist of four different types (adenine and guanine, which are purines, and thymine and cytosine, which are pyrimidines); they do not indicate the necessity for a purine to pair with a pyrimidine, which would contradict the claim of a random pairing. (B) is wrong because lines 9–10 simply state that “the sequence of bases along the chain is irregular,” which neither supports nor contradicts the claim that nitrogenous bases pair randomly with one another between the two chains. As for (C), lines 23–25 only state that “[t]he bases are joined together in pairs” but do not go so far as to say that only certain bases will pair with each other.

**TIP** This Textual Evidence item is an exception to the explanation for item #5 regarding Textual Evidence items; in this case, the item asks for evidence in the passage that contradicts a given claim and not for the best evidence for the answer to the previous question.

**24. (D) Reading/Natural Science/Explicit Detail. SAT Topic: INFID.1a.** In lines 12–14, the authors explicitly state that “[t]he first feature of our structure which is of biological interest is that it consists not of one chain, but of two.” So, (D) is the correct answer choice. As for (A), while the authors say that “there [is] only one chain in the chemical formula” (lines 16–17), the feature of biological interest is that there are two chains in the structural unit. As for (B) and (C), it is not the common fiber axis around which the two chains are coiled or the X-ray evidence suggesting the existence of the two chains that is the feature of biological interest; it is the fact that there *are* two chains rather than one in the structural unit.

**25. (C) Reading/Natural Science/Development. SAT Topic: RHET.4.** In lines 18–19, the authors state that the density and X-ray evidence of the structure suggest that there are two chains. So, (C) is the correct answer choice. As for (A), while the authors state that DNA carries genetical information (lines 43–45), this statement does not relate to density or X-rays. As for (B), the authors do not present an alternate hypothesis about nucleotide composition. And (D) is wrong because the authors mention density in support of their two-chain structure model, not in defending their chemical formula for DNA.

**26. (B) Reading/Natural Science/Implied Idea. SAT Topic: INFID.1b.** As discussed in the explanation for item #23, “only certain pairs of bases will fit into the [DNA] structure” (lines 25–26) and “[o]ne member of a pair must be a purine and the other a pyrimidine in order to bridge between the two chains” (lines 27–29). In lines 29–30, the authors proceed to state that “[i]f a pair consisted of two purines ... there would not be room for it.” So, it can be inferred that a pair of purines would be larger than a pair consisting of a purine and a pyrimidine, (B). As for (A), while one might infer from the author’s statement that a pair of



purines would be larger than the space between the two chains, it says nothing about the space between a sugar and a phosphate group. As for (C), if a pair consisting of a purine and a pyrimidine would bridge the gap but there would be no room between the two chains for a pair consisting of two purines, then we can deduce that a pyrimidine is smaller than a purine and therefore a pair of pyrimidines would be *smaller* than a pair of purines. As for (D), while this option is supported by the reasoning outlined above for (C), the question asks what we can know about a pair of purines based on what we already know about a mixed pair; it does not ask what we can know about a pair of pyrimidines.

27. **(D) Reading/Natural Science/Development. SAT Topic: RHET.1.** This item asks you to determine why the authors use the words “exact,” “specific,” and “complement” in the last paragraph. In this case, the best approach is to read lines 45–51 where the three words appear in order to gain a better understanding of the context in which they are used:

“If the actual order of the bases on one of the pair of chains were given, one could write down the *exact* order of the bases on the other one, because of the *specific* pairing. Thus one chain is, as it were, the *complement* of the other, and it is this feature which suggests how the deoxyribonucleic acid molecule might duplicate itself.”

The idea that one could write down the exact order of the bases on one of the pair of chains based on the given order of the bases on the other pair is representative of a template. And DNA replication is expressed by the phrase that “the deoxyribonucleic acid molecule might duplicate itself.” So, (D) is the correct answer choice. Do not be distracted by the terminology used in the remaining answer choices. The words “exact,” “specific,” and “complement” are suggestive of precision and order and therefore resonate with the ideas of confirming that something is known, (A); countering that something is random, (B); and supporting that something is completely regular, (C). None of these options, however, explain why the authors use these words in the last paragraph.

28. **(C) Reading/Natural Science/Data Presentations. SAT Topic: SYN.2.** This item asks you to use both the table and the passage in order to determine which choice gives the correct percentages of the purines in yeast DNA. Lines 7–8 state that “adenine and guanine ... are purines ... and ... thymine and cytosine ... are pyrimidines.” According to the table, the percentages of the purines (adenine and guanine) in yeast DNA are 31.3 and 18.7, respectively. So, (C) is the correct answer choice. As for the rest of the answer choices, they are incorrect because they do not list the percentages of only the purines in yeast DNA.
29. **(A) Reading/Natural Science/Data Presentations. SAT Topic: SYN.2.** Remember that the authors’ proposed pairing of bases in DNA consists of a purine and a pyrimidine. And in the fourth paragraph, the authors hypothesize that “the conditions for forming hydrogen bonds are more restrictive, and the only pairs of bases possible are: adenine with thymine, and guanine with cytosine” (lines 33–35). For the table to support this proposition, the data for each organism would consist of adenine and thymine percentages that are close to each other and guanine and cytosine percentages that are close to each other. Upon examination of the table, you will notice that these percentages are accurate. So, (A) is the correct answer choice. (B) and (D) are incorrect because the data in the table does not support the proposition: the percentage of adenine is not closest to the percentage of guanine, and the percentage of cytosine is not closest to the percentage of thymine. (C) is wrong because it contradicts (A).
30. **(A) Reading/Natural Science/Data Presentations. SAT Topic: SYN.2.** Not unlike a Textual Evidence item, this item asks you to interpret the table to find evidence in support of the answer to the previous question. The correct answer to the previous question is that the data in the table does support the authors’ proposed pairing of bases in DNA because for each given organism, the percentage of adenine is closest to the percentage of thymine, and the percentage of guanine is closest to the percentage of cytosine. So, the correct answer to this item would be the pair of percentages in sea urchin DNA that reflects either of these two conditions.

**TIP** Note that there are two components to each of the two conditions: that they are particular base pairs (adenine/thymine and guanine/cytosine) and that the percentages between the two bases in each pair are close to each other. Using the process of elimination, you can eliminate (B), (C), and (D) on the basis that the percentages in each of these cases are not close to each other. (A) is the only option in which the two percentages are close to each other.

Now, confirm that (A) is the correct answer choice by checking the percentages against those associated with sea urchin DNA in the table to see if they match up with either the two aforementioned base pairs (adenine/thymine and guanine/cytosine). Indeed, 17.3 and 17.7 are the percentages in sea urchin DNA of cytosine and guanine, respectively. As for (B), (C), and (D), they are incorrect because none of these pairs match the conditions described above.

31. **(D) Reading/Natural Science/Data Presentations. SAT Topic: SYN.2.** In lines 41–42, the authors state that “in a long molecule many different permutations are possible.” Since permutations are variations, (D) must be the correct answer choice. As for (C), lines 36–38 refer to the authors’ proposed pairing of adenine and thymine bases in DNA; it does not suggest that the percentage of adenine in each organism’s DNA is the same.

**TIP** This question consists of two parts, the first of which is very straightforward and easy to confirm by glancing at the table: is the percentage of adenine in each organism’s DNA the same or does it vary? It is quite obvious that the percentages in the adenine column are all different from each other, with the single exception of the human and grasshopper DNAs that are at 29.3%. So, (A) and (B) can immediately be eliminated on the basis that they both say that the percentage of adenine in each organism’s DNA is the same. Now, the second part of this question requires you to examine the passage in order to determine whether the statement in (C) or (D) is consistent with this information.

32. **(B) Reading/Social Studies/Main Idea. SAT Topic: RHET.4.** The author, Virginia Woolf, discusses “the procession of the sons of educated men” (lines 10–11) and the possibility of joining this procession and as a result sharing in the spoils of worldly success. In lines 47–49, Woolf states that she and those she is addressing are there “to ask [them]selves certain ... very important questions” about this matter and that they “have very little time in which to answer [these questions].” (B) best captures this idea. (A) is wrong because Woolf clearly does not value the tradition that she describes: a male-dominated society. As for (C), whether the divisions between men and women may be considered severe, Woolf’s purpose is to rally educated women around the idea of using their minds in the same situations that men do in order to minimize such divisions. And as for (D), Woolf does not question the feasibility of joining the procession of educated men; in fact, the spirit with which she delivers her message suggests that she thinks the task to be feasible indeed.
33. **(A) Reading/Social Studies/Main Idea. SAT Topic: INFID.3.** Woolf’s focus is drawn to educated women in particular. She says that “trapesing along at the tail end of the procession, we go ourselves” (lines 23–24), and later in the passage she refers to themselves as “the daughters of educated men” (line 64). Of the four answer choices, (A) and (D) make reference to educated women as opposed to women in general. As for (D), however, Woolf does not discuss whether women joining the workforce and holding positions typically held by men would transform those positions for the better (or even for the worse). Instead, as mentioned in the previous explanation, she claims that there are very important questions to be not only asked but also answered regarding how educated women are to participate in some of the same institutions as do men: “during this moment of transition ... we have to ask ourselves ... do we wish to join that procession” (lines 51–55). So, (A) is the correct answer choice. As for (B), while Woolf does mention some of women’s more traditional roles (organizing bazaars, cooking, and caring for children), she does not suggest that they need to give up these roles in order to participate in the typically male institutions. And as for (C), while Woolf does suggest a male monopoly, discussing the imbalance between the sexes, and would most likely consider the effects of this imbalance to be quite serious, she does not address those effects.



34. **(C) Reading/Social Studies/Development. SAT Topic: RHET.1.** This is a fairly straightforward Development item, asking you to determine why Woolf uses the pronoun “we” throughout the passage. In the first paragraph, she uses the pronoun to powerful effect: “Now we are pressed for time. Now we are here to consider facts; now we must fix our eyes upon the procession—the procession of the sons of educated men” (lines 8–11). And as already established, she is addressing educated women (herself counted among them), expressing the need for them to ask themselves certain questions that “may well change the lives of all men and women for ever” (lines 52–53). So, it is quite clear that Woolf uses the pronoun “we” to establish a sense of solidarity among the educated women of English society, (C). (A) is wrong because Woolf takes on a very serious tone throughout the passage and does not suggest an air of friendliness or otherwise; in lines 45–46, she says that “we have not come here to laugh, or to talk of fashions.” As for (B) and (D), while Woolf most likely does feel the need for candor and self-respect, respectively, among the educated women of society, she does not use the word “we” to reinforce such qualities.
35. **(B) Reading/Social Studies/Explicit Detail. SAT Topic: INFID.1a.** As stated quite clearly in the first paragraph, Woolf chooses the setting of the bridge because it offers “an admirable vantage ground for [the women] to make a survey” (lines 2–3) and “fix [their] eyes upon the procession—the procession of the sons of educated men” (lines 9–11). So, the bridge provides a good view of that procession, (B); it allows the women to look upon the men “no longer [as] a sight merely, a photograph, or fresco ... at which [they] can look with merely an esthetic appreciation” (lines 20–23) but to carefully consider the potential for their own developing roles in a society consisting of typically male-dominated institutions. As for (A), while Woolf does say that the bridge “is a place to stand on by the hour, dreaming” (lines 6–7), she makes clear that now is not the time for such fanciful reflection. As for (C), while Woolf does provide a sense of time as she looks upon the procession, saying that the daughters of educated men have at least been “at the tail end of the procession” (lines 23–24) “for the past twenty years or so” (lines 19–20), she does not allude to particular historic events let alone to the proximity of such events to the bridge. Finally, as for (D), while the phrase “sons of educated men” is used in a general way, suggesting sons of the past and present, Woolf does not choose the setting of the bridge to symbolize an idea of legacy. If anything, the bridge might be interpreted in a sense more affirming to Woolf’s cause as symbolic of the “transition ... that ... may well change the lives of all men and women for ever” (lines 51–53).
36. **(D) Reading/Social Studies/Implied Idea. SAT Topic: INFID.1b.** As discussed in the previous explanation, Woolf provides a sense of time as she looks upon the procession, saying that the daughters of educated men have at least been “at the tail end of the procession” (lines 23–24) “for the past twenty years or so” (lines 19–20) and “that makes a difference” (lines 24–25). So, Woolf indicates that the procession has become less exclusionary in its membership in recent years, (D). As for (A), Woolf mentions how things have improved for women in the last twenty years, as they are now a tail part of that procession; she does not describe whether the procession has had more practical influence in recent years. In fact, she describes the procession as “a solemn sight always ... like a caravanserai crossing a desert” (lines 17–19), which suggests that little has changed beyond the recent inclusion of educated women. As for (B), while Woolf does seem to characterize certain institutions as celebrated features of English public life that were women to share in them they would be able to “speak from a pulpit” (line 34) and “be ... mouthpieces of the divine spirit” (lines 35–36), she does not indicate that the procession has become such a celebrated feature. As for (C), the procession includes “the sons of educated men” (lines 10–11), some of whom by virtue of education, legacy, and status may very well count themselves as some of the richest and most powerful men in England, but the procession certainly does not include *all* of the richest and most powerful men.
37. **(C) Reading/Social Studies/Textual Evidence. SAT Topic: INFID.2.** Woolf’s remark that the daughters of educated men have at least been “at the tail end of the procession” (lines 23–24) “for the past twenty years or so” (lines 19–20) is the best evidence supporting the fact that the procession has become less exclusionary in its membership in recent years. So, (C) is the correct answer choice. As for (A), lines 12–17 describe the seemingly timeless roles of the sons of educated men throughout the years (“ascending

