

ANSWER KEY

Practice Test 2

Section 1, Module 1: Reading and Writing

- | | | |
|-------------|--------------|--------------|
| 1. A | 10. A | 19. D |
| 2. A | 11. A | 20. D |
| 3. C | 12. D | 21. B |
| 4. A | 13. B | 22. D |
| 5. A | 14. C | 23. A |
| 6. C | 15. A | 24. D |
| 7. B | 16. C | 25. D |
| 8. B | 17. A | 26. C |
| 9. C | 18. A | 27. A |

Section 1, Module 2: Reading and Writing

- | | | |
|-------------|--------------|--------------|
| 1. B | 10. D | 19. C |
| 2. C | 11. C | 20. D |
| 3. A | 12. D | 21. C |
| 4. C | 13. A | 22. D |
| 5. D | 14. A | 23. D |
| 6. A | 15. C | 24. D |
| 7. B | 16. A | 25. C |
| 8. D | 17. A | 26. D |
| 9. A | 18. C | 27. B |

ANSWER KEY

Practice Test 2

Section 2, Module 1: Math

- | | |
|--|--|
| 1. B | 12. .3333 or $\frac{1}{3}$ |
| 2. C | 13. D |
| 3. 2 | 14. C |
| 4. A | 15. D |
| 5. C | 16. D |
| 6. C | 17. 12 |
| 7. D | 18. D |
| 8. 1 | 19. C |
| 9. B | 20. A |
| 10. 1.5 or $\frac{3}{2}$ | 21. D |
| 11. B | 22. D |

Section 2, Module 2: Math

- | | |
|--------------|----------------|
| 1. A | 12. C |
| 2. A | 13. A |
| 3. C | 14. 3 |
| 4. B | 15. D |
| 5. B | 16. C |
| 6. A | 17. B |
| 7. 54 | 18. 144 |
| 8. C | 19. D |
| 9. B | 20. B |
| 10. C | 21. 43 |
| 11. D | 22. C |

Answer Explanations

Section 1, Module 1: Reading and Writing

1. **(A)** The teacher is suggesting what the students can do to no longer fail their assignments—therefore, the teacher is providing them with a “solution.” Although the assignment relates to mixing chemicals, the teacher is not suggesting a different “mixture.” “Choice” and “origin” would not necessarily relate to solving the problem.
2. **(A)** The phrase “off his mark” means that the throw was inaccurate, making choice (A) correct. This can be seen by the fact that the catcher had to run and fetch the wild pitch. It is not choice (B) because there is no question that the pitcher is motivated—he is just not accurate with his throw. It is not (C) because the previous sentence says that he mounted the mound. It is not (D) because the pitcher is nervous, not serene or calm.
3. **(C)** The judge is trying to be patient and understanding with the prosecutor because it was his first case. As such, she will give him “leeway” to make some errors, making choice (C) correct. It is not choice (A) because the judge is being patient with the prosecutor, not giving him consequences. It is not (B) because “carte blanche” means to give someone total freedom—this is too extreme as the judge is only giving the prosecutor leeway on “some mistakes,” not all of them. It is not (D) because the prosecutor does not need freedom from punishment, which is what amnesty is; instead, he simply needs the judge to be more patient with his rookie mistakes.
4. **(A)** “Impacts” best fits the meaning needed in this context, since the author is referring to the negative consequences or effects of the bystander effect. Choices (B) and (C) are overly violent, and (D) is overly positive.
5. **(A)** The text refers to a seller ridding himself of a “bloated instrument” which will certainly devalue. Hence, overvalued is a precise word choice. While the other choices are synonyms of bloated, they do not capture the author’s meaning as related to inflated value.
6. **(C)** The narrator rhetorically asks “who has seen the wind?,” then states that no one has. Instead, we have seen its effects indirectly from the trembling of the leaves and the bending of the trees. So, the overall structure of the text is that it presents different ways that the invisible wind may be seen. It is not choice (A) because it does not examine weather formation in general. It is not (B) because the focus is on the wind, not natural growth. It is not (D) because the emotional impact of the wind is not discussed.
7. **(B)** This sentence explains that the men who were rescued from the sinking ship were given a place to stay and enough money to complete their journey. The citizens of the town were hospitable toward the men when they landed, making choice (B) the best option. There is no evidence within the text that they were treated with scorn (looked down upon), envy, or humor, making the other choices incorrect.

