P11

OBJECTS ON AN INCLINED PLANE – PRACTICE 1

- Use the "GRASS" method and always include a situation diagram as well as an FBD.

1. Determine the acceleration of a 12.0-kg object that is placed on top of an inclined plane with an angle of inclination of 68°. Assume that the surfaces are frictionless.

2. Will the object from question 1 accelerate if the coefficient of static friction is 0.27 and the coefficient of kinetic friction of 0.23? Justify your answers. The angle inclination remains the same.

3. Will a 35-kg object accelerate when pulled by a rope up the plane? Given that the coefficient of static friction is 0.30 and the coefficient of kinetic friction is 0.26, the force of tension in the rope is 300 N [parallel wit the plane], and the angle of inclination is 40°, calculate this acceleration.

4. What coefficient of static friction will ensure that a 1.5 kg object remains at rest on an inclined plane with an angle of inclination of 60°?

5. Provided that the coefficient of kinetic friction between legs of a sofa and a 50°plane is 0.18, how much do you have to push parallel with the inclined plane to move the 65-kg sofa with constant speed up the plane?

6. What force parallel with the inclined plane will ensure that a 20-kg object remains at rest if the inclined plane has an angle of inclination of 57° and the coefficient of static friction is 0.32?