

Lesson 5.3:

Writing Proportions

5.3 Notes

Get out your spiral notebooks!

Essential Question

How can you write a proportion that solves a problem in real life?

One way to write a proportion is to use a table.

	Last Month	This Month
Purchase	2 ringtones	3 ringtones
Total Cost	6 dollars	x dollars

Use the columns or the rows to write a proportion.

Use columns:

$$\frac{2 \text{ ringtones}}{6 \text{ dollars}} = \frac{3 \text{ ringtones}}{x \text{ dollars}}$$

Numerators have the same units.

Denominators have the same units.

Use rows:

$$\frac{2 \text{ ringtones}}{3 \text{ ringtones}} = \frac{6 \text{ dollars}}{x \text{ dollars}}$$

The units are the same on each side of the proportion.

Example 1:

A chef increases the amounts of ingredients in a recipe to make a proportional recipe. The new recipe has 6 cups of black beans. Write a proportion that gives the number x of tomatoes in the new recipe.

black beans
tomatoes

$$\frac{1.5}{1} = \frac{6}{x}$$

Black Bean Soup
 1.5 cups black beans
 0.5 cup salsa
 2 cups water
 1 tomato
 2 teaspoons seasoning

1. Write a different proportion that gives the number x of tomatoes in the new recipe.

old
new

$$\frac{1.5}{6} = \frac{1}{x}$$

How many tomatoes are in the new recipe?

*Use either proportion

$$\frac{1.5}{1} = \frac{6}{x}$$

x4

x4

$$x = 4$$

~~$$\frac{1.5}{6} = \frac{1}{x}$$~~

$$1.5x = 6$$

$$\div 1.5 \quad \div 1.5$$

$$x = 4$$

Example 2: use mental math

Solve $\frac{3}{2} = \frac{x}{8}$

$$\frac{3}{2} = \frac{12}{8}$$

x4

x4

Solve the proportion. **Use mental math**

$$2. \frac{5}{8} = \frac{20}{d}$$

$$d = 32$$

$$3. \frac{7}{z} = \frac{14}{10}$$

$$z = 5$$

$$4. \frac{21}{24} = \frac{x}{8}$$

$$x = 7$$

5. A school has 950 students. The ratio of female students to all students is $\frac{48}{95}$. Write and solve a proportion to find the number f of students who are female.

$$\frac{f}{a} \rightarrow \frac{48}{95} = \frac{480}{950}$$

$\times 10$ (above 48 to 480)
 $\times 10$ (below 95 to 950)

Example 3:

Write a proportion to find how many points a student needs to score on the test to get the given score.

A test is worth 50 points; test score of 84% *out of 100!*

points earned $\rightarrow x$
 out of $\rightarrow 50$
 total points $\rightarrow 50$

$$\frac{x}{50} = \frac{84}{100}$$

\leftarrow per cent

$$\frac{x}{50} = \frac{84}{100}$$

$\div 2$ (above 84 to 42)
 $\div 2$ (below 100 to 50)

$$x = 42$$

~~$$\frac{x}{50} = \frac{84}{100}$$~~

$$100x = 84 \cdot 50$$

$$100x = 4200$$

$\div 100$ $\div 100$

$$x = 42$$