8. **(B)** In reference to some thinkers who might believe that the slave songs expressed joy for a carefree and happy life, Du Bois states that he can believe it of “some, of many.” However, Du Bois goes on to state from his viewpoint, the songs of slaves generally express the “music of an unhappy people.” Therefore, he ultimately believes that the songs are largely expressions of the extremely difficult lives that slaves led. So, it is reasonable to infer that Du Bois would have an attitude of qualified skepticism toward these claims, since he acknowledges that there may have been some joy expressed in the songs—this is his “qualification” of the claim. He is primarily skeptical, however, believing that the emotional expressions of the songs are mainly ones of sadness. It will not be choices (A) or (D) since they are overly positive. And it is not (C) because he does not completely dismiss those who may think that the songs were happier.
9. **(C)** From the conversation between Haley and Mr. Shelby, it is clear that Haley is first and foremost a businessman. Moreover, he won’t be persuaded to just accept Tom as payment for the debt, so choice (C) is an accurate depiction of his character. He is neither empathizing nor passive. In fact, he is nearly uncompromising. Finally, choice (B) won’t work because we can infer by his negotiation skills that he is not an amateur.
10. **(A)** The office administrator argues that career services are only useful if students actually take advantage of them. Choice (A) best supports this position because it is the service that the students least used, and it is also the one that students thought would be the least helpful. Perhaps if more students actually tried the career testing, more of them would find it to be helpful. Choices (B) and (D) do not compare the helpfulness and usefulness of services, instead focusing on just one aspect. Choice (C) does not show a large gap between those who used a service and those who thought it would be helpful.
11. **(A)** If we examine the first sentence of the text, we see that broken-heart syndrome often looks like a heart attack with one key difference—there is no arterial blockage. That would mean that if we wished to tell the difference between the two, we could simply look for arterial blockage. If it were absent, we could conclude that the patient is suffering from broken-heart syndrome, not a heart attack. This makes choice (A) the best answer. The other choices do not directly relate to the claim as stated in the first sentence of the text.
12. **(D)** Vocational paths have to do with career choices. Choice (D) best deals with the assertion because it mentions “providing the community with efficient workmen in various lines.” Choice (A) asserts that children are not ready to figure out their careers. Choice (B) does not discuss careers at all. Choice (C) is too vague as it would relate to career choices and does not suggest that schools should be in the business of helping guide students in their job options.
13. **(B)** This quotation provides the most direct support to the idea that at the time of the text’s composition, the recognition of civil rights for the citizens of countries around the world was relatively limited. It is not choice (A) because this quotation refers to the connection Burke believes that the colonists and the British people share. It is not (A) or (D) because these quotations directly question supposed sources of British governmental authority.
14. **(C)** The previous sentence states that plastic-eating microorganisms could help solve the problem of plastic waste in the environment. The final sentence of the text begins by showing a contrast with the previous sentence—it states that “others are skeptical of the claims.” Thus, it makes sense that the insertion should refer to whether bacteria could consume plastic deposits. Choice (A) is too vague. Choice (B) does not make a logical contrast. Choice (D) would make matters worse and so does not make sense.

15. **(A)** The text shows that in 14th- and 15th-century Florence, women were less and less likely to participate in court proceedings. The narrator acknowledges that many upper-class women may not have been affected by this, but that lower-class women were. A way of expressing that lower-class women were negatively affected by not being able to participate in court proceedings would be to state that they were “essentially at the mercy of their accusers,” meaning that they could not advocate for themselves while their accusers could make whatever claims they wished. All of the other options would suggest that these women were more powerful than they in fact were in this historical context.
16. **(C)** This choice separates the introductory phrase, “Within your online profiles,” from the independent clause that follows. Choice (A) has confused word order, (B) lacks a comma after the introductory phrase, and (D) inserts an unnecessary colon, creating a far too abrupt pause.
17. **(A)** “It’s” means “it is,” which is correct given the context—this is the only option that has an implicit verb. “Its” and “their” are used to show possession. “There” typically refers to a place.
18. **(A)** “Homeowners” correctly indicates that there are multiple homeowners who possess returns on assets. Choices (B) and (C) are singular, and (D) does not indicate possession.
19. **(D)** “Felt” is the only option that maintains the past tense verb use in the sentence as seen in the other verbs “depicted” and “used.”
20. **(D)** Choice (D) provides a comma after the introductory dependent clause and an apostrophe with “s” after the person’s name to signify possession, which is logical since the name is singular. Choices (A) and (C) do not have an apostrophe at all, and choice (B) would be used for plural possession.
21. **(B)** “Allow” is parallel to the next part of the sentence that uses the verb “tie.” The other options lack parallel structure. Also, “flexibility” is what it would make sense to permit, not “flexing” as one would do with a muscle.
22. **(D)** This option provides a needed pause between the two independent clauses in the sentence and before the clarification of “rodents.” Choice (A) has no pause before “but,” choice (B) has an unneeded pause after “also,” and choice (C) gives no pause before “rodents.”
23. **(A)** “Also” gives the most logical transition, introducing another description of birds in the sentence. The other options are overly wordy and do not provide a logical transition. Choice (B) incorrectly shows a contrast, and choices (C) and (D) incorrectly show cause and effect.
24. **(D)** “In order to” provides a logical transition between combining an enzyme and forming the organic molecule. The other options do not provide a logical transition. Choices (A) and (B) show cause and effect and (C) shows a contrast.
25. **(D)** The student wants to emphasize the time period when Ibn Battuta travelled. Choice (D) is the only option that explicitly refers to the time when he made his explorations—the 1300s. The other options use information from the text but do not mention the time.
26. **(C)** Focus on the specific claim—the student wants to show that there are two pumpkin varieties that can be eaten. Based on the notes, Casperita pumpkins are “edible” and Porcelain Doll pumpkins are a “good choice for pumpkin pie,” implying that they too are edible. So, choice (C) is the most logical option. The other options refer to pumpkins in the notes that are not consistently referred to as being edible.

