Answers

Skills Test in Reading

1. c. The sentence in choice c explains that conditions would be inhospitable at the equator and the polar regions without the circulation of the atmosphere; therefore, it is the best choice to support the author's argument that circulation of the atmosphere is vital to life on Earth. The sentence in choice a describes how the atmosphere protects Earth, but it does not speak of the circulation of the atmosphere; therefore, it cannot be correct. The sentences in choices b and c deal with solar radiation, not with circulation of the atmosphere, so they are incorrect. The fact that solar radiation is spread over a greater area, choice d, does not directly explain how the circulation of the atmosphere is vital to life on Earth; a different sentence better makes the connection to the author's argument.

2. a. The passage states that the biosphere is the region of Earth capable of sustaining life. Therefore, you can infer that human beings must live within the biosphere, making choice a correct. If you read the passage carefully, you will see that it is the solar energy that is responsible for the creation of the biosphere, not the other way around. Therefore, choice b cannot be correct. According to the passage, a combination of Earth's rotation and solar radiation causes the atmosphere to circulate. Because the passage does not mention the atmosphere as one of the causes, you can eliminate choice c. There is no indication in the passage that the biosphere is the uppermost layer of Earth's atmosphere or the most susceptible to climate change, so choices d and e are incorrect.

3. c. The word oblique as it appears in line 35 refers to the angle of the solar radiation on Earth. If you read the sentence before the one in which oblique appears, you will see that the radiation strikes the polar regions where the solar radiation is least direct. Therefore, the meaning of oblique will also mean least direct; slanted describes this perfectly. Opaque sounds similar to oblique, but its meaning is dense or unclear. An angle cannot be described as opaque, so choice a is not correct. An obtuse angle is an angle with a measure greater than 90 degrees. However, it cannot be inferred that the measure of the angle at which radiation hits Earth must be greater than 90 degrees, so choice b is not correct. Perpendicular lines form right angles, such as the x- and y-axes of a coordinate plane. The oblique angle referred to in this sentence is describing the way that the solar radiation strikes the polar regions of Earth. This striking of the radiation is also called not direct in the previous sentence. Perpendicular lines are perfectly direct, so choice d cannot be correct. Similarly, the striking of the radiation is also referred to as not direct in the passage. Straight means direct, so choice e cannot be correct either.
4. a. The very first sentence of the first paragraph sums up the main effect of the atmosphere on Earth—to create a **protective envelope around Earth**. This can be described as a sheltering effect because it shelters Earth from most dangers other than large meteors. There is no mention in the first paragraph of any reviving or cleansing effect of the atmosphere on Earth. Therefore, choices b and d are not correct. In a sense, enabling Earth to sustain life is invigorating; however, there is a better choice than choice c because the first two sentences talk about how the atmosphere specifically protects Earth from harmful forces. The first paragraph mentions ways in which the solar energy warms the planet, not the atmosphere itself. The heat in the atmosphere may be spread across Earth through circulation, but that is not the same as suggesting that the focus of the paragraph is the atmosphere’s warming effect on Earth; therefore, choice e is incorrect.

5. d. The word **oscillate** means to move back and forth, making choice d correct. The sun may indeed shine brightly or radiate energy, choices b and c, but that is not the meaning of the word in the context of the passage. The word is not suggesting that the sun rotates around itself or remains stationary, meaning choices a and e are also not correct.

6. c. The sentence that precedes this line in the text suggests that Plato used a metaphor to convey his ideas. This sentence then provides details of the metaphor, describing the visions of the people inside the cave as seeing only the shadows of those that passed by. The concept of living in a world of shadows may be difficult to grasp without a description to give it some perspective. The illustrative concept of living within the walls of the cave does provide an understandable context, meaning that choice c represents the author’s function for including the sentence. Keep in mind that the sentence is still a description of a metaphor; the sentence does not provide any sort of concrete evidence—no indisputable proof or confirmation—that Plato’s philosophical idea was, in fact, true. Therefore, choice a cannot be correct. Also note that the sentence illustrates the metaphor but does not itself provide a metaphor, making choice b incorrect. The description of a cave is not to provide a setting for a story, and it is actually obscuring the eternal reality, so choices d and e are not correct.

7. d. The word **position** has several meanings. In the context of this sentence, however, it is describing Plato’s argument that the world is only a picture of a greater reality. This is his point, his opinion. The word position can mean situation, a specific location, or style. However, if you substitute those terms for position in the given sentence, you will see that they do not fit very well in the provided context; therefore, choices a, b, and e are incorrect. The word position in this sentence describes Plato’s main point; if anything, this point is unmoving and static, so choice c is not correct.
8. b. The passage focuses on a suggestion that artists should not let their output be constrained within a solitary structure, meaning that he or she should experiment with media other than the one that they're most well known for using. That's choice b, and the opposite of choice d. The author describes two successful artists, but that is not the primary concern of the passage, so choice a is not correct. The focus is also not specifically on the rejection of commercial exploits or on people who disregard artists' non-primary art forms, making choices c and e incorrect.

9. d. Because the author's primary idea is that talented artists can and should experiment with multiple art forms, the description of Marc Chagall—who paints and creates stained glass—best fits that idea. Nothing about the description of Chuck Close or Samuel Clemens suggests that they've experimented with multiple media, making choices a and b incorrect. Claude Monet may have experimented with different styles, but those styles were all within the painting medium. Likewise, Paul Simon recorded songs in a partnership and as a solo artist, but that description still limits him to a single art form: songwriting. Therefore, choices c and e are incorrect.

10. d. The passage states that mediation focuses on mutually acceptable solutions, which suggests that both parties could be satisfied by the resolution of a conflict. Since litigation results in "winning or losing," it is fair to presume that the author would agree with the statement in choice d. The statement in choice a may be felt by some people, but it is not supported by the passage. It is too broad to be correct. Choice b is incorrect; the author states that mediation can be faster, less expensive, and can lead to more creative solutions than litigation. However, that is not the same thing as suggesting that litigation is expensive, slow, and limited by its reliance on following the letter of the law. The author might not agree that litigation is expensive or slow—just that mitigation can be faster and cheaper. Choice e might seem attractive, but the passage does not say that mediation is the best way to resolve a conflict—simply that it is an alternative way that might prove effective. The dependent clause that begins the passage hints at the idea that the author thinks that lawyers prefer litigation to resolve conflicts. However, it cannot be deduced from that little information that lawyers are overly concerned with their earning potential; this is beyond the scope of the information provided, making choice e incorrect.
11. e. The overall conclusion of this short passage is that recycling is not entirely efficient. The first section in boldface suggests a transitional conclusion to that larger conclusion: that some materials don't offer much reduction in waste. The second section in boldface supports that transitional conclusion by explaining that plastic cannot be recycled to make the same object. The first section does not provide the support for the second section in boldface, so choices a, c, and d are not correct. The first section does not contradict the other section either, so choice b cannot be correct.

12. e. An opinion is a statement that cannot be verified. Whether or not plastic is a "dreadful" material is not a statement that can or cannot be verified. The statements in sentences 2 through 6 each contain facts that can be verified, such as that an aluminum product can be recycled as a similar aluminum product or that recycled plastics are frequently not recyclable; therefore, choices a, b, c, and d represent facts instead of opinions and are not correct.

13. e. The passage describes many attributes of hypothermia, but never are the symptoms of hypothermia—such as shaking or sluggishness—provided. The passage states that the cause of hypothermia is exposure to cold weather, so choice a is incorrect. The passage does not explicitly say how to prevent hypothermia, but it does say that the living environments of the elderly should be closely monitored to ensure that their temperatures are maintained within appropriate ranges. The reason for this is to avoid hypothermia in the elderly, an approach to prevention; therefore, choice b is incorrect. External warming is listed as a type of treatment, so choice c cannot be correct. By stating that hypothermia can be fatal, the passage does indicate its most grave hazard; choice d is therefore not correct.

