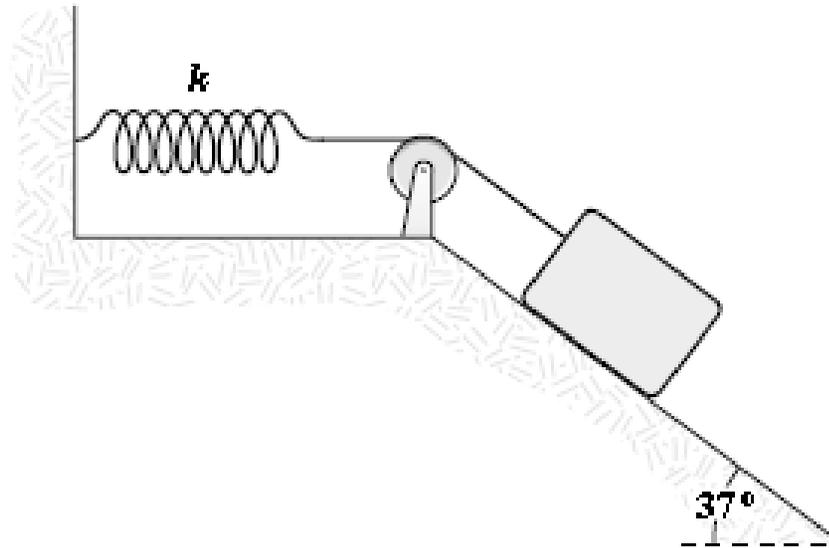
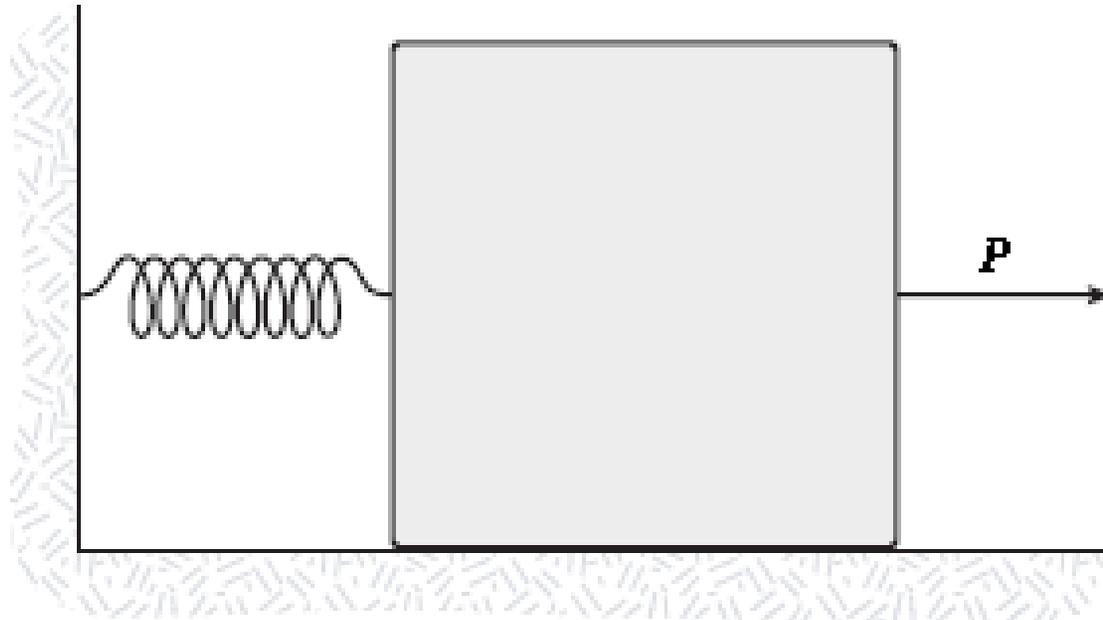


- A 2.0-kg block situated on a frictionless incline is connected to a light spring ($k = 100 \text{ N/m}$), as shown. The block is released from rest when the spring is unstretched. The pulley is frictionless and has negligible mass. What is the speed of the block when it has moved 0.20 m down the plane?



- A 12-kg block on a horizontal frictionless surface is attached to a light spring (force constant = 0.80 kN/m). The block is initially at rest at its equilibrium position when a force (magnitude $P = 80$ N) acting parallel to the surface is applied to the block, as shown. What is the speed of the block when it is 13 cm from its equilibrium position?



1. A 3.0-kg object moving in the positive x direction has a one-dimensional elastic collision with a 5.0-kg object initially at rest. After the collision the 5.0-kg object has a velocity of 6.0 m/s in the positive x direction. What was the initial speed of the 3.0 kg object?
2. A 10-g bullet moving horizontally with a speed of 2.0 km/s strikes and passes through a 4.0-kg block moving with a speed of 4.2 m/s in the opposite direction on a horizontal frictionless surface. If the block is brought to rest by the collision, what is the kinetic energy of the bullet as it emerges from the block?

Rotation

- A wheel rotates about a fixed axis with an initial angular velocity of 20 rad/s . During a 5.0-s interval the angular velocity decreases to 10 rad/s . Assume that the angular acceleration is constant during the 5.0-s interval. How many radians does the wheel turn through during the 5.0-s interval?

- A wheel (radius = 0.20 m) is mounted on a frictionless, horizontal axis. A light cord wrapped around the wheel supports a 0.50-kg object, as shown in the figure. When released from rest the object falls with a downward acceleration of 5.0 m/s^2 . What is the moment of inertia of the wheel?