27. **(A)** If there are few of the Rice's whales left, it makes sense that there are fewer opportunities to observe them—thus, choice (A) is the most logical answer. Choice (B) does not have to do with the observability of the whale. Choice (C) is not supported by the notes since the whale is found in the Gulf of Mexico. Choice (D) refers to a potential future event, not to something that presents an issue for observation in the present moment.

Section 1, Module 2: Reading and Writing

- (B)** The sentence shows where in the body the vestibular system is found, so “located” is most appropriate. The other options would be more appropriate in referring to people and where they live instead of where a bodily system is located.
- (C)** “Bolster” means “to solidify or build” in this context, making it the most logical option to refer to improving one’s resume. “Cushion” and “rebuild” would suggest protecting one’s career against a hardship while the emphasis here is on positive growth. And “maintain” does not suggest growth but keeping things as they are.
- (A)** The “while” in this sentence indicates a contrast between the attraction that the hydrophilic heads have towards water and the repulsion that the hydrophobic tails have. Thus, “repelled” makes the most sense. Another way you could think about this is to look at the word roots—“phobic” indicates fear or repulsion, making this a logical option. The other options would not provide a logical contrast with “attracted.”
- (C)** “Derive” means “obtain,” making this a logical option to express how aerobic organisms gather their energy. It is not “discover” or “discern,” since these are advanced thought processes that are not integral to obtaining energy. It is not “inhale” because while oxygen may be inhaled, the energy is gathered from the process of cellular respiration.
- (D)** “Lucrative” suggests that marine welding would be a career that has a high salary. While the other options could be associated with money, they would not be logically applicable to this situation, in which the potential earnings from a career are described.
- (A)** In the text, the author summarizes his argument that aiding the German Socialists and recognizing the Bolsheviks would be “playing with fire”—i.e., would lead to potentially negative consequences due to an indecisive outcome to the war. It is not choice (B) because this is too literal an interpretation. And it is not (C) or (D) because this phrase does not refer to making peace or reconciling.
- (B)** Text 1 provides a detailed description of the painting *A Sunday on La Grande Jatte*, while Text 2 looks at how Claude Monet’s painting *Impression: Sunrise* fits into the overall context of the impressionist movement. This makes choice (B) the most logical option. It is not choice (A) because Text 1 describes the painting technique. It is not (C) because Text 1 describes the setting of the painting. It is not (D) because Text 2 does not provide biographical details about Monet.
- (D)** The text describes the genetic changes associated with antigenic shift, stating that via “viral reassortment” the particles will produce completely new proteins “to which the entire human race is vulnerable.” While the antigenic drift can also result in renewed vulnerability, it is to viral strains of which one was previously immune. Therefore, the changes would not be as great as those associated with antigenic shift. Likewise, the author uses the example of a genome split in a bird that is capable of infecting humans making (D), rather than (C), the correct choice.

9. **(A)** The narrator argues that balance is key to achieving the best health results with hand-washing. If you wash your hands too frequently, it can cause problems; similarly, if you wash your hands infrequently, it can cause problems. Choice (A) is the most logical option because it suggests that those who wash their hands just eight times a day have less illness than those who wash their hands far more frequently. It is not (B) because these are both situations in which the narrator believes handwashing would be warranted. It is not choice (C) because the narrator does not make any comparisons about geography. It is not choice (D) because the narrator does not consider the effects of hand sanitizer.
10. **(D)** The idea that needs support is that the characters in the novel find it quite difficult to plan their budget because of how unpredictable expenses are. Choice (D) provides the best support for this since it mentions how there is no end to the things they had to buy and to unforeseen contingencies, i.e., random expenses that come up. Choice (A) does not focus on budgetary matters. Choices (B) and (C) do not refer to unpredictable expenses.
11. **(C)** The graph indicates that women, those in the age group of 18–29, and those who have completed some college are the most likely categorizations to use social networking sites—choice (C) is the only option that fits all these criteria. Choices (A) and (B) both have males, and (D) uses an age group that is outside the range given by the graph.
12. **(D)** The researchers' hypothesis is that losing body water is not as detrimental if one is losing it while exercising in cold weather. If someone does not sweat as much in a cold environment, there would be less of a need to have water in one's body to produce sweat. Thus, losing body water would not be as detrimental to someone in this situation. It is not (A) because this does not address the specifics of someone exercising in cold conditions. It is not (B) because cold would not affect whether someone could take supplements. It is not (C) because the factor in question is cold, not body mass index.
13. **(A)** We do not know the precise makeup of the client's portfolio, so we can consider the potential impacts of each of the possible switches. If we check the answers against the table, we can see the biggest drop in variance, and thus the biggest drop in risk, occurs as stocks owned go from one to two. This change cuts the variance nearly in half. The other choices still decrease the risk, but not by as much as choice (A).
14. **(A)** The text argues that Sweden has done a great job at political compromise over the years, with stakeholders from a variety of backgrounds in society able to successfully find common ground. This point is emphasized in the last sentence, in which the narrator draws a contrast between the near uniformity of private industry ownership (which would lead one to think that business would have a greater influence than labor on outcomes) and showing how labor disputes can be settled in a way that involves all interested parties. Choice (A) best accomplishes this goal by showing that workers and management both trust in the government managed settlement. It is not choice (B) because this would involve a one-sided deal for business. It is not (C) because that would not necessarily indicate compromise. It is not (D) because such actions would show the failure of compromise.
15. **(C)** This is the only option that correctly uses an apostrophe after "workers" to show that there are plural workers who own passports and visas. Choice (A) incorrectly shows that the visas and passports possess something. Choice (B) does not show possession at all. Choice (D) uses singular possession by putting the apostrophe before the "s."

