Physics 1A Discussion (Week 2)

Name		UID	

Problem 1 (problem 1.53 on page 30 of the textbook)

BIO Estimate the number of atoms in your body.(Hint: Based on what you know about biology and chemistry, what are the most common types of atom in your body? What is the mass of each type of atom?

Group / Period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1 **H** 1.008																	2 **He** 4.003
2	3 **Li** 6.941	4 **Be** 9.012											5 **B** 10.811	6 **C** 12.011	7 **N** 14.007	8 **O** 15.999	9 **F** 18.998	10 **Ne** 20.180
3	11 **Na** 22.990	12 **Mg** 24.305											13 **Al** 26.982	14 **Si** 28.086	15 **P** 30.974	16 **S** 32.065	17 **Cl** 35.453	18 **Ar** 39.948
4	19 **K** 39.098	20 **Ca** 40.078	21 **Sc** 44.956	22 **Ti** 47.867	23 **V** 50.942	24 **Cr** 51.996	25 **Mn** 54.938	26 **Fe** 55.845	27 **Co** 58.933	28 **Ni** 58.693	29 **Cu** 63.546	30 **Zn** 65.409	31 **Ga** 69.723	32 **Ge** 72.64	33 **As** 74.922	34 **Se** 78.96	35 **Br** 79.904	36 **Kr** 83.798

For each element, the average atomic mass of the mixture of isotopes occurring in nature is shown. For elements having no stable isotope, the approximate atomic mass of the longest-lived isotope is shown in parentheses. All atomic masses are expressed in atomic mass units $(1\ \mathrm{u} = 1.660539040\,(20) \times 10^{-27}\ \mathrm{kg})$, equivalent to grams per mole $(\mathrm{g/mol})$.

Problem 2(problem 1.72 on page 30 of the textbook)

Ricardo and Jane are standing under a tree in the middle of a pasture. An argument ensues, and they walk away in different directions. Ricardo walks 26.0 m in direction 60.0° west of north. Jane walks 16.0 m in a direction 30° south of west. They then stop and turn to face each other.
(a) What is the distance between them?
(b) In what direction should Ricardo walk to go directly toward Jane?

Problem 3 (problem 1.82 on page 31 of the textbook)

Vector $\vec{A}$ has magnitude 5.00 m and lies in the xy-plane in a direction 53.0° from the $+x$-axis measured toward the $+y$-axis. Vector $\vec{B}$ has magnitude 8.00 m and a direction you can adjust.
(a) You want the vector product $\vec{A} \times \vec{B}$ to have a positive z-component of the largest possible magnitude what direction should you select for vector $\vec{B}$?
(b) What is the direction of $\vec{B}$ for which $\vec{A} \times \vec{B}$ has the most negative z-component?
(c) What are the two directions of $\vec{B}$ for which $\vec{A} \times \vec{B} = \vec{0}$?