

Aim: How do we use proportional relationships to problems? Date: _____

Do Now

1.) You pay \$184 for 2 concert tickets, and your friend pays \$266 for 3 tickets to the same concert. Who got the better buy?

$$\frac{\$184}{2 \text{ tickets}} \rightarrow \boxed{\$92 \text{ per ticket}}$$

$$\frac{\$266}{3 \text{ tickets}} \rightarrow \boxed{\$88.67 \text{ per ticket}}$$

*** The Better Buy is the 3 tickets ***

2.) You get 75 points for answering 15 questions correctly, and your friend got 70 points for answering 14 questions correctly. Who received the most point per question?

$$\frac{75 \text{ pts.}}{15 \text{ questions}} \rightarrow \boxed{5 \text{ pts. per question}}$$

$$\frac{70 \text{ points}}{14 \text{ questions}} \rightarrow \boxed{5 \text{ pts. per question}}$$

*** They each receive the same ***

3) You swim your first lap in 2.4 minutes. You complete 16 laps in 12 minutes. Is the number of laps proportional to your time?

$$\frac{1 \text{ lap}}{2.4 \text{ min}} = \frac{16 \text{ laps}}{12 \text{ min.}}$$

\neq

No

4) Do $\frac{6}{4}$ and $\frac{8}{12}$ form a proportion?

$$\frac{6}{4} \neq \frac{8}{12} \quad \boxed{\text{No}}$$

5) Is the table proportional?

x	$\frac{1}{2}$	1	$\frac{3}{2}$	2
y	3	6	9	12

YES

Unit rates and Cross-products determine if proportional relationships exist.

If unit rates are equivalent, there is a proportional relationship. If cross-product are equivalent, there is a proportional relationship.

Using Proportions to Find Missing Quantities

1. Derek scored a total of 42 points in the first 4 basketball games. If he continues to score at this rate, how many points will he score during the entire 18 game season?

points
games

$$\frac{42}{4} = \frac{x}{18}$$

$$\frac{4x}{4} = \frac{756}{4}$$

$$\boxed{x = 189 \text{ points}}$$

To Solve a Word Problem Using Proportions

1. Write units
2. Set up proportion
3. Cross Multiply
4. Solve/Answer (write units)

2. In order to make 4 servings, a recipe calls for 3 cups of flour. How many cups of flour are needed for 38 servings?

$\frac{\text{servings}}{\text{cups}}$

$$\frac{4}{3} = \frac{38}{x}$$

$$\frac{4x}{4} = \frac{114}{4}$$

$$x = 28.5 \text{ cups}$$

3. Daniel can read 8 pages of his book in 5 minutes. At this rate, how long will it take him to read an entire 264 page book?

$\frac{\text{pgs.}}{\text{min}}$

$$\frac{8}{5} = \frac{264}{x}$$

$$\frac{8x}{8} = \frac{1320}{8}$$

$$x = 165 \text{ min.}$$

4. A photograph is 3.5 inches wide and 5 inches long. A newspaper editor enlarges the photograph for the newspaper. It is now 7 inches in length, how wide is the enlarged photograph?

$\frac{\text{in. wide}}{\text{in long}}$

$$\frac{3.5}{5} = \frac{x}{7}$$

$$\frac{5x}{5} = \frac{24.5}{5}$$

$$x = 4.9 \text{ in. wide}$$

5. A broken pipe was leaking 2 gallons of water every 5 minutes. How many gallons of water were wasted if it took 23 minutes to stop the leak?

$\frac{\text{gal.}}{\text{min}}$

$$\frac{2}{5} = \frac{x}{23}$$

$$\frac{5x}{5} = \frac{46}{5}$$

$$x = 9.2 \text{ gallons}$$

6. It takes Zach 15 minutes to walk $7\frac{1}{2}$ blocks to the swimming pool. At this rate, how many blocks can he walk in one minute?

$\frac{\text{min}}{\text{blocks}}$

$$\frac{15}{7.5} = \frac{1}{x}$$

$$\frac{15x}{15} = \frac{7.5}{15}$$

$$x = 0.5 \text{ blocks}$$

7. A 14-ounce energy drink contains $10\frac{1}{2}$ teaspoons of sugar. How much sugar is in one ounce of the drink?

$\frac{\text{oz.}}{\text{tsp.}}$

$$\frac{14}{10.5} = \frac{1}{x}$$

$$\frac{14x}{14} = \frac{10.5}{14}$$

$$x = 0.75 \text{ tsp.}$$

8. Sally has a recipe that needs $\frac{3}{4}$ teaspoon of butter for every 2 cups of milk. If Sally increases the amount of milk to 3 cups of milk, how many teaspoons of butter are needed?

$\frac{\text{tsp}}{\text{cups}}$

$$\frac{3/4}{2} = \frac{x}{3}$$

$$\frac{3x}{2} = \frac{9}{4} \div \frac{2}{2}$$

$$x = \frac{9}{4} \cdot \frac{1}{2}$$

$$x = \frac{9}{8} \text{ tsp}$$