

## Lesson 7-1: Ratio, Proportion, and Similarity

Ratios can be written in three different forms.

$a/b$     $a:b$     $a$  to  $b$

Express the following ratios in simplest form.

1)  $\frac{12}{20}$

2)  $\frac{3p}{5p}$

3)  $\frac{4n}{n^2}$

4)  $\frac{3(x+4)}{a(x+4)}$

**Answers:**

$$\frac{12 \div 4}{20 \div 4} = \frac{3}{5}$$

$$p \text{ 's cancel out} \\ = \frac{3}{5}$$

$$\text{one } n \text{ cancels out} \\ = \frac{4}{n}$$

$$(x+4) \text{ cancels out} \\ = \frac{3}{a}$$

5) Is the ratio of  $a:b$  always, sometimes, or never equal to  $b:a$ ?

Sometimes...when  $a = b$  the ratios are equal

6) The ratio of the measures of two complementary angles is 4:5. Find the measure of each angle.

$$4x + 5x = 90 \text{ (since they are complementary)}$$

$$9x = 90$$

$$x = 10$$

The angles are  $4(10) = 40^\circ$  and  $5(10) = 50^\circ$

7) The measures of the angles of a triangle are in the ratio 3:4:5. Find the measure of the largest angle.

$$3x + 4x + 5x = 180$$

$$12x = 180$$

$$x = 15$$

The largest angle =  $5(15) = 75^\circ$

8) The perimeter of a triangle is 132 cm and the lengths of its sides are in the ratio 8: 11: 14. Find the length of each side.

$$8x + 11x + 14x = 132$$

$$33x = 132$$

$$x = 4$$

$$\text{sides} = 11(4) = 44$$

$$14(4) = 56$$

$$8(4) = 32$$