those pulpits, preaching, teaching, administering justice, practicing medicine, transacting business, making money”) and indicate nothing about the procession’s inclusion of women. As for (B), lines 17–19 compare the procession of the sons of educated men to a desert caravan to symbolize not only its appearance but also the monotony and changelessness of its members’ roles until recent years. Finally, as for (D), lines 30–34 repeat some of those very same roles to reinforce what might be possible for educated women in the future were they to succeed in their pursuit for greater equality.

**TIP** Remember the tip included with the explanation for item #5 regarding Textual Evidence items; in this case, look to those passage quotations that you used to determine the answer to item #36.

**38. (C) Reading/Social Studies/Implied Idea. SAT Topic: INFID.1b.** In lines 53–57, Woolf asks three questions: “[D]o we wish to join that procession, or don’t we? On what terms shall we join that procession? Above all, where is it leading us, the procession of educated men?” As already discussed in the explanation for item #32, Woolf states that she and those she is addressing are there “to ask [them]selves certain ... very important questions” about joining the procession and that they “have very little time in which to answer [these questions]” (lines 47–49). So, (C) is the correct answer choice; Woolf characterizes the questions as momentous (very important) and pressing (there is very little time to answer them). As for (A), while such a shift in the inertia that is male-dominance would most likely be considered controversial and threatening, particularly to the procession of the sons of educated men, Woolf does not characterize the questions in such a way. As for (B) and (D), while Woolf considers the questions to be weighty (of great importance) and the men of the procession would most likely find them to be provocative, respectively, there is nothing to suggest that they are unanswerable or mysterious.

**39. (B) Reading/Social Studies/Textual Evidence. SAT Topic: INFID.2.** The best evidence that Woolf characterizes the questions as momentous (very important) and pressing (there is very little time to answer them) can be found in lines 47–49 (“to ask [them]selves certain ... very important questions” about joining the procession and that they “have very little time in which to answer [these questions]”). (B) captures the specific lines in question. (A) is wrong because lines 46–47 merely state that the women are there to ask certain questions. As for (C), line 57 does elliptically address the issue of urgency, but it does not speak of the questions explicitly or underlie their importance. As for (D), in line 62, Woolf addresses the women as “Madam,” stating that not having the time to participate in this greater cause (when compared to the more trivial concerns of their individual lives) is a poor excuse.

**TIP** Remember the tip included with the explanation for item #5 regarding Textual Evidence items; in this case, look to those passage quotations that you used to determine the answer to item #38.

**40. (C) Reading/Social Studies/Vocabulary. SAT Topic: SUM.2.** This is an interesting Vocabulary item because it asks you to determine the figurative meaning rather than the literal meaning of a term. In lines 70–71, Woolf twice uses the term “sixpence,” which is a British coin, saying that educated women are entitled to their new sixpence and asking how they plan on spending it. So, it can be inferred that Woolf’s use of the term “sixpence” refers to the women’s newfound opportunity to join the ranks of the workforce, (C).

**TIP** Use the process of elimination to eliminate (A), (B), and (D), since none of them have an obvious relation to the term “sixpence,” let alone to Woolf’s intended meaning. As for (A) and (D), tolerance and perspective, respectively, would be qualities that the women would hope to see from the procession of the sons of educated men. And as for (B), while knowledge is a commodity sought after by educated women, it is not the referent for “sixpence.”

**41. (B) Reading/Social Studies/Development. SAT Topic: SUM.1.** In lines 72–76, Woolf lists places and occasions that range widely not only in their level of formality but also in their tone: “in offices; in omnibuses ... in the crowd watching Coronations and Lord Mayor’s Shows ... in ... the House of Commons; in the Law Courts ... at baptisms and marriages and funerals.” Since Woolf reiterates that





they are places and occasions where and when women must think, the list must serve to emphasize how pervasive is the need for critical reflection, (B). As for (A), not only do the places and occasions not speak to the challenge faced by women but the challenge would not be considered novel either. (C) is wrong because the list does not exemplify the complexity of the political and social issues of the day. And (D) is wrong because Woolf describes places and occasions, not examples of career possibilities.

42. **(B) Reading/Natural Science/Development. SAT Topic: RHET.4.** In lines 9–17, the author of Passage 1 mentions three companies formed in 2012 (Planetary Resources of Washington, Deep Space Industries of Virginia, and Golden Spike of Colorado) who all plan on “mak[ing] space mining a reality” (line 8) in the near future. So, (B) is the correct answer choice; the development of new mining firms and related commercial ventures goes to show that there is a growing interest in space mining. As for (A), while the author of Passage 1 does mention “prospect telescopes” in line 12, he does not mention these companies to note the technological advances that make space mining possible. As for (C), while space miners will “enrich themselves” (line 24) and “water mined from other worlds could become the most desired commodity” (lines 29–30), the author does not mention these companies to emphasize the potential for monetary gain. Finally, as for (D), while there may be diversity in the nature and objectives of these companies, the author of Passage 1 does not mention the companies to highlight the diverse ways in which space mining operations could be performed.
43. **(A) Reading/Natural Science/Implied Idea. SAT Topic: INFID.1b.** The author of Passage 1 mentions that these companies “may be meeting earthly demands for precious metals, such as platinum and gold, and the rare earth elements vital for personal electronics” (lines 18–21). So, (A) is the correct answer choice; space mining could yield materials important to Earth’s economy. As for (B), while the author of Passage 1 does mention the “earthly demands for precious metals” (line 19), he does not discuss whether space mining could raise the value of such precious metals. As for (C) and (D), while unanticipated technological innovations and a new understanding of space resources, respectively, might be expected from developments in space mining, the author of Passage 1 does not indicate so.
44. **(A) Reading/Natural Science/Textual Evidence. SAT Topic: INFID.2.** As just stated in the previous explanation, the space mining firms mentioned “may be meeting earthly demands for precious metals, such as platinum and gold, and the rare earth elements vital for personal electronics” (lines 18–21). And knowing what we do about the value of platinum and gold as well as the demand for personal electronics, it can be inferred that space mining could yield materials important to Earth’s economy. So, (A) is the correct answer choice. As for (B), lines 24–28 discuss “an off-planet economy” where extracted materials “are delivered for space-based projects” but do not indicate that mined materials will have a positive effect on the Earth’s economy. (C) is wrong because the idea that “water mined from other worlds could become the most desired commodity [in space]” (lines 29–30) does not speak to our earthbound economic needs. Finally, as for (D), while the fact that “[c]ompanies are eyeing the iron, silicon, and aluminum in lunar soil and asteroids, which could be used in 3D printers to make spare parts or machinery” (lines 41–44) bears a relationship to the Earth’s economy (the development of a new technology and other marketable uses), the idea that there are *demands* for precious metals and that rare elements are *vital* to the production of electronics provides the *best* evidence for the answer to the previous question.



Remember the tip included with the explanation for item #5 regarding Textual Evidence items; in this case, look to those passage quotations that you used to determine the answer to item #43.

45. **(D) Reading/Natural Science/Vocabulary. SAT Topic: SUM.2.** This is a fairly easy Vocabulary item. If the correct answer is not immediately clear to you, go ahead and substitute each of the four options for “demands” in the context of the sentence:
- A) “... these firms may be meeting earthly *offers* for precious metals ....” ✗  
 B) “... these firms may be meeting earthly *claims* for precious metals ....” ✗  
 C) “... these firms may be meeting earthly *inquiries* for precious metals ....” ✗

D) "... these firms may be meeting earthly *desires* for precious metals ...." ✓

So, (D) is the correct answer choice. The phrase "earthly desires" should be a dead giveaway. As for the remaining answer choices, none of them satisfy the first author's intended meaning: offers are the opposite of demands; to claim is to assert something; and to make an inquiry is to ask about something.

46. **(C) Reading/Natural Science/Development. SAT Topic: RHET.2b.** In lines 35–40, the author of Passage 1 discusses how astronauts could use "[w]ater ice from the moon's poles ... for drinking or as a radiation shield" and how "[s]plitting water into oxygen and hydrogen makes spacecraft fuel," which might inspire the opening of "interplanetary refueling stations." In the previous paragraph is where the author of Passage 1 states that "water mined from other worlds could become the most desired commodity [in space]" (lines 29–30). So, his discussion of the uses of water in space serve as hypothetical examples supporting the claim that water could become a most desired commodity, (C). As for (A), while the previous paragraph does compare the value of water with the value of gold to a person in the desert, the lines in question do not continue that comparison but instead discuss only the potentials of water. (B) is wrong for a reason similar to that of (A). The question in the previous paragraph asks whether a kilogram of gold or a kilogram of water is worth more and an answer is provided in that very same paragraph ("Gold is useless. Water will let you live."); lines 35–40 do not discuss gold. And (D) is wrong because the previous paragraph does not put forth a proposal but instead makes a claim, asks a question, and then answers that question.
47. **(B) Reading/Natural Science/Main Idea. SAT Topic: INFID.3.** The authors of Passage 2 do hold that "we all stand to gain" (line 50) from "bringing celestial riches down to Earth" (lines 48–49). In lines 53–59, however, they qualify this statement by saying that "before the miners start firing up their rockets, we should pause for thought" and that the consequences of space mining "merit careful consideration." So, (B) is the correct answer choice. As for (A), while the authors of Passage 2 do say that "space mining seems to sidestep most environmental concerns" (lines 54–56) and that "miners have much to gain from a broad agreement on the for-profit exploitation of space" (lines 83–85), they do not suggest that space mining will encourage us to treat the environment recklessly. As for (C) and (D), while the authors of Passage 2 consider "the emerging off-world economy" (line 73) and the relative value of space-mined resources to those found on Earth, they make no mention of key resources that are disappearing on Earth nor do they present a debate as to the commercial viability of earthly resources.
48. **(A) Reading/Natural Science/Vocabulary. SAT Topic: SUM.2.** In lines 67–68, the authors of Passage 2 say that the positions argued in the previous paragraph ("space's 'magnificent desolation' is not ours to despoil" and "glutting ourselves on space's riches is not an acceptable alternative to developing more sustainable ways of earthly life") "will be hard lines to hold." So, to "hold" a line of argument most nearly means to "maintain" that line, (A). As for the remaining answer choices, while "grip," "restrain," and "withstand" are possible meanings of the word "hold," none of them are suitable in this context.
49. **(D) Reading/Natural Science/Development. SAT Topic: SYN.1.** The author of Passage 1 talks a good deal about the benefits of space mining, saying that companies "may be meeting earthly demands for precious metals, such as platinum and gold, and the rare elements vital for personal electronics" (lines 18–21); that "[w]ater ice ... could be sent to astronauts ... for drinking or as a radiation shield" (lines 35–37); that water could be split "into oxygen and hydrogen [to make] spacecraft fuel [and in turn] interplanetary refueling stations" (lines 37–40); that "iron, silicon, and aluminum in lunar soil and asteroids ... could be used in 3D printers to make spare parts or machinery" (lines 41–44); and that space dirt could be made into "concrete for landing pads, shelters, and rocks" (line 45). The authors of Passage 2 also believe that "we all stand to gain" (line 50) from "bringing celestial riches down to Earth" (lines 48–49), but they have some reservations about these developments, saying that "before the miners start firing up their rockets, we should pause for thought" (lines 53–54) and that the consequences of space mining "merit careful consideration" (lines 58–59). So, (D) is the correct answer choice. As for (A), the authors of Passage 2 do not refute the claim that space mining could be a beneficial venture, but they are certainly more wary of its consequences to the environment. As for (B),



the authors of Passage 2 do not describe the phenomenon of space mining and its benefits in a more general way than does the author of Passage 1; they simply make brief reference to its potential benefits and focus more on its potential concerns. Finally, (C) is wrong because the authors of Passage 2 make no mention as to whether the space mining proposals described in Passage 1 are practical.