16. **(A)** Choice (A) puts the words in the most logical sequence, clearly stating the subject of “scientific method” and following with the description of it. The other options all put the words in an illogical order.
17. **(A)** The adjectives “loveable” and “fluffy” can have their order reversed and the sentence would still be logical, so it is appropriate to separate them with a comma, as in choice (A). Choice (B) lacks a comma, choice (C) is too choppy, and choice (D) provides too large of an interruption at this point.
18. **(C)** Choice (C) correctly uses a colon to come before the clarification of who makes up the two players. Choices (A), (B), and (D) have unnecessary punctuation breaking up the two-part clarification.
19. **(C)** “Struck” correctly provides the past tense conjugation of “strike”—this means that the law was overturned. The other options do not provide a proper past tense conjugation of “strike.”
20. **(D)** This option provides a comma before the dependent clause that starts with “which.” Choices (A) and (B) do not provide this comma, and choice (C) does not have a complete sentence after the semicolon.
21. **(C)** The subject here is “a struggle,” which is a singular noun. We need a singular verb to match. “Does” is the correct answer—it is the only singular verb out of the choices. “Do” is a plural verb in this context, “doing” leads to gibberish, and “have done” uses the incorrect tense.
22. **(D)** Choice (D) is the only option to correctly place commas around the transitional word “however.” This choice also correctly uses a colon to come before a clarification.
23. **(D)** “Thus” means “therefore,” and is logical at this point since the previous sentence discusses how humans follow their instincts in seeking out a meditative state, and the current sentence elaborates on the poem’s symbolism. Choices (A) and (C) would introduce new ideas most likely in a list, and choice (B) would be used to show a contrast.
24. **(D)** The text starts by highlighting Chancourtois’s important contribution to chemistry. It then goes on to state that because of some minor errors and differences in terminology, his discovery was mainly ignored. Since the author is speaking about Chancourtois’s discovery in a positive light, it would make sense to say that it was “unfortunate” that his discovery was ignored. It is not “simultaneously” since the text goes on to talk about the future, which would not be simultaneous to Chancourtois. It is not “moreover” because this is not a continuation of an idea. It is not “naturally” because with all the unusual circumstances surrounding the way Chancourtois set up his table, it would not be logical to describe it as “natural.”
25. **(C)** The student’s goal is to show why it was difficult to find information about the *Hunley* during the 20th century. Since the ship remained submerged until the beginning of the 21st century, it makes sense that there would be little information about it. It is not choice (A) because the ship was not destroyed. It is not (B) because this would be an accurate assertion about recent discoveries, but not about ones during the 20th century. It is not choice (D) because this is not directly related to the student’s goal.
26. **(D)** Choice (D) is the only option that mentions specialized terminology as it relates to genealogical records—“consanguineous” and “affinal.” None of the other options mentions specialized terminology.

27. **(B)** The student's goal is to suggest something that could be done to do a comparative analysis of how effective certain antibiotics are. Choice (B) is the only option that provides a direct comparison between two antibiotics and their effectiveness. Choice (A) provides a comparison but not of antibiotics. Choice (C) is rather vague. Choice (D) focuses on history instead of biological analysis.

Section 2, Module 1: Math

1. **(B)**

$$\begin{aligned}(0.8a + 0.7b) - (1.4a - 0.3b) &\rightarrow \\ 0.8a + 0.7b - 1.4a + 0.3b &\rightarrow \\ (0.8a - 1.4a) + (0.7b + 0.3b) &\rightarrow \\ -0.6a + b\end{aligned}$$

2. **(C)** Take two clearly identifiable points from the line: $(0, 1)$ and $(-2, -2)$. The slope is the change in y divided by the change in x :

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - 1}{-2 - 0} = \frac{-3}{-2} = \frac{3}{2}$$

3. **(2)** Make things as easy as possible to solve for this expression: simply take half of the equation to find the value of $-5 + 6x$.

$$\begin{aligned}12x - 10 &= 4 \rightarrow \\ \frac{12x - 10}{2} &= \frac{4}{2} \rightarrow \\ 6x - 5 &= 2 \rightarrow \\ -5 + 6x &= 2\end{aligned}$$

4. **(A)** Manipulate the equation to isolate the height of the cylinder:

$$v = \pi r^2 h \rightarrow$$

Divide both sides by $\pi r^2 \rightarrow$

$$\frac{v}{\pi r^2} = h$$

This corresponds to choice (A).

5. **(C)** The voter turnout in the year 2008 was nearly 62 percent, making it the highest turnout for any of the years presented in the graph.

