1. A pitcher claims he can throw a 0.145-kg baseball with as much momentum as a 3.00-g bullet moving with a speed of $1.50 \times 10^3$ m/s. (a) What must the baseball's speed be if the pitcher's claim is valid? (b) Which has greater kinetic energy, the ball or the bullet?
2. A 0.500 kg football is thrown toward the east with a speed of 15.0 m/s. A stationary receiver catches the ball and brings it to rest in 0.020 s. 
(a) What is the impulse delivered to the ball as it is caught? 
(b) What is the average force exerted on the receiver?
3. A 730-N man stands in the middle of a frozen pond of radius 5.0 m. He is unable to get to the other side because of a lack of friction between his shoes and the ice. To overcome this difficulty, he throws his 1.2-kg physics textbook horizontally toward the north shore at a speed of 5.0 m/s. How long does it take him to reach the south shore?
4. A rifle with a weight of 30 N fires a 5.0-g bullet with a speed of 300 m/s.
(a) Find the recoil speed of the rifle (b) If a 700-N man holds the rifle firmly against his shoulder, find the recoil speed of the man and rifle.
5. A 10-kg bowling ball moving at 2.0 m/s hits a 1.0-kg bowling pin, which is initially at rest. The other pins are all gone already, and the collision is head-on, so that the motion is one-dimensional. The ball continues travelling at 0.5 m/s. Find the velocity of the pin immediately after the collision.