50. (B) *Reading/Natural Science/Application*. SAT Topic: INFID.1c. The authors of Passage 2 say that “the relevant legal and regulatory framework [regarding resources from space] is fragmentary” (lines 77–78) and that “[w]ithout consensus, claims will be disputed, investments risky, and the gains made insecure” (lines 85–87). So, the authors of Passage 2 would most likely claim that such a future will be difficult to bring about in the absence of regulations, (B). As for (A), the authors of Passage 2 discuss “developing more sustainable ways of earthly life” (lines 65–66), not the sustainable use of space resources. As for (C), the authors of Passage 2 make no issue of developments in technology but instead are focused on environmental concerns and the need for stewardship. Finally, (D) is wrong because the authors of Passage 2 state that “we all stand to gain: the mineral bounty and spin-off technologies could enrich us all” (lines 50–52).
51. (D) *Reading/Natural Science/Textual Evidence*. SAT Topic: INFID.2. The best evidence that it will be difficult to bring about the successful future of space mining in the absence of regulations is the description of what could result from not having a consensus on these matters: “Without consensus, claims will be disputed, investments risky, and the gains made insecure” (lines 85–87). So, (D) is the correct answer choice. As for (A), lines 60–63 discuss arguments made by those who seek to protect the environment in space as they would our environment on Earth; such principled stances in and of themselves do not speak to the future of space mining. (B) is wrong because lines 74–76 simply state that resources that are highly valued in space may be very different from resources that are highly valued on Earth, which does not address the future of space mining. As for (C), lines 81–83 make reference to a particular instance in which a space miner argued that regulation should be avoided; this is an example that demonstrates the lack of consensus regarding regulations (as opposed to those making arguments on principle), but it does not connect this lack of consensus to the future of space mining.



Remember the tip included with the explanation for item #5 regarding Textual Evidence items; in this case, look to those passage quotations that you used to determine the answer to item #50.

52. (A) *Reading/Natural Science/Application*. SAT Topic: SYN.1. As just mentioned in the previous explanation, the authors of Passage 2 state in lines 74–76 that resources that are highly valued in space may be very different from resources that are highly valued on Earth. The author of Passage 1 suggests that while gold is typically considered to be one of the most desired commodities on Earth, “water mined from other worlds could become the most desired commodity [in space]” where gold would be useless. So, (A) is the correct answer choice. As for (B), neither Passage 1 nor Passage 2 discusses or even suggests the need to mine space resources more cheaply. As for (C), while the author of Passage 1 does mention the mining of precious metals and rare earth elements, he does not go so far as to say that these things will *primarily* make up what is harvested from space mining; the authors of Passage 2 do not mention precious metals and rare earth elements. As for (D), while the author of Passage 1 refers to *rare* earth elements, the authors of Passage 2 make no reference to resources becoming rare on Earth.

## Writing and Language

1. **(D) Writing and Language/Expression of Ideas/Style/Precision. SAT Topic: EXPID.3a.** This sentence compares the benefits and drawbacks of Greek yogurt. (A) is incorrect because drawbacks can't "outdo" benefits; (C) can be eliminated for the same reason—benefits can't "outperform" drawbacks. (B) is incorrect because it contradicts the message of the passage—that there are more benefits than drawbacks to Greek yogurt. Only (D) preserves the relationship the sentence sets up between benefits and drawbacks.



When dealing with a topic that is being compared and contrasted through drawbacks and benefits, think of a balance scale. If you put the benefits on one side of the scale and the drawbacks on the other, one of them will be heavier than the other because it *outweighs* the other.

2. **(B) Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material. SAT Topic: EXPID.1b.** (B) is the best answer because it offers an additional way acid whey can be disposed of, because, as the previous sentence indicates, "farmers have found a number of uses for acid whey." (A), (C), and (D) are incorrect because they do not offer an additional way to use acid whey; they provide extensions of ideas about Greek yogurt overall. Also, (A) introduces a new idea, that people can make their own yogurt. This addition is not consistent with the topic of the paragraph, which is focused on acid whey.
3. **(A) Writing and Language/Standard English Conventions/No Change. SAT Topic: SEC.1.** The original sentence is correct because it is the only choice that upholds the present tense grammatical structure of the sentence. (B) is incorrect because adding an apostrophe to waterways makes it possessive, and the waterways aren't possessing anything; (D) is incorrect for the same reason, and (C) would make an incorrect shift in tense: the clause that begins the sentence is in present tense, so the rest of the passage also needs to stay in present tense.
4. **(C) Writing and Language/Standard English Conventions/Punctuation/Commas. SAT Topic: SEC.3d.** This sentence gives a list of the people working together to develop additional solutions for reusing whey. When writing a list that contains three or more items, each item in the list is separated by a comma, and (C) correctly does this. Both (A) and (B) can be eliminated because they do not separate the items in the list with commas, and (D) is incorrect because when presenting a list or items in a series, no comma is necessary after the conjunction "and."
5. **(C) Writing and Language/Expression of Ideas/Organization/Paragraph-Level Structure. SAT Topic: EXPID.2a.** The first sentence of this paragraph introduces the main environmental problem with Greek yogurt: the creation of acid as a by-product, and sentence 2 explains why Greek yogurt produces larger amounts of acid whey. Sentence 5 logically connects the ideas in these sentences by explaining why acid as a by-product of Greek yogurt is an environmental problem and properly introduces the remaining sentences which explain alternative ways farmers have created to fix the problem, (C). All other choices would not preserve this logical sequence of ideas.



Preview each paragraph. The first sentence of a paragraph almost always tells you what the paragraph will be about. Understand the meaning of the first sentence and you will understand the purpose of the paragraph, which will make ordering the sentences in the paragraph easier.

6. **(D) Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material. SAT Topic: EXPID.1c.** The author states in the first paragraph that the benefits of Greek yogurt outweigh the drawbacks, but the second paragraph deals with a drawback. To keep with the overall idea of the passage—that the benefits are greater than the drawbacks—this sentence is a necessary transition to introduce the list of benefits, (D).



7. **(B) Writing and Language/Standard English Conventions/Grammar and Usage/Verb Tense. SAT Topic: SEC.2c.** The original creates an additional verb phrase; the main verb in this clause is “serves.” “To be” needlessly introduces a verb tense shift from present to future tense. (C) is wrong because “like” is used to compare two things and nothing is being compared in this clause; (D) is incorrect because “for” would indicate that digestive aid is the object or recipient of Greek yogurt. Only (B) preserves the grammatical structure and meaning of the sentence.
8. **(C) Writing and Language/Standard English Conventions/Sentence Structure/Faulty Parallelism. SAT Topic: SEC.1a.iii.** There are three clauses in this sentence that modify the benefits of Greek yogurt. The first clause contains the subject “it” (Greek yogurt), so the rest of the clauses in the list do not need to repeat the subject, which means (A) can be eliminated. Both (B) and (D) would also destroy the parallelism of the sentence by shifting the verb form in each clause. Only (C) preserves the parallel structure of the sentence correctly.
9. **(A) Writing and Language/Expression of Ideas/No Change. SAT Topic: EXPID.2b.** This sentence introduces another benefit of Greek yogurt, and the only transitional word that introduces another example is “also,” (A). (B) is incorrect because “in other words” is a transitional phrase that signals clarification of something that was just said; (C) is incorrect because “therefore” indicates some kind of conclusion; and (D) is incorrect because “for instance” doesn’t introduce another example, it introduces an example that explains an idea that preceded it.
10. **(A) Writing and Language/Expression of Ideas/No Change. SAT Topic: EXPID.3a.** This question tests your vocabulary. “Satiated” means satisfied, and the high protein in Greek yogurt helps people feel full or satisfied longer, (A). The remaining answer choices are incorrect because “fulfilled” means to do what is required or to succeed, “complacent” means satisfied with how things are, and “sufficient” means enough; none of these words preserve the idea that a person can eat until he or she is no longer hungry.
11. **(B) Writing and Language/Standard English Conventions/Sentence Structure/Problems of Subordination and Coordination. SAT Topic: SEC.1a.ii.** Choice (B) is the only answer that correctly punctuates the dependent clause with the independent clause and preserves the meaning of the sentence. (A) and (C) are both incorrect because “so” is redundant to “because” and makes the sentence needlessly wordy, and (D) is incorrect because a colon cannot follow a dependent clause, only a complete sentence.
12. **(B) Writing and Language/Expression of Ideas/Strategy/Data Presentation. SAT Topic: EXPID.1d.** The graph shows that the lowest drop in temperature is 12 degrees in March, (B). (A) is incorrect because the phrase “as low as” indicates that temperatures do not drop below 20 degrees, and the graph clearly shows that it does. (C) and (D) are also inconsistent with the information presented in the graph.
13. **(A) Writing and Language/Expression of Ideas/Style/Conciseness. SAT Topic: EXPID.3b.** This question can seem tricky, because most of the answer choices are not improperly punctuated. Most of them are, however, needlessly wordy. It is unnecessary to repeat the subject of the first clause. (A) is the only choice that preserves the meaning of the sentence without adding unnecessary words.
14. **(B) Writing and Language/Expression of Ideas/Style/Clarity of Meaning. SAT Topic: EXPID.1a.** The best answer is (B) because it correctly introduces an opposing idea with a transition word to demonstrate that contradiction. (A) is incorrect because the sentence describes this thawing as the “earliest date on record,” but the previous sentence states that thawing typically occurs in late summer, so the earliest instance of thawing is not an example of this idea. (C) and (D) are both incorrect for the same reason: “as such” and “moreover” are transition words that signal an extension of an idea.
15. **(C) Writing and Language/Standard English Conventions/Punctuation/Commas. SAT Topic: SEC.3b.** This question tests your knowledge of appositives. An appositive renames someone or something, and whatever is being renamed needs to be set off in commas; (C) is the only answer that includes a comma at both the start of the appositive phrase and the end of the appositive phrase. The original is incorrect because it doesn’t have the comma at the end of the appositive phrase; (B) is incorrect because it doesn’t

have the comma at the beginning of the appositive phrase; and (D) is incorrect because the last comma is placed in the middle of the phrase and not at the end.

**TIP** A good way to figure out where commas need to be in sentences that contain appositives is to find a whole phrase that can be removed but still hold the sentence’s meaning and be grammatically correct. For example, in this question, if you remove “an associate professor of geology at Ohio State,” the sentence still makes sense and is grammatically correct: *But Jason Box believes that another factor added to the early thaw.* The commas need to go around the entire phrase in the middle of this sentence.