6. **(C)**

$$\begin{aligned}(2y^2 - y) - (2y^2 + 2y) &\rightarrow \\ 2y^2 - y - 2y^2 - 2y &\rightarrow \\ -y - 2y &= -3y\end{aligned}$$

7. **(D)** All three of the angles will add up to 180, so set up an equation to solve for x :

$$\begin{aligned}2x + 3x + 4x &= 180 \rightarrow \\ 9x &= 180 \rightarrow \\ x &= 20\end{aligned}$$

Since $\angle CED$ is equal to $3x$, multiply 3 by 20 to find the measure of the angle:

$$3 \times 20 = 60 \text{ degrees.}$$

8. **(1)** Take the cube root of both sides of the equation, then solve for x :

$$\begin{aligned}(x + 2)^3 &= 27 \rightarrow \\ \sqrt[3]{(x + 2)^3} &= \sqrt[3]{27} \rightarrow \\ x + 2 &= 3 \rightarrow \\ x &= 1\end{aligned}$$

9. **(B)** The number of diners who ordered a dessert is 50. Out of those 50, there were 15 diners who ordered an appetizer. Solve for the probability that a diner who ordered a dessert also ordered an appetizer by dividing 15 by 50:

$$\frac{15}{50} = \frac{3}{10}$$

10. **(1.5 or $\frac{3}{2}$)** The x -intercept of the equation is found when the y value of the point equals 0. So, plug 0 in for y to solve for the x -coordinate of the x -intercept.

$$\begin{aligned}y &= 2x - 3 \rightarrow \\ 0 &= 2x - 3 \rightarrow \\ 3 &= 2x \rightarrow \\ x &= \frac{3}{2}\end{aligned}$$

11. **(B)** The line is already in slope-intercept form, $y = mx + b$, in which the b represents the y -intercept. So, the y -intercept is -2 .

12. **($\frac{1}{3}$ or .3333)** Use substitution to solve for y . Since $y = \frac{1}{2}x$, $x = 2y$. Plug $2y$ in for x into the first equation:

$$\begin{aligned}3 &= \frac{3}{2}(4x - 2y) \rightarrow \\ 3 &= \frac{3}{2}(4(2y) - 2y) \rightarrow \\ 3 &= \frac{3}{2}(8y - 2y) \rightarrow \\ 3 &= \frac{3}{2}(6y) \rightarrow \\ 3 &= 9y \rightarrow \\ \frac{3}{9} &= \frac{1}{3} = y\end{aligned}$$

13. **(D)** All of the options have a y value of 0. So, look at what values of x will cause there to be a y value of 0, since a point that intersects the x axis must have a y value of 0. In $y = (x + 4)(x - 5)$, if x is 0, -4 , or 5, the entire right side of the equation would be 0. Therefore, all three options would be points at which the function intersects the x axis.

14. **(C)** The initial number of the bacteria can be found when you plug 0 in for h , since when $h = 0$ no time has passed.

$$1000 \times 2^0 = 1000 \times 1 = 1000.$$

Now, determine the value of h that would be needed to find a number of bacteria that is 8 times the initial value of 1,000: $8 \times 1000 = 8000$.

$$\begin{aligned}B(h) &= 1000 \times 2^h \rightarrow \\8000 &= 1000 \times 2^h \rightarrow \\8 &= 2^h \rightarrow 8 = 2^3\end{aligned}$$

Since 8 is equal to 2 cubed, the correct value for h in this situation is 3 hours. If you do not remember that 8 is equal to 2 cubed, you could also plug in the answer choices to solve.

15. **(D)** The spins that had total values of 6 or less are bolded and italicized below:

Total of Combined Spins	Number of Spins with That Total Value
2	1
3	2
4	2
5	4
6	5
7	6
8	7
9	4
10	3
11	4
12	2

Out of the 40 total turns, there is therefore a total of $1 + 2 + 2 + 4 + 5 = 14$ turns in which Pete has a total of 6 or less. Find the fraction of the combined spins as follows:

$$\frac{14}{40} = \frac{7}{20}$$

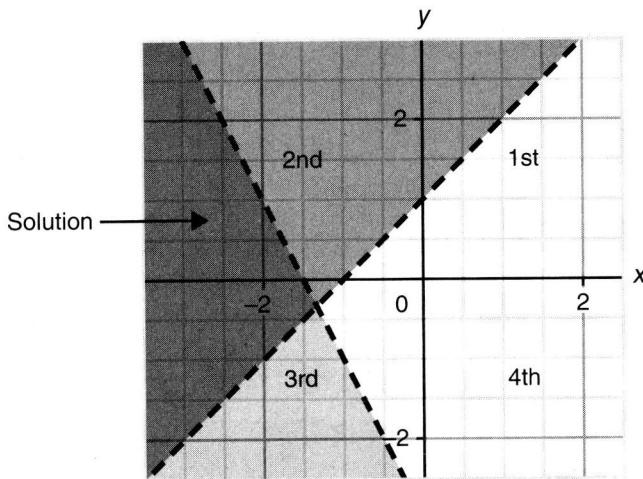
16. **(D)** Since the Mexico City area represented 17% of the total population of Mexico, solve for the total population of Mexico, x , by using this equation:

$$\begin{aligned}0.17x &= 22,000,000 \rightarrow \\x &= \frac{22,000,000}{0.17} \approx 129,000,000\end{aligned}$$

17. **(12)** Plug 5 in for x to solve for $f(5)$:

