

4.

D

$$\frac{15x^2y^4}{3xy^2} = 5x^{2-1}y^{4-2} = 5xy^2$$

5.

C

First, find the amount saved. $\$15.00 - \$12.00 = \$3.00$. Then, divide the amount saved by the original price.

$$\begin{array}{r} .20 \\ 15 \overline{)3.00} \\ \underline{3.00} \\ 0 \end{array}$$

Lastly, convert this decimal of 0.20 into a percentage by moving the decimal point 2 places to the right. The final answer is 20%.

6.

B

Round 90 to 100 and round 190 to 200. Then, divide 100 by 200 which equals $1/2$.

$1/2$ in percentage is 50%.

7.

A

When multiplying terms with a common base, you add exponents.

$$5^3 \times 5^7 = 5^{3+7} = 5^{10}$$

8.

C

First, multiply $\$32.00$ times 20%. 20% in decimal form is 0.2.

$$\$32.00 \times 0.2 = \$6.40$$

Then, subtract the saving from the regular price in order to find the sale price.

$$\$32.00 - \$6.40 = \$25.60$$

9.

B

First, find the probability of each outcome. Since a die has 6 sides, the probability of each outcome is $1/6$. This question asks you to find the probability of rolling a 2 or a 3. Add the probabilities of each outcome.

$$1/6 + 1/6 = 2/6$$

$2/6$ in lowest terms is $1/3$.

10.

A

First, multiply 10 times 0 which equals 0. Then, multiply 10 times 1 which equals 10. Therefore, the number must be between 0 and 10.

11.

D

There are a number of fractions that could represent 80%. Therefore, convert each fraction into a decimal and find out which fraction equals 0.8, because 0.8 is the decimal form of 80%. The answer is $4/5$ because $4/5 = 0.8$; (A) $1/4 = 0.25$ or 25%, (B) $1/3 = 0.\bar{3}$ or about 33%, and (C) $3/8 = 0.375$ or 37.5%.

12.

D

Convert the words "five more than three times a number" into an expression. The term "five more" means to add five, and the term "three times a number" means multiply by three. Therefore, the expression $3x + 5$ is correct.

13. **D**

First, multiply the regular price by the percent off. In decimal form 15% is 0.15.

$$\$60 \times 0.15 = \$9$$

Then, subtract the savings from the regular price.

$$\$60 - \$9 = \$51$$

14. **A**

First, find the lowest common denominator for the numbers 6 and 7. The lowest common denominator is 42, because both 6 and 7 divide evenly into 42. Then, put 42 into prime factored form. A prime number is a number that can only be divided by one and itself. A factor divides evenly into a number.

$$2 \times 3 \times 7 = 42$$

Therefore, $2 \times 3 \times 7$ is the final answer.

15. **C**

This question is really asking you to find the square root of 225 and then the square root of 400. Remember, squaring a number and taking the square root of a number are opposite operations.

The square root of 225 is 15 because $15 \times 15 = 225$. The square root of 400 is 20 because $20 \times 20 = 400$. Therefore, the final answer is between 15 and 20.

16. **B**

The absolute value of a number is just the positive form of that number. The absolute value of -7 is simply 7.

17. **C**

First, find 10% of \$16.00. $\$16.00 \times 0.1 = \1.60

Then, add $1/2$ of \$1.60, which is \$0.80, to \$1.60.

$$\$1.60 + \$0.80 = \$2.40$$

18. **C**

This question is really asking, "Which of the following answers can be divided evenly by the numbers 2, 5, and 8?" The answer is the number 40.

19. **C**

Round 216 to 200 and round 192 to 200. Then multiply.

$$200 \times 200 = 40,000$$

20. **B**

In order to find the probability of a single outcome, you need to first list all possible outcomes from the experiment. If you flip a coin 2 times, there are four possible outcomes: {HH, HT, TH, TT}. Each outcome has a $1/4$ chance of occurring. $1/4$ in percentage terms is 25%. Therefore, the probability of rolling 2 heads in two flips of a fair coin is 25%.

21. **B**

In order to find Mary's mean score, add her scores for each of the four tests, and then divide by four.

$$9 + 8 + 10 + 5 = 32$$

$$32/4 = 8$$

22. **A**

Tuesday has the greatest increase in temperature over that of the previous day.