14. c. The bar graph shows the number of Americans, per 100,000, who fell victim to hypothermia in 2001. Because each bar is taller than the previous bar, the percentage of 80-year-olds who fell victim to it was greater than the percentage of 70-year-olds, choice c. Choice a is wrong because the bar graphs show a rate, not a total number, meaning that you cannot confirm that the majority of all hypothermia victims were 90 years old or older. Similarly, children under 10 have the lowest rate of hypothermia, but that does not mean that there are no dangers to them. The graph provides no indication that choice d is correct. The statement in choice e is contradicted by the different-sized bars in the bar graph, so it cannot be correct either.
15. c. The passage states that the majority of hypothermia victims are senior citizens. That must mean that a minority, or less than 50%, of all other cases are from people who are not senior citizens, including those under 60 years of age. The passage says that older people are less easily able to tolerate cold weather compared to younger people. However, it also says that the elderly are less able to respond to long exposure to very hot or very cold temperatures, so choice a cannot be supported. The statement in choice b is an overgeneralization that is not supported by the passage. The majority of sufferers of hypothermia are older people, but younger people can be affected as well. It may be the case that older people living in warmer climates are less likely to suffer from hypothermia, but that does not necessarily make them healthier, so the statement in choice d is not supported. No explanation for elderly people’s susceptibility to hypothermia is provided in the given text. It may or may not be a result of a deteriorating circulation system; however, without the support from the passage, choice e cannot be the correct answer.

16. b. The passage mentions that the immune system is capable of distinguishing between body cells and non-body cells, so the statement in choice b is correct. Every individual’s immune system must learn to recognize and deal with non-self molecules through experience. Therefore, no one is able to prevent their offspring from getting an infection, making choices a and e incorrect. The passage also explains how the body is able to remember the specifics of a foreign body, such as the chicken pox virus; however, because this is the first encounter with the virus, the body’s immune system will not yet be able to remember previous experiences with the virus, making choice c incorrect. A normally functioning immune system will not attack its own tissues, so choice d is not right either.
17. b. According to the passage, the ability to distinguish between self and non-self is the heart of the immune system. This topic is set up in the first half of the passage and further elucidated throughout the body. The passage begins with a description of the complexity of the immune system, choice a; however, the rest of the passage does not support that statement as a major point since it does not focus on the structure of the immune system specifically, so that choice is not correct. The point in choice c is provided in the passage, but it represents only a very minor point about the balance between self cells and non-self cells. It does not represent the major point of the passage, so it is incorrect. On the other hand, the point in choice d is too general to be considered correct for the given passage. A major point could be that the human body's immune system is an extraordinary and complicated mechanism, but the focus is not on the human body's capabilities in general. The final sentence of the passage suggests that the human body is exposed to a sea of microbes, but that does not mean that that point is the focus of the passage. In fact, the passage is more about the immune system as a whole instead of the fact that the body is a habitat for microbes, so choice e is not right either.

18. a. The passage states that self-markers are unique to DNA, meaning that identical twins would have the same self-markers. Because self-markers are responsible for preventing the body’s immune system from attacking its own tissues, the explanation in choice a makes the most sense. There is no indication in the passage that the age of tissues would have any relevance to whether a body identifies it as self or non-self; therefore, there is no support for choice b. The passage does not suggest that the sex of the host body plays any role in whether an immune system identifies a cell or tissue as self or non-self, making choice c incorrect. Of greater importance is the presence of self-markers, which are unique to each person’s DNA. Choice d is incorrect; previous illnesses, even if both were shared by the twins during childhood, would not set precedent for tissues being shared between the people. The passage states that the immune system can recall the specifics of a foreign body, such as a virus. However, the transplant of tissue is not something that would have necessarily occurred beforehand—and that does not explain why the twins would have a more likely chance of success at a transplant than the father and daughter—so choice e is incorrect.
19. a. The word *sensitive* has several definitions. In the context of this passage, it is being used to describe the immune system—specifically, its ability to react quickly and effectively. In that sense, it can be considered *responsive*, choice a. The word *sensitive* can mean *delicate or nervous*, choices b and d, but those meanings do not make sense in the context of the sentence in the passage. The word *indifferent* is an antonym of *sensitive*, so choice c cannot be correct. There is no indication that the word means *sensible*, so choice e is incorrect.

20. c. The main argument of the passage is that there are no boundaries when it comes to pollutants. Only the statement in choice e weakens the argument by suggesting that the levels of the pollutants found are so low as to be "statistically insignificant." That doesn't mean that the compounds aren't there at all, but that the levels are so low that the argument is weakened. The statements in the other answer choices do not significantly weaken the argument. For choice a, the main argument of the passage is not about the companies' claims about their pollutants. Whether or not companies make claims about them, the author's main argument—that there are no boundaries when it comes to pollutants—is not weakened. The statement in choice b would suggest that some compounds travel better than others. That doesn't necessarily weaken the main argument that pollutants are not constrained by boundaries, however. If the sentence in choice c were true, the author's argument would be strengthened, not weakened. This is suggesting that even years after a compound stops being created, it can be found throughout the planet's oceans. The statement in choice d would weaken the author's argument if the chief argument were that DDT causes significant damage. However, the chief argument is simply that there are no boundaries when it comes to pollutants. This statement, even if it were true, does not address that issue.
21. **b.** The passage begins by pointing out the concerns about getting energy from oil, gas, coal, or nuclear sources. It then introduces a potentially clean, safe, and efficient energy as a solution to the problems of these other sources. Therefore, choice b provides the best organization of the passage. Because the passage begins with the drawbacks of some energy technologies, choice d is not correct. No untested theory is introduced at the beginning of the passage, so choice a is not correct. While a new technology is introduced in the passage, it is not how the passage begins; furthermore, its difficulties are not listed in detail, so choice c is not correct. The organization of the passage is not built around the comparison or contrast between technologies, making choice e incorrect.

22. **c.** Given that the dangerous effects of gas, oil, coal, and nuclear energy are described in the beginning of the passage, it would make sense that deleterious would have a negative meaning. That eliminates choices c and d, which have words with positive meanings. While the word contains the prefix dele-, deleterious does not mean deleting or disappearing, choice a. It has nothing to do with cost, so choice b is not correct either.

23. **d.** Because the East River does not always flow quickly, the tidal energy turbines cannot always generate electricity. This would detract from the author’s argument that tidal energy is a clean, safe, and efficient energy source. The statements in choices a and e have little relevance on the author’s argument about tidal energy; the statements neither weaken nor strengthen the argument. The statement in choice b could introduce a negative factor of the turbines, but there is another choice that more significantly weakens the point that they are effective generators of electricity. The statement in choice c actually strengthens the case for tidal energy; detractors of wind energy complain that the large windmills are eyesores, so an invisible turbine would be a positive development.

24. **a.** Tidal energy requires the movement—the ebb and flow—of the tides. The Bay of Fundy, as part of the Atlantic Ocean, is known for its massive tidal flows. Choices b and d cannot be correct since they do not involve water. Neither the Great South Lake, choice c, nor Bullough’s Pond, choice e, involve waterways that would be influenced much by tides. Because they are smaller bodies of water that are not related to the oceans, they are not as good an option for tidal energy experiments as a location by the Bay of Fundy.
25. a. The author describes the concerns of nuclear energy before describing the advantages of tidal energy; this contrast accentuates its benefits, making choice a correct. This is the opposite of choice e, which states that the safety of renewable energy sources would be downplayed, so choice e is wrong. No other negative feature of nuclear power is provided, so choice b cannot be correct. In fact, the passage states that nuclear energy does not create greenhouse gases, meaning that choice c is not correct. The mention of safety concerns does not involve financial considerations, so choice d is not correct.

26. c. The only statement from the answer choices that cannot be verified as fact is listed in choice c, because whether an event is “demoralizing” is not a verifiable statement. The statements in choices a, b, d, and e can all be proven and are therefore facts, not opinions.

27. c. The passage states that all but a dozen U.S. presidents served in uniform. That means that 31 presidents have served in some capacity, making choice e correct. The fact that twelve men become president with no military experience also means that choice b cannot be correct. The statements in choices a, c, and d are neither confirmed nor denied based on the information in the passage; therefore, they are not correct.

