

## Lesson 10: A Critical Look at Proportional Relationships

### Classwork

#### Example 1

Paul walks 2 miles in 25 minutes. How many miles can Paul walk in 137.5 minutes?

$$y = 0.08x \text{ or } y = \frac{2}{25}x$$

$$\frac{2}{25} = \frac{y}{137.5}$$

$$25y = 2(137.5)$$

$$\frac{25y}{25} = \frac{275}{25}$$

$$y = 11 \text{ miles}$$

Paul walks 11 miles in 137.5 minutes.

Time (in minutes)	Distance (in miles)
25	2
50	4
75	6
100	8
125	10
137.5	11 miles
x	y

$$\frac{4}{50} = \frac{2}{25} = 0.08$$

$$\frac{2}{25} = \frac{y}{x}$$

$$\frac{25y}{25} = \frac{2x}{25}$$

$$y = \frac{2}{25}x$$

$$y = 0.08x$$

unit rate

Linear equation

**Exercises**

1. Wesley walks at a constant speed from his house to school 1.5 miles away. It took him 25 minutes to get to school.  
 a. What fraction represents his constant speed,  $C$ ?

$$\frac{1.5}{25} = C$$

- b. You want to know how many miles he has walked after 15 minutes. Let  $y$  represent the distance he traveled after 15 minutes of walking at the given constant speed. Write a fraction that represents the constant speed,  $C$ , in terms of  $y$ .

$$\frac{y}{15} = C$$

- c. Write the fractions from parts (a) and (b) as a proportion and solve to find how many miles Wesley walked after 15 minutes.

~~$$\frac{1.5}{25} = \frac{y}{15}$$~~

$$25y = 1.5(15)$$

$$\frac{25y}{25} = \frac{22.5}{25}$$

$$y = 0.9$$

- d. Let  $y$  be the distance in miles that Wesley traveled after  $x$  minutes. Write a linear equation in two variables that represents how many miles Wesley walked after  $x$  minutes.

$$\frac{y}{x} = \frac{1.5}{25}$$

$$\frac{25y}{25} = \frac{1.5x}{25}$$

$$y = \frac{1.5}{25}x$$

$$y = 0.06x$$

2. Stefanie drove at a constant speed from her apartment to her friend's house 20 miles away. It took her 45 minutes to reach her destination.  
 a. What fraction represents her constant speed,  $C$ ?