

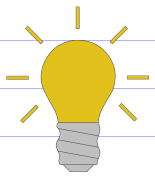
1.1 Rates, Ratios, and Proportions



Ratio: a comparison of 2 #'s usually written as a fraction $\frac{2}{3}$ 2:3 2 to 3

Rate: a ratio that compares 2 quantities w/ different units mpg, dollars per hour

Proportion: an equation where 2 ratios are equal
 $\frac{\quad}{\quad} = \frac{\quad}{\quad}$



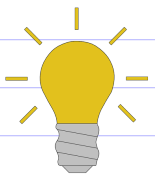
Ratio Example

A landscaping company planted 100 azalea bushes and 75 box elder trees. Give the ratio of the following:

A: Azaleas to Box Elders $\frac{100}{75} \div 25 = \frac{4}{3}$ 4 to 3 4:3

B: Box Elders to Azaleas $\frac{75}{100} = \frac{3}{4}$ 3 to 4 3:4

C: Azaleas to all plants $\frac{100}{175} = \frac{4}{7}$



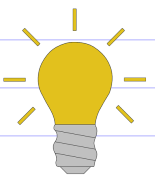
Rates: Find the rates of the following

A: A car traveled 400 miles on 18 gallons of gas. Find the rate (mpg)

$$\frac{400 \text{ mi}}{18 \text{ gal}} = 22.4 \text{ mpg}$$

B: A 20 lb bag of fertilizer should cover 5000 square feet. Find the coverage per pound

$$\frac{5000}{20} = 250 \text{ ft}^2/\text{lb}$$



Proportions: Cross Multiplication

$$\frac{5}{7} = \frac{x}{100}$$

$$5 \cdot 100 = 7 \cdot x$$

$$\frac{500}{7} = \frac{7x}{7}$$

$$71.4 = x$$

$$600 \div 8 \times 3$$

The ratio of female to male employees in a large department store is 8 to 3. If there are 600 female workers, how many male workers are there?

	8	3	
F	8	600	
M	3	x	

	F	M	
	8	3	
	600	x	$\frac{3}{8} = \frac{x}{600}$

$$3 \cdot 600 = 8 \cdot x$$

$$\frac{1800}{8} = \frac{8x}{8}$$

$$x = 225 \text{ males}$$