Reminders 8-30-10:

-1st Webassign Homework Due Tuesday 8/31.

-Conceptual Quiz Wed. on how to add vectors.

-Log onto Computers

-Website will migrate to Blackboard soon!!!!!

-Lab software can be obtained from desktop of computers in lab.

-Read Chapter 1, 3.1-3.2, 4.1-4.2 and Appendix A

-Sign up for Physics 2X. Homework will be discussed in this class, not (generally) during lecture.

-The Measurement Worksheet is an individualized lab; each person must have their own set of data for the blocks.

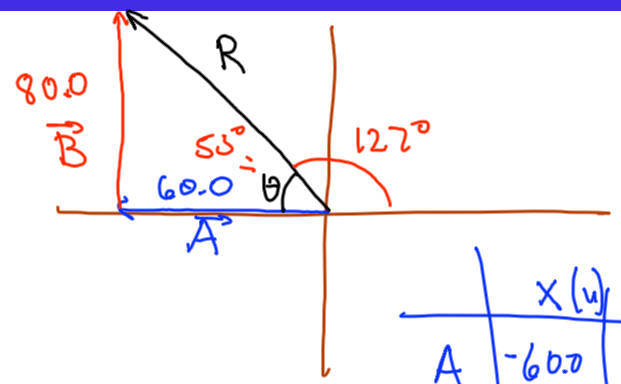
-The Measurement Worksheet can be done either in black or blue pen or it can be typed in Microsoft Word. The Word document will be made available shortly.

-All Lab Reports are worth 20 points. They all require a cover sheet. Due date is next week in your lab session.

-One lab precheck is allowed for the 1st 3 labs this semester. You must come at least one day before it is due with a completed lab report.

Objectives:
-Vector Addition
-Statics+Examples

A vector is 60.0 units long and directed along the negative x-axis. A second vector is 80.0 units long and directed along the y-axis. Determine the magnitude and direction of the resultant vector.



	x (u)	y (u)
A	-60.0	0
B	0	80.0
R	-60.0	80.0

$$R = \sqrt{(-60.0\,u)^2 + (80.0)^2}$$

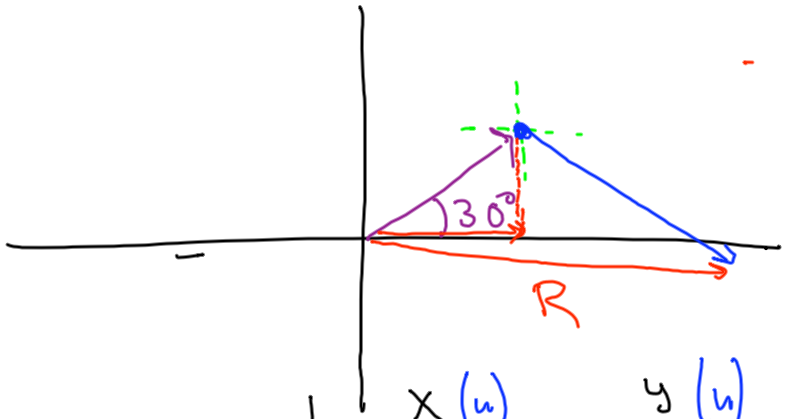
$$= 100.0 \text{ units}$$

$$\tan^{-1}\left(\frac{80.0}{-60.0}\right) + 180^\circ = 127^\circ$$

100.0 units

127° from +x-axis
53° above -x-axis
53° N of W
37° W of N

A vector is 60.0 units long and directed 30.0 degrees above the x-axis. A second vector is 80.0 units long and directed 45 degrees below the x-axis. Determine the magnitude and direction of the resultant vector.

