Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Impulse**

*The equation for impulse is* ***force x the change in time (F∆t).*** *Impulse can also be measured by* ***multiplying the mass by the change in velocity (m∆v).***

***F∆t=m∆v***

1. A 50 kg man is walking at a velocity of 3 m/s. All of a sudden he starts running with a velocity of 10 m/s.
   1. What is the man’s initial momentum? m = \_\_\_\_\_\_\_\_\_\_, v = \_\_\_\_\_\_\_\_\_\_\_, p = \_\_\_\_\_\_\_\_\_
   2. What is the man’s final momentum? m = \_\_\_\_\_\_\_\_\_\_, v = \_\_\_\_\_\_\_\_\_\_\_, p = \_\_\_\_\_\_\_\_\_
   3. What is the man’s change in momentum?
   4. What is the man’s impulse?
2. A 40 kg man is walking at a velocity of 5 m/s. All of a sudden he slows down to a velocity of 3 m/s.
   1. What is the man’s initial momentum? m = \_\_\_\_\_\_\_\_\_\_, v = \_\_\_\_\_\_\_\_\_\_\_, p = \_\_\_\_\_\_\_\_\_
   2. What is the man’s final momentum? m = \_\_\_\_\_\_\_\_\_\_, v = \_\_\_\_\_\_\_\_\_\_\_, p = \_\_\_\_\_\_\_\_\_
   3. What is the man’s change in momentum?
   4. What is the man’s impulse?
3. A football player kicks a stationary ball with a force of 25N (F=25N). His foot is in contact with the ball for 1 second (t=1sec). How much impulse is applied to the ball? What is the change in momentum?
4. A soccer player kicks a stationary ball with a force of 40N (F=40N). His foot is in contact with the ball for 2 seconds (t=2sec). How much impulse applied to the ball? What is the change in momentum?
5. If the mass of the ball from question #3 is 1kg, how much does the velocity change due to the kick?
6. If the mass of the ball from question #4 is 2kg, how much does the velocity change due to the kick?