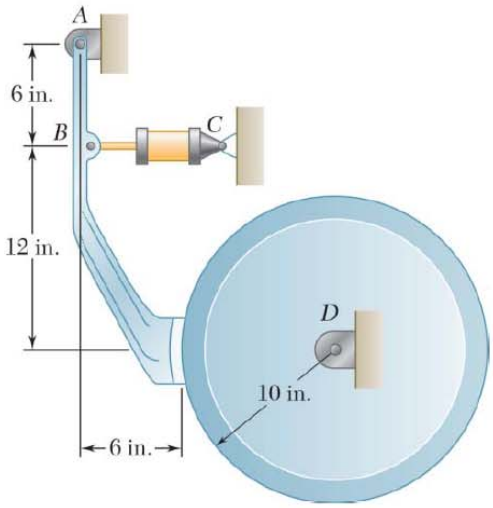
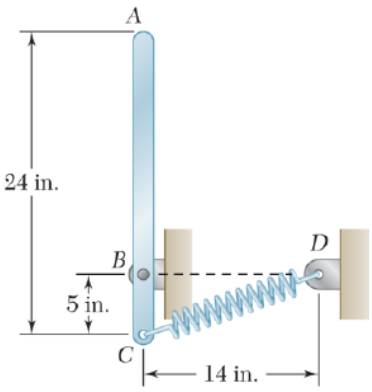
HW # 11 – Chapter 17



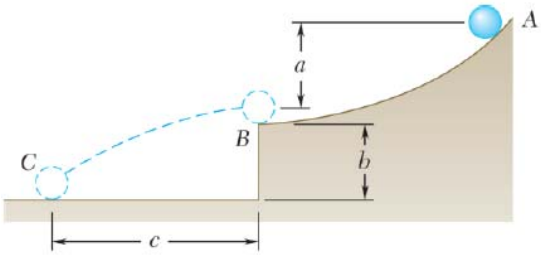
PROBLEM 17.9

The 10-in.-radius brake drum is attached to a larger flywheel which is not shown. The total mass moment of inertia of the flywheel and drum is 16 lb · ft · s^2 and the coefficient of kinetic friction between the drum and the brake shoe is 0.40. Knowing that the initial angular velocity is 240 rpm clockwise, determine the force which must be exerted by the hydraulic cylinder if the system is to stop in 75 revolutions.



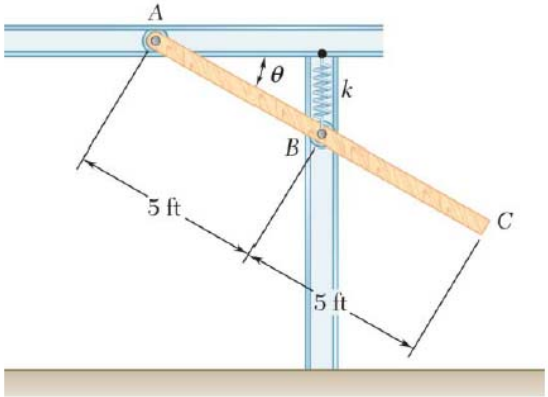
PROBLEM 17.18

A slender 9 lb rod can rotate in a vertical plane about a pivot at B. A spring of constant k = 30 lb/ft and of unstretched length 6 in. is attached to the rod as shown. Knowing that the rod is released from rest in the position shown, determine its angular velocity after it has rotated through 90°.



PROBLEM 17.28

A small sphere of mass m and radius r is released from rest at A and rolls without sliding on the curved surface to Point B where it leaves the surface with a horizontal velocity. Knowing that a = 1.5 m and b = 1.2 m, determine (a) the speed of the sphere as it strikes the ground at C, (b) the corresponding distance c.



PROBLEM 17.40

The mechanism shown is one of two identical mechanisms attached to the two sides of a 200-lb uniform rectangular door. Edge ABC of the door is guided by wheels of negligible mass that roll in horizontal and vertical tracks. A spring of constant k = 40 lb/ft is attached to wheel B. Knowing that the door is released from rest in the position $\theta = 30°$ with the spring unstretched, determine the velocity of wheel A just as the door reaches the vertical position.