

Name: _____

Date: _____

Study:

Objective: SWBAT Find Ratios and Proportions

Homework? **yes!**

Word Wall Vocabulary

Ratio: uses division to compare two quantities. Can be written in three ways

$$a \text{ to } b \quad a:b \quad \frac{a}{b}$$

Read as the ratio of a to b

Word Wall Vocabulary

Proportion: an equation that states that two ratios are equivalent

$$\frac{a}{b} = \frac{c}{d}$$

Comparing two quantities

Write the ratio of limes to lemons?



$$\frac{\text{limes}}{\text{lemons}} = \frac{6}{4} = \frac{3}{2}$$

$$3 \div 2$$

$$3:2$$

Example 1: Write a ratio

A volleyball team plays 14 home matches and 10 away matches.

a.) Find the ratio of home matches to away matches.

$$\frac{\text{home}}{\text{away}} = \frac{14}{10} = \boxed{\frac{7}{5}} = \boxed{7:5} = \boxed{7+5}$$

b.) Find the ratio of home matches to all matches.

$$\frac{\text{home}}{\text{All}} = \frac{14}{24} = \boxed{\frac{7}{12}} \text{ or } \boxed{7:12} \text{ or } \boxed{7+12}$$

Try on your own.....

Derek and his brother decide to combine their CD collections. Derek has 44 CD's, and his brother has 52 CDs. Find the ratio

1. The number of Derek's CDs to the number of his brother's CDs

$$\frac{\text{Derek's CDs}}{\text{brother's CDs}} = \frac{44}{52} = \boxed{\frac{11}{13}} \text{ or } \boxed{11+13} \text{ or } \boxed{11:13}$$

2. The number of Derek's CDs to the number of CD's in the entire collection.

$$\frac{\text{Derek CD's}}{\text{All}} = \frac{44 \div 4}{52+44 \div 4} = \boxed{\frac{11}{24}}$$

Example 2: Solve a proportion

Solve the proportion: $\frac{11}{6} = \frac{x}{30}$ $\cdot \frac{11}{6} = \frac{x}{30} \cdot 30$

Word Wall Vocabulary

Cross Product Property: $\frac{11}{6} = \frac{x}{30}$ multiply

The product of the numerator of the ratio and the denominator of the ratio.

Example 3: Solve the proportions using cross products

$$\frac{4}{a} = \frac{24}{30}$$

$$\frac{24a}{24} = \frac{120}{24}$$

$$\boxed{a = 5}$$

$$\frac{8}{x} = \frac{6}{15}$$

$$\frac{9}{2} = \frac{m}{12}$$

$$\frac{108}{2} = \frac{2m}{2}$$

$$\boxed{54 = m}$$

$$\frac{z}{54} = \frac{5}{9}$$

$$\frac{9z}{9} = \frac{270}{9}$$

$$\boxed{z = 30}$$

$$\frac{6x}{6} = \frac{120}{4}$$

$$\boxed{x = 20}$$

Again.....

John wrote a total of 10 pages in 2 hours in the library. After being in the library for 3 hours. How many pages did John write?

$$\frac{\text{pages}}{\text{hour}} \quad \frac{10}{2} = \frac{x}{3} \quad \frac{30}{2} = \frac{2x}{2}$$

$$15 = x \quad \boxed{15 \text{ pages}}$$

What is the value of x in the proportion? $\frac{4}{x} = \frac{8}{x-3}$

- a.) -6
 b.) -3
 c.) 3
 d.) 6

$$4(x-3) = 8x$$

$$4x - 12 = 8x$$

$$\begin{array}{r} -4x \qquad -4x \\ \hline -12 = 4x \\ \frac{4}{4} \quad \frac{4}{4} \\ \hline -3 = x \end{array}$$

$$\boxed{-3 = x}$$

Try on your own: solve the proportion:

$$\frac{3}{x} = \frac{2}{x-6}$$

$$2x = 3(x-6)$$

$$2x = 3x - 18$$

$$\begin{array}{r} -3x \quad -3x \\ \hline -x = -18 \\ \hline \boxed{x = 18} \end{array}$$

$$\frac{m}{5} = \frac{m-6}{4}$$

$$4m = 5(m-6)$$

$$4m = 5m - 30$$

$$\begin{array}{r} -5m \quad -5m \\ \hline -m = -30 \\ \hline \boxed{m = 30} \end{array}$$

Exit Ticket

A student can read 7 pages of a book in 10 minutes. How many pages of the book can the student read in 30 minutes?

Solve the proportions:

$$\frac{2}{3} = \frac{4}{x} \quad \text{_____}$$

$$\frac{7}{3} = \frac{2x+5}{x} \quad \text{_____}$$