16. **(C) Writing and Language/Standard English Conventions/Punctuation/Colons. SAT Topic: SEC.3b.** The best answer is (C) because it correctly uses a colon to introduce the other factor Box believes added to the early thaw. (A) is incorrect because “the ‘dark snow’ problem” is not a complete sentence, and a semi-colon is used to separate independent clauses without a conjunction. (B) is incorrect for the same reason and also because it is needlessly wordy. (D) is incorrect because it changes the meaning of the sentence: “dark snow” is not “being” a problem.
17. **(C) Writing and Language/Standard English Conventions/Sentence Structure/Comma Splices. SAT Topic: SEC.1a.** The only answer choice that preserves the correct grammatical structure of the sentence is, (C). (A), (B), and (D) are incorrect because they result in a comma splice—the clauses on both sides of the comma are independent clauses, so they would need to be separated with a semi-colon or each as their own sentence.
18. **(A) Writing and Language/Standard English Conventions/No Change. SAT Topic: SEC.1b.iii.** This question deals with verb agreement; all verbs in a sentence need to be in the same tense, and the previous verbs in the sentence—“produced” and “drifted”—are in past tense, so the next verb also needs to be in past tense, and (A) is the only answer with a past tense verb.
19. **(D) Writing and Language/Standard English Conventions/Grammar and Usage/Pronoun Usage. SAT Topic: SEC.2c.i.** This question tests pronoun agreement. The subject in this sentence is plural—“snow and ice;” therefore, the pronoun must also be plural, so both (A) and (B) can be eliminated. (C) is also incorrect because the pronoun needs to be both plural and possessive (snow and ice *have* or *own* the ability). (D) is the only answer that satisfies both conditions.
20. **(D) Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material. SAT Topic: EXPID.1b.** This question tests your comprehension of the self-reinforcing cycle. The author states the soot particles settle over the snow and ice and capture the Sun’s heat by darkening the surface. Heat will raise temperatures so (C) can quickly be eliminated. The remaining three choices are all true, but only (D) relates melting—the overall purpose of soot particles—to the self-reinforcing cycle.
21. **(B) Writing and Language/Expression of Ideas/Style/Conciseness. SAT Topic: EXPID.3b.** The only answer choice that does not repeat unnecessary words or ideas is (B). (A) is incorrect because “again” is redundant to the “pattern” stated at the beginning of the sentence. (C) is incorrect because it is needlessly wordy and “damage” is redundant to “harmful effects,” and (D) is incorrect because “possibly” is redundant to “may.”
22. **(D) Writing and Language/Expression of Ideas/Organization/Paragraph-Level Structure. SAT Topic: EXPID.2a.** This question asks about the logical sequence of ideas in the paragraph. Sentence 4 uses the demonstrative pronoun “this,” and the only answer choice that provides details as to what “this” refers to and presents a logical sequence of the ideas in the paragraph is after sentence 5, (D).
23. **(D) Writing and Language/Expression of Ideas/Style/Conciseness. SAT Topic: EXPID.3b.** The best answer choice is (D) because it eliminates the redundancy of the other answer choices. Both (A) and (B) are incorrect because “worn” is not consistent with the past tense used in the rest of the paragraph, and “soon” and “promptly” are redundant to “quickly.” The redundancy of (C) also eliminates that choice.



24. (D) *Writing and Language/Standard English Conventions/Sentence Structure/Misplaced Modifiers*. SAT Topic: SEC.1a.iv. When a sentence begins with a modifier, such as “Having become frustrated,” the subject should follow the modifier to avoid confusion. The only answer choice that results in a grammatically correct sentence is (D). The phrase “Having become frustrated” correctly modifies “I,” while the remaining answer choices all result in dangling modifiers.

25. (B) *Writing and Language/Standard English Conventions/Grammar and Usage/Diction*. SAT Topic: SEC.2f. This question tests your knowledge of prepositions. (B) is the best answer because it provides the correct preposition for the sentence’s context: “about.” (A) and (C) are both incorrect because an article can’t be “into” or “upon” a subject. (D) is also incorrect because when dealing with an article or any other type of published work, “for” should only be used in relation with some type of argument about the work’s content.

26. (A) *Writing and Language/Standard English Conventions/No Change*. SAT Topic: SEC.3b. The best answer is (A) because it properly uses a comma to set off the dependent clause. (B) and (C) are both incorrect because a colon introduces an idea or a list, so using both “such as” and a colon is redundant; and (D) is incorrect because no comma is necessary before the first item in a list.

**TIP** A general rule to test if a colon is being used properly is to replace it with “namely.” If you remove the colon and the sentence makes sense with “namely” in place of it, the colon is being used correctly.

27. (B) *Writing and Language/Expression of Ideas/Style/Clarity of Meaning*. SAT Topic: EXPID.1a. The best answer choice is (B) because it uses a transitional phrase that introduces a new element or feature, correctly connecting the relationship between this sentence and the previous sentence. (A) is incorrect because “However” indicates a contrast to the previous idea, and the sentence is not contrasting anything from the previous sentence; it is giving another feature of these coworking spaces. (C) and (D) are also incorrect because neither “For these reasons” or “Likewise” are transitional words or phrases that introduce another feature.

28. (C) *Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material*. SAT Topic: EXPID.1b. Both (A) and (C) can be quickly eliminated because nowhere in this paragraph is starting your own coworking business discussed. (D) is also incorrect because this information isn’t given elsewhere in the passage, either, so (C) is the correct choice; it eliminates a sentence that isn’t closely tied to the ideas presented in the paragraph.

29. (B) *Writing and Language/Expression of Ideas/Strategy/Data Presentation*. SAT Topic: EXPID.1d. The author wants to use the graph to support the idea that coworking spaces are “melting pots of creativity.” (B) is the correct answer because it is the only choice that specifically supports creativity and is an accurate reflection of the information presented in the graph. Furthermore, (A) and (D) are false according to the data, and (C) does not cite creativity.

30. (D) *Writing and Language/Standard English Conventions/Grammar and Usage/Pronoun Usage*. SAT Topic: SEC.2c.i. This question tests your knowledge on pronoun/subject agreement. The underlined words modify the subject of the clause “people,” a plural noun, so the verb clause must agree with people, which eliminates both (B) and (C). (A) is incorrect because “whom” is only used when referring to the object of a clause, and “people” is the subject, not the object. Only (D) correctly creates agreement with the subject of the clause, “people.”

**TIP** When trying to figure out whether to use “who” or “whom,” ask yourself if the answer to the question would be “he” or “him.” If it’s “he,” use “who,” and if the answer is “him,” use “whom.”

31. (C) *Writing and Language/Expression of Ideas/Organization/Paragraph-Level Structure*. SAT Topic: EXPID.2b. The last two sentences of this paragraph describe chronological events that happened throughout the author’s first day in a coworking space, and the sentence the author wants to add is the

first step in those events: she took a tour and got to work. To keep the chronological order of events, the additional sentence needs to be placed after sentence 2, (C).

32. (A) *Writing and Language/Standard English Conventions/No Change*. SAT Topic: SEC.3b. The word “colleague” in this sentence introduces a list of the different types of colleagues the author met while working in the coworking space, and a colon is the best way to introduce this type of list, (A). (B) is incorrect because a semi-colon would result in a fragment; (C) is incorrect because it makes the phrase “several of my coworking colleagues” part of the list; and (D) is incorrect because it doesn’t provide any punctuation to separate the independent clause and the list.
33. (A) *Writing and Language/Expression of Ideas/No Change*. SAT Topic: EXPID.3a. At the end of paragraph 3, the author cites an article that states “the most valuable resources of coworking spaces are the people who use them,” and the sentence this question refers to indicates that the people in the space “help each other.” To keep with this idea of collaboration in this sentence, and in the passage as a whole, the phrase in question needs to indicate the same idea. (B), (C), and (D) are all individual acts; only (A) uses a word that preserves this collaboration theme: “share.”
34. (A) *Writing and Language/Expression of Ideas/No Change*. SAT Topic: EXPID.1a. It is evident the author intends to give a loose definition of philosophy first, because in the next sentence the author makes that definition more narrowly defined; so “in broad terms” is the best way to introduce the more general definition of philosophy, (A).
- TIP** It doesn’t make logical sense to use transitional words and phrases like “however,” “nevertheless,” and “for example,” in the first paragraph of any passage. The first paragraph is usually an introduction, so there likely isn’t enough information given yet to provide the contrast or examples that these transitions signal.
35. (A) *Writing and Language/Expression of Ideas/No Change*. SAT Topic: EXPID.3b. The only choice that does not create a needlessly wordy introductory or transitional phrase is (A). (B), (C), and (D) include the word “speaking,” which is redundant.
36. (B) *Writing and Language/Standard English Conventions/Grammar and Usage/Verb Tense*. SAT Topic: SEC.2f. The best answer choice is (B) because it provides a verb that creates a correct, grammatically structured sentence. The remaining answer choices all result in a sentence that is either incoherent or inconsistent with grammar conventions.
37. (D) *Writing and Language/Expression of Ideas/Strategy/Effective Transitional Sentence*. SAT Topic: EXPID.2b. The next sentence states that over 400 colleges eliminated philosophy from their curriculum, so the answer must introduce why so many colleges dropped the major from their school, which means (B) can be eliminated. (A) and (C) are incorrect because the information says nothing about philosophy students and both would result in an incoherent paragraph. Therefore, the best answer choice is (D).
38. (C) *Writing and Language/Expression of Ideas/Style/Clarity of Meaning*. SAT Topic: EXPID.1a. Both sentences give evidence of the colleges’ lack of support for philosophy programs, so a transition word or phrase is needed to introduce another type of evidence; “Moreover,” which means, “in addition,” is the best choice, (C). “Therefore” and “Thus” are typically used to introduce some type of conclusion or result, and this information about philosophy courses is not a conclusion, so both (A) and (B) are incorrect; and (D) is incorrect because “however” indicates a contrasting idea.
39. (A) *Writing and Language/Expression of Ideas/Style/Conciseness*. SAT Topic: EXPID.3b. (A) is the best answer that expresses the idea in the sentence. (B) and (D) are incorrect because they are needlessly wordy or redundant and it’s not clear what “results” refers to; and (C) is incorrect because the word “also” indicates that it is in addition to something, and no additional criteria have been mentioned.





**TIP** The original is grammatically correct. However, the question stem asks that the two sentences be “effectively” combined, and (A) is more concise than the original and (B) and (D), which are also grammatically correct.

40. **(B) Writing and Language/Standard English Conventions/Grammar and Usage/Subject-Verb Agreement. SAT Topic: SEC.2c.ii.** The subject in this sentence is “students”—a plural noun, so the verb must also be plural. For this reason (A) and (C) can be eliminated. (D) is incorrect because “ing” verbs are progressive verbs, which indicate that the subject is/was/has been/will be in progress at a particular time; this sentence refers to the general term “studies,” which happen all the time, not at a particular time. Only (B) provides a plural verb to maintain the past participle grammatical structure of the sentence.
41. **(B) Writing and Language/Standard English Conventions/Grammar and Usage/Verb Tense. SAT Topic: SEC.2f.** (A) and (D) are incorrect because there is nothing in this sentence requiring possession. (C) and (D) are both incorrect because removing the “ing” from majoring creates two verbs in one clause, resulting in a grammatically incorrect sentence. Only (B) removes the possessive apostrophe and upholds the grammatical structure of the clause.
42. **(C) Writing and Language/Expression of Ideas/Strategy/Appropriate Supporting Material. SAT Topic: EXPID. 1b.** The correct answer is (C), because while Plato is an important and historical philosopher, introducing him here would be confusing; this sentence gives no context as to how Plato fits into students who majored in philosophy applying their analytical skills to other disciplines—the subject of this paragraph.
43. **(D) Writing and Language/Standard English Conventions/Sentence Structure/Fragments. SAT Topic: SEC.1a.i.** This sentence starts with the word “that,” automatically making the first part of this sentence a dependent clause, which must be connected to an independent clause to be grammatically correct. (D) is the only choice that doesn’t use some kind of conjunction or pronoun to introduce another dependent clause.
44. **(D) Writing and Language/Standard English Conventions/Grammar and Usage/Pronoun Usage. SAT Topic: SEC.2c.i.** This question asks about pronoun agreement. A pronoun must agree with the subject it modifies; in this case the subject is “students”—a plural noun; therefore, the pronoun must also be plural. (D) is the only answer with a plural pronoun.

