

$G = 10^9$ ,  $M = 10^6$ ,  $k = 10^3$ ,  $c = 10^{-2}$ ,  $m = 10^{-3}$ ,  $\mu = 10^{-6}$ ,  $n = 10^{-9}$ , 2.54 cm = 1 in,  
 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, 454 g = 1 lb.

1. (5 Pts) A car is traveling at a speed of 35 km/hr. Determine how fast the <sup>car</sup> ~~train~~ is going in miles/second.

$$\frac{35 \frac{\text{km}}{\text{hr}}}{1} \times \frac{10^3 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ in}}{2.54 \times 10^{-2} \text{ m}} \times \frac{1 \text{ ft}}{12 \text{ in}} \times \frac{1 \text{ mi}}{5280 \text{ ft}} \times \frac{1 \text{ hr}}{3600 \text{ s}} = 6.04 \times 10^{-3} \frac{\text{mi}}{\text{s}}$$

2. (5 Pts) Chloroform,  $\text{CHCl}_3$ , has a density of 1.48 g/mL. How many mL of chloroform are needed to provide 165.0 grams?

$$\frac{165.0 \text{ g}}{1.48 \text{ g/mL}} = 111.5 \text{ mL} \quad (112 \text{ mL})$$

3. (8 Pts) Complete the following table:

Element or ion name	Element or ion symbol	Number of Protons	Number of Electrons	Number of Neutrons
chlorine-37	Cl-37	17	17	20
carbon-14	C-14	6	6	8
A magnesium-25 <u>cation</u>	$\text{Mg}^{2+}$ -25	12	10	13
An fluorine-18 <u>anion</u>	$\text{F}^{-}$ -18	9	10	9

4. (2 Pts) Give the name and the symbol of an element that would be classified as a non-metal chlorine Cl

Give the name and symbol of an element that would be classified as a metal sodium Na

5. (5 Pts) The recommended adult dose of Elixophyllin<sup>®</sup>, a drug used to treat asthma, is 6 mg/kg of body mass. Calculate the dose in milligrams for a 155 lb person.

$$\frac{155 \text{ lb}}{1} \times \frac{454 \text{ g}}{1 \text{ lb}} \times \frac{1 \text{ kg}}{10^3 \text{ g}} \times 6 \frac{\text{mg}}{\text{kg}} = 422 \text{ mg}$$

SHOW ALL WORK TO RECEIVE CREDIT

G = 10<sup>9</sup>, M = 10<sup>6</sup>, k = 10<sup>3</sup>, c = 10<sup>-2</sup>, m = 10<sup>-3</sup>, μ = 10<sup>-6</sup>, n = 10<sup>-9</sup>, 2.54 cm = 1 in,  
 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, 454 g = 1 lb.

1. (5 Pts) Chloroform, CHCl<sub>3</sub>, has a density of 1.48 g/mL. How many mL of chloroform are needed to provide 265.0 grams?

$$\frac{265.0 \text{ g}}{1.48 \text{ g}} = 179.1 \text{ mL}$$

2. (5 Pts) A car is traveling at a speed of 45 km/hr. Determine how fast the train is going in miles/second.

$$\frac{45 \times 10^3 \text{ m}}{\text{hr}} \times \frac{1 \text{ hr}}{3600 \text{ s}} \times \frac{1 \text{ ft}}{12 \text{ in}} \times \frac{1 \text{ mi}}{5280 \text{ ft}} = 7.77 \times 10^{-3} \frac{\text{mi}}{\text{s}}$$

3. (8 Pts) Complete the following table:

Element or ion name	Element or ion symbol	Number of Protons	Number of Electrons	Number of Neutrons
chlorine-35	Cl-35	17	17	18
carbon-13	C-13	6	6	7
An fluorine-19 <u>anion</u>	F <sup>-</sup> -19	9	10	10
A magnesium-25 <u>cation</u>	Mg <sup>2+</sup> -25	12	10	13

4. (2 Pts) Give the name and the symbol of an element that would be classified as a non-metal chlorine Cl

Give the name and symbol of an element that would be classified as a metal  
sodium Na

5. (5 Pts) The recommended adult dose of Elixophyllin<sup>®</sup>, a drug used to treat asthma, is 6 mg/kg of body mass. Calculate the dose in milligrams for a 175 lb person.

$$\frac{175 \text{ lb}}{1 \text{ lb}} \times \frac{454 \text{ g}}{1 \text{ kg}} \times \frac{1 \text{ kg}}{10^3 \text{ g}} \times 6 \text{ mg/kg} = 476.7 \text{ mg}$$