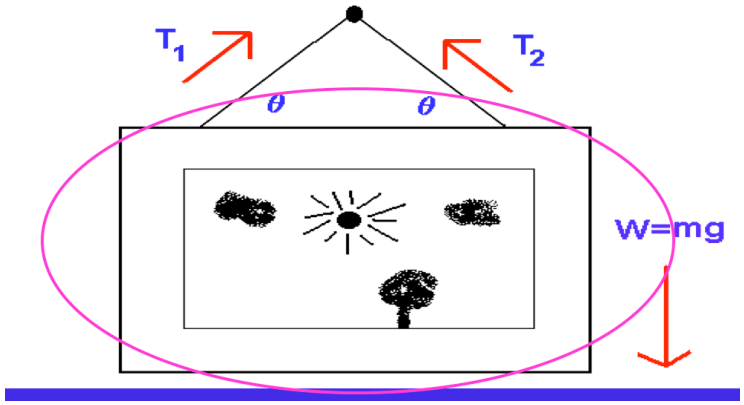


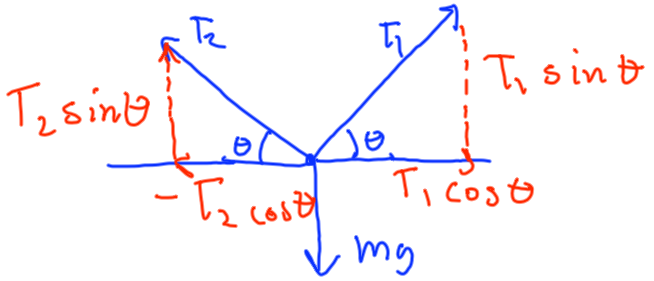
	x (u)	y (u)
A	$60.0\cos 30$ 52.6	$60.0\sin 30$ 30.0
B	$80.0.\cos 45$ 56.6	$-80\sin 45$ -56.6
R	109.2	-26.6

$$R = \sqrt{(109.2)^2 + (-26.6)^2}$$

$$R = 112 \text{ u}$$

$$\theta = \tan^{-1}\left(\frac{-26.6}{109.2}\right) = -13.7^\circ$$





$$\Sigma F_x = -T_2\cos\theta + T_1\cos\theta = 0$$

$$T_1 = T_2$$

$$\Sigma F_y = T_2\sin\theta + T_1\sin\theta - mg = 0$$

$$= 2T_1\sin\theta - mg = 0$$

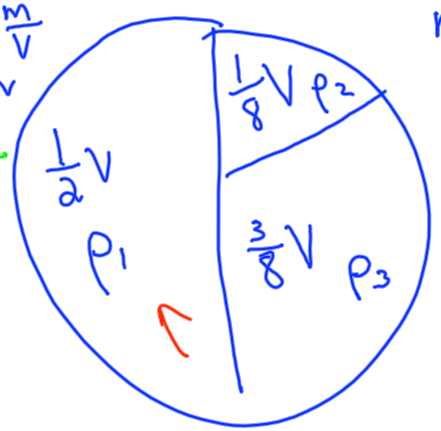
$$2T_1\sin\theta = mg$$

$$T_1 = \frac{mg}{2\sin\theta}$$

$\rho = \frac{m}{V}$

$m = \rho V$

$V = \frac{m}{\rho}$



$m_1 = \frac{1}{2}V\rho_1$

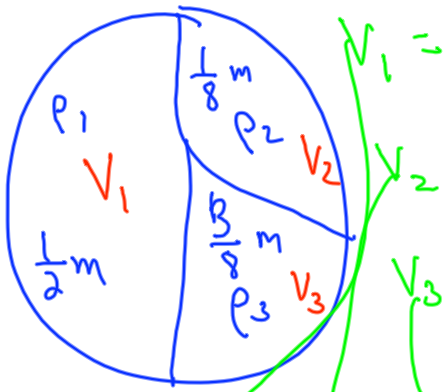
$m_2 = \frac{1}{8}V\rho_2$

$m_3 = \frac{3}{8}V\rho_3$

$$\frac{\text{TOTAL Mass}}{\text{Total Volume}} = \frac{m_1 + m_2 + m_3}{V_1 + V_2 + V_3}$$

$$\rho_{AVG} = \frac{\frac{1}{2}V\rho_1 + \frac{1}{8}V\rho_2 + \frac{3}{8}V\rho_3}{V}$$

$$= \frac{1}{2}\rho_1 + \frac{1}{8}\rho_2 + \frac{3}{8}\rho_3$$



$V_1 = \frac{\frac{1}{2}m}{\rho_1}$

$V_2 = \frac{1}{8}m / \rho_2$

$V_3 = \frac{3}{8}m / \rho_3$

$$\rho = \frac{m}{V_1 + V_2 + V_3}$$

Arc length = $R\theta$

θ in radians