Physics I
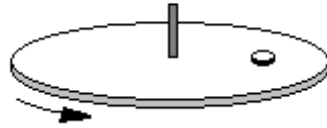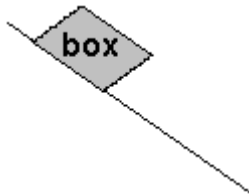
Friction

Problem 1.- A coin is located 0.2 m away from the center of a horizontal turntable which accelerates slowly. Calculate at what angular velocity (ω) the coin will start sliding if the coefficient of static friction is μ=0.5

Problem 2.- A block begins to slide down a ramp after being elevated to an angle of 35 degrees. What is the coefficient of static friction?


Problem 3.- What is the maximum acceleration a car can undergo on a level road if the coefficient of static friction between the tires and the pavement is 0.65?

Problem 3a.- What is the minimum distance to stop a car with an initial velocity of 15 m/s on a level road if the coefficient of static friction between the tires and the pavement is 0.65?

Problem 4.- Rubber on ice has a very low coefficient of kinetic friction $\mu_K = 0.13$

Based on this, calculate the distance needed to stop a car that is going at 20 miles per hour on a level icy road. Assume that the driver slam on the brakes, locking the wheels.
[1 mile=1609 m]
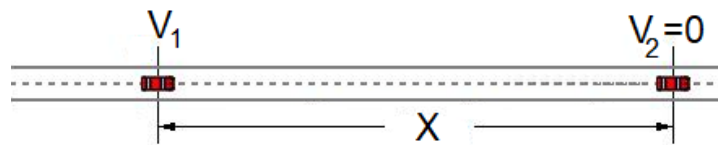
Problem 5.- A hockey puck is given an initial speed of 2.5m/s and it slides 15m on the ice before it stops. Calculate the coefficient of kinetic friction.

Problem 6.- A 15 kg box is sitting on a rough, level surface. A horizontal force of 95 N is needed to start moving the box. Once the box starts moving the 95N force is maintained and the box accelerates at 1.5m/s^2
   a) Find the coefficient of static friction.
   b) Find the coefficient of kinetic friction.