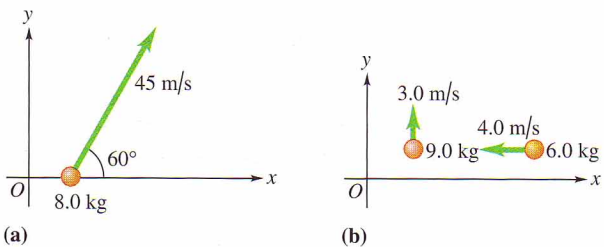


1. • For each case in Figure 8.33, the system consists of the masses shown with the indicated velocities. Find the net momentum of each system.



▲ **FIGURE 8.33** Problem 1.

2. • For each case in Figure 8.34, the system consists of the masses shown with the indicated velocities. Find the x and y components of the net momentum of each system.



▲ **FIGURE 8.34** Problem 2.

5. • The speed of the fastest-pitched baseball was 45 m/s , and the ball's mass was 145 g . (a) What was the magnitude of the momentum of this ball, and how many joules of kinetic energy did it have?
37. • A catcher catches a 145 g baseball traveling horizontally at 36.0 m/s . (a) How large an impulse does the ball give to the catcher? (b) If the ball takes 20 ms to stop once it is in contact with the catcher's glove, what average force did the ball exert on the catcher?
38. • A block of ice with a mass of 2.50 kg is moving on a frictionless, horizontal surface. At $t = 0$, the block is moving to the right with a velocity of magnitude 8.00 m/s . Calculate the magnitude and direction of the velocity of the block after each of the following forces has been applied for 5.00 s : (a) a force of 5.00 N directed to the right; (b) a force of 7.00 N directed to the left.