

Show All Work To Receive Credit! Conversion factors and prefixes:

G = 10⁹, M = 10⁶, k = 10³, c = 10⁻², m = 10⁻³, μ = 10⁻⁶, n = 10⁻⁹, p = 10⁻¹², 2.54 cm = 1 in, 1 km = 0.6215 mi, 12 in = 1 ft, 5280 ft = 1 mile, 3 feet = 1 yd, 60 sec = 1 min, 1 hr = 60 min, 4 quarts = 1 gal, 2 pints = 1 quart

1. (9 Pts) Perform each of the following conversions. You must show the complete setup.

a. Convert 437 Gg to kg. $\frac{437 \text{ Gg}}{1 \text{ G}} \times \frac{1 \text{ kg}}{10^3} = 437 \times 10^6 \text{ kg} \text{ or } 4.37 \times 10^8 \text{ kg}$

b. Convert 333 nL to μL $\frac{333 \text{ nL}}{1 \text{ nL}} \times \frac{1 \mu\text{L}}{10^{-6}} = 333 \times 10^{-3} \mu\text{L} \text{ or } 3.33 \times 10^{-1} \mu\text{L}$

c. Convert 6 miles/hr to km per minute.

$\frac{6 \text{ mi}}{1 \text{ hr}} \times \frac{1 \text{ km}}{0.6215 \text{ mi}} \times \frac{1 \text{ hr}}{60 \text{ min}} = 0.1609 \frac{\text{km}}{\text{min}}$ (Don't worry about sig figs if not a measurement)

2. (6 Pts) Assume each of following numbers are measurements. Perform the indicated operations and then report the answer with the proper number of significant figures.

a. 402 cm + 33 cm + 125.65 cm = 561 cm

$\begin{array}{r} 402 \\ 33 \\ 125.65 \\ \hline 560.65 \end{array}$ ← place

b. 10.5 cm x 12.100 cm x 18.145 cm = 2310 or 2.31×10^3 cm³ (3 s.f.)

c. $\frac{(23.2 + 15)}{(13.2 \times 2.53)} = \textcircled{1.1}$ The top answer is limited to the ones place and therefore 2 s.f.

3. (5 Pts) A sign measures 128 inches by 55 inches. Determine its area in square cm (cm²) (you may ignore significant figures).

$\frac{128 \text{ in}}{1 \text{ in}} \times \frac{55 \text{ in}}{1 \text{ in}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} = 45419 \text{ cm}^2$

5. (5 Pts) A sample of silver ore was found to contain 0.025 % silver by mass. How many mg of silver can be recovered 970.0 kg of ore?

$\frac{970.0 \times 10^3 \text{ g ore}}{100 \text{ ore}} \times \frac{0.025 \text{ Ag}}{100} \times \frac{1 \text{ mg}}{10^{-3}} = 2.4 \times 10^5 \text{ mg Ag}$
242500 mg Ag

Show All Work To Receive Credit! Conversion factors and prefixes:

$G = 10^9, M = 10^6, k = 10^3, c = 10^{-2}, m = 10^{-3}, \mu = 10^{-6}, n = 10^{-9}, p = 10^{-12}$, 2.54 cm = 1 in, 1 km = 0.6215 mi, 12 in = 1 ft, 5280 ft = 1 mile, 3 feet = 1 yd, 60 sec = 1 min, 1 hr = 60 min, 4 quarts = 1 gal, 2 pints = 1 quart

1. (9 Pts) Perform each of the following conversions. You must show the complete setup.

a. Convert 437 Gg to mg.
$$\frac{437 \text{ Gg}}{1} \times \frac{10^9}{1} \times \frac{1 \text{ m}}{10^{-3}} = 437 \times 10^{12} \text{ mg} \text{ or } 4.37 \times 10^{14} \text{ mg}$$

b. Convert 333 pL to μL
$$\frac{333 \text{ pL}}{1} \times \frac{10^{-12}}{1} \times \frac{1 \mu}{10^{-6}} = 333 \times 10^{-6} \mu\text{L} \text{ or } 3.33 \times 10^{-4} \mu\text{L}$$

c. Convert 8 miles/hr to km per minute.

$$\frac{8 \text{ mi}}{\text{hr}} \times \frac{1 \text{ km}}{0.6215 \text{ mi}} \times \frac{1 \text{ hr}}{60 \text{ min}} = 0.215 \text{ km/min}$$

2. (6 Pts) Assume each of following numbers are measurements. Perform the indicated operations and then report the answer with the proper number of significant figures.

a. $902.44 \text{ cm} + 33 \text{ cm} + 125.2 \text{ cm} = 1060.64 \text{ cm}$
ones place

b. $100.5 \text{ cm} \times 12.100 \text{ cm} \times 18.145 \text{ cm} = 22070 \text{ cm}^3$

c. $\frac{(23.2 + 95)}{(13.2 \times 2.53)} = \frac{118.2}{(13.2 \times 2.53)} = 3.54$

3. (5 Pts) A sign measures 22 inches by 45 inches. Determine its area in square cm (cm^2) (you may ignore significant figures).

$$\frac{22 \text{ in}}{1 \text{ in}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \times \frac{45 \text{ in}}{1 \text{ in}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} = 6387.08 \text{ cm}^2$$

5. (5 Pts) A sample of silver ore was found to contain 0.035 % silver by mass. How many mg of silver can be recovered 1070.0 kg of ore?

$$\frac{1070.0 \text{ kg ore}}{1} \times \frac{0.035 \text{ Ag}}{100 \text{ ore}} \times \frac{10^3}{1} \times \frac{1 \text{ m}}{10^{-3}} = 374500 \text{ mg Ag}$$

$3.7 \times 10^5 \text{ mg Ag}$