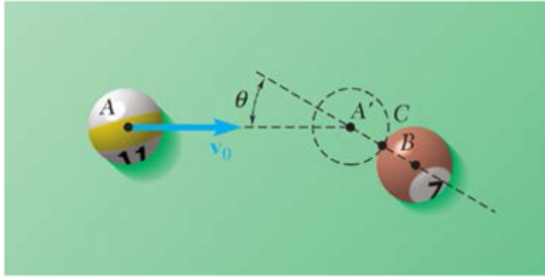


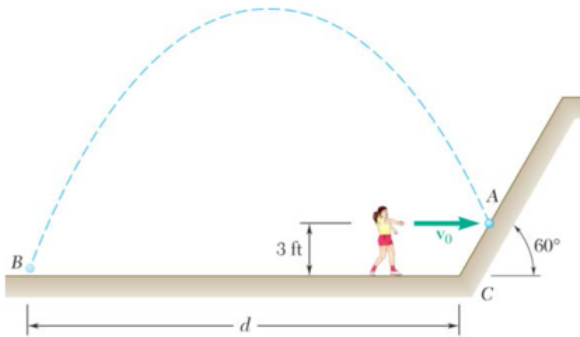
# HW #6 – Chapter 13

## PROBLEM 13.164



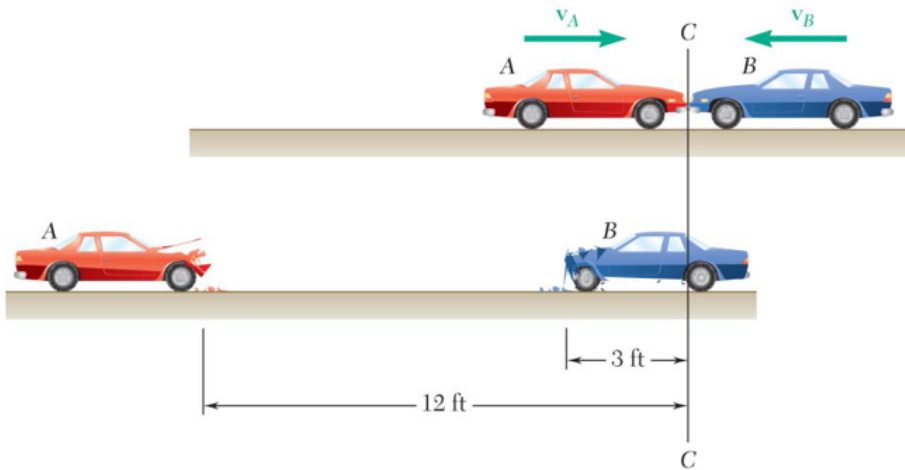
Two identical billiard balls can move freely on a horizontal table. Ball  $A$  has a velocity  $v_0$  as shown and hits ball  $B$ , which is at rest, at a Point  $C$  defined by  $\theta = 45^\circ$ . Knowing that the coefficient of restitution between the two balls is  $e = 0.8$  and assuming no friction, determine the velocity of each ball after impact.

## PROBLEM 13.171



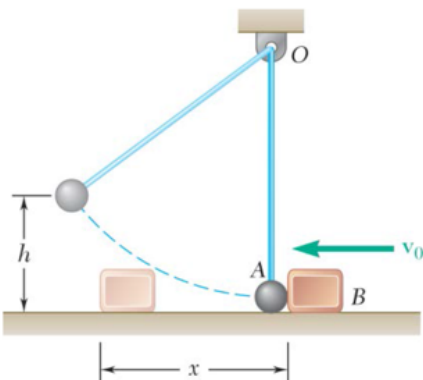
A girl throws a ball at an inclined wall from a height of 3 ft, hitting the wall at  $A$  with a horizontal velocity  $v_0$  of magnitude 25 ft/s. Knowing that the coefficient of restitution between the ball and the wall is 0.9 and neglecting friction, determine the distance  $d$  from the foot of the wall to the Point  $B$  where the ball will hit the ground after bouncing off the wall.

## PROBLEM 13.174



Two cars of the same mass run head-on into each other at  $C$ . After the collision, the cars skid with their brakes locked and come to a stop in the positions shown in the lower part of the figure. Knowing that the speed of car  $A$  just before impact was 5 mi/h and that the coefficient of kinetic friction between the pavement and the tires of both cars is 0.30, determine (a) the speed of car  $B$  just before impact, (b) the effective coefficient of restitution between the two cars.

## PROBLEM 13.175



A 1-kg block  $B$  is moving with a velocity  $v_0$  of magnitude  $v_0 = 2$  m/s as it hits the 0.5-kg sphere  $A$ , which is at rest and hanging from a cord attached at  $O$ . Knowing that  $\mu_k = 0.6$  between the block and the horizontal surface and  $e = 0.8$  between the block and the sphere, determine after impact (a) the maximum height  $h$  reached by the sphere, (b) the distance  $x$  traveled by the block.