

Dimensional Analysis

(D.A.) (unit conversion)

use conversion factors!

$$1 \text{ in} = 2.54 \text{ cm}$$

$$2.54 \text{ cm} = 1 \text{ in}$$

$$\frac{1 \text{ in}}{2.54 \text{ cm}} \quad \frac{2.54 \text{ cm}}{1 \text{ in}}$$

YOU CAN FLIP CONVERSION FACTORS!

19 inches to feet

$$\frac{19}{12} \text{ WRONG WORK!}$$

$$19 \text{ in} \times \left(\frac{1 \text{ ft}}{12 \text{ in}} \right) \text{ WRONG FORMAT!}$$

LINE METHOD

$$\frac{19 \text{ in} \times 1 \text{ ft}}{12 \text{ in}} = \boxed{1.6 \text{ ft}}$$

* MUST USE LINE METHOD!

840 inches to cm

$$\frac{840 \text{ in} \times 2.54 \text{ cm}}{1 \text{ in}} = \boxed{2133.6 \text{ cm}}$$

YOU NEED

- mark up Q
- pathway
- conv. factors
- Line set up
- cancel units
- Answer w/ units & box

5,400 inches to miles

Pathway: baby steps: in → ft → mi

$$\frac{5400 \text{ in} \times 1 \text{ ft} \times 1 \text{ mi}}{12 \text{ in} \times 5280 \text{ ft}} = \frac{(5400 \times 1 \times 1)}{(12 \times 5280)} = \boxed{0.085 \text{ mi}}$$

12 in = 1 ft
5280 ft = 1 mi

2300 seconds to weeks

sec → min → hr → days → weeks

$$\frac{2300 \text{ sec} \times 1 \text{ min} \times 1 \text{ hr} \times 1 \text{ day} \times 1 \text{ wk}}{60 \text{ sec} \times 60 \text{ min} \times 24 \text{ hr} \times 7 \text{ days}} = \boxed{0.0038 \text{ WKS}}$$

In my class, each student is given 3 pens. If there are 8 pens in one package, priced at \$1.88 per package, and I have 28 students in my chemistry class, what is the total cost of giving away pens?

St → pens → PKG → \$

$$\frac{28 \text{ St} \times 3 \text{ pens} \times 1 \text{ PKG} \times \$1.88}{1 \text{ St} \times 8 \text{ pens} \times 1 \text{ PKG}} = \boxed{\$19.74}$$

You need to drive 350 miles from San Ramon to Los Angeles. Your car gets an average of 42 miles per gallon of gas. Gas costs \$3.00 per gallon. How much money will you spend on gas to drive from here to LA?

mi → gal → \$

$$\frac{350 \text{ mi} \times 1 \text{ gal} \times \$3.00}{42 \text{ mi} \times 1 \text{ gal}} = \boxed{\$25}$$