

KEY

Representing Proportional Relationships with Equations



Objective

In this lesson, you will

Equations of Proportional Relationships

Example: When Jeb woke up this morning and looked out his bedroom window, he saw that it was snowing. He switched on the TV and heard the weather forecaster predict 1 inch of snowfall every 3 hours.

Write an equation that shows the relationship between the _____ in inches (w) and the _____ in hours (t).

1. Find the _____ of proportionality in terms of inches of snowfall per hour:

$$\text{constant of proportionality} = \frac{\text{snowfall in inches}}{\text{time in hours}} = \frac{\boxed{}}{\boxed{}} \text{ inch per hour}$$

2. Write a general _____ between the amount of snowfall and time using this equation:

$$\frac{w}{t} = \frac{\boxed{}}{\boxed{}}$$

3. Rewrite the equation in a _____ form by multiplying both sides of the equation by _____:

$$w = \frac{\boxed{}}{\boxed{}} t$$



In standard form, the equation of a proportional relationship will be in the same form: $y = \underline{\hspace{2cm}}$. In this equation, y and x are the quantities and k is the constant of _____.

? Question

Tiesha enjoys reading in her spare time. She reads 4 pages every $\frac{1}{10}$ of an hour.

✓ The proportional relationship between the number of _____ (p) and the number of _____ (h) is represented by the equation $p = \underline{\hspace{2cm}} h$.

Using Equations of Proportional Relationships

➤ Use this type of equation to find the value of either of the two _____ in the relationship.

Example: Tyler is painting some rooms in his house. He uses 1 gallon of paint to cover a surface area of 200 square feet.

✓ The _____, or constant of proportionality, is _____ square feet per gallon. If g is the gallons of paint that Tyler uses to paint a surface _____ of p square feet, the equation of this proportional relationship is $p = \underline{\hspace{2cm}}g$.

Find the area that Tyler can paint using 1.5 gallons of paint.

Substitute the value of g (1.5) in the equation and solve for _____:

$$p = 200(\underline{\hspace{2cm}})$$

$$p = \underline{\hspace{2cm}}$$

✓ With 1.5 gallons of paint, Tyler can paint an area of _____ square feet.

If Tyler wants to paint an area of 500 square feet, find how many gallons of paint he needs.

Substitute the value of p (500) in the equation and solving for _____:

$$p = 200g$$

$$\underline{\hspace{2cm}} = 200g$$

$$\frac{\boxed{\hspace{2cm}}}{200} = g$$

$$\underline{\hspace{2cm}} = g$$

✓ Tyler needs _____ gallons to paint 500 square feet. If Tyler cannot buy a half-gallon, he will have to buy _____ gallons.

Summary

Give an example of a proportional relationship and write an equation that represents the relationship.