

5.7 Solving Proportions (Part 2: Word Problems)

Example 1: A model car is made to the following scale: 1 inch to 10 inches. If the door of the actual car is 33 inches long, what is the door length of the model?

$$\begin{array}{l} \text{model} \\ \hline \text{actual} \end{array} \frac{1}{10} = \frac{x}{33}$$

$$\frac{10x}{10} = \frac{33}{10}$$

$$x = 3.3 \text{ or } \frac{33}{10}$$

Example 2: Ted travels 110 miles in 2 hours.

At this rate, how long will it take Ted to travel

385 miles?

$$\begin{array}{l} \text{miles} \\ \hline \text{hour} \end{array} \frac{110}{2} = \frac{385}{y}$$

$$\frac{110y}{110} = \frac{770}{110}$$

$$y = 7$$

Example 3: The wait time to ride a roller coaster is 20 minutes when 160 people are in line. At this rate, how long is the wait time when 220 people are in line?

people
min

$$\frac{160}{20} = \frac{220}{w}$$

people
min

27.5

$$16 \overline{) 440.0}$$

-320

120
-112

80
-80

0

$160w = 4400$

$$\frac{160w}{160} = \frac{4400}{160}$$

$w = 27.5$

Example 4: Alicia's class is making care packages for a local shelter. They can make 8 care packages with 240 food items. How many care packages can they make with 500 food items?

items
package

$$\frac{240}{8} = \frac{500}{f}$$

items
packages

16.6

$$24 \overline{) 400.0}$$

-240

160
-144

160
-144

16

$240f = 4000$

$$\frac{240f}{240} = \frac{4000}{240}$$

$f = 16.\bar{6}$

$f \approx 17$

Example 5: An architect builds a model of a building before the actual building is built. The model is 8 inches tall and the actual building will be 22 feet tall. The model is 20 inches wide. Find the actual width of the building.

model	$\frac{8}{22} = \frac{20}{b}$	model
actual	$\frac{8b}{8} = \frac{440}{8}$	actual
	$b = 55$	

Example 6: A serving of 4 crackers contains 70 calories. How many calories are in 7 crackers?

calories	$\frac{70}{4} = \frac{c}{7}$	Calories
crackers	$\frac{4c}{4} = \frac{490}{4}$	crackers
	$c = 122.5$	

$$\begin{array}{r}
 122.5 \\
 4 \overline{) 490.0} \\
 \underline{-4} \\
 09 \\
 \underline{-8} \\
 10 \\
 \underline{-8} \\
 20 \\
 \underline{-20} \\
 0
 \end{array}$$

Example 7: Mrs. Hidalgo paid \$30 for 4 students to visit an art museum. Find the cost for 20 students.

$\frac{\$30}{4 \text{ Student}} = \frac{a}{20 \text{ Student}}$

$4a = 120$
 $\frac{4a}{4} = \frac{120}{4}$
 $a = 150$

$$\begin{array}{r} 150 \\ 4 \overline{) 600} \\ \underline{-40} \\ 200 \\ \underline{-200} \\ 0 \end{array}$$

Example 8: Joaquin has a total of 12.5 hours of football practice after school five days a week.

a.) How many hours of practice will he have for 15 school days?

$\frac{12.5}{5} = \frac{p}{15}$

$5p = 187.5$
 $p = 37.5$

$$\begin{array}{r} 37.5 \\ 5 \overline{) 187.5} \\ \underline{-150} \\ 375 \\ \underline{-350} \\ 250 \\ \underline{-250} \\ 0 \end{array}$$

b.) For 22 school days?

$\frac{12.5}{5} = \frac{j}{22}$

$5j = 275$
 $j = 55$

$$\begin{array}{r} 12.5 \\ \times 22 \\ \hline 250 \\ 2500 \\ \hline 275.0 \end{array}$$