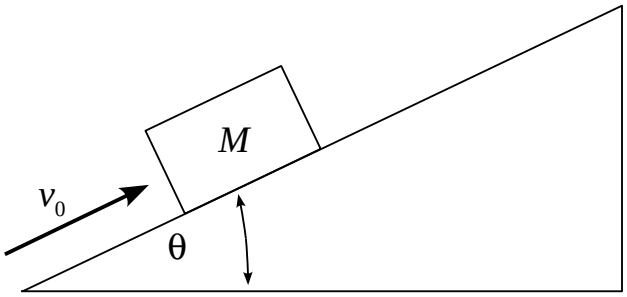
Physics 10310
Discussion Section Questions

Set 5

Directions: One person in your group should act as "scribe" to record your group's solution on a sheet of paper. Please make sure your answers are legible and comprehensible.

1. A block of mass M is launched up an inclined plane with initial velocity v_0 along the plane. The coefficient of kinetic friction is given as μ_k. Assume for this problem that $\mu_k = \mu_s$, and that the coefficients are small so that the block is only instantaneously at rest at the top of its motion.



a) Compare the length of time the block takes to go up to its highest point with the time it takes to come down. Does it take longer, shorter, or the same amount of time to return back to the ground? Explain in words, not equations.

b) Now, assuming M=2kg, $\theta = 60^o$, $\mu_k = 0.1$, and $v_0 = 9.0$ m/s, find the time it takes to reach its maximum height starting from the bottom.

c) Find the total work done by the force of Friction during the block's motion. How would you find the block's final velocity?

2. Mass m_1 moves in a circular path of radius r on a frictionless horizontal table. It is attached to a string that passes through a frictionless hole in the center of the table. A second mass m_2 is attached to the other end of the string. If the period of revolution is T, find an expression for the radius of the circle, r, in terms of T, m_1 and m_2.