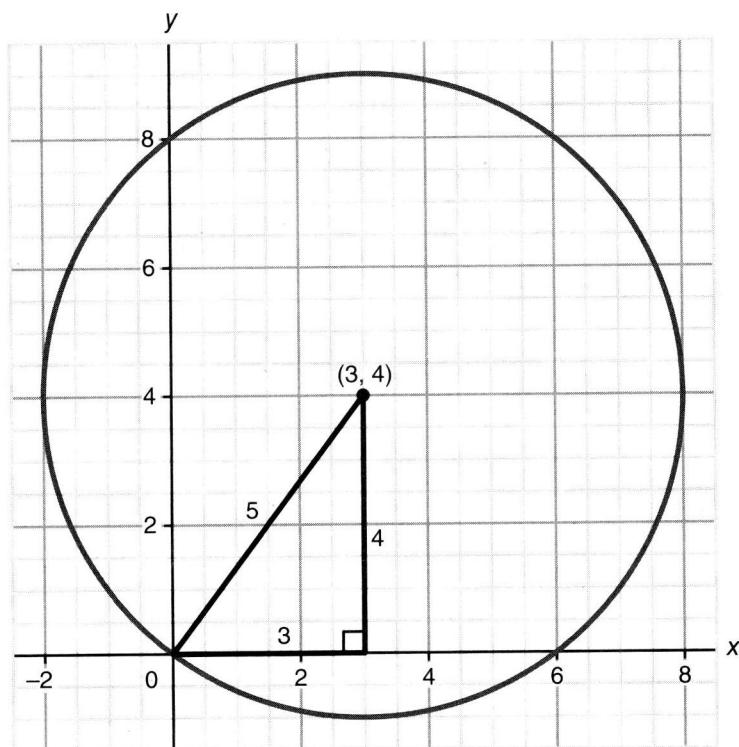
$$\begin{aligned}f(x) &= (x - 3)(x + 1) \rightarrow \\f(5) &= (5 - 3)(5 + 1) \rightarrow \\f(5) &= 2 \times 6 = 12\end{aligned}$$

18. **(D)** The solution set of the two inequalities $y > x + 1$ and $y < -2x - 3$ and the quadrants of the coordinate plane are graphed below:



So, the solution set is in quadrants 2 and 3 only.

19. **(C)** The computer costs \$2,000 and goes down by the same amount each year. After 6 years, the total amount of depreciation is $2000 - 800 = 1200$. So, to find the annual amount of depreciation, take 1200 and divide it by 6: $\frac{1200}{6} = 200$.
20. **(A)** A circle with a center at $(3, 4)$ that intersects at the origin, $(0, 0)$ would look like this:



To find the radius, notice that you can inscribe a special 3-4-5 right triangle as shown above. The radius is therefore 5. The equation of a circle is $(x - h)^2 + (y - k)^2 = r^2$, in which (h, k) represents the center, and r represents the radius. Plug in $(3, 4)$ for the center and 5 for the radius to find the answer:

$$\begin{aligned}(x - h)^2 + (y - k)^2 &= r^2 \rightarrow \\ (x - 3)^2 + (y - 4)^2 &= 5^2 \rightarrow \\ (x - 3)^2 + (y - 4)^2 &= 25\end{aligned}$$

21. **(D)** Find how many minutes there are in 16 hours:

$$\begin{aligned}16 \text{ hours} \times \frac{60 \text{ minutes}}{1 \text{ hour}} &\rightarrow \\ 16 \text{ hours} \times \frac{60 \text{ minutes}}{1 \text{ hour}} &= 960 \text{ minutes}\end{aligned}$$

Then, since Susan blinks 20 times per minute while awake, multiply 20 by 960 to find the total number of times she will blink:

$$20 \times 960 = 19,200$$

22. **(D)** Hugo spends \$400 a month on miscellaneous expenses. If he cut this expense by half and allocates all that he has cut to his savings, his savings would increase by \$200 a month. Hugo is trying to allocate more money into savings. Now, calculate how large of an increase this additional \$200 would be relative to the \$250 he is currently saving:

$$\frac{200}{250} \times 100 = 80\%$$

So, he would increase his monthly savings by 80% if he were to make this change.

Section 2, Module 2: Math

1. **(A)** Plug -2 in for x and solve:

$$\begin{aligned}g(x) &= \frac{x^3}{2} \rightarrow \\ g(-2) &= \frac{(-2)^3}{2} = \frac{-8}{2} = -4\end{aligned}$$

2. **(A)** The answers are all written in slope-intercept form, and they all have different slopes. So, calculate the slope of the linear function by using two points. We can use $(6, 0)$ and $(9, 1)$ since there is no negative value in the point, which could more easily lead to a careless error:

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - 0}{9 - 6} = \frac{1}{3}$$

The only option with a slope of $\frac{1}{3}$ is choice (A), $f(x) = \frac{1}{3}x - 2$.

3. **(C)** $\sqrt[3]{a} \times a^{\frac{5}{3}} = a^{\frac{1}{3}} \times a^{\frac{5}{3}} = a^{(\frac{1}{3} + \frac{5}{3})} = a^{\frac{6}{3}} = a^2$

4. **(B)** First, use the ordered pair $(8, 16)$ to solve for the value of the constant a :

$$y = ax \rightarrow$$

$$16 = a8 \rightarrow$$

$$\frac{16}{8} = a \rightarrow a = 2$$

Now, plug -3 in for y to the function that has the constant a as 2 :

$$y = 2x \rightarrow$$

$$-3 = 2x \rightarrow$$

$$\frac{-3}{2} = x \rightarrow x = -1.5$$

So, the answer is choice (B).

