20101027_0945 Name_____
Impulse – Momentum – Acceleration - Force

A force of 10.0 newtons pushes on a 6.00 kilogram object for 3.00 seconds.

1) Determine the Impulse

Solution: Use the formula for Impulse

Impulse = (Force)(Time the force is applied)
Impulse = (10.0 newtons)(3.00 seconds)
Impulse = 30.0 newton – seconds

2) Assume that the object was initially at rest and on a frictionless flat surface. Then determine the acceleration of the object caused by the force.

Solution: Use Force = (mass)(acceleration) and simply solve for acceleration.

Force = (Mass)(Acceleration)
Acceleration = (Force)/(Mass)
Acceleration = (10.0 newtons)/(6.00 kilograms)
Acceleration = 1.67 newtons/kilogram but 1 n/kg = 1 m/s/s so
Acceleration = 1.67 meters/second^2

3) Find the change in the velocity of the object caused by the impulse.

Solution: Use Impulse = Change in Momentum.

Impulse = Change in Momentum
Impulse = (Mass)(Change in Velocity) Solve for Change in Velocity
Change in Velocity = (Impulse)/(Mass)
Change in Velocity = (30.0 newton seconds)/(6.00 kilograms)
Change in Velocity = 5.00 m/s