Homework 2.

Problem 1.

A 500-kg car is moving at 28 m/s. The driver sees a barrier ahead. If the car takes 95 meters to come to rest, what is the magnitude of the minimum average net force necessary to stop?

(a) 47.5 N
(b) 1400 N
(c) 2060 N
(d) 19600 N
(e) 133000 N

Problem 2.

A cart is initially moving at 0.5 m/s along a track. The cart comes to rest after traveling 1 m. The experiment is repeated on the same track, but now the cart is initially moving at 1 m/s. How far does the cart travel before coming to rest?

(a) 1 m   (b) 2 m   (c) 3 m   (d) 4 m   (e) 8 m

Problem 3.

A toy car moves along the x-axis according to the velocity versus time curve shown to the right. When does the car have zero acceleration?

(a) at 2 and 4 seconds
(b) at approximately 3.0 seconds
(c) at approximately 3.3 and 5.1 seconds
(d) the acceleration is always zero
(e) at no time
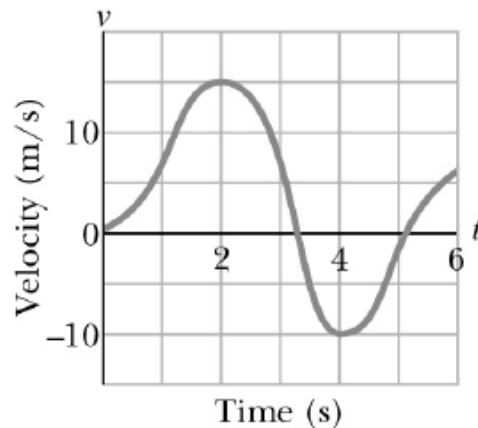
Problem 4.

In which one of the following situations is the net force constantly zero on the object?

(a) A mass attached to a string and swinging like a pendulum.
(b) A stone falling freely in a gravitational field.
(c) An astronaut floating in the International Space Station.
(d) A snowboarder riding down a steep hill.
(e) A skydiver who has reached terminal velocity.