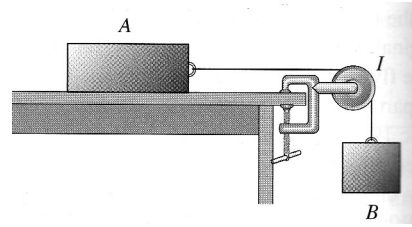


The system shown at the right starts from rest. Block A slides across a frictionless table and has a mass of 2.00kg . The pulley has a mass of 1.00kg and a radius of 5.00cm . Block B has a mass of 5.00kg .



1. Find (a) the rotational inertia of the pulley, (b) the acceleration of the blocks, (c) the tension in the vertical part of the string, (d) the tension in the horizontal part of the string, and (e) the speed of block B after it has fallen 1.00m . *Hint: the answers to (c) and (d) are not the same because these tensions create the net torque that spins the massive pulley.*
2. Find the speed of block B after it has fallen 1.00m using energy methods and compare your answer with problem 1.
3. A physics student is given a sphere and asked to determine whether it is hollow or solid. She makes a ramp 20.0cm high and lets the sphere roll from rest down the incline where she measures the final speed to be 1.53m/s . Find the type of sphere she was given.
4. A 12.0cm long pencil is balanced temporarily on its point. The mass of the pencil is 20.0g . As the pencil tips, the point of contact stays fixed. Find the speed of the center of mass just as it lands on the horizontal tabletop.

