# **Dimensional Analysis**

A method for converting units

Look at these problems - what pattern do you notice?



Think about the pattern you noticed on the last slide. Using that - what symbols belong in the ? locations on these two problems?



## **Equivalence Statements**

A statement of any two values that are equivalent to each other.

For example:

A cross-country race is 5 kilometers long. If you measure the race course using imperial units, it is 3.1 miles long. Since the distance is the same:

3.1 miles = 5 km

## **Conversion Factor**

Any number divided by itself equals 1. Since the values in equivalence statements equal each other, they can be written as fractions that equal 1.

#### Example:

3.1 miles = 5 km

So... 3.1 miles = 1 and 5 km = 15 km 3.1 miles

Every equivalence statement can create TWO conversion factors

## **Example: Single Step Conversion**

A cook in France is reading an American recipe for chocolate chip cookies. The American recipe calls for 1-¼ cup of milk (1.25 cups) to be added to the dry ingredients in the recipe. However, the French cook only has a measuring cup that is divided into mL. How many mL of milk should he use if milk if 1 cup equals 237 mL?

Step 1: Write applicable equivalence statement(s): \_\_\_\_

Step 2: Set up your dimensional analysis: \*always begin with the number that is unique to the situation in the problem

Step 3: Round your answer to the proper number of significant figures: \_\_\_\_

### Example: Multistep conversion

Each wheel of a bicycle has 32 spokes. How many spokes do three bikes have?

Step 1: Write applicable equivalence statement(s): \_\_\_\_\_

Step 2: Set up your dimensional analysis: \*always begin with the number that is unique to the situation in the problem

Step 3: Round your answer to the proper number of significant figures: \_\_\_\_