Dimensional Analysis

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Definition: A tool used to convert given units into other units. Phyllis Payne calls this technique multiplying by "a name for one".

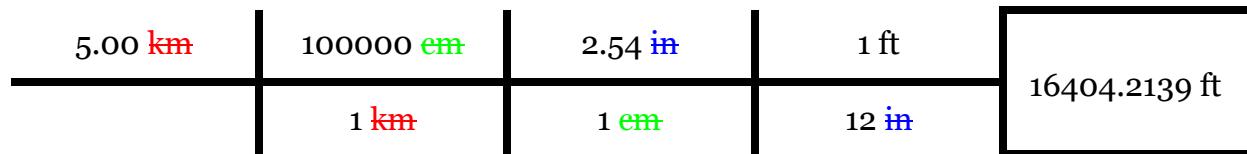Example: *How many feet are in a 5.00 kilometer race?*

Conversions: 1 km = 100000 cm
1 cm = 2.54 in*
12 in = 1 ft

So long as these are equal, the symmetric property of equality holds true. In other words, you can "flip" the fractions around to get the dimensions to cancel.

Solution:

5.00 km	100000 cm	2.54 in	1 ft	
	1 km	1 cm	12 in	16404.2139 ft

BUT WAIT! THERE'S MORE! We have given an absurdly long number of significant figures. Using dimensional analysis, we treat every definition as having an *infinite* number of sig figs. Therefore our answer should have 3 sig figs because 5.00 km is the value with the least number of sig figs.

Answer: There are *16400 ft* in 5.00 km.

Side Note: As a class, let's collectively decide to *not* call this "train tracks" because
1. It looks nothing like real train tracks.
2. It sounds stupid and brings down the IQ of the whole class.

* In 1959 the inch became defined as 2.540005 cm after the U.S. yard was defined as 0.9144018 meters. However, 2.54 cm has been universally recognised as the definition of one inch.