The high temperature for Tuesday was 65, while for Monday, it was 50. The difference is a 15 degree increase. On Wednesday (B), the temperature *decreased* 10 degrees. On Thursday (C), the temperature increased 10 degrees, and on Friday (D), the temperature increased only 5 degrees.

23. **D**

If there is a 35% chance of rain, then there is a 65% chance that it *does not* rain. The probability that it *does not* rain is equal to 100% minus the probability that it does rain.

$$100\% - 35\% = 65\%$$

24. **B**

Each flip of a coin is an independent event. Therefore, the probability that the coin lands heads is $\frac{1}{2}$, no matter how many times it has just landed tails. The coin does not remember.

25. **B**

The mode is the most frequently occurring score. Because the number 3 occurs more often than any other number in the set, it is the mode score.

26. **D**

The number of complaints is not as important as the average number of complaints. This is because an average takes into consideration how long a company has been in business. SPEEDY delivery company has $\frac{100}{25}$ or an average of four complaints per month.

However, ON TIME delivery company has $10/2$ or an average of five complaints per month. Therefore, on average, ON TIME delivery company has more complaints per month. It is misleading for a company to say that they have less complaints than another company when they have not been in business as long.

27.

C

Since there are four cards, each card has a 0.25 probability of being selected. This is because $1/4 = 0.25$. Thus, the probability of selecting a heart is 0.25.

The probability of *not* selecting a heart is $1.0 - 0.25 = 0.75$.

28.

B

The warmest day of the week is Thursday. Tuesday is the second warmest while Wednesday is the third warmest. Starting from the point on the graph that marks Wednesday, look left at the temperature axis that shows 55 degrees.

29.

C

The amount of rainfall is determined by looking at the length of the bars. First, find the shortest bar which is July, and the second shortest which is August. The third shortest is March. Next, looking left from March to the rainfall axis, you can see that March had 5 inches of rain.

30.

B

In order to find the median, you must first rank order the scores like this:

0, 2, 3, 5, 6, 7, 12.

The median value is the score in the middle. The median is 5.

31. **A**

Draw a line through the set of data points. Notice that low values of temperature go with high sales, and that high-temperature values go with low sales. Next, evaluate the truth of each possible answer. The graph shows that as temperature decreases, sales of jackets increase.

32. **C**

The amount of rainfall is determined by the length of the bars used to make the graph. First, find the longest bar, which is October, then the second longest, which is November, then the third longest, which is December. Finally, the fourth-longest bar is May. May has the fourth-highest average monthly rainfall.

33. **A**

Divide a number by 2 means $x/2$. Add 3 to the result means plus 3. The answer is 10 means equals 10. The final answer is $x/2 + 3 = 10$.

34. **D**

The general equation for a line is $y = mx + b$ where m is the slope and b is the y -intercept. The slope is equal to rise over run, so the slope of the line in the graph is equal to $1/1$ or 1. The y -intercept is the point at which the line crosses the y -axis, so the y -intercept of the line is equal to 2. Therefore, the equation of the line is $y = x + 2$.

35. **C**

Draw a line through the set of data points. Notice that low grade levels go with low hours of reading, and that high grade levels go with high hours of reading. Next, evaluate the truth of each possible answer. The graph shows that as the grade level goes up, the number of reading hours goes up.

36.

D

The graph of the function y equals x squared is called a parabola.

(A) This is a graph of y equals negative x to the third power.

(B) This is a graph of y equals x .

(C) This is a graph of y equals negative x .

37.

C

$$(3xy^2)(7x^2y^3) = 21x^{1+2}y^{2+3} = 21x^3y^5$$

38.

B

Solve for x means to get x by itself.

$$3x + 5 < 20$$

$$3x < 20 - 5$$

$$3x < 15$$

$$\frac{3x}{3} < \frac{15}{3}$$

$$x < 5$$

39.

C

The variable on the x -axis is "Balance in \$1,000." The variable on the y -axis is "Interest rate in %." One line represents Bank A and one line represents Bank B. Notice that the two lines cross each other at \$3,000. For balances of more than \$3,000, Bank A pays more interest than Bank B.

40. **D**

Let g equal the number of girls, and let b equal the number of boys. The number of boys as equal to four times the number of girls is expressed by $4 \times g = b$.

41. **B**

The variable on the x -axis is number of music CDs. The variable on the y -axis is total cost. The price of each CD can be read from finding one CD on the x -axis, going up until you hit the line, then reading the cost on the y -axis. One CD costs \$20.