5. **(B)** Match the constants with the corresponding numbers on the other side of the equation.
 a equals 2 , b equals 16 , and c equals 32 . Add these numbers together to find the sum of a , b , and c :

$$2 + 16 + 32 = 50$$

6. **(A)** In the function $S(w) = 500 + 10w$, when zero weeks have gone by, the value of w will be 0 . Plugging 0 into the function for w , the amount of money she will have in her savings account will be 500 . This represents how much money she has in the account when no weeks have gone by, so it corresponds to choice (A), the money that is in her account at the beginning of the time period. Profit corresponds to revenue minus expenses, and the slope of 10 corresponds to the weekly increase in money in the account.
7. **(54)** The width of 2 inches on the map corresponds to 6 miles in actual distance, and the length of 3 inches on the map corresponds to 9 miles in actual distance. So, multiply 6 by 9 to find the actual area of the rectangular plot of land:

$$6 \times 9 = 54 \text{ square miles.}$$

8. **(C)** The total amount of time that it took Samara to complete the trip is $4 + 6 = 10$ hours. Use the equation $\text{Distance} = \text{Rate} \times \text{Time}$ to work with this problem. The problem asks for the average speed, which corresponds to the rate. Using that equation, the $\text{Rate} = \frac{\text{Distance}}{\text{Time}}$. Use 400 for the distance and 10 for the time to solve for the average rate over the entire trip:

$$\text{Rate} = \frac{\text{Distance}}{\text{Time}} \rightarrow$$

$$\text{Rate} = \frac{400 \text{ miles}}{10 \text{ hours}} = 40 \text{ mph}$$

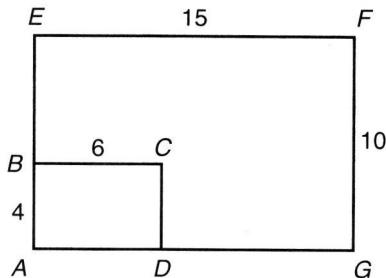
9. **(B)** Since the triangles are similar to one another, the ratios of the sides will be the same. So, the tangent of angle C will be the same as the tangent of angle F . The tangent of angle F is the opposite side ED divided by the adjacent side DF : $\frac{10}{24} = \frac{5}{12}$. This corresponds to choice (B).
10. **(C)** Based on the best-fit line that could connect the points, the amount that the value of an airplane decreases each year is approximately $\$5,000$. Since the initial cost of the airplane is approximately $\$100,000$, divide $100,000$ by $5,000$ to estimate when the plane value will closely approximate 0 dollars:

$$\frac{100,000}{5,000} = 20$$

So, 20 years after purchase the plane will closely approximate a value of 0 dollars.

11. **(D)** 400% of x is $4x$. This must be added to the original value of x to find the total value when x is increased by 400%: $4x + x = 5x$.

12. **(C)**



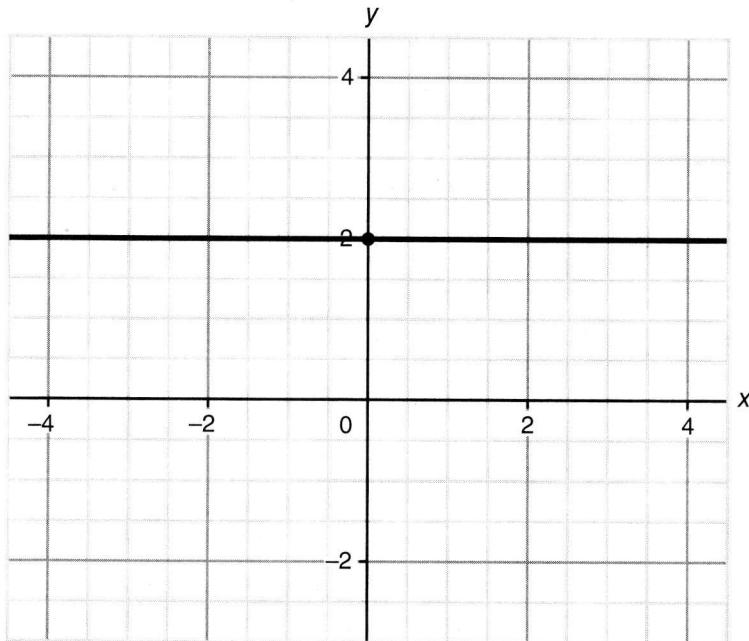
Since the rectangles are similar to one another, the sides are proportional. Therefore, the ratio of \overline{EF} to \overline{FG} will be the same as the ratio of \overline{BC} to \overline{AB} . Call x the length of side \overline{EF} , and set up a proportion to solve:

$$\frac{x}{10} = \frac{6}{4} \rightarrow \\ x = \frac{10 \times 6}{4} = \frac{60}{4} = 15$$

Since $AEGF$ is a rectangle, there will be two sides of length 15 and two sides of length 10. Find the perimeter of the rectangle by adding the lengths of all these sides together:

$$15 + 15 + 10 + 10 = 50.$$

13. **(A)** A line with the form $y = k$ will simply be a horizontal line. Since the constant k is greater than zero, it will not intersect the x axis at all, and will therefore have no zeros. For example, consider the equation $y = 2$. The graph of this line is given below:



As you can see, the line is horizontal and will never intersect the x -axis.

