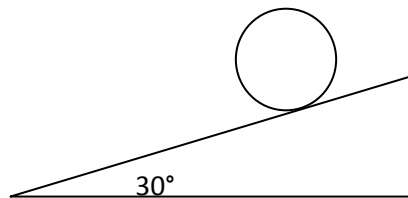


152 Homework Assignment

Please show the details of your calculation. Just a result is not acceptable.

A very thin ring with a mass of 5.0 kg rolls down a slope of 30° . (Thin ring means you may assume the thickness of the wall and assume all the mass of the ring has a distance r away from the center.) The radius of the ring is 1.0 m.



- (a) If the ring runs down a **frictionless** slope for 5.0 meters *along* the slope. What is the speed of the center of the mass of the ring? What is the angular velocity of the ring? What is the linear acceleration of the ring?
- (b) If the ring runs down a **frictional** slope for 5.0 meters *along* the slope. The friction is so large that the ring is having a pure rolling without slip. What is the speed of the center of the mass of the ring? What is the angular velocity of the ring? What is the friction between the ring and the slope?
- (c) A **solid disc** with same mass and radius runs down the same **frictional** slope for 5.0 meters *along* the slope. The friction is also large so that the ring is having a pure rolling without slip. What is the speed of the center of the mass of the disc? What is the angular velocity of the disc? What is the friction between the ring and the slope?