28. c. The end of the passage states that voters are most concerned now with their presidents’ knowledge of the law. Therefore, based on the passage, a lawyer is the best prediction for the next president’s former occupation (choice c). The passage mentions that at least one president was a tailor, choice a, and one was an actor, choice d, but there is nothing to indicate that that is the most likely occupation of the next U.S. president. While many presidents were previously soldiers, not as many lately have served in the military, so choice b is not the best answer. Only three presidents were generals, so choice e is not the best answer either.

29. b. The passage mentions that the U.S. presidents have had a variety of occupations before holding the highest office. To contrast those varying paths to the presidency, the passage mentions the clearer path from the U.S. military to the presidency. Therefore, the path was being described as indirect, or roundabout (choice b). Direct, choice a, has the opposite meaning of circuitous. Similarly, mainstream (choice c) could also be considered an antonym of circuitous. There is nothing in the passage to suggest that the route would be political or circuitlike, so choices d and e are not correct either.

30. e. There are several numbers given in this passage, but the only one that matters for this question is that there are more than 2,500 difference species of snakes around the world; therefore, choice e is correct. Choice a refers to the approximate number of snake bite fatalities in the United States each year, so it is not correct. Choices b and c could refer to the number of annual snake bites in the United States, so they are not correct. Choice d is less than 2,500, so it cannot be correct either.
31. a. An opinion cannot be proven with facts or statistics. The statement in the second sentence, choice a, cannot be proven because there is no way to show definitively whether someone is or is not irrational. On the other hand, the statements in choices b, c, d, and e each contain statements that can be verified—making them statements of fact rather than opinion. Therefore, those answer choices cannot be correct.

32. c. The passage begins with the proposed name change from starfish to sea stars, and then the rest of the passage provides support for this change. Therefore, the statement in choice c best summarizes the passage. The statements in choices a, d, and e are all correct, but they act as supporting details that reinforce the main point of the idea: that the name should be changed. The statement in choice b is also correct, but the main idea of the passage is not the difficulties in changing a name but how and why the starfish should be changed to the sea star specifically. Therefore, there is a better choice than choice b.

33. d. The author makes it clear that the name starfish is factually incorrect and should therefore be revised to something more scientifically accurate. Given that information, it would also make sense that the author would agree that jellyfish should also have their name changed if they are also not technically fish (choice d). The author may agree that sea stars are beautiful, choice a, but that cannot be verified from any information in the passage; the author is interested in naming the marine creatures appropriately, but that does not necessarily mean that he or she finds them attractive. The author would likely disagree with the statements in choices b, c, and e since he or she clearly states that sea stars are not vertebrates, and they should therefore not be referred to as “fish”—and it is worth the trouble to rename them.

34. d. Calling a monument a masterpiece is an opinion because it cannot be verified with facts or statistics; whether it is taller than a pyramid, however, is a fact because it can be verified with measurements. Therefore, choice d contains both a fact and an opinion. The statement in choice a contains only an opinion and no verifiable facts. The statements in choices b and e contain only facts and no opinions, so they are not correct either. The quote in choice c is a fact because it can be proven that Saarinen said those words, and it does not contain the author’s opinion.

35. b. The passage states that the winner of the contest was a plan for a completely different type of structure. Therefore, this describes a design that was like any other existing monument (choice b). This is the opposite of the statement in choice a, so that choice is not correct. There is no evidence in the passage that Saarinen’s design was part of a series of monuments or less expensive than other monuments, making choices c and d incorrect. The shape of the arch is considerably different from the shape of the Great Pyramid, so choice e is not correct.
36. b. The author in the passage reveals the material of the arch's casing by saying that it is stainless steel. As a result, the Arch often reflects dazzling bursts of sunlight. Therefore, the purpose of including this information was to describe another astounding quality of the monument (choice b). No other information about the metallic components of the arch is given, so choice a is not correct. Similarly, no materials are listed for the Great Pyramid, so choice c cannot be correct. The following sentence in the passage describes the arch's symmetry, but the information about the stainless steel skin does nothing to illustrate the symmetry; therefore, choice d is incorrect. The information also does not provide any historical context for the monument, meaning that choice e is incorrect as well.

37. c. The initial sentence of the passage describes the skyline of St. Louis as unremarkable with one prodigious exception. The word prodigious must therefore have the opposite meaning as unremarkable. The best choice is extraordinary (choice c). Commonplace and lackluster, choices a and e, have similar meanings as unremarkable, so they cannot be correct. The exception is not being described as talented or timely, so choices b and d are incorrect as well.

38. e. The word nevertheless is generally used to provide a contrasting transition. In this passage, it is used to contrast the high costs of NASA with the important technological advancements; therefore, choice e is correct. Because the key transition word is changing the direction of the passage up to that point, choices a and b cannot be correct. There is nothing about this key word to suggest that space operations specifically make up too great a fraction of NASA's budget, so choice c is incorrect. Choice d is likewise incorrect because the financial expenditures of the agency have not changed too much over the past decade or so; the annual budget has steadily increased each year.

39. a. The passage focuses on the high cost of the government agency NASA. Therefore, the meaning of exorbitant must reflect these high costs: excessive, choice a, is the best word to describe its meaning. The high costs may be painful for taxpayers, but that is not the meaning of the word, so choice b is incorrect. Choice c, reasonable, has the opposite meaning as exorbitant; exorbitant spending is unreasonable, so choice c is incorrect. The budget continues to rise, so choice d cannot be correct. Space travel may be exciting, but there is nothing in the passage to suggest that the costs are exciting, making choice e incorrect.
40. b. The author mentions the high costs for operating NASA, but he or she ends the passage with a declaration of support for the agency’s valuable research and development. This is summed up by the statement in choice b. The author says that it may be difficult to justify the expense at a time of domestic crises, but he or she uses nevertheless to suggest that it’s still justifiable; this eliminates choices a and d. There is no specific support in the passage to suggest that the author would want the costs to decrease during a time of deficit, choice c, or only during times of planetary exploration, choice e.

The following is a chart of the different skills assessed by the questions in this practice PPST; you can use it to identify your strengths and weaknesses in this subject to better focus your study.

<table>
<thead>
<tr>
<th>LITERAL COMPREHENSION SKILLS</th>
<th>QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main ideas</td>
<td>8, 17, 32</td>
</tr>
<tr>
<td>Supporting Ideas</td>
<td>13, 30, 35</td>
</tr>
<tr>
<td>Organization</td>
<td>4, 11, 21, 38</td>
</tr>
<tr>
<td>Vocabulary in Context</td>
<td>3, 5, 7, 19, 22, 29, 37, 39</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CRITICAL AND INFERENTIAL COMPREHENSION SKILLS</th>
<th>QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation</td>
<td>1, 6, 12, 20, 23, 25, 31, 34, 36</td>
</tr>
<tr>
<td>Inferential Reasoning</td>
<td>2, 10, 15, 16, 26, 27, 33, 40</td>
</tr>
<tr>
<td>Generalization</td>
<td>9, 14, 18, 24, 28</td>
</tr>
</tbody>
</table>

**Skills Test in Mathematics**

1. d. To find the average of a set of data, first add all the data numbers together and then divide that sum by the number of data pieces. In this case, if the average for 7 days is 4 miles, then Veronica must have run a total of 28 miles, since $28 \div 7 = 4$. Her Sunday through Friday mileage totals 23 miles, so Veronica needed to run 5 miles on Saturday. Choices a, b, c, and e would all give a sum that is different from 28 miles, so the resulting average would not have been 4.
2. a. In order to compare percentages, fractions, and decimals it is easiest to convert them all into decimals. The \( \frac{3}{4} \) in choice a is equivalent to 0.75, so 42.5% is the same as 4.75%. When working with percentages, remember that they mean "out of 100." Therefore, in order to turn them into decimals you need to divide them by 100, which simply moves the decimal point two places to the left. So in this case, 4.75% is the same as 0.0475. Next, turn choice b into a decimal the same way: 4.09% becomes 0.0409. Choice c, \( \frac{47}{1000} \), is equivalent to 0.047 (move the decimal three times to the left). Choice d, \( \frac{23}{500} \), is the same as \( \frac{46}{1000} \) or 0.0460. Choice e is already in decimal form for us, 0.0408. Once they are all in decimal form and you are looking for the largest value, follow these steps: compare the numbers' tenths place, looking for the highest number. If all the numbers have the same value in the tenths place, then move to the hundredths place and exclude any decimals whose value in the hundredths place is smaller than the rest. Next move to the thousandths place, still looking for the largest number, and so on. Of all these choices, a has the largest value.

