Momentum-Impulse Theorem

Name: _____   Date: _____

Equations:

Examples

1. A net force of 8.0 N acts on a 5.0 kg mass for 8.0 s. If the final velocity of the mass is 40.0 m/s:

   a) What is the impulse on the mass?

   $\Sigma F(t)$

   b) What is the initial momentum of the mass?

   c) What is the initial velocity of the mass?

Time-Variant Forces & Impulse Theorem

AREA = IMPULSE = CHANGE IN MOMENTUM

Key Point: The *area* between the x-axis and the line/curve represents the impulse (change in momentum) of the object. For simple net force functions you can calculate the area easily for more complicated, time-variant forces integral calculus must be used.

Example

2. An object of mass, 3.0 kg, and an initial velocity of 7.0 m/s, is acted upon by a force shown in the graph for 10 seconds.
    a) Calculate the **final velocity** of the mass.

$\Sigma F(t)$

2N

2

t
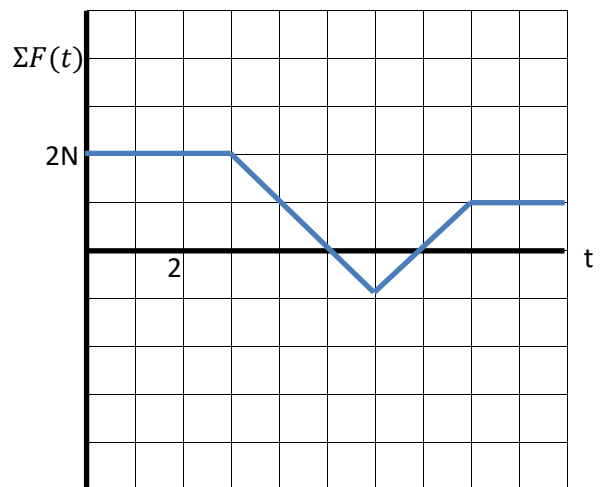
    b) Calculate the **average net force**.