CHEM 103
PLI 1
Tuesday, May 24, 2016

Please simplify/solve/express in scientific notation to 3 sig figs. If you can, try to manipulate each one in multiple ways. For instance:

$$\left(16\cdot\frac{1}{4}\right)^{\frac{1}{2}} = 16^{\frac{1}{2}}\cdot\left(\frac{1}{4}\right)^{\frac{1}{2}} = \sqrt{16}\cdot\frac{\sqrt{1}}{\sqrt{4}} = 4\cdot\frac{1}{2} = 2 \qquad OR \qquad \left(16\cdot\frac{1}{4}\right)^{\frac{1}{2}} = \left(4\right)^{\frac{1}{2}} = 2$$

There is often an "eastist" way to simplify a given expression, but it takes practice to develop comfort with different operations.

1) $\sqrt[5]{1.28 \times 10^{19}} =$

2) $\log x = 8.73$

3) $\left(12\times\frac{1}{6}\right)^{7} =$

4) $4^{5}\times 6^{5} =$

5) $\frac{1}{2}\times\ln\left(50\right)\times\ln\left(400\right) =$

6) $\log_{x} 8 = 3$

7) If Jane and Dan are 1.97 x 10^{-2} miles apart, how many micrometers apart are they?
   Givens: 1 mile = 5,280 ft.   1 ft. = 12 in.   1 in. = 0.0254 m   1 m = 1 x 10^{6} µm

8) Pure water has its highest density of 1000 kg/m³ at temperature 4°C.
   You heat water to 90°C and find that a 15 mL sample has mass 14.5 g.
   By what percent of its original, highest density has your sample's density decreased?
   Givens: 1 mL = 1 cm³   1 m³ = 1 x 10⁶ cm³ (does this make sense?)   1 kg = 1000 g

10) What is the difference between accuracy and precision? Is it possible for measurements to be precise but not accurate? Accurate but not precise?

9) Given the chemical symbol, provide the name of the following elements:
   a. Na
   b. F
   c. Cu
   d. Ag
   e. Fe
   f. Pb

10) Please connect and fill in the boxes with the terms below, providing brief explanations.

Compounds
Homogenous mixture
Heterogeneous mixture
Pure substances
Mixtures
Elements
Matter