3. b. It is important to notice that although the markings on this spinner only show that it is divided into 5 sections, the pie-shaped section labeled "1" on top is actually equivalent to any of the other two sections combined. That means that there are actually six equal sections, four of them having a "1" in them, one with a "2," and one with a "3." To find the probability of an event happening, put the number of desired events possible over the total number of events. In this case, there are four "desired events" (or number "1" sections) and six total events (or sections on the board); \( \frac{4}{6} \) can be reduced to \( \frac{2}{3} \). Choice a incorrectly gives the probability of the spinner not landing on a "1" with the incorrect assumption that there are 5 equal chances. Choice c is the probability of not getting a 1 since there are two chances out of six to not land on a 1, and \( \frac{2}{6} = \frac{1}{3} \). Choice d is not valid because there are not four equal chances on the board, so four should not be in the denominator. Choice e incorrectly gives the probability of the spinner landing on a "1" with the incorrect assumption that there are 5 equal chances and three chances for "1."
4. d. This question is asking "7,225,800 is 3% of what number, x?" In order to set this up, set up a proportion that has "part" in the numerator and "whole" in the population ratio and $\frac{3}{100}$ in the percentage ratio. Set these two ratios equal to one another in a proportion and solve:
\[
\frac{\text{part}}{\text{whole}} = \frac{7,225,800}{7,225,800 \times 100} = \frac{3}{100}
\]
\[
7,225,800 \times 100 = (\text{U.S. Population}) \times 3
\]
\[
722,580,000 = 3x
\]
\[
x = 240,860,000
\]
Choice a is 7,225,800 divided by 3, but percentages always need to be turned into decimals first, and in this instance, a proportion needs to be used. Choice b is 7,225,800 multiplied by 30, but in this instance, a proportion needs to be used. Choice c is 7,225,800 multiplied by 300, which yields a population that is unrealistic for the United States. Choice e is the answer when using the correct method listed above, but incorrectly including $\frac{0.03}{100}$ as the percentage fraction instead of $\frac{3}{100}$.

5. b. An isosceles triangle has exactly two equal sides. Since the hypotenuse of a right triangle is always the longest side, the base of the triangle must be equal to the height, or 5. Use the Pythagorean theorem to find the value of $h$:
\[
a^2 + b^2 = c^2
\]
\[
(5)^2 + (5)^2 = h^2
\]
\[
25 + 25 = h^2
\]
\[
50 = h^2
\]
\[
\sqrt{50} = h
\]
Because $\sqrt{50}$ is not one of the choices, simplify the radical to arrive at $h = \sqrt{25 \times 2} = 5\sqrt{2}$. Choice a, 5, cannot be correct because this is not an equilateral triangle, which has equal sides. In an isosceles triangle, only the legs have equal lengths. Choice c, 10, would be correct if 5 were the shortest side in a 30-60-90 triangle because in those special triangles the hypotenuse is twice the length of the shortest side. Choice d, $\sqrt{10}$, is an incorrect way to write $5\sqrt{2}$. Choice e, 9, cannot be possible because in any triangle the sum of any two sides must be greater than the third side, and in this case the sum of the two legs is 10.
6. d. First, represent the work that Ryan and Kimberly did by letting Kimberly’s hours be \( k \) and Ryan’s hours be \( 3k \). Their combined work would be represented as \( 3k + k = 12 \). So \( 4k = 12 \) and \( k = 3 \). Therefore Kimberly worked 3 hours (which is the incorrect choice a), and Ryan worked 3, or 9 hours (which is the incorrect choice b). If Jaime worked 5 more hours than Ryan, that means he worked 14 hours (which is the incorrect choice c). Because Jaime and Janet worked a total of 18 hours, that means that Janet worked 4 hours. Choice e, 7, is the answer when subtracting the 5 more hours that Jaime worked from the 12 total hours that Ryan and Kimberly worked, which does not show how many hours Janet worked.

7. a. In order to solve this problem, you need to look at how many people recalled the same digit for each of the seven numbers in the phone number. Choice e is out of the running right away because only one person recalled 996 as the first three digits. Looking at the fourth digit, three of the friends recalled a 9 versus the two who recalled an 8, so answer choice d is ruled out. Next, look at the fifth digit: three friends remembered a 2 there, and the other two friends recalled different numbers, so since choice b has a 3 in the fifth place, you can rule this one out. Lastly, looking at the sixth and seventh places, a 6 and another 6 are the most commonly recalled digits in those places, making choice a a better choice than choice c.

8. c. The concepts to be considered here are area and surface area. The amount of paper needed to cover a cube is equivalent to the surface area of a cube. The surface area of a cube is the area of each face \((a \times a) \times 6\), which is \( 6a^2 \) (incorrect choice a). Although it is tempting to just double \( 6a^2 \) to \( 12a^2 \) (incorrect choice b), that will not work because it doesn’t take into consideration that each side length has doubled. Instead, you must consider that Maya’s gift has a side length of \( 2a \), which will, in turn, have 6 faces that are each \( 4a^2 \) in area. The total surface area of Maya’s gift will be \( 6 \times 4a^2 = 24a^2 \). Choice d, \( 2d^3 \), is a mistake made by taking the volume, \( l \times w \times h \), of Marvin’s gift and doubling that. Choice e, \( 12d^2 \), comes from a combination of errors made by confusing volume, surface area, and how the doubling of an edge length affects either of these measures.

9. d. The question being asked here is “What is \( \frac{1}{4} \) of \( \frac{1}{2} \)?” The word of in math is normally an indication that multiplication is required. To multiply fractions, multiply straight across their numerators and straight across their denominators: \( \frac{1}{4} \times \frac{1}{2} = \frac{1}{8} \). Choice a, \( \frac{1}{16} \), is one-quarter of one-quarter, not one-quarter of one-half. Choice b, \( \frac{1}{6} \), is the answer when \( \frac{1}{4} \) and \( \frac{1}{4} \) are incorrectly added by keeping the numerator the same and adding the denominators. Choice c, \( \frac{1}{2} \), is \( \frac{1}{2} \) minus \( \frac{1}{2} \), but they need to be multiplied, not subtracted. Choice e, \( \frac{3}{4} \), is the correct sum of \( \frac{1}{2} \) and \( \frac{1}{4} \), but it is not the correct way to answer this question.
10. a. To see what amount of money Frank’s employer was putting into his retirement account each month, isolate any two dates in the table, find out how much money was deposited during that period, and then divide by the number of full months in that period. The answer in all cases is $420. From April 1, 2006 to December 1, 2006, there were eight full months. There was $3,360 deposited in that period (this is known from $6,720 − $3,360 = $3,360). Because $3,360 ÷ 8 = $420, it is clear that Frank’s employer contributed $420/month into his retirement account. Choice b comes from dividing $3,360 by 9 months, thinking that the month of December counts, but it doesn’t since the deposit only gets posted on the last day of the month. Similarly, choice c comes from incorrectly dividing the $5,040 deposited from December 1, 2006 to December 1, 2007 by 13 months, and choice d comes from incorrectly dividing the $2,100 deposited from December 1, 2007 to May 1, 2008 by 6 months. Choice e comes from dividing $3,360 by 7 months.

11. e. Using the information in the table and the method employed in question 10, Frank’s wife knows that his employer deposited $420 into his retirement account every month. There are 16 full months between May 1, 2010, and September 1, 2011. $420 × 16 = $6,720, which is what Frank’s employer has deposited since May 1, 2010, so add this to the May 1st balance: $13,860 + $670 = $20,580. Choice a is incorrect because it only multiplies the $420 by 15 months, and choice c is incorrect because it multiplies the $420 by 17 months. Choices b and d are both wrong because they use the incorrect monthly deposit amount of $373 combined with 16 months and 17 months, respectively.