42. **A**

This question is asking you to substitute 2 for x and 5 for y . Then, perform the indicated operations in the equation to come up with a single number.

$$\begin{aligned}\frac{xy + 4}{2} - 3 &= \frac{(2)(5) + 4}{2} - 3 \\ &= \frac{10 + 4}{2} - 3 \\ &= \frac{14}{2} - 3 \\ &= 7 - 3 \\ &= 4\end{aligned}$$

43. **B**

$$(5x^3y^2z)(9xy^2z) = 45x^{3+1}y^{2+2}z^{1+1} = 45x^4y^4z^2$$

44. **C**

Solve for x means to get x by itself.

$$4x + 4 = 7$$

$$4x = 7 - 4$$

$$4x = 3$$

$$\frac{4x}{4} = \frac{3}{4}$$

$$x = \frac{3}{4}$$

45. **B**

Slope is equal to rise over run. In the figure, you can see that the rise is 3 and the run is 2. Therefore, the slope is 3 over 2 or $3/2$.

46. **B**

Divide 20 by 2.5 in order to find out how many minutes it will take to fill the gas tank. 20 divided by 2.5 equals 8.

47. **B**

Draw a line through the points given but also extend this line downward. Next, find the year 1995 on the x -axis and then go up until you hit the line that you have drawn. Then, read the number of oranges produced on the y -axis. The answer is 10,000.

48. **D**

Solve for x means to get x by itself.

$$\frac{x}{3} - 2 = 8$$

$$\frac{x}{3} = 8 + 2$$

$$\frac{x}{3} = 10$$

$$\frac{(3)x}{3} = 10(3)$$

$$x = 30$$

49. **D**

In order to calculate the average number of miles per gallon, you need to know two different variables—miles and gallons. This question gives you the number of gallons, but *not* the number of miles traveled. The fact that the truck made 100 different deliveries is irrelevant information.

50. **C**

Average speed is expressed in terms of “miles per hour.” *Per* means *divide*, so divide miles by hours. Thus, 376 divided by 8 equals 47.

51. **B**

Multiply the number of centimeters in one inch by ten.

$$2.54 \times 10 = 25.4$$

This is approximately equal to 25.

52.

A

In order to answer this question, you need to use the Pythagorean theorem. The Pythagorean theorem tells you about the relationships between the length of the sides of a right triangle. The Pythagorean theorem is $a^2 + b^2 = c^2$, where a and b are the sides, and c is the hypotenuse. The hypotenuse is the side opposite the right angle. The present question is really asking you to find c .

$$a^2 + b^2 = c^2$$

$$4^2 + 3^2 = c^2$$

$$16 + 9 = c^2$$

$$25 = c^2$$

$$\sqrt{25} = \sqrt{c^2}$$

$$c = 5$$

53.

A

Divide the number of square feet by nine.

$$135/9 = 15$$

There are 15 square yards in 135 square feet.

54.

C

See the shaded region as being made up of four separate triangles. Calculate the area of one triangle using the formula *one-half its base times its height*, or in formula form: $1/2bh$. In the present problem, the base is 3 and the height is 3.

$$\frac{1}{2}(3)(3) = \frac{1}{2}(9) = 4.5$$

This is the area of one triangle. Since there are four triangles in the shaded region, multiply this area times four. Thus, $4.5 \times 4 = 18$. The final answer is 18 square inches.

55. **C**

This question is asking you to find the circumference of a circle using this formula: circumference equals pi times the diameter. However, in this question you are given the length of the radius which is 5 inches. The diameter is equal to the radius times two, so the diameter is equal to $2(5) = 10$ inches. Now, use the formula $C = \pi d$; $\pi = 3.14$.

$$C = 3.14(10) = 31.4 \approx 31$$

The circumference of the circle is approximately equal to 31 inches.

56. **A**

Find the y -axis. Find the side of the figure closest to the y -axis and measure the distance that this side is from the y -axis. A reflection of the figure will put this side the same distance from the y -axis, but on the other side.

Also, notice the point labeled C. A reflection of this point across the y -axis will also be the same distance from the y -axis, but on the other side.