## Math

### Section 3

1. (D) *Math: Multiple-Choice/Algebra/Manipulating Algebraic Expressions/Evaluating Expressions. SAT*

**Topic: ALG.2.** Note that  $k = 3$  so the problem reduces to:  $\frac{x-1}{3} = 3$ . To solve for  $x$ , multiply both sides of the equation by 3, yielding:  $x - 1 = 9$ . Add 1 to both sides:  $x = 10$ , (D).

**TIP** On the SAT, numerical answers are always presented in ascending or descending order. Take advantage of this fact by employing “test-the-test” to solve this problem. Starting with (C), plug in  $x = 9$ :  $\frac{9-1}{3} = 3 \Rightarrow \frac{8}{3} \neq 3$ . Since  $\frac{8}{3}$  is less than 3, the correct value for  $x$  must be bigger than 9. Thus, (D) is the correct answer.

2. (A) *Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Advanced Arithmetic Items/Complex Numbers. SAT Topic: ATM.3.* To add complex numbers, we add real parts to real parts and imaginary parts to imaginary parts; in other words, we add like-terms. In this case, the sum of real parts is:  $7 + (-8) = -1$ . The sum of imaginary parts is  $3i + 9i = 12i$ . Thus, the overall sum is  $-1 + 12i$ , (A).
3. (C) *Math: Multiple-Choice/Algebra/Creating, Expressing, and Evaluating Algebraic Equations and Functions. SAT Topic: ALG.1.* To solve this problem, first determine how many text messages Armand and Tyrone send individually. Armand sends  $m$  text messages per hour for 5 hours, thus he sends a total of  $5m$  text messages. Tyrone sends  $p$  text messages per hour for 4 hours, thus he sends a total of  $4p$  text messages. Add Armand’s total to Tyrone’s total to get the total number of messages sent by them both:  $5m + 4p$ , (C).
4. (B) *Math: Multiple-Choice/Algebra/Creating, Expressing, and Evaluating Algebraic Equations and Functions. SAT Topic: ALG.8.* Notice that 108 is the  $y$ -intercept; that is, when  $d = 0$ , signifying the start of the week,  $P = 108$ , denoting the number of unfixed phones. Thus, 108 is the number of phones Kathy starts with each week, (B).

(A) is incorrect because the number of days it takes Kathy to complete the repairs corresponds to the  $x$ -intercept (when  $P = 0$ ), which is  $d = \frac{108}{23} \approx 4.7$ . (C) and (D) are incorrect because the rate at which Kathy repairs phones corresponds to the slope of the linear equation, which is  $-23$ .

5. (C) *Math: Multiple-Choice/Algebra/Manipulating Algebraic Expressions/Manipulating Expressions Involving Exponents. SAT Topic: PAM.2.* To solve this problem, we first distribute the minus sign:  $(x^2y - 3y^2 + 5xy^2) - (-x^2y + 3xy^2 - 3y^2) = x^2y - 3y^2 + 5xy^2 + x^2y - 3xy^2 + 3y^2$ . Add/subtract like-terms:  $2x^2y + 2xy^2$ , (C).
- (A), (B), and (D) are incorrect because they are derived from either an incorrect distribution of the minus sign or incorrect adding/subtracting of like-terms.
6. (A) *Math: Multiple-Choice/Algebra/Creating, Expressing, and Evaluating Algebraic Equations and Functions. SAT Topic: ALG.1.* The problem asks for the estimated increase, in inches, of a boy’s height each year, which is a rate. In other words, the problem is simply asking for the slope of the given



equation. Recognizing that the given linear equation is in slope-intercept form, we see that the slope is 3, (A).

7. (B) *Math: Multiple-Choice/Algebra/Solving Algebraic Equations or Inequalities/Equations Involving Rational Expressions.* SAT Topic: PAM.9. In order to solve the equation for  $P$  we multiply both sides of

the equation by the reciprocal of  $\frac{\left(\frac{r}{1,200}\right)\left(1+\frac{r}{1,200}\right)^N}{\left(1+\frac{r}{1,200}\right)^N - 1}$ , which is  $\frac{\left(1+\frac{r}{1,200}\right)^N - 1}{\left(\frac{r}{1,200}\right)\left(1+\frac{r}{1,200}\right)^N}$ . Thus,

$$P = \frac{\left(1+\frac{r}{1,200}\right)^N - 1}{\left(\frac{r}{1,200}\right)\left(1+\frac{r}{1,200}\right)^N} m, \text{ (B).}$$

8. (C) *Math: Multiple-Choice/Algebra/Solving Algebraic Equations with Two Variables.* SAT Topic: PAM.2. To

solve this problem, multiply both sides of the given equation by  $\frac{b}{a}$  yielding:  $\frac{2b}{a} = 1$ . Multiplying both sides by 2 yields:  $\frac{4b}{a} = 2$ , (C). Alternatively, since  $\frac{a}{b} = 2$ , then  $\frac{b}{a} = \frac{1}{2}$ . Thus,  $\frac{4b}{a} = 4\left(\frac{b}{a}\right) = 4\left(\frac{1}{2}\right) = 2$ , (C).

**TIP** You can also use the “Plug-and-Chug” method to derive the answer if an algebraic approach does not come to mind. Let  $a = 8$  and  $b = 4$  so that  $\frac{a}{b} = \frac{8}{4} = 2$ , as required (any other combination of  $a$  and  $b$  whose quotient is 2 will also work). Then,  $\frac{4b}{a} = \frac{4(4)}{8} = \frac{16}{8} = 2$ , (C).

9. (B) *Math: Multiple-Choice/Algebra/Solving Simultaneous Equations.* SAT Topic: ALG.4. To solve this problem we will first rewrite our system lining up like-terms:

$$\begin{aligned} 3x + 4y &= -23 \\ -x + 2y &= -19 \end{aligned}$$

The goal is to eliminate one of the variables, leaving an equation of one variable which we can easily solve. While you will arrive at the same solution eliminating either variable first, we strategically choose to eliminate the  $y$  variable because, among the answer choices, the  $x$  values are all distinct (so once we solve for  $x$ , no more computation is necessary). To eliminate the  $y$  variable, multiply the bottom equation by  $-2$  yielding:

$$\begin{aligned} 3x + 4y &= -23 \\ 2x - 4y &= 38 \end{aligned}$$

Now, add the two equations, yielding  $5x = 15 \Rightarrow x = 3$ . The only choice whose  $x$ -value is 3 is (B).

**TIP** This can also be solved using “Test-the-Test”:

$$\begin{aligned} \text{A) } (-5, -2): 3(-5) + 4(-2) &\stackrel{?}{=} -23 \Rightarrow -23 = -23 \\ 2(-2) - (-5) &\stackrel{?}{=} -19 \Rightarrow 1 \neq -19 \quad \times \end{aligned}$$

$$\begin{aligned} \text{B) } (3, -8): \quad & 3(3) + 4(-8) = -23 \Rightarrow -23 = -23 \\ & 2(-8) - (3) = -19 \Rightarrow -19 = -19 \quad \checkmark \end{aligned}$$

Thus, (B) is the correct answer.

10. (A) **Math: Multiple-Choice/Algebra/Creating, Expressing, and Evaluating Algebraic Equations and Functions/Function Notation. SAT Topic: PAM.13.** To solve this problem, we use the given information to first solve for  $a$ . Since  $g(4) = 8$ , we have  $a(4)^2 + 24 = 8 \Rightarrow 16a = -16 \Rightarrow a = -1$ . Thus,  $g(x) = -x^2 + 24$ . Finally,  $g(-4) = -(-4)^2 + 24 = -16 + 24 = 8$ , (A).

Alternatively, this can be solved by recalling symmetry properties of quadratic functions. The given quadratic function has vertex  $(0, 24)$  and thus, axis of symmetry at  $x = 0$ . Therefore,  $g(x) = g(-x)$ , hence,  $g(4) = g(-4) = 8$ , (A).

11. (D) **Math: Multiple-Choice/Algebra/Solving Simultaneous Equations. SAT Topic: ALG.5.** To solve this problem, we set the two equations equal to each other and solve for  $x$ :  $2.35 + 0.25x = 1.75 + 0.40x \Rightarrow 0.60 = 0.15x \Rightarrow x = 4$ . The problem asks for the price per pound of beef when it was equal to the price per pound of chicken, so we plug in  $x = 4$  into either of the equations, yielding:  $2.35 + 0.25(4) = 3.35$ , (D).

Note that this problem does *not* lend itself to the “Test-the-Test” method like other system of equations problems. If we were to use “Test-the-Test”, we would have to set each equation equal to an answer choice, solve for  $x$  in both equations, and then check if the  $x$  values match. This would be significantly more work than just solving for  $x$  directly.

12. (D) **Math: Multiple-Choice/Coordinate Geometry/Graphs of Linear Equations. SAT Topic: ALG.9.** We are given that the line has a slope of  $\frac{1}{7}$  and passes through the origin. Using point-slope form for the equation of the line yields:  $y - 0 = \frac{1}{7}(x - 0) \Rightarrow y = \frac{1}{7}x$ . To determine which point lies on the line, use the “Test-the-Test” method:

$$\text{A) } (0,7): \quad \frac{1}{7}(0) = 0 \neq 7 \quad \times$$

$$\text{B) } (1,7): \quad \frac{1}{7}(1) = \frac{1}{7} \neq 7 \quad \times$$

$$\text{C) } (7,7): \quad \frac{1}{7}(7) = 1 \neq 7 \quad \times$$

$$\text{D) } (14,2): \quad \frac{1}{7}(14) = 2 = 2 \quad \checkmark$$

Thus, (D) is the correct answer.

13. (B) **Math: Multiple-Choice/Algebra/Manipulating Algebraic Expressions/Basic Algebraic Manipulations. SAT Topic: PAM.9.** The first step to solve this problem is to simplify the denominator:



$\frac{1}{x+2} + \frac{1}{x+3} = \frac{x+3}{(x+2)(x+3)} + \frac{x+2}{(x+2)(x+3)} = \frac{(x+2)+(x+3)}{(x+2)(x+3)} = \frac{2x+5}{x^2+5x+6}$ . Thus the given expression can be rewritten:  $\frac{1}{\left(\frac{2x+5}{x^2+5x+6}\right)} = \frac{x^2+5x+6}{2x+5}$ , (B).

Note that the  $x > 3$  requirement given in the problem is extraneous information. However, this extra information lends itself to an alternative solution described in the following tip.

**TIP** If an algebraic approach does not come to mind, try solving this problem using the “Plug-and-Chug” method. Since  $x > 3$ , pick any valid  $x$  to use in your Plug-and-Chug, say  $x = 4$ . We plug  $x = 4$  into the original expression and see which answer choice yields the same result.

Original Expression:  $\frac{1}{\frac{1}{(4)+2} + \frac{1}{(4)+3}} = \frac{42}{13}$ .

A)  $\frac{2(4)+5}{(4)^2+5(4)+6} = \frac{13}{42} \neq \frac{42}{13}$  ✗

B)  $\frac{(4)^2+5(4)+6}{2(4)+5} = \frac{42}{13} = \frac{42}{13}$  ✓

C)  $2(4)+5 = 13 \neq \frac{42}{13}$  ✗

D)  $(4)^2+5(4)+6 = 42 \neq \frac{42}{13}$  ✗

Therefore, (B) is the correct answer.

14. (A) **Math: Multiple-Choice/Algebra/Manipulating Algebraic Expressions/Manipulating Expressions Involving Exponents. SAT Topic: PAM.3.** To solve the problem, we convert the numerator to base 2 and

invoke properties of exponents to simplify:  $\frac{8^x}{2^y} = \frac{(2^3)^x}{2^y} = \frac{2^{3x}}{2^y} = 2^{3x-y}$ . The exponent matches the given

information  $3x - y = 12$ , so  $\frac{8^x}{2^y} = 2^{3x-y} = 2^{12}$ , (A).