12. d. To solve this problem, you need to work backward, starting with q, and use substitution: Because $q = 12p + 8$, put $12p + 8$ in for $q$ in the equation $3k = 10 − \frac{1}{2}q$. Doing this, $3k = 10 − \frac{1}{2}(12p + 8)$ can be written as $3k = 10 − \frac{1}{2}(12p + 8)$. Here it is essential to remember to distribute the negative sign with the $\frac{1}{2}$ as you multiply it by the $12p$ and $8$ in the parentheses: $3k = 10 − \frac{1}{2}(12p) − \frac{1}{2}(8) = 10 − 6p − 4 = 6 − 6p$. Because $3k = 6 − 6p$, the incorrect answer choice a is then incorrectly divided by 2 to get incorrect answer choice b. Next, seeing that the first equation has $15k$ in it, you need to multiply all the terms in $3k = 6 − 6p$ by 5 so that you get $15k = 30 − 30p$ (the incorrect answer choice c). Now you can substitute $30 − 30p$ in for the $15k$ in $2w = 15k + 4.2w = 30 − 30p + 4$, which yields $2w = 34 − 30p$, and dividing both sides by 2 gives $w = 17 − 15p$ (correct choice d). The answer choice e is what will happen if there is a mistake distributing the negative sign in the first substitution resulting in $14 − 6p$; following the next steps with the $14 − 6p$ would yield $37 − 15p$.

13. c. Because the garden needs 200 feet of linear fencing to enclose it, the distance around the garden (the perimeter) is 200 feet. The formula for calculating the perimeter of a rectangle is $2 \times \text{length} + 2 \times \text{width}$. Because $2 \times 80 + 2 \times 20 = 200$, the dimensions of the garden could be 80 feet long and 20 feet wide. Choice a seems like it might work since the length and width add up to 200 feet, but because there are two lengths and widths it would yield $2 \times 100 + 2 \times 100 = 400$ feet of linear fencing. Choice b would yield 240 feet of linear fencing, choice d would yield 180 feet of linear fencing, and choice e would yield just 60 feet of linear fencing.
14. c. First, calculate the volume of the pool by multiplying length \( \times \) width \( \times \) height: \( 5 \times 20 \times 30 = 3,000 \) cubic feet (which is the incorrect answer choice a). Then, in order to find out how many gallons \( 3,000 \) cubic feet is, multiply \( 3,000 \) by \( 7.5: 3,000 \times 7.5 = 22,500 \) (which is the incorrect answer choice b). Next, because each gallon weighs \( 8.35 \) pounds, multiply the number of gallons by \( 8.35: 22,500 \times 8.35 = 187,875 \) (correct choice c). Choice d is incorrect because in the first step, the width and length of 20 and 30 are incorrectly multiplied to 500 to get a mistaken volume of 2,500. Multiplying that by 7.5 followed by 8.35 yields 156,563 pounds. Choice e is the incorrect result when the volume of \( 3,000 \) cubic feet is just multiplied by the \( 8.35 \) pounds per gallon without first converting to gallons.

15. a. Adding the 18 students who are in Physics to the 26 students who are enrolled in biology sums to 44 students. Because only 34 students are enrolled in either one or both of these classes, and there are a total of 44 registrations, 10 students must be in both Physics and Biology. Choice b, 8, is the answer to \( 34 - 26 \), but this does not count into account the students who are in Physics. Choice c, 16, is the answer to \( 34 - 18 \), but this does not count into account the students who are in Biology. Choice d, 46, subtracts the 34 students enrolled in just Physics, just Biology, or both from the entire student body of 80; however, not all the students have to take a science class, so the 80 students is not relevant. Choice e, 36, subtracts the headcount of 44 students from the entire student body of 80; however, not all the students have to take a science class, so the 80 students is not relevant.

16. e. In Venn diagrams, the overlapping sections of the circles represent subsets of the data that belong to two separate categories. If any single point inside a Venn diagram is in just one circle, that means that this data point only falls into one category (like "just Physics"). If a point inside a Venn diagram is in two circles, then this data point falls into two categories (like "Physics and Biology"). Similarly, when a point inside a Venn diagram is contained in three circles, then this data point falls into three categories (like "Physics, Biology, and Chemistry"). Therefore, the shaded region represents the students who are enrolled in three science classes this summer. While choice a may be true, it is not guaranteed. Choice b is not the best answer because these students are also in Chemistry. Choice c is illogical because all the students represented in the Venn diagram are taking science classes. While some of the students in the shaded region may like Chemistry the best (choice d), the Venn diagram is not indicating preference of subject—just class enrollment.

17. b. In order to find the total number of students who chose two sports, find the number of sports indicated and subtract 50, the total number of students, from that sum. The total number of sports played is \( 13 + 16 + 12 + 10 + 9 = 60 \). Therefore, 10 of the students reported 2 sports. The percentage of students who play two sports is \( \frac{10}{50} = 20\% \). Choice a, 10\%, would be correct if the survey had resulted in 56 selections and only 6 students played two sports Choice c, 50\%, would have needed 25 students to report two sports, which would have been a survey with 75 results. Choices d and e, 60\% and 80\%, would have also required a survey result of more than 75 answers.
18. **c.** First you must keep in mind that the interior angles of all triangles sum to 180°. First consider choice **a:** all equilateral triangles have three 60° angles and an acute angle is an angle less than 90°. Acute triangles are triangles that do not have an angle greater than 89°; therefore, all equilateral triangles are acute, and the triangle in choice **a** exists. An obtuse angle is an angle that is greater than 90° but less than 180°, and an obtuse triangle is a triangle that has one obtuse angle. An isosceles triangle has two equal base angles and one unique vertex angle; a triangle could have one obtuse angle and two acute angles that would sum to 180°, so choice **b** works. A scalene triangle has three unique angles and since it is possible that a triangle could have one 90° angle and two other different angles, choice **c** also works. Choice **d** works because an isosceles triangle can have three angles that are all less than 90°. An obtuse right triangle is impossible because a right triangle has one 90° angle and two acute angles, while an obtuse triangle must have at least one angle greater than 90°.

19. **a.** To test each equation, sub $x = 1$ into each equation to see if the output $y = 7$ is obtained. For example, for choice **a** you would get $y = 3(1) + 4 = 7$. Using this method the equations in choices **b** and **c** also work with the point $x = 1$ and $y = 7$, but the equations in choices **d** and **e** do not work. Next, sub $x = 2$ into the equation in choices **a**, **b**, and **c** to see if the output $y = 10$ is obtained. Only the equation $y = 3x + 4$ in choice **a** yields 10 for $y$, so this is the only possible solution.

20. **a.** The six factors of 12 are 1, 2, 3, 4, 6, and 12. A prime number is any number greater than 1, whose only factors are 1 and itself. Therefore, the prime factors of 12 are 2 and 3, so there are two chances out of 12 to roll a prime factor of 12 when rolling a dodecahedron: $\frac{2}{12} = \frac{1}{6}$ (choice **a**). Ignoring the requirement for these factors to be prime would result in incorrect choice **b**, since $\frac{6}{12} = \frac{1}{2}$. It is a common mistake to think that 1 is a prime number, but it is not. This would lead to thinking that three out the 12 numbers were prime, which results in $\frac{3}{12} = \frac{1}{4}$ (choice **c**). It is also a common mistake to think that 2 cannot be a prime number because it is even; however, 2 is the only prime number that is even. This error leads to thinking that only one of the 12 numbers is prime, which results in $\frac{1}{12}$ (choice **d**). Choice **e** is the reciprocal of choice **a**, but probabilities must always be a number between 0 and 1.

