**Impulse- Momentum Theorem**

The unit for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is the same as the unit for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Unit for impulse is \_\_\_\_\_\_\_\_\_\_\_\_\_. This equals \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 The seconds cancel out to equal\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Which is the same unit for

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Deriving the Impulse- Momentum Theorem**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Newton’s 2nd law
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Definition of a
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Multiply both sides by t
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Definition of Δv
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Distributed the m into (vf – vi)
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Where p = momentum = mv
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Δp = change in momentum
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ equals the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Example #1:** 100 N of force is applied to an object for 8 seconds. What is the change in the object’s momentum?

Formula:

Plug in numbers:

Answer:

**Example #2:** A 50kg object is at rest and after a force is applied to the object for 3 seconds, the object reaches a velocity of 3.8 m/s. What is the magnitude of the applied force?

Formula:

Plug in numbers:

Answer:

**Example #3:** 80 Ns of impulse is applied to an object at rest with unknown mass. After the impulse, the object travels at 2 m/s. What is the mass of the object?

Formula:

Plug in numbers:

Answer: