Vocabulary

Ratio: is a comparison of two quantities. It can be a part-to-whole; part-to-part and whole-to-whole. (i.e. 2/3; part/part = girls/boys; part/whole = girls/class; whole/whole # in class/# of computers)

Equivalent ratios: are different ratios that have the same value. (i.e.1/2 = 2/4)

Rate: is a ratio used to compare quantities of different units (i.e. 175 miles/5 gallons)

Unit Rate: is a comparison to a single unit. (i.e. 175 miles/5 gallons = **35 miles/gallon**)

Proportion: is an equation stating that two ratios are equivalent.

An equation is proportional if the ***cross products*** are equal. $\frac{3}{5}=\frac{9}{15}\rightarrow\frac{5x9=45}{3x15=45}$

Similar Figures: are geometric figures that have the same shape but not the same size. If two figures are similar, you can use proportions to determine unknown measurements.

Natural Numbers: 1,2,3,4,5, ...

Whole numbers: 0,1,2,3, ... (add a 0 to Natural numbers)

Integers: ...,-3,-2,-1,0,1,2,3,.... (add the negative numbers)

Rational numbers: ratios of integers (i.e. 1/2, 2/3, 5/6)

Irrational number: cannot write it as the ratio of ANY two integers.

(i.e. $\sqrt{2}$ = 1.414213562373095048801688724209698078570…)

(i.e. π = 3.14159265358979323846264338327950288419716939937510…)

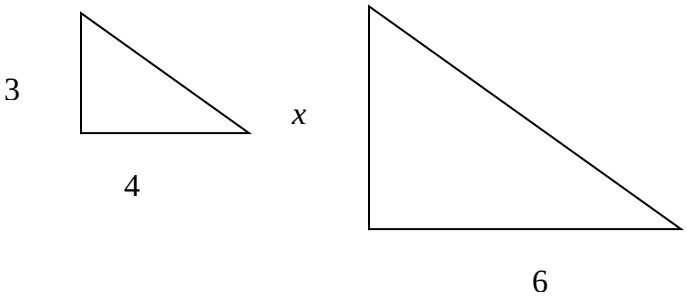
Proportions

Method One: Use a ***constant factor***: $\frac{5}{20}=\frac{15}{x}\Rightarrow\frac{5}{20}\frac{(3)}{(3)}=\frac{15}{x}$ then $20(3)=x \quad x=60$

Method Two: Use ***cross product***: $\frac{5}{20}=\frac{15}{x}\Rightarrow 5x=20\cdot 15$ then $x=\frac{20\cdot 15}{5} \quad x=60$

Similar Figures

Similar figures can be solved by using proportions. Choose one side over another side of one figure and make it equal to the same set of sides of the other similar figure. This works with all polygons.



$\frac{3}{4}=\frac{x}{6}$

$3\,(6)=4x$

$\frac{3(6)}{4}=x$

$x=4.5$

$$\frac{leftside}{bottom}=\frac{leftside}{bottom}$$

Vocabulary

Percent: is a ratio that compares a number to 100 and uses the symbol %.

$\frac{7}{8} = 0.875 = 87.5\%$ $\frac{9}{4} = \frac{225}{100} = 2.25 = 225\%$

Terminating decimal: is a decimal that ends or repeats only zeros. ¼ = .25

Repeating decimal: is a decimal which one or more digits after the decimal point repeat unendingly. $\frac{2}{3} = .6\overline{6}$

Proportional relationship: exists between two or more sets of numbers if a proportion can be written. (i.e. {2,4,10} and {4,8,20} are proportional because $\frac{2}{4} = \frac{4}{8} = \frac{10}{20}$.

Nonproportional relationship exists between sets of numbers when a proportion or extended proportional with equal rations cannot be written. (i.e. {1,3,5} and {3,6,9} are nonproportional because $\frac{3}{6} \neq \frac{5}{9}$.

Fractions to Decimals

Fractions can be converted to decimal by dividing the denominator into the numerator.

$\frac{2}{3} = 3\overline{)2.0}^{.\overline{6}}$ $\frac{7}{5} = 5\overline{)7.0}^{1.4}$

Decimals to Percentage

Decimals can be converted to a % by multiplying by 100 (i.e. 1.75 = 1.75(100) = 175%) or by shifting the decimal two places to the right and adding the % symbol (i.e. 3.255 = 325.5%).

Solving Percent Problems

Percent problems involve three quantities: the percent, the number that is the part and the number that is the whole. $percent = \frac{part}{whole}$

This "percent equation" can be used to solve any percent problem. If you know any two of these three quantities, you can solve the equation to find the unknown quantity.