21. **c.** The points on the scatter plot create an almost perfect line, and extending that imaginary line would result in a population of 25,000 in 2010. Choice **a** is actually lower than the population in the year 2000, which would oppose the demonstrated trend. Choice **b** is only slightly larger than the population in the year 2000 and is probably a better estimate for the year 2005 than for 2010. Choices **d** and **e** are both way too large to match the trend shown in the scatter plot.
22. d. To begin, remember that 1 yard = 3 feet and that each foot has 12 inches in it. So, first, recall or calculate that 1 yard is $3 \times 12$, or 36 inches long. Because Josh bought $5\frac{3}{4}$ yards, which is a mixed fraction, turn that into an improper fraction by multiplying 5 by the denominator and adding that to the numerator, while keeping the denominator the same: $5\frac{3}{4} = 23\frac{3}{4}$. Next, multiply $2\frac{3}{4}$ by 36 inches: $23\frac{3}{4} \times 36$ becomes $\frac{95}{4} \times 36$ after some diagonal cross-canceling. $\frac{95}{4} \times \frac{36}{1}$ results in 207 inches (incorrect choice a). Then because there are two seats, dividing 207 results in 103.5 inches of fabric for each chair. Choice b, 192.24, incorrectly translates the mixed fraction $5\frac{3}{4}$ to 5.34 before multiplying it by 3 feet and next by 12 inches. (This choice forgets to divide it by two seats, but incorrect choice c is 192.24 $\div$ 2 = 96.12) Choice e, 34.5, forgets to apply that there are 3 feet in a yard, and only multiplies $5\frac{3}{4}$ by 12 inches before dividing it by two.

23. c. If Kris always tells the truth, then both Emily and Kris have dogs (statements I and II). If Emily has a dog, then Emily is lying (statement III). This means that all three statements are true, and choice c is the only possible correct answer.

24. e. In order to know how many square feet of tile are needed to cover the table, the area of the table must be calculated. The area of a circle is calculated with the formula, $A = \pi r^2$. The diameter of the table is 10 feet, and therefore the radius is 5 feet (the radius is always half the diameter). So the area of the tabletop will be $\pi \times 5^2 = 3.14 \times 25 = 78.5$ square feet. The closest approximation of 78.5 is 79 square feet. Choice a is only the diameter of the table; it is not the area. Choice b mistakenly uses the diameter of 10 as $r$ in the formula $A = \pi r^2$. Choice c uses the circumference formula $C = 2\pi r$ instead of the area formula: $C = 2 \times 3.14 \times 5 = 31.4$ feet. Choice d also uses the circumference formula but mistakenly puts the diameter in for the radius: $C = 2 \times 3.14 \times 10 = 62.8$ feet.

25. e. The smallest number of buttons that one machine could make in one hour would be 80(60 minutes) = 4,800 (which is incorrect choice b). The largest number of buttons that one machine could make in one hour would be 100(60 minutes) = 6,000 (which is incorrect choice c). Because one machine will make from 4,800 to 6,000 buttons in one hour, multiply both of these numbers by 20 to see how many buttons can be made by 20 machines in one hour; the range is from 96,000 to 120,000 buttons, and 100,000 (correct choice e) falls within that range. Choice a is incorrectly arrived at by multiplying 20 machines times 80 buttons, forgetting that 80 is buttons per minute. Choice d is just below the number of buttons that all 20 machines would make if they were operating at their slowest capacity.
26. d. If Susie and Doug are both working on typing the manuscript, that means that together, they are typing at a rate of 34 words per minute \((12 + 22 = 34)\). Since the manuscript is 68,000 words long, divide 68,000 by 34 to see how many minutes this will take them. 
\[68,000 \div 34 = 2,000 \text{ minutes.}\] 
(Incorrect choice a only considers these 2,000 minutes and divides 2,000 by 60 to get 33.3 hours.) Because it takes Susie and Doug 20% of additional time to proofread their work, add 20% of 2,000 (which is 400 minutes) onto 2,000 to get 2,400. (Incorrect choice b only considers these 2,400 minutes and divides 2,400 by 60 to get 40 hours.) So together Susie and Doug have worked 40 hours, but for each 3 hours, they were both given a 30-minute, billable break. There are 13 sets of 3 in 40 hours \((13 \times 3 = 39)\), so they each got 13 breaks of 30 minutes, which results in another 13 billable hours. (Incorrect choice c considers only 30 minutes for each 3-hour period, forgetting that they both got a break. This choice reflects 40 hours plus 7.5 hours, which rounds to 48 hours.) The correct answer, choice d, is 40 hours plus their 13 break hours, which gives Susie and Doug 53 billable hours.

27. a. In graphs of inequalities, a dotted line symbolizes that the equation is not part of the solution, so a < or > symbol is used. A solid line symbolizes that the equation is part of the solution, so a ≤ or ≥ symbol is used. Because the dotted line was using the equation \(y = \frac{1}{2}x\), it must have a < or > in the answer to the system of equations to show that the line is NOT included in the answer. And because the graph is shaded above the dotted line, the solution for that equation will be \(y \leq \frac{1}{2}x\). The solid line for \(y = -4x\) will include the line in its answer and is shaded to the left of the line, so the correct equation to model that is \(y < 4x\). All the answer choices have incorrect combinations of inequalities except for answer choice a, which is correct.

28. a. Because \(\Psi\) is divisible by 3 and 10, then \(8\Psi\) must be divisible by any of the factors of the product of 3, 10, and 8. Since \(3 \times 10 \times 8 = 240\), any factors of 240 will also be factors of \(8\Psi\). To find all the potential factors of 240, break it down into its prime factorization by breaking it into factors until all the factors are prime: \(240 = 24 \times 10 = (6 \times 4) \times (5 \times 2) = (3 \times 2) \times (2 \times 2) \times 5 \times 2\) is the prime factorization of 240. Any number that is a product of two or more of the factors of 240 will also divide into 240 as well as \(8\Psi\).
Answer choices b through e are all products of two or more of the prime factors above; 14, choice a, is the only number that cannot be the product of any of the prime factors of 240.
29. b. In 1999, the Sales Department had an electricity cost of $750, and in 2000, the Customer Service Department had an electricity cost of $700, so their difference is $50. Choice a is the cost of electricity for the Sales Department in 2000, not the increase in electricity costs. Choice c, $150, is the difference between the Sales Departments in 2002 and 1999 ($900 – $750). Choice d is the difference between the Sales and Engineering Departments in 1999 ($1,000 – $750). Choice e is a comparison of the two departments in 1999 when they both had the same electricity costs.

30. d. The first statement, i, is not true, because the Sales Department’s increase was not steady since it declined from 2000 to 2001. The second statement is true because in every year other than 2000, the Engineering Department’s electricity usage was at least $100 more than the second-highest user. The Customer Service and Sales Departments were the same in 1999, and in 2000–2002 their electricity usages were more similar to each other’s than to the Engineering Department’s. The third statement is true since the Engineering Department’s electricity usage increased by $100 each year from 2000 to 2002.

31. b. The Engineering Department’s electricity usage decreased $200, from $1,000 to $800, in the period from 1999 to 2000. To calculate the percentage decrease between two numbers, divide the difference between the two numbers by the original number. So \( \frac{200}{1,000} = 0.20 \) which is 20%. Choice a, 25%, is the increase of $200 from $800 to $1,000 in 2000 to 2002, but these were not the dates in question. Choice c, 12.5%, is the increase of $100 from $800 to $900 in 2001 to 2002, but these were not the dates in question. Choice d, 10%, is the decrease in the Engineering Department’s electricity usage between the years 1999 and 2001, when it went from $1,000 to $900. Choice e, 0%, is the decrease in the Engineering Department’s electricity usage between the years 1999 and 2002, when they were both $1,000.

