Name _____

CHEM 20 Chapter 2 and 3 Mathematical Topics Review

1. Dimensional Analysis

Set up and solve the following using dimensional analysis.

a. 5,400 inches to ? mi

b. 16 weeks to ? sec

c. 54 yards to mm

2. The density of copper is 8.96 g/cm^3. What is the density of copper in lb/ft^3?

3. In Europe gasoline is sold by the liter. Assume that it takes 14 gallons of gasoline to fill the tank of a compact car. How many microliters of gasoline will it take?

4. If a chemical reaction happens in 3.8×10^4 ps. How many seconds is this?

5. How many Gigaseconds is 3.8×10^{4} ps?

II. Density *Densities are in Table 2.4 of your book.*

1. What is the density of an object that has a mass of 67.0 g and a volume of 14.7 mL?

2. What volume will 88.0 g of an object with a density of 3.44 g/ mL occupy?

3. How many grams of tin would 5.5 cL of tin weight if tin has a density of 7.265 g/mL?

4. A vase is thought be made of solid gold. It has a volume of 18.65 mL and a mass of 157 g. Is the vase solid gold? Consider table 2.4

5. What is the mass of 17.5 mL of acetone? ($D_{acetone}$= 0.7857 g/cm^3)

III. Temperature Conversions

a. 123 ^{0}C to Kelvin

b. 79.6 ^{0}F to Kelvin

c. -47 ^{O}F to C

IV. Heat *Specific heats are on in Table 3.4 of your book*

a. Calculate the required amount of heat required to raise temperature of 45.6 grams of water from room temperature (21.6 ^{0}C) to its boiling point of (100.0 ^{0}C)

b. If 55.5 Joules of heat are added to a 28.5 gram pan composed of iron, what will be the pan's temperature change?

c. A copper pan has a mass of 235 grams. If the pan absorbs 15 Joules of heat and starts at 21.5 C, what will be the final temperature of the pan?

d. How much heat in Joules is needed to raise the temperature of 125 decagrams of aluminum from 25.0°C to 95.8°C?