57. **D**

Use the formula $\frac{1}{2}bh$.

$$\frac{1}{2}(16)(6) = \frac{1}{2}(96) = 48$$

The triangle has an area of 48 square inches. Note: The length of the side that equals 10 inches is irrelevant.

58. **D**

Multiply the number of cubic centimeters in one cubic inch by two.

$$2 \times 16.38 = 32.76$$

There are approximately 32.76 cubic centimeters in two cubic inches.

59.

A

First, make use of the fact that the sum of the angles of any triangle is 180 degrees. The missing angle in the second triangle can be found by adding the two angles and then subtracting from 180.

$$80 + 30 = 110$$

$$180 - 110 = 70$$

The missing angle equals 70 degrees. Now compare the two triangles. You can see that both triangles have an angle 70 degrees, a side 8 inches, and an angle 30 degrees. Therefore, by the Angle-Side-Angle postulate, the two triangles are congruent.

60.

B

The formula for the area of a triangle is $\frac{1}{2}bh$ where b equals base, and h equals height. The area of triangle A equals $\frac{1}{2}(5)(2) = \frac{1}{2}(10) = 5$. The area of triangle B equals $\frac{1}{2}(10)(4) = \frac{1}{2}(40) = 20$. Lastly, divide the area of triangle A by the area of triangle B, and put this fraction into lowest terms.

$$\frac{5}{20} = \frac{1}{4}$$

61.

C

Plot the points given on an x, y graph. Then, connect the nearest points. The figure created is called a parallelogram. A parallelogram is a figure with four sides, having the opposite sides parallel and equal.

62. **B**

In the scaled drawing, length is equal to $3\frac{1}{4}$ inches or, in decimal form, 3.25 inches. The scale is "1 inch equals 24 feet." In order to find the length in feet, multiply the number of inches times 24.

$$3.25 \times 24 = 78$$

63. **C**

See this figure as a square with a triangle removed. Calculate the area of the triangle. Area equals $\frac{1}{2}(3)(4) = \frac{1}{2}(12) = 6$. Then, calculate the area of the square. Area equals $5 \times 5 = 25$. Lastly, in order to find the area of the actual figure, subtract the area of the triangle from the area of the square.

$$25 - 6 = 19$$

64. **D**

First, calculate the area of the duck pond. Round 47 to 50, and round 43 to 40. Next, multiply: $50 \times 40 = 2,000$. The area of the duck pond is 2,000 square feet. Now, calculate the area of the lot: $100 \times 100 = 10,000$. Lastly, in order to find the approximate area of the flower garden, subtract the area of the duck pond from the area of the lot.

$$10,000 - 2,000 = 8,000$$

The flower garden is approximately 8,000 square feet.

65. **C**

Use the formula: distance equals rate times time. In this question, you are given the rate, and you are given the distance. In order to solve for time, divide distance by rate thusly: 220 divided by 40 equals 5.5 hours. However, this question is asking for time in minutes. In order to convert hours into minutes, multiply by 60.

$$5.5 \times 60 = 330$$

66. **A**

Calculate volume by multiplying height times width times length.

$$4 \times 6 \times 20 = 480$$

67. **D**

The formula given for the area of a circle is pi times r squared. Pi is approximately equal to 3.14 or more approximately 3, while r is equal to the radius of the circle. In this question, r is equal to 30.3 or approximately 30. The equation for area is pi times r squared. r squared equals r times r . Therefore, the approximate area of the circle is $3 \times 30 \times 30 = 2,700$.

68. **C**

Determine the length of the trips in parts. For the first trip (A), there are 3 hours between 9:00 a.m. and 12:00 p.m., and there are 3 hours and 20 minutes between 12:00 p.m. and 3:20 p.m. So, the entire trip takes 6 hours and 20 minutes. Similarly, the second trip (B) takes 6 hours 35 minutes, the third trip (C) takes 6 hours and 5 minutes, and the last trip (D) takes 6 hours and 10 minutes. So, the third trip (C) is the shortest.

69. **A**

Solve for x means to get x by itself.

$$2(7x - 3) + 4(x - 2) = 22$$

$$14x - 6 + 4x - 8 = 22$$

$$18x - 14 = 22$$

$$18x = 22 + 14$$

$$18x = 36$$

$$\frac{18x}{18} = \frac{36}{18}$$

$$x = 2$$

70. 