32. a. In this series there is a pattern of pairs with a difference of three that is interrupted every third term by a “5.” Looking at the first two terms, you can see that they are decreasing by 3 (28 – 25 = 3), as is the second pair of numbers (21 – 18 = 3). The jump “over the 5” from one pair to the next pair is decreased by four each time since 25 – 21 = 4 and 18 – 14 = 4. Because the pairs themselves are decreased by 3 and then followed by a random 5, it follows that the next two numbers would be 11 and 5. Choices b and e decrease 14 by 4 to get 10, which does not follow the decrease in the first two pairs’ patterns. Choice c does not have the spacer “5,” and choice d has the spacer “5” in the wrong place.
33. c. The formula for distance is \( \text{distance} = \text{rate} \times \text{time} \), and in this case, the distance is \( k \) kilometers and the time is \( h \) hours, so putting this into the formula gives \( k = \text{rate} \times h \). Solving for rate gives \( \text{rate} = k \div h \). Time in this formula usually represents hours, but since we are now introducing minutes, it is necessary to express the hours in terms of minutes. \( m \) minutes can be translated into hours by dividing by 60, so time can be written as \( m \div 60 \). Putting these two equivalents into the formula \( \text{distance} = \text{rate} \times \text{time} \), one gets \( k \times \frac{m}{60} = \frac{mk}{60} \). Choice a incorrectly puts the kilometers in the denominator. Choice b is the reciprocal of the correct answer, so the terms were mistakenly flipped during the calculations. Choice d puts 60 over minutes, which will not correctly translate into hours. Choice e will also not correctly convert minutes into hours since it is multiplying the minutes by hours.

34. b. Looking at the pie chart, you can see that the darkest section, the Pediatrics, is slightly bigger than the next darker section, Surgical; about three times bigger than the ER section; and slightly smaller than the lightest section, Maternity. Looking at the bar graphs, choices a and d have bars that are equal, so those two graphs are disqualified as being equivalent to the pie chart. The chart in choice c shows Pediatrics as less than Surgical, which is not accurate, so this answer can also be disqualified. That leaves only choices b and e. The data represented in choice b achieves the relative breakdown displayed in the pie chart, and choice e is wrong because bar graphs can be used to represent the data found in pie charts.

35. a. The first calculation needed is how many gallons of gas Belicia's car will consume on the 364-mile trip. Because her car gets 28 miles per every gallon of gas, divide 364 by 28: 364 miles ÷ 28 miles per gallon = 13 gallons of gas needed. Because gas costs $4.85 per gallon, calculate the total cost by multiplying 13 gallons of gas by $4.85: 13 × $4.85 = $63.05. Choice b incorrectly divides the 364-mile trip by the $4.85 cost of gas per gallon while ignoring the 28 miles per gallon that Belicia's car gets. Choice c makes the same error as in choice b, but in addition to this error, it also rounds the $4.85 to $5 before dividing 364 miles. Choice d incorrectly multiplies the $4.85 cost of gas per gallon with the 28 miles per gallon that Belicia's car gets—it ignores that the trip is 364 miles. Choice e correctly calculates 13 gallons needed for the trip, but rounds the $4.85 per gallon to $5 per gallon before multiplying it to the 13 gallons. The rounding should be done after this product is found, not beforehand.

36. c. Three-quarters is written as \( \frac{3}{4} \), which is equivalent to 0.75. One million is 1,000,000, and the word of in math means to multiply, so \( 0.75 \times 1,000,000 \) gives 750,000, which is seven hundred fifty thousand. Choice e almost does this correctly, but it multiplies \( \frac{3}{4} \) by one billion and not one million. Choice b also almost does this correctly, but it divides instead of multiplying the \( \frac{3}{4} \) by 1,000,000. Choice a mistakes \( \frac{3}{4} \) as 34 and multiplies it by one hundred million, and not by one million. Choice d is 750 billion and not 750 million.
37. **d.** The prefix *milli-* means 1,000. It is found in words such as millipede (the insect) and millimeter, the unit of linear measurement. In this case, there are 1,000 milliliters in each liter of solution. Therefore, in 150 liters of solution there are $150 \times 1,000 = 150,000$ milliliters. Choices **b** and **e** incorrectly use 100 milliliters per liter and 10 milliliters per liter, respectively, in their calculations. Choice **a** incorrectly uses 50 milliliters per liter in its calculation, and choice **c** incorrectly uses 500 milliliters per liter in its calculation.

38. **b.** Because Shane would like to average $5,000 per month, that means she would like to sell $5,000 \times 12$ months = $60,000 over the course of the year. Since she has already sold $35,400, Shane needs to sell $24,600 over the last three months of the year to make her year-end goal. Therefore, the average per month that she needs to sell will be $24,600 \div 3 = \$8,200$. Choice **a** is Shane’s sales of $35,400 divided by three months: $35,400 \div 3 = \$11,800$. Choice **c** is the average per month that she wants, but her average per month during the holiday season must be much higher than this in order to compensate for the slower first 9 months of the year. Choice **d** is the average of Shane’s monthly sales for the first nine months: $35,400 \div 9 = \$3,933$.

39. **a.** With graphs of inequalities, it is important to notice if the endpoint is an empty circle or if it is filled in. If it is empty, then the point that the circle is on is not part of the solution set. If the endpoint is filled in, then that number exists in the solution set. In this case, the circle above $-4$ is filled in, so this equation must include $-4$ and will have $a \leq$ symbol, which means “less than or equal to,” or $a \geq$ symbol, which means “greater than or equal to.” Because the shading points to the right, it is shading values that are greater than or equal to $-4$, so the appropriate inequality to represent the graph is $x \geq -4$. Choices **b** and **d** cannot be correct because $x > -4$ and $x < -4$ do not include $-4$. Choice **c** cannot be correct because $x \leq -4$ represents the points that are *less than* or equal to $-4$. Choice **e** cannot be correct because the solution set extends past the 10 as indicated by the shading and arrow, and the given inequality, $10 > x > -4$, does not include $-4$.

40. **c.** Remember that percentages are always out of 100. Therefore, in order to convert a fraction to a percent, change the denominator to 100 by multiplying the denominator and the numerator by the factor that will convert the denominator into 100: $\frac{3}{5} \times \frac{20}{20} = \frac{60}{100}$. We see that $\frac{3}{5}$ is equivalent to 60%, so choices **b** and **d** are both incorrect. The next way to approach this problem is to change $\frac{3}{5}$ to a decimal by dividing the numerator, 3, by the denominator, 5; $3.00 \div 5 = 0.60$. This rules out choices **a** and **e** and shows that choice **c** is the correct answer.

The following is a chart of the different skills assessed by the questions in this practice PPST; you can use it to identify your strengths and weaknesses in this subject to better focus your study.
<table>
<thead>
<tr>
<th>NUMBER AND OPERATIONS SKILLS</th>
<th>QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order</td>
<td>2</td>
</tr>
<tr>
<td>Equivalence</td>
<td>40</td>
</tr>
<tr>
<td>Numeration and Place Value</td>
<td>36</td>
</tr>
<tr>
<td>Number Properties</td>
<td>28</td>
</tr>
<tr>
<td>Operation Properties</td>
<td>0</td>
</tr>
<tr>
<td>Computation</td>
<td>1, 9, 26, 35</td>
</tr>
<tr>
<td>Estimation</td>
<td>21</td>
</tr>
<tr>
<td>Ratio, Proportion, and Percent</td>
<td>4, 17, 31</td>
</tr>
<tr>
<td>Numerical Reasoning</td>
<td>23</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALGEBRA SKILLS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Equations and Inequalities</td>
<td>12, 25, 39</td>
</tr>
<tr>
<td>Algorithmic Thinking</td>
<td>6, 15</td>
</tr>
<tr>
<td>Patterns</td>
<td>32</td>
</tr>
<tr>
<td>Algebraic Representations</td>
<td>8, 27</td>
</tr>
<tr>
<td>Algebraic Reasoning</td>
<td>33</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GEOMETRY AND MEASUREMENT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Geometric Properties</td>
<td>5, 18, 24</td>
</tr>
<tr>
<td>The xy-Coordinate Plane</td>
<td>19</td>
</tr>
<tr>
<td>Geometric Reasoning</td>
<td>13</td>
</tr>
<tr>
<td>Systems of Measurement</td>
<td>22, 37</td>
</tr>
<tr>
<td>Measurement</td>
<td>8, 14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DATA ANALYSIS AND PROBABILITY SKILLS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Interpretation</td>
<td>10, 11, 16, 29</td>
</tr>
<tr>
<td>Data Representation</td>
<td>34</td>
</tr>
<tr>
<td>Trends and Inferences</td>
<td>7, 30</td>
</tr>
<tr>
<td>Measures of Center and Spread</td>
<td>38</td>
</tr>
<tr>
<td>Probability</td>
<td>3, 20</td>
</tr>
</tbody>
</table>
**Skills Test in Writing—Section 1, Part A**

1. **c.** This sentence contains a subject-verb agreement error. The subject states is plural and takes a plural verb, such as are.

