Unit Conversions (PA 9.4)

Note Title 4/6/2010

unit fraction: fraction of two different measures, equal to one

Ex: $\frac{12 \text{ inches}}{1 \text{ foot}}$, $\frac{1 \text{ yard}}{3 \text{ feet}}$, $\frac{16 \text{ ounces}}{1 \text{ pound}}$

We can convert units by using unit fractions.

(1) Convert

a) 84 inches to feet

$$\frac{84 \text{ inches}}{1} \cdot \frac{1 \text{ foot}}{12 \text{ inches}} = 7 \text{ feet}$$

b) $8\frac{1}{2}$ feet to inches

$$\frac{17}{2} \text{ feet} \cdot \frac{12 \text{ inches}}{1 \text{ foot}} = 102 \text{ inches}$$

$8 \cdot 12 = 96$

$\frac{1}{2} \cdot 12 = 6$

102 in

c) 5 ft, 2 in to inches

$$\frac{5 \text{ ft}}{1} \cdot \frac{12 \text{ in}}{1 \text{ ft}} = 60 \text{ in} \Rightarrow +2 \text{ in} \Rightarrow 62 \text{ inches}$$

② Subtract

14ft 8in — 3ft 11in

borrowing 1ft = 12in

~~14~~ 13 ft ~~8~~ 20 in

— 3 ft 11 in

10 ft 9 in

Metric Units of Length

1 **kilo**meter (km) = 1000 meters (m)	Kilo = 1000
1 **hecto**meter (hm) = 100 m	
1 **deka**meter (dam) = 10 m	
1 meter (m) = 1 m	
1 **deci**meter (dm) = 1/10 m or 0.1 m	
1 **centi**meter (cm) = 1/100 m or 0.01 m	hundredth
1 **milli**meter (mm) = 1/1000 m or 0.001 m	thousandth

Same = .001 km = 1 meter = 100 cm = 1000 mm

③ Convert

a) 400 m to Kilometers

.4 km or ~~400,000~~

$400\,m \cdot \frac{1\ km}{1000\ m} = .4\ km$

b) 4.6 cm to millimeters

1 cm = 10 mm

~~10 cm = 1 mm~~

4.6 cm ⇒ .46 mm or 46 mm

$4.6\,cm \cdot \frac{1000\ mm}{100\ cm} = 46\ mm$

(4) Distance From London to Paris is 342 km finish the chart.

	Meters	millimeters	centimeters	Kilometers
London to Paris	1st 342,000 m	last 342,000,000 mm	2nd 34,200,000 cm	Given 342 km

(5) Convert

a) 51 ounces to pounds (nearest tenth)

$\frac{51\ oz}{1} \cdot \frac{1\ lbs}{16\ oz} = 3.2\ lbs$

$16\overline{)51.0}$ → 3.18, -48, 30, -16, 140

b) 48 mg to grams

$\frac{1}{1000}$

.048 g 48,000 g

	grams	Kilograms	Milligrams	centigrams
c) A six-year-old boy weighs	21,000	21 kg	21,000,000	2100000

d) 42 cups to quarts

$42\ cups \cdot \frac{1\ qt}{4\ cups} = 10.5\ qts$ $10\frac{1}{2}\ qts$

e) 5 Liters to milliliters

5,000 ml

Conversion between U.S. and metric systems (9.7)

(3.79 L = 1 gal)

⑥ 1 L ≈ 0.26 gallons, we spend $1.50 per liter on gas, how much per gallon did we spend?

$$\frac{\$1.50}{1 \text{ liter}} \cdot \frac{3.79 \text{ liters}}{1 \text{ gallons}} \Rightarrow \boxed{5.69\$/\text{gal}}$$

$$\begin{array}{r} 34 \\ 3.79 \\ \times\ 1.50 \\ \hline 1895 \\ 379 \\ \hline 5.6850 \end{array}$$

⑦ A six-year-old boy weighs 21 kg, how many pounds is this?

$$\frac{21 \text{ kg}}{1} \cdot \frac{2.2 \text{ lbs}}{1 \text{ kg}} = \boxed{46.2 \text{ lbs}}$$

$$\begin{array}{r} 21 \\ \times\ 2.2 \\ \hline 42 \\ 42 \\ \hline 46.2 \end{array}$$