

P 181-2 1, 2, 5, 10, 11 – first 2 due Friday 2-4-11

1. A ball of mass  $0.150 \text{ kg}$  is dropped from  $1.25 \text{ m}$  height. It rebounds to reach a height of  $0.96 \text{ m}$ . Calculate the impulse given to the ball by the floor.
2. A tennis player receives a shot with the ball ( $m = 0.06 \text{ kg}$ ) going horizontally at  $50 \text{ m/s}$ . He returns it at  $40 \text{ m/s}$ . (a) What is the impulse delivered to the ball by the racquet? (b) What work does the racquet do on the ball?
5. A pitcher claims he can throw a  $0.145 \text{ kg}$  baseball with as much momentum as a  $3 \text{ g}$  bullet moving at  $1500 \text{ m/s}$ . (a) What must the baseball's speed be if this is true? (b) Calculate which has the greater kinetic energy, the ball or the bullet?
10. A  $0.5 \text{ kg}$  football is thrown toward the east at  $15 \text{ m/s}$ . A stationary receiver catches the ball and brings it to rest in  $0.02 \text{ s}$ . (a) What is the impulse delivered to the ball as it is caught? (b) What is the average force exerted on the receiver?
11. The force shown in the  $F$  vs.  $t$  graph acts on a  $1.5 \text{ kg}$  object. Find (a) the impulse of the force (b) the final velocity of the object if it is initially at rest (c) the final velocity of the object if it is initially moving along the  $x$ -axis with a velocity of  $-2 \text{ m/s}$ .

