Math Help Sheet: Ratios

A ratio is defined as: "The quotient of two measurements in the same unit." In other words, a ratio is the result of dividing one number by another number, if they have the same units. In order to compute a ratio, the two measurements must have the same units. When finding ratios it is often best to follow four rules for computing ratios.

The four rules are as follows:

1. Write a fraction with the first number as the numerator and the second number as the denominator
2. If possible, convert one or both numbers so that the units of measurement are the same
3. Cancel the common unit of measurement
4. Reduce the resulting ratio to lowest terms

Now consider the following examples:

1. Find the ratio of 18 inches to 1 yard

Step 1: Write as a fraction

$$\frac{18 \text{ inches}}{1 \text{ yard}}$$

Step 2: Convert yards to inches (maybe)

1 yard = 3 feet = 3(12 inches) = 36 inches

Step 3: Cancel common units of measurement

$$\frac{18\ inches}{1\ yard} = \frac{18\ inches}{36\ inches} = \frac{18}{36}$$

Step 4: Reduce the resulting ratio

$$\frac{18}{36} = \frac{1}{2}$$ The ratio is 1 to 2

2. Find the ratio of 3 gallons to 2 quarts

Step 1: Write as a fraction

$$\frac{3 \text{ gallons}}{2 \text{ quarts}}$$

Step 2: Convert gallons to quarts

4 quarts in 1 gallon, so 3 gallons = 3 × 4 = 12 quarts

$$\frac{12 \text{ quarts}}{2 \text{ quarts}}$$

Step 3: Cancel common units of measurement

$$\frac{12 \text{ quarts}}{2 \text{ quarts}} = \frac{12}{2}$$

Step 4: Reduce the resulting ratio

$$\frac{12}{2} = \frac{6}{1}$$ The ratio is 6 to 1

3. Find the ratio of 30 dollars to 2 CD's

Step 1: Write as a fraction

$$\frac{30 \text{ dollars}}{2 \text{ CD's}}$$

Step 2: Cannot be completed, CD's cannot be converted into dollars

Step 3: Cannot be completed, CD's and dollars do not cancel

Step 4: Reduce the resulting ratio

$$\frac{30 \text{ dollars}}{2 \text{ CD's}} = \frac{15 \text{ dollars}}{1 \text{ CD}}$$ The ratio is \$15 to 1 CD