2. **b.** This run-on sentence needs to be split into two separate sentences. A semicolon should be inserted after the word actor.

3. **a.** Here, poor is being used to describe how Juliet did. It is describing the verb, so poor is an adverb. Adverbs end in -ly. The sentence should read Juliet did poorly.

4. **c.** Because there are no grammatical, idiomatic, logical, or structural errors in this sentence, choice e is the best answer.

5. **a.** All ways refers to every method, while always means forever. In this sentence, the wrong word has been used. The author means that he has been enamored forever, so he should use the word always.

6. **d.** This sentence compares two activities, so the form, or part of speech, of the two entities must match. As it reads, a verb and a noun are being compared. To be correct, we can change “a horror film” to the verb phrase “sitting through a horror film.” This matches “watching a psychological thriller.”

7. **e.** Because there are no grammatical, idiomatic, logical, or structural errors in this sentence, choice e is the best answer.

8. **b.** Continuous—meaning uninterrupted in time—should be replaced with continual in this sentence. Annabelle’s need to pay rent recurs regularly or frequently, which is the definition of continual, but she doesn’t pay continuously. So, the correct word choice is continual.

9. **a.** This sentence has an error in word choice. Elicit means to stir up. Illicit means illegal. The correct word choice is illicit.

10. **d.** This sentence has a verb error. The senators watched their colleague stand up. Another possible correct answer would be that they watched the colleague as she stood up.

11. **c.** The position belongs to Darby; therefore, an apostrophe is required to indicate possession. The sentence should read “… Darby’s position…”

12. **d.** This error has an error in comparison. The sentence compares the innovations of Carroll’s later novels with the book Alice’s Adventures in Wonderland. The comparison becomes parallel when you simply compare Lewis Carroll’s later novels with his early book. Another way to make the sentence parallel would be to compare the innovations of the later novels with the innovations of the early book.

13. **b.** There is no grammatical reason to use a colon here.

14. **b.** It is unclear to what the ambiguous pronoun they refers as there is no apparent antecedent. However, the sentence makes sense when we replace the pronoun with Olympic Games Knowledge Management (OGKM) resources.

15. **d.** This error is in parallel construction. The series of phrases must all be consistent in structure, so the last phrase should begin, like the other two, with a verb. In this case, we could change it to would have an easy commute.

16. **d.** Less describes singular nouns that represent a quantity or a degree. So, in this case we should use fewer, which describes plural nouns or things that can be counted.

17. **d.** This sentence contains a dangling modifier because the opening phrase mistakenly modifies the wrong noun. Here, it sounds like the day was screaming and shouting. The underlined portion of the sentence could be changed to everyone ended the day with a sore throat.
18. b. Stationery (with an e) is the writing material the context of this sentence requires. Stationary (with an a) means still or not moving.

19. e. Because there are no grammatical, idiomatic, logical, or structural errors in this sentence, choice e is the best answer.

20. e. Because there are no grammatical, idiomatic, logical, or structural errors in this sentence, choice e is the best answer.

21. b. When comparing Samuels to all the people, Samuels is least likely to win. Least is the superlative form for comparisons. Superlative is used when comparing more than two items. Less is the comparative form and used when comparing only two items.

Skills Test in Writing—Section 1, Part B

22. a. To separate independent clauses joined by a coordinating conjunction, such as but, use a comma before the conjunction. Choices b through d do not use a comma. Choice e uses a comma before and after but; however, one is not needed after but.

23. c. No one is considered a negative; in this sentence there are two negatives. Avoid double negatives in a sentence. Choices a and b have double negatives. Choices d and e do not make sense.

24. d. This sentence contains an error in parallel construction because the phrases before and after but also do not match. Choice d uses the past tense verb set to match provided. Choices a, c, and e use present tense verbs that do not match provided. Choices b and c introduce a comma, which is not needed here because these are not two complete sentences joined by a conjunction.

25. d. Choice d is the only one that uses all three pronouns in the correct places. Their means belonging to them; they’re is the contraction for “they are”; there describes where an action takes place.

26. e. When referring to a single person of unknown gender, use his or her, not their.

27. a. Choices b, d, and e use skeptically, which is an adverb. This sentence requires the adjective skeptical because it is describing the teacher, not how she looked (i.e., not the verb). Choices c, d, and e introduce commas, which are not needed in this sentence.

28. c. Alumni is the plural form of alumnus, so choices a, b, and e are incorrect. Choice d is incorrect because dates should not be spelled out.

29. b. Choice a sounds like the frog was slithering rather than the snake. Choices c, d, and e contain misplaced modifiers that are confusing and unclear. Only choice b is arranged in an order that is clear.

30. e. The series of events must all have parallel construction. That is, they must be in the same tense and have the same structure. Choice e has parallel construction in that each item begins with the same tense verb. Choices a through d do not consistently use the same verb tenses.

31. b. The introductory clause must refer to the subject of the sentence. Choice b refers to Ann as the subject, which is correct. Choices a, c, and d do not connect directly to the subject, Ann. Choice e changes the meaning of the sentence.

32. e. The comparative terms for good are good, better, and best. In choice e, we're comparing all the views first (best); then we're saying that the best view, as compared to anywhere else, is better. Better is used when comparing two things; best is used when comparing more than two things. The other choices do this incorrectly.

33. c. Choices a, b, d, and e contain double negatives. Choice e is the only one that does not contain double negatives and is, therefore, correct.
34. c. In choice c the conjunction *after* sets up a contrast between the two clauses that makes sense. None of the other choices make sense.

35. a. Choice a shows the superlative form of the comparison. This is correct, and the other choices are incorrect because we are comparing more than three items. Also, in choices d and e we don’t use both most/more and the comparative/superlative form of an adjective.

36. c. The plural for *crisis* is *crises*. We know it is plural because the pronoun used (*them*) is plural.

37. b. Choices a, c, d, and e contain errors in subordination. These sentences have two subordinate clauses but no independent clause; therefore, they are not correct.

38. a. Choices b and d are incorrect because *well* is an adverb, but here *good* is describing the noun *job*. Choices c and d are incorrect because of the punctuation. If we went with choice c, we’d have a run-on sentence. If we used choice d, we’d need to add a conjunction.

The following is a chart of the different skills assessed by the questions in this practice PPST; you can use it to identify your strengths and weaknesses in this subject to better focus your study.

<table>
<thead>
<tr>
<th>SKILLS TEST IN WRITING STUDY CHART FOR PRACTICE EXAM 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRAMMATICAL RELATIONSHIP SKILLS</td>
</tr>
<tr>
<td>Identify Errors in Adjectives</td>
</tr>
<tr>
<td>Identify Errors in Adverbs</td>
</tr>
<tr>
<td>Identify Errors in Nouns</td>
</tr>
<tr>
<td>Identify Errors in Pronouns</td>
</tr>
<tr>
<td>Identify Errors in Verbs</td>
</tr>
<tr>
<td>STRUCTURAL RELATIONSHIP SKILLS</td>
</tr>
<tr>
<td>Identify Errors in Comparison</td>
</tr>
<tr>
<td>Identify Errors in Coordination</td>
</tr>
<tr>
<td>Identify Errors in Correlation</td>
</tr>
<tr>
<td>Identify Errors in Negation</td>
</tr>
<tr>
<td>Identify Errors in Parallelism</td>
</tr>
<tr>
<td>Identify Errors in Subordination</td>
</tr>
<tr>
<td>WORD CHOICE AND MECHANICS SKILLS</td>
</tr>
<tr>
<td>Identify Errors in Word Choice</td>
</tr>
<tr>
<td>Identify Errors in Mechanics</td>
</tr>
<tr>
<td>Identify Sentences Free from Error</td>
</tr>
</tbody>
</table>