Alternatively, this can be solved using substitution. First, solve for  $y$  in the given equation (solving for  $x$  first will result in an analogous solution):  $3x - y = 12 \Rightarrow y = 3x - 12$ . Then plug this into the expression

we are asked to evaluate:  $\frac{8^x}{2^{3x-12}}$ . To simplify, convert the numerator to base 2 and invoke the properties

of exponents to simplify:  $\frac{(2^3)^x}{2^{3x-12}} = \frac{2^{3x}}{2^{3x-12}} = \frac{1}{2^{-12}} = 2^{12}$ , (A).

15. (D) **Math: Multiple-Choice/Algebra/Solving Simultaneous Equations. SAT Topic: PAM.8.** The first step is to expand the left-hand side of the equation:  $(ax + 2)(bx + 7) = abx^2 + 7ax + 2bx + 14$ . Using  $a + b = 8$ , we

substitute  $b = 8 - a$  into our expanded left-hand side of the equation yielding:

$a(8 - a)x^2 + 7ax + 2(8 - a)x + 14 = (8a - a^2)x^2 + (16 + 5a)x + 14$ . Equating this to the right-hand side of the equation:  $(8a - a^2)x^2 + (16 + 5a)x + 14 = 15x^2 + cx + 14$ . Equating like-terms, we have  $8a - a^2 = 15$  and  $16 + 5a = c$  (and of course,  $14 = 14$ ). We ultimately want to determine the values for  $c$ , but currently,  $c$  is in terms of  $a$ . Thus, we must solve for  $a$  in order to determine the values of  $c$ . To solve for  $a$ , we solve the following equation:  $8a - a^2 = 15 \Rightarrow 8a - a^2 - 15 = 0 \Rightarrow a^2 - 8a + 15 = 0$ . This quadratic equation can be solved most quickly by factoring:  $a^2 - 8a + 15 = (a - 3)(a - 5) = 0 \Rightarrow a = 3$  or  $5$ . Note that you can also use the quadratic formula to solve for  $a$ . Plug  $a = 3$  and  $a = 5$  into the equation for  $c$ :  $c = 16 + 5(3) = 16 + 15 = 31$  and  $c = 16 + 5(5) = 16 + 25 = 41$ , (D).

Alternatively, this can be solved more quickly by first matching like-terms after the expansion of the binomial product; that is, since  $(ax + 2)(bx + 7) = abx^2 + 7ax + 2bx + 14 = 15x^2 + cx + 14$ , then  $abx^2 = 15x^2$  and  $(7a + 2b)x = cx$ . This implies that  $ab = 15$  and  $7a + 2b = c$ , respectively. Since we are given that  $a + b = 8$ , it follows that either  $a = 3$  and  $b = 5$  or  $a = 5$  and  $b = 3$ . Since both pairs add to 8 and multiply to 15, plug in these two pairs into the equation for  $c$ :  $c = 7(3) + 2(5) = 31$  and  $c = 7(5) + 2(3) = 41$ , (D).

16. (2) **Math: Student-Produced Responses/Algebra/Solving Quadratic Equations and Relations/Difference of Two Squares. SAT Topic: PAM.5.** Solving the equation for  $t$ , we have:  $t^2 - 4 = 0 \Rightarrow t^2 = 4 \Rightarrow t = \pm 2$ . The problem requires that  $t > 0$ , so the only valid solution is  $t = 2$ .

Alternatively, you may recognize this equation as a Difference of Squares. Thus, you can easily factor:  $t^2 - 4 = (t - 2)(t + 2) = 0$ , again yielding solutions  $t = \pm 2$  with only  $t = 2$  valid with respect to the domain  $t > 0$ .

17. (1600) **Math: Student-Produced Responses/Geometry/Lines and Angles. SAT Topic: ATM.7.** To solve this problem we must make an important observation: these triangles are similar. To see this, note that the diagram shows one pair of corresponding angles in the two triangles are the same. By equivalence of vertical angles, we also know that the two corresponding angles shared by point B are equal. Since two pairs of corresponding angles of the two triangles are equal, it follows that they must have the same third angle, as well. Thus, the two triangles are indeed similar. We know that similar triangles have proportional side lengths so to solve for  $x$  we set up a proportion:  $\frac{700}{1400} = \frac{800}{x} \Rightarrow \frac{1}{2} = \frac{800}{x}$ . Use the "flying-x" method to solve:  $x = 1600$ .

18. (7) **Math: Student-Produced Responses/Algebra/Solving Simultaneous Equations. SAT Topic: ALG.7.** To solve the system of equations, we use substitution. Solving for  $y$  in the first equation, we have:  $x + y = -9 \Rightarrow y = -9 - x$ . Substituting this into the second equation:  $x + 2(-9 - x) = -25 \Rightarrow x - 18 - 2x = -25 \Rightarrow x = 7$ .

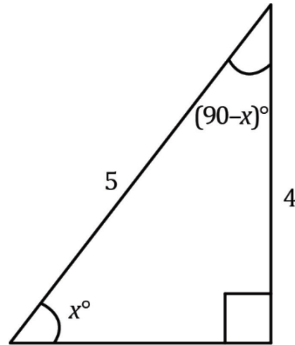
Alternatively, you could use elimination to solve this problem. Since the problem asks for  $x$ , eliminate the  $y$  variable. Multiply the first equation by 2 and subtract the second equation:

$$\begin{array}{r} 2x + 2y = -18 \\ -x - 2y = 25 \\ \hline x = 7 \end{array}$$

19. (4/5) **Math: Student-Produced Responses/Trigonometry/Definitions of the Six Trigonometric Functions/Complementary Angles. SAT Topic: ATM.7.** For an angle in a right triangle, we are given that



$\sin x = \frac{4}{5}$ . This means that the ratio of the side opposite of  $x$  to the hypotenuse is  $\frac{4}{5}$ . To determine the value of  $\cos(90 - x)$ , recall that the two non-right angles in a right triangle are complementary. Therefore, the angle  $90 - x$  is equivalent to the other non-right angle in the right triangle. Hence,  $\cos(90 - x) = \frac{4}{5}$ .



20. (100) **Math: Student-Produced Responses/Algebra/Solving Algebraic Equations or Inequalities/Equations Involving Radical Expressions.** SAT Topic: PAM.7. Multiply the first equation by 2:  
 $2a = 2(5\sqrt{2}) \Rightarrow 2a = 10\sqrt{2}$ . We are given that  $2a = \sqrt{2x}$ , so  $\sqrt{2x} = 10\sqrt{2}$ . Now, square both sides and solve for  $x$ :  $(\sqrt{2x})^2 = (10\sqrt{2})^2 \Rightarrow 2x = 200 \Rightarrow x = 100$ .

#### Section 4

- (B) **Math: Multiple-Choice/Data Interpretation/Bar, Cumulative, and Line Graphs.** SAT Topic: PSD.5. The problem asks for the interval where the target heart rate is strictly increasing then strictly decreasing. Between 0 and 30 minutes, (A), we see that the target heart rate is not strictly increasing because between 10–30 minutes, it is constant. Between 50 and 65 minutes, (C), the heart rate decreases then increases. Between 70 and 90 minutes, (D), the target heart rate is constant between 85 and 90 minutes. Thus, (B) is the correct answer.
- (C) **Math: Multiple-Choice/Algebra/Manipulating Algebraic Expressions/Evaluating Expressions.** SAT Topic: ALG.6. First we use the given information to solve for  $k$ :  $24 = k(6) \Rightarrow k = 4$ . Using this value for  $k$ , solve for  $y$  when  $x = 5$ :  $y = 4(5) = 20$ , (C).
- (D) **Math: Multiple-Choice/Geometry/Lines and Angles.** SAT Topic: ATM.6. Since both pairs of lines are parallel, all acute exterior angles are equal and all obtuse exterior angles are equal. Thus, either angle adjacent to  $\angle 2$  must equal  $\angle 1$ . Let  $\angle 3$  denote the interior angle adjacent to  $\angle 2$ . Since  $\angle 2$  and  $\angle 3$  form a line,  $\angle 2 + \angle 3 = 180^\circ$ . Thus,  $\angle 2 = 180^\circ - \angle 3 = 180^\circ - 35^\circ = 145^\circ$ , (D).
- (C) **Math: Multiple-Choice/Algebra/Creating, Solving, and Interpreting Algebraic Equations and Functions.** SAT Topic: ALG.1. We are given that  $16 + 4x$  is 10 more than 14. This means that  $16 + 4x = 14 + 10 = 24$ . To determine the value for  $8x$ , we first solve for  $4x$ :  $16 + 4x = 24 \Rightarrow 4x = 24 - 16 = 8$ . The problem asks for the value of  $8x$  only, so there is no need to solve for  $x$ . We simply derive the value of  $8x$  from the value of  $4x$ :  $2(4x) = 2(8) \Rightarrow 8x = 16$ , (C).

Alternatively, you could solve for  $x$ :  $16 + 4x = 24 \Rightarrow x = 2$ . Then,  $8x = 8(2) = 16$ , (C).

5. **(D) Math: Multiple-Choice/Data Interpretation/Scatterplots. SAT Topic: PSD.4.** A strong negative association is characterized by tightly clustered points whose  $t$  values decrease when  $d$  values increase. In (D), as  $d$  increases,  $t$  decreases, and the points are tightly clustered, thus (D) is a strong negative association. (A) could be argued to be a negative association, but the points are spread too far apart to be considered a strongly negative association, so (A) is incorrect. (B) shows no clear association between  $d$  and  $t$ . Finally, (C) is incorrect because it shows a strong positive association since  $t$  increases as  $d$  increases and the points are tightly clustered. Therefore, (D) is the correct answer.
6. **(D) Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Proportions and Direct-Inverse Variation. SAT Topic: PSD.3.** We simply convert 2-decagrams into milligrams using unit analysis:  $\frac{1000 \text{ mg}}{1 \cancel{\text{g}}} \times \frac{10 \cancel{\text{g}}}{1 \cancel{\text{dg}}} \times \frac{2 \cancel{\text{dg}}}{1} = 20,000 \text{ mg}$ . Thus, there are 20,000 1-milligram doses, (D), in a 2-decagram container.
7. **(C) Math: Multiple-Choice/Data Interpretation/Bar, Cumulative, and Line Graphs. SAT Topic: PSD.5.** We are given that the total number of installations is 27,500. We need to select the appropriate label so that the sum of installations in cities A, B, C, D, and E is 27,500. If (A) were correct, this would imply that the installations are 90, 50, 60, 40, and 35 for cities A, B, C, D, and E, respectively, which clearly does not sum to 27,500. Similarly, if (B) were correct, this would imply that the installations across the cities were 900, 500, 600, 400, and 350, which also does not sum to 27,500. If (D) were correct, the installations across the cities would be 90,000, 50,000, 60,000, 40,000, 35,000, with sum far exceeding 27,500. (C) implies that the installations were 9,000, 5,000, 6,000, 4,000, and 3,500, which sums to 27,500. Thus, (C) is the correct answer.
8. **(D) Math: Multiple-Choice/Algebra/Solving Algebraic Equations or Inequalities/Equations Involving Absolute Value. SAT Topic: PAM.10.** First, we rewrite the equation:  $|n - 1| + 1 = 0 \Rightarrow |n - 1| = -1$ . Remember that the absolute value can never be negative. Therefore, there are no solutions, (D).

Since the absolute value of  $n - 1$  is  $-1$ , we have two possible cases:  $n - 1 = -1$  or  $-(n - 1) = -1$ . Solving both equations yields candidates  $n = 0$  and  $n = 2$ , respectively. We must now substitute these candidates back into the original equation to determine which, if any, are solutions.

$$n = 0: |0 - 1| \stackrel{?}{=} -1 \Rightarrow 1 \neq -1$$

$$n = 2: |2 - 1| \stackrel{?}{=} -1 \Rightarrow 1 \neq -1$$

Neither candidate satisfies the equation. Thus, there are no solutions, (D).

9. **(A) Math: Multiple-Choice/Algebra/Manipulating Algebraic Expressions/Basic Algebraic Manipulations. SAT Topic: ALG.1.** We are given that the air temperature is represented by  $t$ , thus, we solve the given equation for  $t$ :  $a = 1,052 + 1.08t \Rightarrow a - 1,052 = 1.08t \Rightarrow \frac{a - 1,052}{1.08} = t$ , (A).

