

### Inclined Planes and Friction

- (1) A 100. N block sits on a rough horizontal floor. The coefficient of sliding friction between the block and the floor is 0.250. A horizontal force of 90.0 N acts on the block for 3.00 seconds. Calculate the velocity of the block after 3.00 seconds if it starts from rest.
- (2) A force of 160. N parallel to an inclined plane is required to move a 200. N weight up the inclined plane with a constant velocity. Find the coefficient of sliding friction if the plane is inclined at 30.0 degrees.
- (3) A 15.0 m long plane is inclined at 30.0 degrees. If the coefficient of friction is 0.426, what force is required to move a 40.0 kg mass from rest at the bottom on the plane to the top of the plane with a final velocity of 8.00 m/s?
- (4) A person pushes on the handle of a lawnmower with a force of 280. N. If the handle makes an angle of 40.0 degrees with the ground, calculate the coefficient of friction if the lawnmower weighs 350. N and is moving at a constant velocity.
- (5) An inclined plane 20.0 m long has a slope of 40.0 degrees. An object with a mass of 170. kg is sitting on the top of the incline. (a) If the coefficient of friction between the mass and the plane is 0.235, find the velocity of the object at the bottom of the incline. (b) If the block slides across a horizontal floor after reaching the bottom of the incline, how far will the block travel if the coefficient of friction remains 0.235.
- (6) A box having a mass of 80.0 kg is dragged across a rough horizontal floor by means of a rope tied on the front of it. The coefficient of friction between the box and the floor is 0.450. If the angle between the rope and the floor is 38.0 degrees, what force must be exerted on the rope to move the box at a constant velocity?
- (7) For the diagram below, the coefficient of friction is 0.0500. Find the velocity of the system and the distance the system moves in 3.00 seconds starting from rest.

