

**Ch. 1 Problem Set 1**

1. Estimate the magnitude in kg of a: mouse, car, house, battleship.
2. A cubit was based on the size of a palm. If the ark was supposedly 300 cubits by 50 cubits by 30 cubits, estimate the volume in cubic meters. How does this compare to an average 2000 ft<sup>2</sup> home?
3. What is the mathematical formula for the volume of an object that covers a specific area and has uniform height (use V, h, A)? Prove your formula dimensionally correct using SI units.
4. The equation for the period of a pendulum is,  $T=2\pi(l/g)^{.5}$ . Show this is dimensionally correct.
5. Using dimensional analysis show equation is correct or incorrect.  

$$1/2mv^2 = 1/2mv_0^2 + (mgh)^{.5}$$

$$v = v_0 + at^2$$

$$ma = v^2$$
6. How many significant figures in each of the following:  
 78.9+/- .2      3.788x10<sup>9</sup>      3200      .00320      2.46x10<sup>-6</sup>
7. Mr. L caught two king salmon in Canada this summer, one was 93.46cm and the other was 1.303m, both were delicious. What was the total length? How much longer was the second?
8. What is the volume of 1.00 qt in cm<sup>3</sup>?

9. What is the distance of a fly from the bottom left corner of a wall if it is 1.0m high and 2.0m to the right? What is the polar coordinate?
10. A right triangle has a hypotenuse of 3.00m and angle of  $30.0^\circ$ . What are the lengths of the other two sides?
11. Oleic acid is a non-polar molecule. When placed on water it forms a layer one molecule thick. If you place lycopodium powder on the water and gently place a drop of acid gently in the center a ring will form. The density of oleic acid is  $0.8935 \text{ g/cm}^3$ . Find the height of one molecule. Use the apparatus provided.