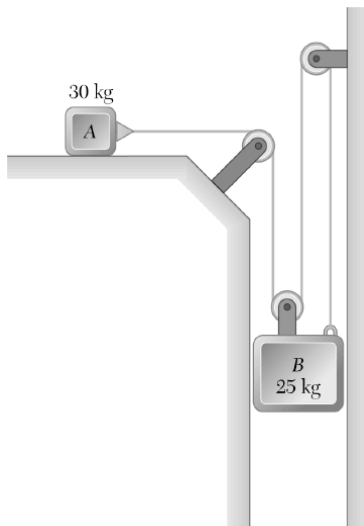


ES 208 Mechanics

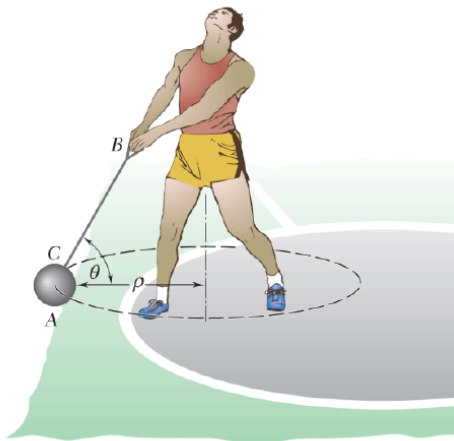
Tutorial 13

All problems are from Beer and Johnston's book



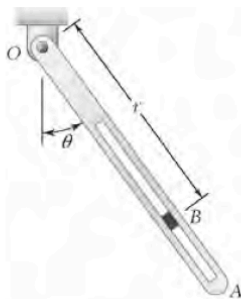
PROBLEM 12.13

The two blocks shown are originally at rest. Neglecting the masses of the pulleys and the effect of friction in the pulleys and between block A and the horizontal surface, determine (a) the acceleration of each block, (b) the tension in the cable.



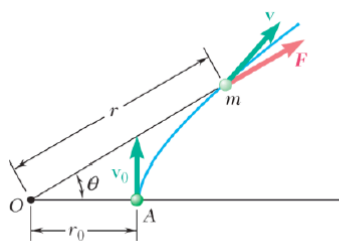
PROBLEM 12.37

During a hammer thrower's practice swings, the 7.1-kg head A of the hammer revolves at a constant speed v in a horizontal circle as shown. If $\rho = 0.93$ m and $\theta = 60^\circ$, determine (a) the tension in wire BC , (b) the speed of the hammer's head.



PROBLEM 12.66

A 0.5-kg block B slides without friction inside a slot cut in arm OA which rotates in a vertical plane at a constant rate, $\dot{\theta} = 2$ rad/s. At the instant when $\theta = 30^\circ$, $r = 0.6$ m and the force exerted on the block by the arm is zero. Determine, at this instant, (a) the relative velocity of the block with respect to the arm, (b) the relative acceleration of the block with respect to the arm.



PROBLEM 12.74

A particle of mass m is projected from Point A with an initial velocity \mathbf{v}_0 perpendicular to line OA and moves under a central force \mathbf{F} directed away from the center of force O . Knowing that the particle follows a path defined by the equation $r = r_0 / \sqrt{\cos 2\theta}$ and using Eq. (12.25), express the radial and transverse components of the velocity \mathbf{v} of the particle as functions of θ .