Proportions Rules

Proportions: an equation that shows two ratios are equal to each other

Setting up a Proportion:

Both denominators have to relate to a common dimension

$$\frac{height\ of\ tree}{length\ of\ trees\ shadow} = \frac{height\ of\ person}{length\ of\ persons\ shadow}$$

Both denominators have to relate to a common object

$$\frac{length\ of\ persons\ shadow}{length\ of\ trees\ shadow} = \frac{height\ of\ person}{height\ of\ tree}$$

Finding a Percent:

$$\frac{is}{of} = \frac{\%}{100} \quad \text{or} \quad \frac{part}{total} = \frac{\%}{100}$$

Percent Increase or Percent Decrease:

$$\frac{difference}{original} = \frac{\%}{100}$$

Similar Figures:

$$\frac{side\ \text{"1"}\ of\ shape\ \text{"1"}}{side\ \text{"2"}\ of\ shape\ \text{"1"}} = \frac{side\ \text{"1"}\ of\ shape\ \text{"2"}}{side\ \text{"2"}\ \text{of shape "2"}}$$

or

$$\frac{side\ \text{"1"}\ of\ shape\ \text{"1"}}{side\ \text{"1"}\ of\ shape\ \text{"2"}} = \frac{side\ \text{"2"}\ of\ shape\ \text{"1"}}{side\ \text{"2"}\ \text{of shape "2"}}$$

Scale Drawings:

$$\frac{scale\ of first\ unit}{scale\ of\ second\ unit} = \frac{actual\ first\ unit}{actual\ second\ unit}$$

or

$$\frac{scale\ of first\ unit}{actual\ first\ unit} = \frac{scale\ of\ second\ unit}{actual\ second\ unit}$$

Ratio: a comparison of two numbers using division

Rate: a ratio comparing two different units

Unit Rate: a rate where the denominator is "1"

$$\frac{first\ unit}{second\ unit} = \frac{x}{1}$$