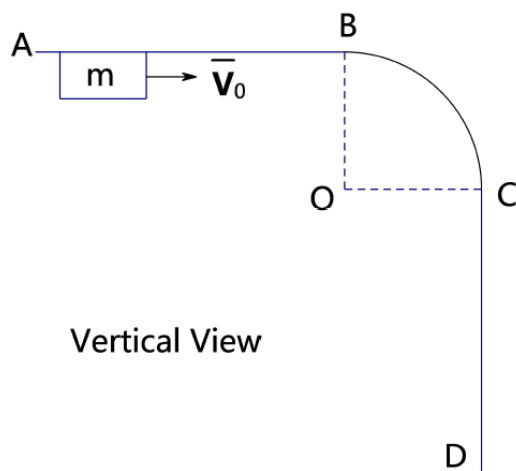1. There is an object with mass m, is moving on a frictionless plane. Its motion is subjected to a fixed baffle on the plane. The baffle 0, consists of two straight board and an arc board with radius R. At t=0, the object is moving along AB with speed v_0. The friction coefficient is μ. Calculate the work done by firction when the object is moving from A to D.

Vertical View

2. The mass of B is m, the mass of C is M. The length of the light rod is L. When there is a slight turbulence, the B falls to the right. When B do not touch C, the angle between the B and C is $\pi/3$. Question: what is the magnitude of m/M? (There is no friction).
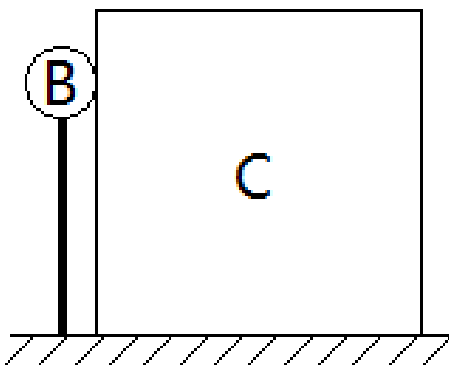
3. A man jumps from the ground with speed v_0 to the wall, the distance between the man and the wall is s_0. When he reaches the wall, he has a vertical velocity pointing downwards. Then the wall gives the man a normal force to help him change his direction to go upward. The coefficient of kinetic friction between the man and the wall is μ .What is the value of θ when the man can jump highest?
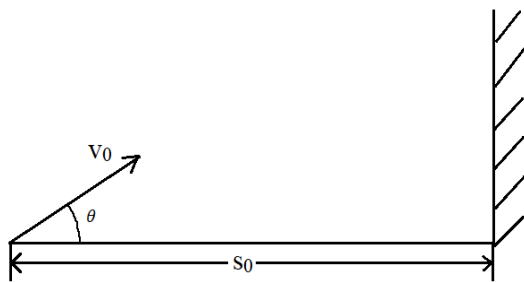
4. The system is shown in the figure. There exists friction between m and M, but the ground is smooth. Initially, the system is at rest. Then m moves along the slope to the ground, try to find the distance M travels in total. Please (a) use kinematics with the help of non-inertial FoR (the slope) (b) use the conservation of momentum to solve the problem.
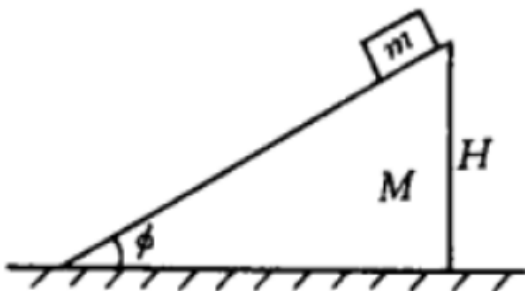
5. Ball B with mass m is placed in a frictionless horizontal pipe. There is a narrow gap along the pipe, where ball A with mass m is connected to ball B with a inextensible massless rope with length l. Initially the distance between A and B is $\frac{l}{2}$, and ball A start moving to the right with initial speed v_0. When the rope is tightened, determine the speed of ball B v_B.