Pre-Algebra

1. During a sale, a shirt’s price is reduced by 30%. If the shirt’s original price was $20, what is the new price of the shirt?
   1. $6
   2. $10
   3. $14
   4. $20
   5. $26

Explanation: **C.** Since you are asked for the new price of the shirt, you must first find 30% of $20 and then subtract that number from the original price. To find 30% of $20, solve *x*/20 = 30/100. Because 30% of $20 is $6, $20 – $6 = $14.

1. Anna has 6 pink marbles, 3 purple marbles, and 1 yellow marble. If all of the marbles are put into a bag, what is the probability that Anna will draw a purple marble?
   1. 10%
   2. 30%
   3. 35%
   4. 50%
   5. 60%

Explanation: **B.** Probability = (specific outcome) ÷ (total number of outcomes). Therefore, (3 purple marbles) ÷ (6 pink marbles + 3 purple marbles + 1 yellow marble) = .30. To change .30 into a percent, multiply by 100% to get 30%.

1. For integers *x* and *y* such that *xy* = 12, which of the following is NOT a possible value for *x*?
   1. -1
   2. 3
   3. 6
   4. 8
   5. 12

Explanation: **D.** The integer 8 cannot be a possible value for *x* because, by definition, integers must be positive or negative whole numbers. In order to get the value 12 after multiplying *x* and *y*, both *x* and *y* would have to divide evenly into 12. When 12 is divided by 8, a remainder is left over. All the other numbers divide evenly into 12 without a remainder.

1. Between which two consecutive integers does √70 lie?
   1. 4 and 5
   2. 5 and 6
   3. 6 and 7
   4. 7 and 8
   5. 8 and 9

Explanation: **E.** Since the square root of 64 is 8 and the square root of 81 is 9, the square root of 70 must lie between consecutive integers 8 and 9 because 70 lies between their squares.

1. If 7(*x* – 7) = -14, then *x* = ?
   1. -9
   2. -5
   3. 0
   4. 5
   5. 9

Explanation: **D.** First, distribute the 7 to (*x* – 7). This results in 7*x* – 49 = -14. To isolate the 7*x*, add 49 to the other side, resulting in 7*x* = 35. Divide 35 by 7, leaving *x* equal to 5.

1. If 60% of *x* is 30, then what is 20% of *x*?
   1. 6
   2. 10
   3. 14
   4. 26
   5. 50

Explanation: **B.** To be able to find 20% of *x*, the value of *x* must first be determined. Knowing that 30 is 60% of *x*, we can solve for *x* using the equation .6*x* = 30. Divide 30 by .6, leaving *x* equal to 50. Then, multiply 50 by .2 to find 20% of *x*, which equals 10.

**Use the table below for questions 7–8.**

A survey of 400 students was taken at one school in Tampa. All 400 students voted for their favorite school subject. The results of the survey are recorded in the following table.

|  |  |
| --- | --- |
| **School Subject** | **Number of Students** |
| History | 90 |
| Math | 70 |
| Science | 130 |
| English | 110 |

1. What percent of students chose math in the survey?
   1. 17.5%
   2. 22.5%
   3. 27.5%
   4. 32.5%
   5. 35.5%

Explanation: **A.** To find the percent of students who chose math in the survey, we need to divide the number of students who chose math (70) by the total number of students who took the survey (400). This can be written as 70 ÷ (90 + 70 + 130 + 110), which equals .175. To change to a percent, multiply by 100 to get 17.5%.

1. If the results are indicative of how the 12,000 total students in Tampa will vote, about how many votes would history receive?
   1. 2100
   2. 2700
   3. 3100
   4. 3300
   5. 3900

Explanation: **B.** Since the survey results are indicative of how the 12,000 total students in Tampa will vote, but only 400 were surveyed, then the survey results must be multiplied by a constant to represent all 12,000 students. To find the constant, divide 12,000 by 400, which equals a constant of 30. This means that the votes in each category must each be multiplied by 30 to represent the votes of the 12,000 students. To find how many votes history would receive, multiply 90 by 30 to get 2700.

1. Leo’s bike odometer read 5,782 miles before his bike ride and 5,845 after his bike ride. If Leo rode his bike for 3.5 hours, what was his average speed (in miles per hour)?
   1. 15
   2. 16
   3. 17
   4. 18
   5. 19

Explanation: To find the average speed, divide the total distance traveled by the time it took. Since Leo’s odometer read 5,782 miles before the bike ride and 5,845 after the bike ride, he rode a total of 63 miles. For average speed, 63 miles ÷ 3.5 hours = 18 miles per hour.

1. |6 – 2| – |2 – 6| = ?
   1. -8
   2. -4
   3. 0
   4. 4
   5. 8

Explanation: The absolute value of a number represents its numerical value, disregarding a positive or negative sign. The absolute value of 6 – 2 is 4, and the absolute value of 2 – 6 is also 4. When simplified, 4 – 4 = 0.

1. In order to earn an A in Ms. Gonzalez’ history class, a student must earn an average of at least 90 points on all 4 tests. Each test is worth 100 points. If a student has earned scores of 94, 87, and 88 on the first 3 tests, what is the minimum score the student can earn to have a test average of 90 points?
2. For every 30 games played by a soccer team, they will lose 6 games. What is the ratio of wins to losses?
3. The average of 5 numbers in a data set is 38. Four of the numbers in the data set are 45, 61, 39, and 30. What is the 4th number?
4. What is the median for the following data set? 3, 4, 7, 10, 12, 4
5. Sarah is in a tournament and has the highest average after 4 games. She has scored 50, 46, 63, and 59. If she wanted to keep this exact average, what must she score in the 5th game?