Chem. 4 – Fall 2008
Quiz #3

1) Give the names or formulae of the following:
    a) lead (IV) carbonate   **b) Ni(C₂H₃O₂)₂**   **c) nitrous acid**

$Pb(CO_3)_2$ **nickel (II) acetate** $HNO_{2(aq)}$

2) The density of platinum is 20.4 g per cm³. What is the volume, in cubic millimeters (mm³), of 0.3267 g of platinum?

$$0.3267\ g \times \frac{1\ cm^3}{20.4\ g} \times \left(\frac{1\times10^{-2}\ m}{1\ cm^3}\right)^3 \times \left(\frac{1\ mm}{1\times10^{-3}\ m}\right)^3 = 16.0\ mm^3$$

3) How many nanoseconds (ns) are there in 4.12 megaseconds (Ms)?

$$4.12\ Ms \times \frac{1\times10^6\ s}{1\ Ms} \times \frac{1\ ns}{1\times10^{-9}\ s} = 4.12\times10^{15}\ ns$$

4) Perform this calculation: $\dfrac{(-0.4680+135.79)\times16.0}{(128.42-129.226)}$

$$\frac{(-0.4680+135.79)\times16.0}{(128.42-129.226)} \Rightarrow \frac{135.3\overline{2}2\times16.0}{-0.80\overline{6}} = -26\overline{8}6.292804 = -2.6\overline{8}6292804\times10^3 \Rightarrow -2.7\times10^3$$

5) **Read carefully!** Do **NOT** solve this problem. Answer **ONLY** the questions below, which are based on the following:
    The Trans Alaskan Pipeline pumps enough crude oil every day to make about 3.53x10⁵ barrels of gasoline. If you own a car that gets 8.19 miles per liter, how many years can you drive at 2906 cm/s before you use up the 3.53x10⁵ barrels of gas?
    (1 barrel = 42 gallons exactly, 1 km = 0.6214 mile, 1 L = 0.2642 gal)

    a) What is given (including units)?

    3.53x10⁵ barrels   **8.19 mile/L**   **2906 cm/s**

    1 barrel = 42 gal   **1 km = 0.6214 mile**   **1 L = 0.2642 gal**

    b) What are the units on the answer going to be?

    time to use all of the gas is YEARS

    c) What other information do you know that might be useful?

    1 km = 1x10³ m   **60 s = 1 min**   **60 min = 1 hr**

    24 hr = 1 day   **365 day = 1 yr**

    d) Where are you going to start and what is your "game plan"?

    3.53x10⁵ barrels → gal → L → mile → km → m → cm → s → min → hr → day → yr

    BONUS Question worth 2 points. Set-up and solve the above problem. Show all work for credit!

$$3.53\times10^5\ barrel \times \frac{42\ gal}{1\ barrel} \times \frac{1\ L}{0.2642\ gal} \times \frac{8.19\ mile}{1\ L} \times \frac{1\ km}{0.6214\ mile} \times \frac{1\times10^3\ m}{1\ km} \times \frac{1\ cm}{1\times10^{-2}\ m} \times \frac{1\ s}{2906\ cm} \times \frac{1\ min}{60\ s} \times \frac{1\ hr}{60\ min} \times \frac{1\ day}{24\ hr} \times \frac{1\ yr}{365\ day} = 807\ yr$$