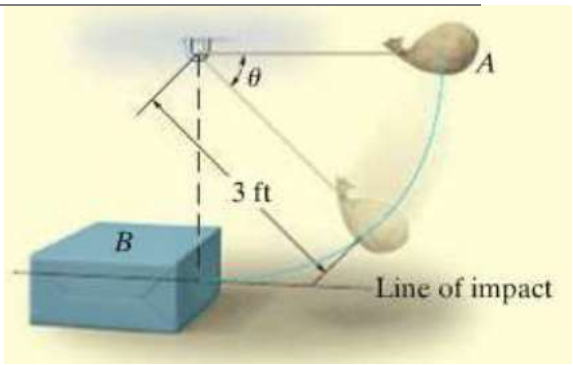
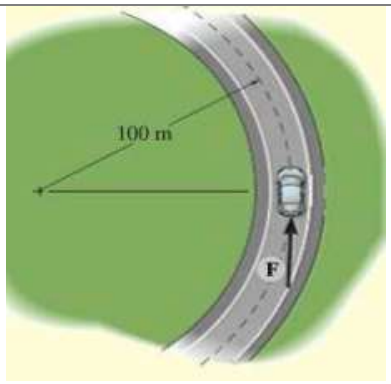
Examples

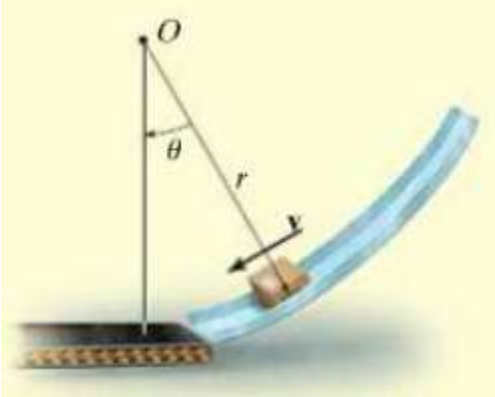
1. *The bag A, having a weight of 6 lb, is released from rest at the position $\theta = 0^o$, as shown in Fig. After falling to $\theta = 90^o$, it strikes an 18-lb box B. If the coefficient of restitution between the bag and box is* ***e = 0.5****, determine the velocities of the bag and box just after impact. What is the loss of energy during collision?*



2. *The 1500Kg car travels along the circular road as shown in Fig. If the traction force of the wheels on the road is F = (150t^2) N, where t is in seconds, determine the speed of the car when t = 5 s. The car initially travels with a speed of 5 m/s. Neglect the size of the car.*



3. *The box shown in Fig. 3, has a mass m and travels down the smooth circular ramp such that when it is at the angle θ it has a speed v. Determine its angular momentum about point O at this instant and the rate of increase in its speed, i.e., a_t*
4. *The* ***10-lb*** *block rests on a surface as shown in fig 4 for which* $\boldsymbol{\mu_k = 0.5}$*. It is acted upon by a radial force of* ***2 lb*** *and a horizontal force of* ***7 lb****, always directed at* ***30°*** *from the tangent to the path as shown. If the block is initially moving in a circular path with a speed* $\boldsymbol{V_1 = 2ft/s}$ *at the instant the forces are applied, determine the time required before the tension in cord AB becomes* ***20 lb****. Neglect the size of the block for the calculation.*



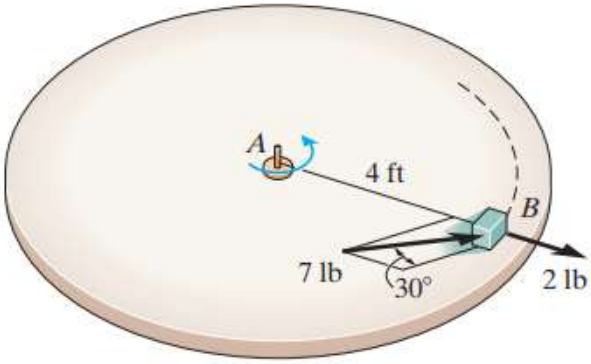


Fig 3 ***Fig 4***

Prepared by: Chala A.