14. **(3)** The combined set of both classes will have a total of 40 students, since there are 20 students in each class. So, the median of the set of both classes will be between the 20th and 21st terms when the numbers are put in order from least to greatest. There are a total of 18 values that are 2 or less, and then there are 9 values that are 3. So, the 20th and 21st terms will both be 3, making 3 the median of the combined set of scores.

15. **(D)** What would be the value(s) of x that would be a solution or solutions to this equation?

$$\begin{aligned}\frac{x^2 - 4}{x - 2} &= 4 \rightarrow \\ \frac{(x - 2)(x + 2)}{(x - 2)} &= 4 \rightarrow \\ \frac{(x - 2)(x + 2)}{(x - 2)} &= 4 \rightarrow \\ x - 2 &= 4 \rightarrow \\ x &= 2\end{aligned}$$

Now, check to be sure this solution is not extraneous by plugging 2 back into the original equation:

$$\begin{aligned}\frac{x^2 - 4}{x - 2} &= 4 \rightarrow \\ \frac{(2)^2 - 4}{(2) - 2} &= 4 \rightarrow \\ \frac{0}{0} &\end{aligned}$$

This is undefined, so there are no solutions to the equation.

16. **(C)** The vertex in a parabola of the form $y = a(x - h)^2 + k$ is (h, k) . In the parabola with the equation $y = (x - 6)^2$, the value of h is 6 and the value of k is 0. So, the vertex of the parabola is $(6, 0)$.
17. **(B)** 14 out of the 44 people to serve as president of the United States prior to 2020 had previously been vice president. So, $\frac{14}{44}$ of the presidents had been vice presidents. Set up an equation expressing this as follows:

$$V = \frac{14}{44}P \rightarrow V = \frac{7}{22}P.$$

Therefore, the answer is choice (B).

18. **(144)** For the equations to have infinitely many solutions, they must be multiples of one another. Rearrange the equations so that the x and y terms match:

$$\begin{aligned}-\frac{1}{4}x + \frac{1}{6}y &= 12 \\ -3x + 2y &= a\end{aligned}$$

Notice that -3 is 12 times $-\frac{1}{4}$ and that 2 is 12 times $\frac{1}{6}$. So, multiply the 12 from the first equation by 12 to find the value of a in the second equation:

$$12 \times 12 = 144$$

So, $a = 144$.

19. **(D)** Given that J stands for the number of people from Julian's side of the family and that M stands for the number of people from Maria's side of the family, the first inequality should be $M + J > 200$, since they want to have more than 200 people in attendance. The second inequality represents the costs. The total cost for the reception should be less than \$18,000, and the cost for each invited guest is \$40. So, the second inequality should be $40(M + J) < 18,000$ to model this relationship. These two inequalities correspond to choice (D).
20. **(B)** Use unit analysis to cancel out the necessary terms and convert the value to the required terms:

$$\begin{aligned} 30 \frac{\text{Miles}}{\text{Hour}} \times \frac{5,280 \text{ Feet}}{1 \text{ Mile}} \times \frac{1 \text{ Hour}}{3,600 \text{ Seconds}} &\rightarrow \\ 30 \frac{\text{Miles}}{\text{Hour}} \times \frac{5,280 \text{ Feet}}{1 \text{ Mile}} \times \frac{1 \text{ Hour}}{3,600 \text{ Seconds}} &\rightarrow \\ \frac{30 \times 5,280}{3,600} = 44 \frac{\text{Feet}}{\text{Second}} \end{aligned}$$

21. **(43)** Since there are 360 degrees in a circle, the sector designated by $\angle ACB$ represents $\frac{100}{360}$ of the total area of the circle. The area for this circle is found using the formula πr^2 , and the radius of the circle is 7. So, multiply the area of the circle by the fraction of the area that the sector represents to find the sector's area:

$$\pi 7^2 \times \frac{100}{360} = 42.74$$

This would be rounded to an area of 43, since that is the nearest whole square unit.

22. **(C)** Use C to represent the number of cups of coffee Shantiel purchased, and T to represent the number of cups of tea purchased. Set up a system of equations to solve for C . First, since the number of cups of coffee is half the number of cups of tea, one equation would be $C = \frac{1}{2}T$. The second equation represents the milligrams of caffeine. Since there are 95 milligrams in each cup of coffee and 26 milligrams in each cup of tea, the equation would be $95C + 26T = 735$. Solve for C by using substitution from the first equation:

$$C = \frac{1}{2}T \rightarrow$$

$$2C = T$$

Now substitute $2C$ in for T into the second equation, then solve for C :

$$\begin{aligned} 95C + 26T &= 735 \rightarrow \\ 95C + 26(2C) &= 735 \rightarrow \\ 95C + 52C &= 735 \rightarrow \\ 147C &= 735 \rightarrow \\ C &= \frac{735}{147} = 5 \end{aligned}$$

So, she purchased 5 cups of coffee, which corresponds to choice (C).