Worksheet 1: Significant Figures, Units, and Conversion Factors

1. How many significant figures are in each of the following numbers?

5.40	3
235.40	5
1.4895	5
3.97×10^{-5}	3
1.400	4
30000	1
250.	3
0.0210	3

2. Complete the following calculations to the appropriate number of sig. figs.:

234.55 + 25.2 = **259.8**

430. – 44.67 = **385**

1420 x 320. = **454000 or 4.54×10^5**

$(6.274 \times 10^3) \times (1.56 \times 10^{-2})$ = **9.79×10^1**

(529 + 1.30) × 1.2 = **530.**

$(1.343 \times 10^2) + (1.5654 \times 10^2)$ = **2.908×10^2**

$\log(3.80 \times 10^{-6})$ = **$\log(3.80) + \log(10^{-6}) = 0.580 + -6.00000\ldots = -5.420$**

$10^{3.201}$ = **$10^{0.201} \times 10^3 = 1.59 \times 10^3 = 1.59 \times 1000.00000\ldots = 1590$**

(202 + 3.50) × 1.2 = **250**

***** These [$\log(10^{-6}) = -6$; $10^3 = 1000$] are exact numbers with infinite sig figs, so they do NOT affect the number of sig figs in the final answer***

3. According to the Office of the Registrar at UW, for an in-state student to enroll with a course load of 12 credit hours, the current cost of tuition and fees for fall 2013 is $4133. Given that CHEM142 is a 5-credit course that meets 30 times per term, calculate how much you are paying to attend a single CHEM142 lecture assuming a 12-credit course load and $4133 in total expenses for the fall term.

$$\left(\frac{\$4133}{\text{quarter}}\right)\cdot\left(\frac{\text{quarter}}{12\text{ credits}}\right)\cdot\left(\frac{5\text{ credits}}{\text{CHEM142}}\right)\cdot\left(\frac{\text{CHEM142}}{30\text{ lectures}}\right)=\frac{\$57.40}{\text{lecture}}$$

4. Write out electron configurations for the following atoms:

O $1s^2\,2s^2\,2p^4$

Na $1s^2\,2s^2\,2p^6\,3s^1$

Al $1s^2\,2s^2\,2p^6\,3s^2\,3p^1$

Cl $1s^2\,2s^2\,2p^6\,3s^2\,3p^5$