CHM 110 Practice Set 1   SOLUTIONS
Significant Figures and Unit Conversions

Follow the directions for each part, and write answers in the provided blanks. Remember to show work if asked.

Count the number of significant figures in each measurement

1) __3__ 0.00645 g   2) __3__ 1050 g   3) __4__ 11.73 g   4) __3__ 0.0140 g

5) __3__ 4.70×10^6 g   6) __1__ 0.0005 g   7) __5__ 0.50057 g   8) __2__ 65000 g

9) __3__ 650. g   10) __2__ 72 g

Solve the following unit conversion problems using dimensional analysis. Write the answer in the answer blank, and show the dimensional analysis setup in the space provided.

11) 11.3 mL to μL   Answer: ___11 300___ μL

$$mL = 10^{-3} L \qquad \mu L = 10^{-6} L$$

$$11.3 \, mL \times \frac{10^{-3} L}{mL} \times \frac{\mu L}{10^{-6} L} = 11300 \, \mu L$$

12) 15500 feet to furlongs. (You may assume that *furlong = 220 yd* and *3 ft = yd*)

$$Furlong = 220 \, yd \qquad 3 \, ft = yd$$

Answer: ___23.5___ furlongs

$$15500 \, Ft \times \frac{yd}{3 \, ft} \times \frac{Furlong}{220 \, yd} = 23.48464848 \, furlongs$$

13) 12.4 mg to kg   Answer: ___1.24×10^{-5}___ kg

$$in = 2.54 \, cm \qquad 12 \, in = ft$$

$$13.24 \, ft \times \frac{12 \, in}{ft} \times \frac{2.54 \, cm}{in} = 403.8552 \, cm$$

14) 0.00045 m^3 to cm^3 Answer: ___450___ cm^3

$$cm = 10^{-2} m$$

$$0.00045 \, m^3 \times \frac{cm}{10^{-2} m} \times \frac{cm}{10^{-2} m} \times \frac{cm}{10^{-2} m} = 450 \, cm^3$$

Solve the problem. Write your answer in the blank, and show your work in the provided space. Round the answer using the significant figures rules we discussed in class.

15) In an experiment to calculate the density of a liquid, an empty cylinder is weighed. The cylinder has a mass of 75.2435g. After filling the cylinder with 25.0 mL of liquid, the cylinder and liquid together weigh 115.8393g. What is the density of the liquid?

Answer: _____1.62_____ $\frac{g}{mL}$

$$\begin{array}{r} 115.8393g \\ - \;\; 75.2435g \\ \hline 40.5958g \end{array}$$

$$d = \frac{40.5958g}{25.0\,mL} = 1.623832 \; g/mL$$

Solve the problem. Write your answer in the blank, and show your work in the provided space. Round the answer using the significant figures rules we discussed in class.

16) A solid object has a mass of 7.7548g. It is placed into a graduated cylinder that already contains 15.0 mL of water. After the object sinks to the bottom of the cylinder, the cylinder reads 17.1 mL What is the density of the object?

Answer: _____3.7_____ $\frac{g}{mL}$

$$\begin{array}{r} 17.1\,mL \\ - \;\; 15.0\,mL \\ \hline 2.1\,mL \end{array}$$

$$d = \frac{7.7548g}{2.1\,mL} = 3.692761905 \; g/mL$$

Perform the unit conversion. Write your answer in the blank, and show your work in the provided space. Round the answer using the significant figures rules we discussed in class.

17) 72.4 cm to ft (You may assume that *12 in = ft* and *2.54 cm = in* . These factors are exact.)

Answer: ___2.38___ ft

$$72.4\,cm \times \frac{in}{2.54\,cm} \times \frac{ft}{12\,in} = 2.375328 \; ft$$