

9A

▲ A 3.00-kg steel ball strikes a wall with a speed of 10.0 m/s at an angle of  $60.0^\circ$  with the surface. It bounces off with the same speed and angle (Fig. P9.7). If the ball is in contact with the wall for 0.200 s, what is the average force exerted by the wall on the ball?

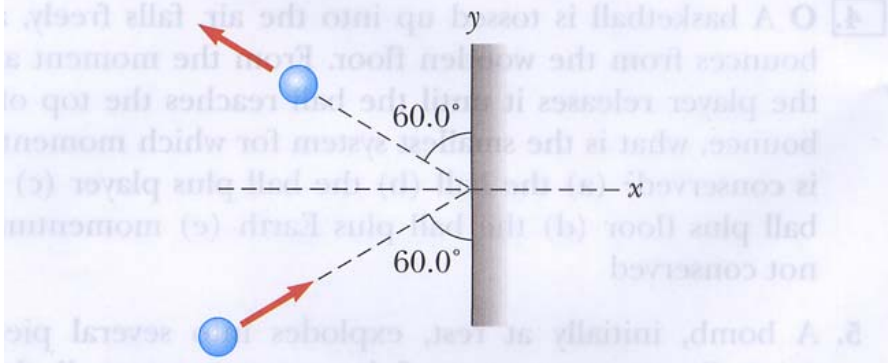


Figure P9.7

9B

As shown in Figure P9.16, a bullet of mass  $m$  and speed  $v$  passes completely through a pendulum bob of mass  $M$ . The bullet emerges with a speed of  $v/2$ . The pendulum bob is suspended by a stiff rod of length  $\ell$  and negligible mass. What is the minimum value of  $v$  such that the pendulum bob will barely swing through a complete vertical circle?

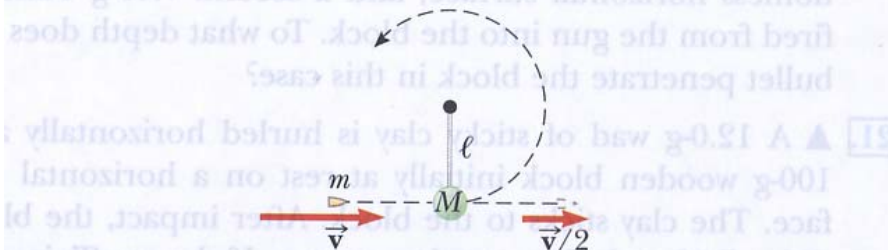


Figure P9.16

9C

Romeo (77.0 kg) entertains Juliet (55.0 kg) by playing his guitar from the rear of their boat at rest in still water, 2.70 m away from Juliet, who is in the front of the boat. After the serenade, Juliet carefully moves to the rear of the boat (away from shore) to plant a kiss on Romeo's cheek. How far does the 80.0-kg boat move toward the shore it is facing?