Reminders 10-27-10:

-<u>Next Exam will require use of conservation of energy and free-body analysis</u>.

-Circular Motion Conceptual Questions Due Today (see Blackboard).

-Chapter 7 Quiz Today

-Rewrite of Momentum Lab Due Next Monday (turn in old and new versions)

-Extra Credit For Exam Due Monday!

Fix calculations for $\Delta p_1=m(v_{1f}-v_{1i})$ $\Delta p_2=m(v_{2f}-v_{2i})$ for inelastic collisions.

Fix units in calculations.

Fix <u>All Sig. Figs. errors</u>!!!!

Fix all plagiarized sections of reports

Fix answer to question 1. Calculate KE before and after collision. One calculation for elastic collision and one from inelastic collision.

If you want to fix the sig. fig. error from mass measurements, you'll need to do the experiment again, unless someone in your group has the correct data.

Grade will be recorded when corrections are made.

Objectives:

-Kepler's Laws

-Apparent Weight

-Torque

-Conditions for Equilibrium

-Quiz

Kepler's 3rd

$$\frac{G M_s \cancel{M_E}}{r_{es}^2} = M_E a_c = \frac{\cancel{M_E} v^2}{r_{es}}$$

$$\frac{G M_s}{r_{es}^2} = \frac{v^2}{r_{es}} = \left(\frac{2\pi r_{es}}{T}\right)^2 \frac{1}{r_{es}} = \frac{4\pi^2 r_{es}}{T^2}$$

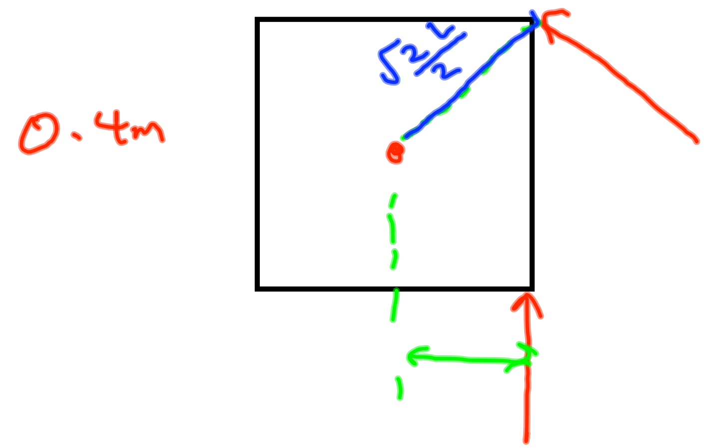
$$G M_s = \frac{4\pi^2 r_{es}^3}{T^2}$$

$$\frac{T^2}{r_{es}^3} = \frac{4\pi^2}{G M_s} = \text{constant}$$

$$\frac{T^2}{r^3} = \text{constant}$$

for any planet orbit sun

A square, 0.40 m on a side, is mounted so that it can rotate about an axis that passes through the center of the square. The axis is perpendicular to the plane of the square. A force of 15 N lies in this plane and is applied to the square. What is the magnitude of the maximum torque that such a force could produce?



$$\tau = \frac{\sqrt{2}}{2} L F = \frac{\sqrt{2}}{2}(.40\,m)(15\,N)$$

$$= \underline{4.2\ N\,m}$$

Shown below are seven situations where a student is holding a meter stick at the left end at various angles. A 1000 g mass is hung on the meter sticks at different locations. All of the meter sticks are identical, but the distance along the meter stick at which the 1000 g mass is hung and the angles at which the student holds the meter stick vary. Specific values are given in each figure. (Ignore the mass of the meter stick.)

Rank these situations, from greatest to least, on the basis of how difficult it would be for the student to hold the meter stick from the left end in the position shown. That is, put first the situation where it would be hardest to hold the meter stick at the angle shown and put last the situation where it would be easiest to hold it at the angle shown.