

## T102 SECTION 5.4 PROPORTIONAL REASONING

### RATIO

A ratio is a comparison of two quantities written as a rational number.  
We can write ratios in three ways:

\_\_\_\_\_

**We encounter ratios all the time in everyday life. For example:**

1. The teacher-student ratio in the first grade is 1 to 25
2. The ratio of males to females in this class is 1 : 8  
(Does this tell us the class size? \_\_\_\_\_)
3. My car gets 35 miles per gallon.

**If there are 5 girls and 7 boys in our kindergarten class, what is**

- The ratio of boys to girls? \_\_\_\_\_ (part to part)  
The ratio of girls to boys? \_\_\_\_\_ (part to part)  
The ratio of boys to the entire class? \_\_\_\_\_ (part to whole)  
The ratio of the entire class to girls? \_\_\_\_\_ (whole to part)

**One-ninth of the student body at the local high school are non-swimmers.**

- What **fraction** of the student body are non-swimmers? \_\_\_\_\_  
What **fraction** of the student body are swimmers? \_\_\_\_\_

- What is the **ratio** of non-swimmers to swimmers? (simplify) \_\_\_\_\_  
What is the **ratio** of swimmers to non-swimmers? (simplify) \_\_\_\_\_  
What is the **ratio** of non-swimmers to the entire student body? (simplify) \_\_\_\_\_

- How many students are non-swimmers? \_\_\_\_\_  
How many students are thus swimmers? \_\_\_\_\_

### PROPORTIONS

Two ratios are called "proportional" if and only if the fractions representing them are equal.

Example: Are  $\frac{2}{3}$  and  $\frac{8}{12}$  proportional? That is, does  $\frac{2}{3} = \frac{8}{12}$  ? \_\_\_\_\_

#### **PROPERTY OF PROPORTIONS**

If  $a$ ,  $b$ ,  $c$  and  $d$  are real numbers, then the proportion  $\frac{a}{b} = \frac{c}{d}$  if and only if \_\_\_\_\_

Many times in a proportion, one of the terms is missing. We use the above property to find it.

$$\frac{3}{15} = \frac{c}{60} \qquad \frac{-5}{42} = \frac{35}{d}$$

At basketball practice, Molly made 27 out of 45 shots and Kelley made 24 out of 40. Which player appears to be the better shooter?

David bought 4 CD's for \$64, how much would it have cost him to buy 7 CD's?

**The next problem we will solve using two different methods.**

Which is a better buy: \$15.00 for 12 tickets or \$23.00 for 20 tickets?

**Scaling Strategy**

(Cost for a common number of tickets)

**Unit-Rate Strategy**

(Cost per one ticket (or unit))

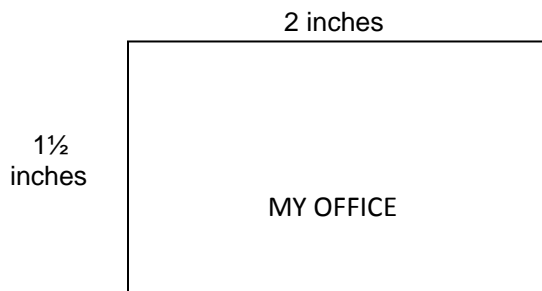
LCM(12, 20) = \_\_\_\_\_

Ann, Bill, and Casey make \$2520 for painting a house. Ann worked 30 hours, Bill worked 50 hours and Casey worked 60 hours. They divided the money in proportion to the number of hours worked. How much did each earn?

**SCALE DRAWINGS**

The SCALE is the ratio of the size of the drawing to the size of the object.

The following is a drawing of my office where 1 inch represents 7 feet. Find the dimensions of my office.



A candle is 30in. long. After burning for 12 min. the candle is 25 in. long. How long will it take for the whole candle to burn at the same rate?