In order to find the coordinates of the y -intercept of a line, let x equal 0 and solve for y .

$$3x - 5y = 15$$

$$3(0) - 5y = 15$$

$$-5y = 15$$

$$\frac{-5y}{-5} = \frac{15}{-5}$$

$$y = -3$$

Therefore, the coordinates of the y -intercept are $(0, -3)$.

71. 

Parallel lines have the same slope but different y -intercepts. Intersecting lines (B) have different slopes. Perpendicular lines (C) cross each other at a 90-degree angle. Parabolic (D) describes a curved function, not a line.

72. **D**

This equation has an absolute value sign in it. An absolute value means the positive value of a number. The equation given is $|x + 5| = 7$. This is read, "the absolute value of $x + 5$ equals 7." There are two possible answers to this equation. Either,

$$x + 5 = -7 \quad \text{or} \quad x + 5 = 7$$

$$x = -7 - 5 \quad \text{or} \quad x = 7 - 5$$

$$x = -12 \quad \text{or} \quad x = 2$$

The final answer is $\{-12, 2\}$.

73. **C**

In order to find which point lies on the line expressed by an equation, plug each (x, y) point into the equation, one at a time, until you find a point that makes the equation true. The multiple choices are: (1, 4) (2, 3) (3, 2) (6, 1)

$$2x + 3y = 12 \quad \text{is the equation given.}$$

$$2(1) + 3(4) = 14 \quad \text{This does not equal 12.}$$

$$2(2) + 3(3) = 13 \quad \text{This does not equal 12.}$$

$$2(3) + 3(2) = 12 \quad \text{This does equal 12. This point (3, 2) falls on the line } 2x + 3y = 12$$

$$2(6) + 3(1) = 15 \quad \text{This does not equal 12.}$$

The final answer is the point (3, 2).

74. **B**

In order to find the area of a rectangle, multiply width times length. The width is x while the length is $x + 2$.

$$x(x + 2) = x^2 + 2x$$

75. **B**

Answering this question involves getting rid of the denominators by cross multiplying.

$$\frac{6}{x+4} = \frac{10}{x}$$

$$\frac{6}{x+4} \times \frac{x}{x} = \frac{10}{x} \times \frac{x}{x}$$

$$6x = 10(x + 4)$$

76. **D**

The equation $4|x| = 24$ has an absolute value sign in it. The absolute value of a number is always positive. There are two solutions to this equation. The two solutions are -6 and 6 .

$$4|x| = 24$$

$$4|-6| = 24$$

$$4|6| = 24$$

The final answer is $\{-6, 6\}$

77. **C**

First, round the number 483 to 500. Second, round the number 21 to 20. Then multiply: 500 times 20 equals 10,000.

78. **C**

Solving this problem requires distributing the number in front of the parentheses across both terms inside of the parentheses.

$$4(x - 1) = 4x - 4$$

Therefore, $2x + 3 < 4(x - 1)$ is equivalent to $2x + 3 < 4x - 4$.

79.

C

The general form for the equation of a line is $y = mx + b$ where m is the slope and b is the y -intercept. *Parallel lines have the same slope.* Inspect each of the multiple choices until you find a line that has the same slope. In the equation $y = 2x - 9$, the slope is 2. Therefore, the line $y = 2x + 7$ is parallel to it.

80.

C

This question is really asking, "Which of the following points will make both equations true?" In order to answer this question, try each (x, y) point, one at a time, until you find a point that makes *both* equations true. The multiple choices are: $(4, -5)$ $(3, 0)$ $(-3, -9)$ $(6, 2)$

$$y = 2x - 3$$

$$y = 3x$$

$$-5 = 2(4) - 3 \qquad -5 = 5 \qquad \text{false}$$

$$-5 = 3(4) \qquad -5 = 12 \qquad \text{false}$$

$$0 = 2(3) - 3 \qquad 0 = 3 \qquad \text{false}$$

$$0 = 3(3) \qquad 0 = 9 \qquad \text{false}$$

$$-9 = 2(-3) - 3 \qquad -9 = -9 \qquad \text{true}$$

$$-9 = 3(-3) \qquad -9 = -9 \qquad \text{true}$$

The point $(-3, -9)$ makes both equations true.

$$2 = 2(6) - 3 \qquad 2 = 9 \qquad \text{false}$$

$$2 = 3(6) \qquad 2 = 18 \qquad \text{false}$$

The final answer is the point $(-3, -9)$.