**TIP** Alternatively, we can use “Test-the-Test”. In this situation, we test each answer choice to see which one matches the given formula,  $a = 1,052 + 1.08t$ , when solved for  $a$ .

$$\text{A) } t = \frac{a - 1,052}{1.08} \Rightarrow 1.08t = a - 1,052 \Rightarrow a = 1.08t + 1,052 \quad \checkmark$$





$$B) t = \frac{a+1,052}{1.08} \Rightarrow 1.08t = a+1,052 \Rightarrow a = 1.08t - 1,052 \quad \times$$

$$C) t = \frac{1,052-a}{1.08} \Rightarrow 1.08t = 1,052 - a \Rightarrow a = 1,052 - 1.08t \quad \times$$

$$D) t = \frac{1.08}{a+1,052} \Rightarrow t(a+1,052) = 1.08 \Rightarrow a = \frac{1.08 - 1,052t}{t} \quad \times$$

Only (A) is equivalent to the given formula.

10. (B) *Math: Multiple-Choice/Algebra/Manipulating Algebraic Expressions/Evaluating Expressions. SAT Topic: ALG.1.* The speed of sound is denoted by  $a$ . Suppose  $a$  were exactly 1,000. Then:

$$t = \frac{1,000 - 1,052}{1.08} = \frac{-52}{1.08} \approx -48.15. \text{ Thus, if } a \text{ was only slightly smaller, yet still very close to 1000, then}$$

$$t = -48, \text{ (B).}$$

**TIP** You can also use “Test-the-Test” to solve this problem. Plug in each value for  $t$  and the correct answer is the one with corresponding  $a$  closest to 1000:

$$A) -46 = \frac{a-1052}{1.08} \Rightarrow -49.68 = a - 1052 \Rightarrow a = 1002.32 \quad \times$$

$$B) -48 = \frac{a-1052}{1.08} \Rightarrow -51.84 = a - 1052 \Rightarrow a = 1000.16 \quad \checkmark$$

$$C) -49 = \frac{a-1052}{1.08} \Rightarrow -52.92 = a - 1052 \Rightarrow a = 999.08 \quad \times$$

$$D) -50 = \frac{a-1052}{1.08} \Rightarrow -54 = a - 1052 \Rightarrow a = 998 \quad \times$$

Thus, (B) is the correct answer.

11. (A) *Math: Multiple-Choice/Algebra/Solving Algebraic Equations or Inequalities/Simple Inequalities. SAT Topic: ALG.2.* We first solve the inequality for  $x$ :  $3x - 5 \geq 4x - 3 \Rightarrow -5 \geq x - 3 \Rightarrow x \leq -2$ . The only choice that is not less than or equal to  $-2$  is  $-1$ , (A).

**TIP** You can use “Test-the-Test” to solve this problem, too. Simply test all answer choices in this case and see which one yields an invalid inequality.

$$A) 3(-1) - 5 \geq 4(-1) - 3 \Rightarrow -8 \geq -7 \quad \times$$

$$B) 3(-2) - 5 \geq 4(-2) - 3 \Rightarrow -11 \geq -11 \quad \checkmark$$

$$C) 3(-3) - 5 \geq 4(-3) - 3 \Rightarrow -14 \geq -15 \quad \checkmark$$

$$D) 3(-5) - 5 \geq 4(-5) - 3 \Rightarrow -20 \geq -23 \quad \checkmark$$

Only (A) is invalid.

12. (C) **Math: Multiple-Choice/Data Interpretation/Bar, Cumulative, and Line Graphs. SAT Topic: PSD.9.** We simply compute the mean and determine which choice is closest. The mean is computed as follows:  

$$\frac{2(3)+4(0)+5(4)+6(1)+7(2)+8(0)+9(3)}{12} = \frac{73}{12} \approx 6, (C).$$

13. (C) **Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Ratios. SAT Topic: PSD.7.** The fastest way to find the solution is to use “Test-the-Test”. We compute the percentages of all answer choices and the choice closest to 19% is correct.

A) Females taking Geometry:  $\frac{53}{310} \approx 17\%$  ✗

B) Females taking Algebra II:  $\frac{62}{310} = 20\%$  ✗

C) Males taking Geometry:  $\frac{59}{310} \approx 19\%$  ✓

D) Males taking Algebra I:  $\frac{44}{310} \approx 14\%$  ✗

Thus, (C) is the correct answer.

14. (C) **Math: Multiple-Choice/Statistics/Range. SAT Topic: PSD.9.** To see this, compute the statistics for when the 24-inch measurement is included and not included in the data. The correct answer will have the greatest difference.

A) With 24:  $\frac{8+3(9)+2(10)+2(11)+4(12)+3(13)+2(14)+2(15)+16+24}{21} = \frac{262}{21} \approx 12.48$

Without 24:  $\frac{8+3(9)+2(10)+2(11)+4(12)+3(13)+2(14)+2(15)+16}{20} = \frac{238}{20} = 11.9$

B) With 24: 12

Without 24: 12

C) With 24:  $24 - 8 = 16$

Without 24:  $16 - 8 = 8$

They all change by different amounts, eliminating (D). (C) changes the most when the 24-inch measurement is removed.

15. (A) **Math: Multiple-Choice/Coordinate Geometry/Graphs of Linear Equations. SAT Topic: ALG.1.** The C-intercept is the C-value when  $t = 0$ . In context,  $t = 0$  represents the initial cost of renting the boat, (A). Note that (B) is incorrect because there is no information in the graph corresponding to the total number of boats rented. (C) is incorrect because the C-intercept represents a cost, not a number of hours. (D) is incorrect because it is describing the slope of the line, and the C-intercept is not the slope.

16. (C) **Math: Multiple-Choice/Coordinate Geometry/Slope-Intercept Form of a Linear Equation. SAT Topic: ALG.3.** The quickest way to determine the answer is to use the process of elimination. The graph has a C-intercept of 5, therefore, we can eliminate (A) and (D) immediately as they have no C-intercept. Both (B)



and (C) have the correct  $C$ -intercept. To determine which of these is correct, we simply determine the slope of the graph. Picking any two points on the graph, say,  $(0,5)$  and  $(1,8)$ , compute the slope:

$$\frac{8-5}{1-0} = 3. \text{ (C) has a slope of 3, thus this is the correct answer.}$$

Alternatively, this can be solved by creating the equation of the line from scratch. Using points  $(0,5)$  and  $(1,8)$ , we see from above that the slope is 3. Using point-slope form of a linear equation, we have:

$$C - 5 = 3(h - 0) \Rightarrow C - 5 = 3h \Rightarrow C = 3h + 5, \text{ (C).}$$

17. **(B) Math: Multiple-Choice/Algebra/Creating, Expressing, and Evaluating Algebraic Equations and Functions/Concepts of Domain and Range. SAT Topic: PAM.12.** By examining the graph of  $f(x)$ , the minimum value is  $-2$ . The function  $f(x)$  achieves this value when  $x = -3$ , (B). Note that (A) is incorrect because when  $x = -5$ ,  $y = 2$ , which is not the lowest possible  $y$  value. Similarly,  $x = -2$ , (C), and  $x = 3$ , (D), are incorrect because they yield  $y = -0.5$  and  $y = 5$ , respectively, both of which are not the lowest possible  $y$ -values.
18. **(A) Math: Multiple-Choice/Algebra/Solving Simultaneous Equations. SAT Topic: ALG.4.** We are given that  $(0,0)$  is a solution to the system of inequalities. Plugging in  $(0,0)$ , we have:

$$0 < 0 + a \Rightarrow 0 < a$$

$$0 > 0 + b \Rightarrow 0 > b$$

This can be rewritten as:  $b < 0 < a$ , and hence,  $a > b$ , (A).

**TIP** A problem with multiple variables like this lends itself to the “Plug-and-Chug” method. We first plug in the given information, that  $(0,0)$  is a solution, yielding:

$$0 < 0 + a \Rightarrow 0 < a$$

$$0 > 0 + b \Rightarrow 0 > b$$

Now, to use Plug-and-Chug, pick any  $a$  and  $b$  satisfying the inequalities. For instance, we will pick  $a = 1$  and  $b = -2$ . We now test the answer choices with these values of  $a$  and  $b$ .

A)  $a > b: 1 > -2 \Rightarrow 1 > -2 \checkmark$

B)  $b > a: -2 > 1 \Rightarrow -2 \not> 1 \times$

C)  $|a| > |b|: |1| > |-2| \Rightarrow 1 \not> 2 \times$

D)  $a = -b: 1 = -(-2) \Rightarrow 1 \neq 2 \times$

Only (A) is valid.

19. **(B) Math: Multiple-Choice/Algebra/Creating, Expressing, and Evaluating Algebraic Equations and Functions. SAT Topic: ALG.4.** Set up a system of equations based on the given information. Let  $x$  denote the number of salads sold and  $y$  denote the number of drinks sold. We are given that in one day, the food truck sold \$836.50 in total. Thus, we have the following equation:  $\$6.50x + \$2.00y = \$836.50$ . We are also given that the food truck sold a total of 209 salads and drinks, giving us the following equation:  $x + y = 209$ . The problem asks for only the number of salads, so we only need to solve for  $x$ . To do this,

we will use substitution. We have  $x + y = 209 \Rightarrow y = 209 - x$ . Substituting into the other equation yields:  
 $\$6.50x + \$2.00(209 - x) = \$836.50 \Rightarrow \$418 + \$4.50x = \$836.50 \Rightarrow x = 93$ , (B).

Note: This is another example of a problem where solving the system directly is faster than “Test-the-Test.” If we solve using “Test-the-Test,” we would have to plug each answer choice for  $x$  in both equations in the system, solve for  $y$  in both equations, and check if both equations yield the same  $y$  value.

20. (D) **Math: Multiple-Choice/Algebra/Creating, Expressing, and Evaluating Algebraic Equations and Functions. SAT Topic: ALG.3.** Let  $c$  denote the original price for Alma’s laptop. Recall that her final cost of laptop included a 20% discount and then 8% tax on that quantity. After the discount, the cost of the laptop is:  $c - 0.2c = 0.8c$ . Now including the 8% tax, we have:  $0.8c + 0.08(0.8c) = 1.08(0.8c) = p$ . The

problem asks for the original price of the laptop,  $c$ , thus we solve for  $c$ :  $1.08(0.8c) = p \Rightarrow c = \frac{p}{1.08(0.8)}$ ,

(D).

21. (C) **Math: Multiple-Choice/Data Interpretation/Tables (Matrices). SAT Topic: PSD.7.** The total number of people that recalled at least 1 dream is the sum of people that recalled 1 to 4 dreams and 5 or more dreams, 164. In this group of people, the total number of people that are in Group Y is 79. Therefore, the probability that a person belonged to Group Y given that they recalled at least 1 dream is  $\frac{79}{164}$ , (C).

22. (B) **Math: Multiple-Choice/Data Interpretation/Tables (Matrices). SAT Topic: PSD.9.** We compute the average rate of change:  $\frac{\$488,106 - \$358,708}{2010 - 2008} = \frac{\$129,398}{2} = \$64,699$ . The table values are in thousands of dollars. Therefore, the average rate of change is approximately \$65,000,000, (B).

23. (B) **Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Ratios. SAT Topic: PSD.1.** We first compute the human resources program’s ratio of its 2007 budget to its 2010 budget:  $\frac{\$4,051,050}{\$5,921,379} \approx 0.684$ . To determine the correct answer, we use the “Test-the-Test” method by computing the 2007 to 2010 ratios for each of the answer choices.

A) Agriculture/natural resources:  $\frac{373,904}{488,106} \approx 0.766$

B) Education:  $\frac{2,164,607}{3,008,036} \approx 0.720$

C) Highways and Transportation:  $\frac{1,468,482}{1,773,893} \approx 0.828$

D) Public Safety:  $\frac{263,463}{464,233} \approx 0.568$

The ratio in (B) is closest to the human resources ratio of 0.684.

