5.1: Ratios

A ratio is a comparison of two numbers by division.

4 to 5 4:5 $\frac{4}{5}$

Always write ratios in simplest form !

Example 1: Write each ratio in simplest form.

a) 24:32

$\div 2 \quad \div 2$

12 : 16

$\div 4 \quad \div 4$

3 : 4

b) 50 to 40

$\div 10 \quad \div 10$

5 to 4

c) $\frac{20}{2}$ $\div 2$ $\div 2$ $= \frac{10}{1}$

Example 2: Express each ratio as a fraction.

a) 12 boys to 16 girls

$\frac{12 \div 4}{16 \div 4} = \frac{3}{4}$

b) 24 out of 50 light bulbs

$\frac{24 \div 2}{50 \div 2} = \frac{12}{25}$

c) 36 DVDs out of 84 DVDs

$\frac{36 \div 4}{84 \div 4} = \frac{9 \div 3}{21 \div 3} = \frac{3}{7}$

d) 50 tiles to 25 tiles

$\frac{50 \div 25}{25 \div 25} = \frac{2}{1}$

Example 3: In Mr. Blackwell's class, 15 out of 24 students play sports. Express this ratio as a fraction in simplest form. Explain its meaning.

$$\frac{15 \div 3}{24 \div 3} = \boxed{\frac{5}{8}}$$

*In a group of 8 students, 5 of them play sports.

When writing a ratio involving measurements, both quantities should have the same unit of measure.

Example 4:

a) What is the ratio of 20 inches to 4 feet?

1 ft = 12 inch
4 ft = 48 inch
48 inch

$$\frac{20 \div 4}{48 \div 4} = \boxed{\frac{5}{12}}$$

b) What is the ratio of 16 inches to 3 feet?

36 inch
1 ft = 12 inch
3 ft = 36 inch

$$\frac{16 \div 4}{36 \div 4} = \boxed{\frac{4}{9}}$$

Example 5:

1 qt = 2 pts
4 qt = 8 pts

a) What is the ratio of 3 pints to 4 quarts?

8 pints

$$\frac{3}{8}$$

b) What is the ratio of 2 pounds to 6 ounces?

32 oz

1 lb = 16 oz
2 lb = 32 oz

$$\frac{32 \div 2}{6 \div 2} = \frac{16}{3}$$

Example 6:

1 yd = 3 ft
3 ft = 36 inch

a) What is the ratio of 9 inches to 1 yard?

36 inch

$$\frac{9 \div 9}{36 \div 9} = \frac{1}{4}$$

b) What is the ratio of 6 gallons to 3 quarts?

24 quarts

1 gal = 4 qt
6 gal = 24 qt

$$\frac{24 \div 3}{3 \div 3} = \frac{8}{1}$$