

# K-12

## CC-G8-Math

### Common Core Grade 8 Mathematics Exam

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## Question: 1

Which fraction is equivalent to 0.375?

- a.  $\frac{4}{25}$
- b.  $\frac{1}{6}$
- c.  $\frac{3}{8}$
- d.  $\frac{3}{20}$

- A. Option A
- B. Option B
- C. Option C
- D. Option D

**Answer: C**

Explanation:

Changing 0.375 into a fraction by writing  $\frac{375}{1000}$  because 0.375 is in the thousandths. Then reduce the fraction by dividing the numerator and the denominator by the greatest common factor of 125 to get  $\frac{3}{8}$ .

## Question: 2

$2\sqrt{5}$  is between which two numbers?

- A. 4 and 5
- B. 2 and 3
- C. 3 and 4
- D. 10 and 11

**Answer: A**

Explanation:

Compare the square of  $2\sqrt{5}$  to the square of the whole numbers.  $(2\sqrt{5})^2 = 2^2\sqrt{5}^2 = 4 \times 5 = 20$ . See that 20 is between 16 and 25, or  $4^2$  and  $5^2$ , so  $2\sqrt{5}$  is between 4 and 5. Checking with a calculator,  $2\sqrt{5} \approx 4.472$

## Question: 3

A square has an area of 64 square units. What is the length of one side square?

- A. 7
- B. 6
- C. 10
- D. 8

**Answer: D**

Explanation:

The formula for the area of a square is  $A = s^2$ , where  $s$  is the length of one side of the square. In this case,  $64 = s^2$ . To solve for  $s$ , just square root both sides of the equation and  $s=8$ .

### Question: 4

The total length of the world's coastlines is about 315,000 miles. Which answer expresses this in scientific notation?

- a.  $3.15 \times 10^{-6}$
- b.  $3.15 \times 10^{-5}$
- c.  $3.15 \times 10^6$
- d.  $3.15 \times 10^5$

- A. Option A
- B. Option B
- C. Option C
- D. Option D

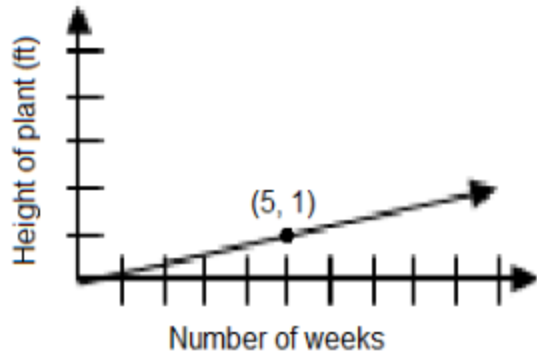
**Answer: D**

Explanation:

To write a number in scientific notation, the form is  $a \times 10^n$ , where  $1 \leq a < 10$ . The decimal need to move 5 spaces to the left so it is immediately to the right of the 3. Because it moved 5 spaces to the left,  $n = 5$ , so the answer is  $3.15 \times 10^5$

### Question: 5

Marla is growing a plant. The plant's growth is graphed below. Based on the graph how many feet does the plant grow each week?

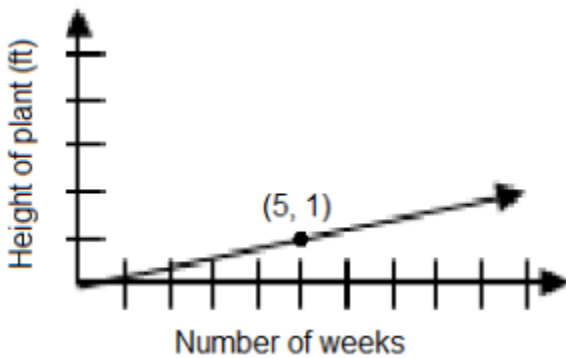


A. For answer see Explanation below.

**Answer: A**

Explanation:

The point on the graph is at (5,1), which shows that after 5 weeks the plant has grown 1 foot. This means that the plant grows  $\frac{1}{5}$  ft. per week.



### Question: 6

John's Gym charges its members according to the equation  $C = 40m$  where  $m$  is the number of months and  $C$  represents the total cost to each customer after  $m$  months. Ralph's Recreation Room charges its members according to the equation  $C = 45m$ . What relationship can be determined about the monthly cost to the members of each company?

- A. John's monthly membership fee is equal to Ralph's monthly membership fee.
- B. John's monthly membership fee is more than Ralph's monthly membership fee.
- C. John's monthly membership fee is less than Ralph's monthly membership fee.
- D. No relationship between the monthly membership fees can be determined.