24. (A) **Math: Multiple-Choice/Coordinate Geometry/Graphs of Quadratic Equations and Relations. SAT Topic: ATM.8.** Recall the general formula for the equation of a circle centered at  $(h, k)$  with radius  $r$ :  $(x - h)^2 + (y - k)^2 = r^2$ . We can immediately eliminate answer choices (B) and (D) since they do not have



center  $(0,4)$ . To determine whether (A) or (C) is correct, we need to compute the radius. We are given that from the center, the radius has endpoint  $\left(\frac{4}{3}, 5\right)$ . We compute the length of this segment:

$$\sqrt{\left(\frac{4}{3}-0\right)^2 + (5-4)^2} = \sqrt{\frac{16}{9} + \frac{9}{9}} = \sqrt{\frac{25}{9}} = \frac{5}{3}. \text{ Thus, } r = \frac{5}{3} \Rightarrow r^2 = \frac{25}{9}. \text{ So (A) is the correct answer.}$$

**TIP** You can also solve this using “Test-the-Test”. We are given that the endpoint of the radius is  $\left(\frac{4}{3}, 5\right)$ , so we know that this point lies on the circle. Simply plug this point into all answer choices and check which choice yields a valid equation.

$$\text{A) } \left(\frac{4}{3}\right)^2 + (5-4)^2 \stackrel{?}{=} \frac{25}{9} \Rightarrow \frac{25}{9} = \frac{25}{9} \checkmark$$

$$\text{B) } \left(\frac{4}{3}\right)^2 + (5+4)^2 \stackrel{?}{=} \frac{25}{9} \Rightarrow \frac{745}{9} \neq \frac{25}{9} \times$$

$$\text{C) } \left(\frac{4}{3}\right)^2 + (5-4)^2 \stackrel{?}{=} \frac{5}{3} \Rightarrow \frac{25}{9} \neq \frac{5}{3} \times$$

$$\text{D) } \left(\frac{4}{3}\right)^2 + (5+4)^2 \stackrel{?}{=} \frac{5}{3} \Rightarrow \frac{745}{9} \neq \frac{5}{3} \times$$

Only (A) is a valid solution.

25. **(D) Math: Multiple-Choice/Algebra/Creating, Expressing, and Evaluating Algebraic Equations and Functions/Functions as Models. SAT Topic: PAM.5.** The ball hits the ground when  $h = 0$ . We solve for  $t$  when  $h = 0$ :  $0 = -4.9t^2 + 25t \Rightarrow 0 = t(-4.9t + 25) \Rightarrow t = 0$  and  $t = \frac{25}{4.9} \approx 5$ . The ball begins ( $t = 0$ ) on the ground ( $h = 0$ ). It returns to the ground at  $t = \frac{25}{4.9} \approx 5$ , (D).

**TIP** “Test-the-Test” works here, too. Simply plug in each answer choice and see which one gives  $h$  closest to 0.

26. **(B) Math: Multiple-Choice/Problem Solving and Advanced Arithmetic/Common Problem Solving Items/Percents. SAT Topic: PSD.2.** Let  $A$  denote the number of pears produced from Type A trees and  $B$  denote the number of pears produced from Type B trees. Type A trees produced 20 percent more pears than Type B trees did:  $A = 1.2B$ . If the Type A trees produced 144 pears, then  $A = 144$ , and we simply solve for  $B$ :  $144 = 1.2B \Rightarrow B = 120$ , (B).

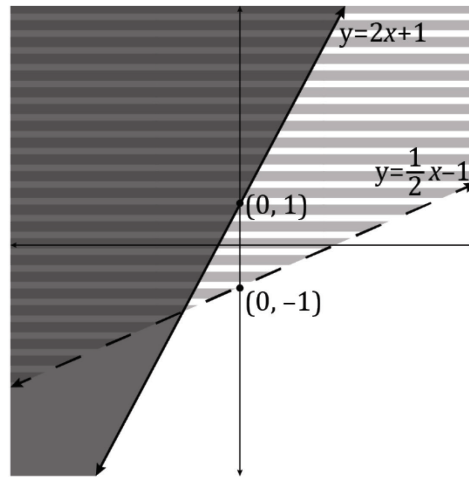
**TIP** “Test-the-Test” works well here. We know that  $A$  has to be 20 percent more than  $B$ . Multiply each answer choice by 1.2 to see which answer choice equals 144 after a 20 percent increase. We see that  $120 \times 1.2 = 144$ , so (B) is indeed the correct answer.

27. **(C) Math: Multiple-Choice/Statistics/Drawing Inferences. SAT Topic: PSD.1.** Note that each region has dimensions 1 meter by 1 meter. Therefore, in a 10 meter by 10 meter field, we can fit 100 regions. To reasonably approximate, we can estimate the average number of worms found in one region and multiply that by 100 to determine the total number of worms in the entire field. Based on the table, a

reasonable approximation for the average number of worms per region is 150. Thus, the approximation for the total number of worms in the entire field is:  $100 \times 150 = 15,000$ , (C).

28. (C) *Math: Multiple-Choice/Coordinate Geometry/Graphs of First-Degree Inequalities. SAT Topic: ALG.4.*

To solve this problem, first sketch both linear equations  $y = 2x + 1$  and  $y = \frac{1}{2}x - 1$  on the  $xy$  plane. Since  $y \geq 2x + 1$ , shade above (and including) the  $y = 2x + 1$  line. Since  $y > \frac{1}{2}x - 1$ , shade above (not including) the  $y = \frac{1}{2}x - 1$  line. The region where the shading intersects is the solution region. We see there is no intersecting shading at Quadrant IV, (C).



29. (D) *Math: Multiple-Choice/Algebra/Manipulating Algebraic Expressions/Evaluating Expressions. SAT Topic: PAM.11.* The quickest way to arrive at the correct answer is to use the process of elimination. (A), (B), and (C) claim that  $(x - 5)$ ,  $(x - 2)$ , and  $(x + 2)$ , respectively, are factors of  $p(x)$ . This implies that 5, 2, or  $-2$ , respectively, is a root of  $p(x)$ . We are only given that  $p(3) = -2$ , so while it is possible that 5, 2, or  $-2$  is a root of  $p(x)$ , we cannot know for sure. Therefore, we eliminate (A), (B), and (C). So (D) must be the correct answer.

To arrive at (D), recall the definition of division. Dividing  $p(x)$  by  $x - 3$  yields a quotient  $q(x)$  and remainder  $r$  so that  $p(x) = q(x)(x - 3) + r$ . Using the given information,  $p(3) = -2$ , we have:

$$-2 = p(3) = q(3)(3 - 3) + r \Rightarrow r = -2, \text{ (D).}$$

30. (D) *Math: Multiple-Choice/Coordinate Geometry/Graphs of Quadratic Functions and Relations. SAT*

**Topic: PAM.1.** Choice (D) is in vertex-form of a quadratic equation  $y = (x - h)^2 + k$  where  $(h, k)$  is the vertex. (A) is incorrect because it is in factored form,  $y = (x - x_1)(x - x_2)$ , where the constants denote the roots of the equation. (B) is incorrect because it is both in factored form and not an equivalent form of the equation. (C) is incorrect because it is not in any standard form, so the constants have no specific geometric meaning in this case.

31. (any number between 4 and 6, inclusive) *Math: Student-Produced Responses/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Simple Inequalities. SAT Topic: ALG.2.* If Wyatt husks corn at

his slowest rate of 12 dozen per hour, then it would take him  $\frac{72 \text{ dozen}}{12 \text{ dozen/hour}} = 6$  hours to husk 72



dozen. If Wyatt husks corn at his fastest rate of 18 dozen ears per hour, it would take him

$\frac{72 \text{ dozen}}{18 \text{ dozen/hour}} = 4$  hours. Therefore, any length of time from 4 to 6 hours, inclusive, is appropriate.

32. **(107) Math: Student-Produced Responses/Algebra/Solving Algebraic Equations or Inequalities with One Variable/Simple Inequalities. SAT Topic: ALG.2.** The empty delivery truck and its driver are 4500 lbs. We are told that the sum of 4500 lbs and the 14 lbs boxes carried in the truck must be less than 6000 lbs. Let  $x$  denote the number of 14 lbs boxes. Note that  $x$  must be a whole number. To solve this problem, we set up an inequality:  $4500 + 14x \leq 6000$  and solve for  $x$ :
- $$4500 + 14x \leq 6000 \Rightarrow 14x \leq 1500 \Rightarrow x \leq \frac{1500}{14} \approx 107.14.$$
- Thus, the maximum possible value for  $x$  is 107.
33. **(5/8 or 0.625) Math: Student-Produced Responses/Bar, Cumulative, and Line Graphs. SAT Topic: PSD.1.** The total number of portable media players sold in 2011 was 160 million. In 2008, 100 million portable media players were sold. The fraction of 2011 media player sales that equals the 2008 sales is  $\frac{100}{160} = \frac{5}{8}$ .
34. **(96) Math: Student-Produced Responses/Data Interpretation/Common Problem Solving Items/Proportions and Direct-Inverse Variation. SAT Topic: PSD.3.** Each day the television station operates for 24 hours. On Tuesday and Wednesday the television station operates for 48 hours. To determine the number of 30-minute time slots the station can sell for Tuesday and Wednesday, we convert the total hours to minutes:  $48 \text{ hours} = \frac{60 \text{ min}}{1 \text{ hr}} \times 48 \text{ hrs} = 2880 \text{ min}$ . Dividing the total number of minutes by 30 min yields the number of 30-minute time slots:  $\frac{2880 \text{ min}}{30 \text{ min}} = 96$ . Alternatively, you can arrive at the correct answer by noticing that since there are 24 hours in a day, there must be 48 30-minute time slots per day. In two days, there must be  $48 \times 2 = 96$  time slots.
35. **(6) Math: Student-Produced Responses/Geometry/Volume. SAT Topic: ATM.1.** We are given that the volume of the silo, a right circular cylinder, is  $72\pi$  cubic yards. Recall the formula for the volume of a cylinder:  $V_{\text{cylinder}} = \pi r^2 h$ . From the diagram, we see that  $h = 8$ . Substituting in the known information and solving for  $r$ , we have:  $72\pi = \pi r^2 (8) \Rightarrow r^2 = 9 \Rightarrow r = 3$ . Since the diameter is equal to twice the radius, the correct answer is 6.
36. **(3) Math: Student-Produced Responses/Algebra/Solving Quadratic Equations and Relations. SAT Topic: PAM.5.** The rational function is undefined for all  $x$  that makes the denominator equal to 0. In this case, the value of  $x$  that makes the rational function undefined is the solution to the equation:  $(x - 5)^2 + 4(x - 5) + 4 = 0$ . Expanding the left side of the equation we have:  $(x - 5)^2 + 4(x - 5) + 4 = x^2 - 10x + 25 + 4x - 20 + 4 = x^2 - 6x + 9$ . To solve the quadratic equation  $x^2 - 6x + 9 = 0$ , we factor:  $x^2 - 6x + 9 = (x - 3)^2 = 0 \Rightarrow x = 3$ . Alternatively, you can use the quadratic formula to solve the quadratic equation.
37. **(1.02) Math: Student-Produced Responses/Algebra/Evaluating Sequences Involving Exponential Growth. SAT Topic: PAM.1.** The expression  $\$100(x)^t$  denotes value of the account after  $t$  years at 2% interest compounded annually. Recall the general formula for interest compounded annually:  $y = p(1 + r)^t$ , where  $p$  is the principal (initial) investment and  $r$  is the interest rate, written as a decimal. In this case,  $r = .02$ , so  $x = 1.02$ .

38. (6.11) *Math: Student-Produced Responses/Algebra/Evaluating Sequences Involving Exponential Growth.*

**SAT Topic: PAM.1.** After 10 years, Jessica's bank account will have:  $\$100(1.02)^{10} = \$121.90$ . After 10 years, Tyshaun's bank account will have:  $\$100(1.025)^{10} = \$128.01$ . The difference between Tyshaun's account and Jessica's:  $\$128.01 - 121.90 = \$6.11$ .