

## 2.5 Ratios and Proportions

**Ratios:** A ratio uses division to compare 2 quantities.

a to b

a : b

$\frac{a}{b}$

Read as "The ratio of a to b." **Must be written in simplest form.**

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

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

$$\frac{14}{10} = \boxed{\frac{7}{5}}$$

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

$$\frac{14}{24} = \boxed{\frac{7}{12}}$$

**Proportions:** Is an equation that states 2 ratios are =.

$$\frac{a}{b} = \frac{c}{d} \text{ where } b \neq 0, d \neq 0.$$

Sometimes you will need to solve for variable(s).

**Solving with a variable in the numerator only!!**

Ex. 1: Solve

$$\frac{50}{20} \cdot \frac{11}{6} = \frac{x}{30} \cdot \frac{30}{1}$$

$$x = \underline{55}$$

Ex. 2: Solve

$$\frac{35}{1} \cdot \frac{w}{35} = \frac{4}{7} \cdot \frac{25}{1}$$

$$w = \underline{20}$$

Ex. 3: Solve

$$\frac{9 \cdot 54}{1 \cdot 6} = \frac{36 \cdot 54}{54 \cdot 1}$$
$$\frac{18t}{18} = \frac{36}{18}$$

t = 2

Ex. 4: Solve

$$\frac{145 \cdot (c+2)}{1 \cdot 45} = \frac{8 \cdot 459}{5 \cdot 1}$$
$$c+2 = 72$$
$$\underline{-2} \quad \underline{-2}$$

c = 70

Write the sentence as a proportion. Then solve the proportion.

Ex. 5: 5 is to 7 as x is to 49.

$$\frac{5}{7} = \frac{x}{49}$$

x = \_\_\_\_\_

Ex. 6: y is to 20 as 9 is to 5.

$$\frac{y}{20} = \frac{9}{5}$$

y = \_\_\_\_\_

How to set up a proportion from word problems.

A recipe for salsa calls for 30 tomatoes to make 12 pints of salsa. How many tomatoes are needed to make 4 pints of salsa?

$$\frac{30}{12} = \frac{t}{4}$$

Homework: