Physics 209: Worksheet 4

1. Find the Tensions and masses for each of the examples below:

2. You push a 40 kg box along a frictionless horizontal surface with a force, $F = 40$ N. What is the acceleration of the box?

3. Now suppose, you push the same box up an inclined plane with angle, $\theta = 30$ degrees. What is the acceleration of the box?

4. Suppose you accelerate the incline plane to the right as shown below. For what acceleration, a, will the box not slide up and down the plane? What happens for smaller a? larger a?

5. Now suppose you have the same situation as above, but now we apply an acceleration upward of 3 m/s^2? What does the new acceleration have to be to make sure that the box stays in position on the incline plane?

6. Consider the Figure below. What is the acceleration and what is the two tensions?

7. Consider the Figure below. What is the acceleration of the masses and tension in the string?