**Answer: C**

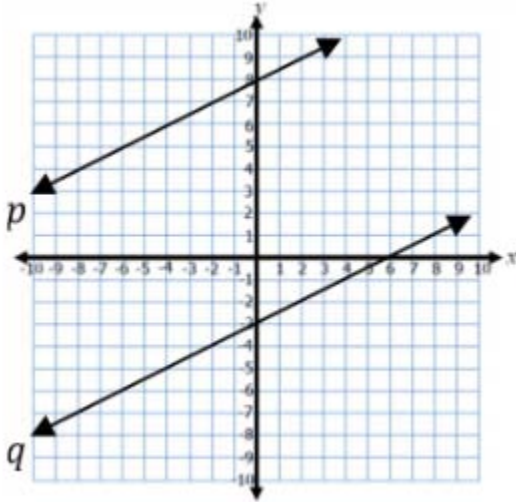
Explanation:

In both equations, the coefficient of  $m$  is the rate of change. In this problem, the rate of change

represents the customer's monthly cost. Therefore the customers at John's Gym pay \$40 per month, and the customers at Ralph's Recreation Room pay \$45 per month. Thus, John's monthly membership fee is less than Ralph's monthly membership fee.

### Question: 7

What relationship can be determined about the slopes of line  $p$  and line  $q$ ?



- A. The slope of line  $p$  is equal to the slope of line  $q$ .
- B. The slope of line  $p$  is greater than the slope of line  $q$ .
- C. The slope of line  $p$  is less than the slope of line  $q$ .
- D. No relationship can be determined from the graph.

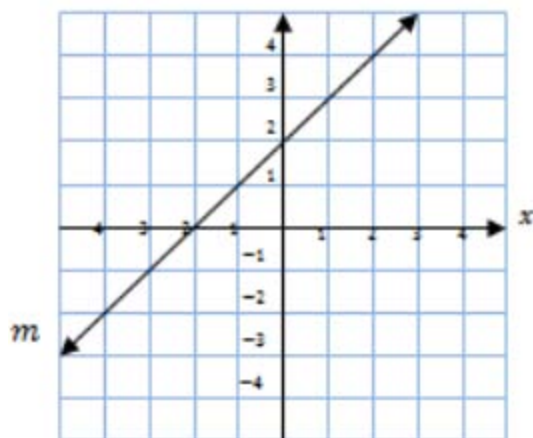
**Answer: A**

Explanation:

The slope of a line is its rate of change, or vertical change over horizontal change. For every 2 the line  $p$  moves right, it moves up 1. The slope for line  $p$  is  $\frac{1}{2}$  and the slope of line  $q$  is also  $\frac{1}{2}$ . Therefore, the slope of line  $p$  is equal to the slope of line  $q$ .

### Question: 8

Write an equation for line  $m$  in slope-intercept form.



- A.  $y = x - 1$
- B.  $y = x + 2$
- C.  $y = x + 3$
- D.  $y = x + 4$

**Answer: B**

Explanation:

Writing the equation of the line in slope-intercept form  $y = mx + b$ , the y-intercept,  $b$ , is  $(0, 2)$  and the slope,  $m$ , or rate of change is  $\frac{1}{1} = 1$ . Substituting these numbers into the equation the answer is  $y = x + 2$ .

### Question: 9

Given the equation  $+1 = \_ x + \_$ . Create an equation with no solutions, one solution, and infinitely many solutions.

Equation with no solutions

$$6x + 1 = \boxed{\phantom{00}}x + \boxed{\phantom{00}}$$

Equation with one solution

$$6x + 1 = \boxed{\phantom{00}}x + \boxed{\phantom{00}}$$

Equation with infinitely many solutions

$$6x + 1 = \boxed{\phantom{00}}x + \boxed{\phantom{00}}$$

- A.  $x = 1$
- B.  $x = 2$
- C.  $x = 3$
- D.  $x = 4$

**Answer: D**

Explanation:

An example of an equation with no solutions is  $6x + 1 = 6x + 3$ .

To solve this equation, we can subtract  $6x$  off of both sides. This leaves  $3=1$  which is not true so there is no solution to this equation.

An example of an equation with one solution is  $6x + 1 = 4x + 9$ .

The equation is solved below:

$$\begin{array}{ll} 6x+1=4x+9 & \text{Subtract } 4x \text{ from both sides of the equation} \\ 2x+1=9 & \text{Subtract } 1 \text{ from both sides of the equation} \\ 2x=8 & \text{Divide by } 2 \text{ on both sides of the equation} \\ x=4 & \text{So there is one solution to this equation.} \end{array}$$

An example of an equation with infinite solutions is  $6x + 1 = 6x + 1$ . For any value of  $x$  that is plugged in each side will always equal the other side.

### Question: 10

How many solutions does the equation  $2(7x - 5) = 14x - 8$  have?

- A. None
- B. One
- C. Two
- D. Infinitely many solutions

**Answer: A**

Explanation:

The equation is solved below:

$$\begin{array}{ll} 2(7x - 5) = 14x - 8 & \text{Distribute } 2 \text{ across the parentheses} \\ 14x - 10 = 14x - 8 & \text{Subtract } 14x \text{ from both sides of the equation} \\ -10 = -8 & \end{array}$$

Because  $-10 \neq -8$ , no solution exists for the equation.

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