Name:

Physics 12
M. Lam   <u>Momentum and Impulse</u>   Block:

1. Calculate the momentum of a 4.0 kg object travelling at a velocity of 12.0 m/s east.

2. A 5.0 kg object has a momentum of 25.0 kg m/s west. What is its velocity?

3. An object has a velocity of 8.0 m/s south and a momentum of 36.0 kg m/s south. What is its mass?

4. An object has a velocity of 2.0 m/s east and a momentum of 29 kg m/s east. What is the weight of the object?

5. A 6.6 N object is travelling at a velocity of 3.0 m/s north. What is the objects momentum?

6. A 7.0 kg object travels 2.6 m west in 1.1 s. Assuming uniform velocity, what is the momentum of the object?

7. A 5.0 kg object is dropped from a height of 2.5 m above the floor. What is the object's momentum after 0.25 s?

8. A 1.0 kg ball hits the floor with a velocity of 2.0 m/s and he bounces back up with a velocity of 1.6 m/s.
    a) What is the ball's change in momentum?
    b) If the ball is in contact with the floor for 0.060 s, what average force does the ground exert on the ball?

9. A 0.144 kg baseball is pitched horizontally at 38 m/s. The batter hits a horizontal line drive at 38 m/s in the opposite direction. What is the impulse exerted on the ball by the bat?

10. A 1200 kg physics dragster is travelling at 35 km/h east when it hits the gas and accelerates at 12.5 m/s² for 3.25s. What is its change in momentum during this time?

11. Jolene is pushing a 40.0 kg box with a constant force of 65 N for 5.0 s. If the box is initially moving at 1.5 m/s, what will the speed of the box be after 5.0s. Assume no friction force.

12. The thrust force on a 1750 kg hovercraft is shown on the graph. If the hovercraft is at rest at t=0 s, what is the speed at 60 s?