1. A 1.5-kg playground ball is moving with a velocity of 3.0 m/s directed 30° below the horizontal just before it strikes a horizontal surface. The ball leaves this surface 0.50 s later with a velocity of 2.0 m/s directed 60° above the horizontal. What is the magnitude of the average resultant force on the ball?

2. In a slow-pitch softball game, a 0.200-kg softball crosses the plate at 15.0 m/s at an angle of 45.0° below the horizontal. The batter hits the ball toward center field, giving it a velocity of 40.0 m/s at 30.0° above the horizontal. (a) Determine the impulse delivered to the ball. (b) If the force on the ball increases linearly for 4.00 ms, holds constant for 20.0 ms, and then decreases to zero linearly in another 4.00 ms, what is the maximum force on the ball? Sketch the F vs t graph.

3. A 3.0-kg mass moving in the positive x direction with a speed of 10 m/s collides with a 6.0-kg mass initially at rest. After the collision, the speed of the 3.0-kg mass is 8.0 m/s, and its velocity vector makes an angle of 35° with the positive x axis. Find the momentum vectors for each mass after the collision. Sketch the vectors before and after. Find the speed of the 6 kg mass.

4. Find the Final Speeds. Mass of B is twice the mass of A.