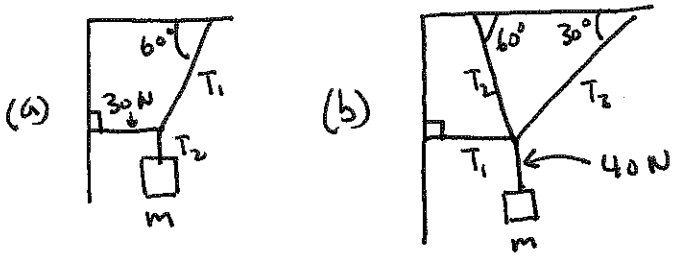
Physics 209: Problem Set 4
Due Date: September 30, 2014

1. (20 pts) Find the Tensions and masses for each of the examples below:

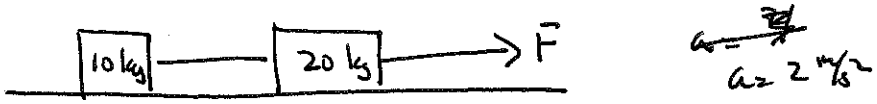


2. (10 pts) You push a 10 kg box along a frictionless horizontal surface with a force, $F = 20$ N. What is the acceleration of the box?

3. (10 pts) Now suppose, you push the same box up an inclined plane with angle, θ. Find the angle at which the box experiences no acceleration? NOTE: the force is still horizontal.

4. (20 pts) A box of mass m that was sliding along the floor, hits an incline plane and slides up the inclined plane with angle θ at a velocity v_0. Find an expression for the maximum height, h, above the floor that the box reaches. This expression should not depend on m or θ, but only on v_0 and g.

5. (10 pts) Consider two 10 kg boxes attached by a string below. A force pulls both boxes toward the right with an acceleration of $a = 2$ m/s^2. (a) What is the magnitude of the forces? (b) What is the tension, T, of the string?



6. (10 pts) TM Ch 4. problem 75

7. (20 pts) Consider the figure below. What is the acceleration of the 20 kg mass?

8. This question is for statistics only. Did you view video tutorials (http://www.gravity.phys.uwm.edu/ pchang/Site/phys209.html) associated with this problem set (Y/N)? If so how much did they help you complete the problem set (1 - not useful to 10 - extremely useful)?