Physics 101
Quiz # 1
Chapter 2

Name : Solution Id : Sec. # : 27

A man moves along the x axis according to the equation

$$x = 5t + 10t^2,$$

where x in meters and t in seconds. Calculate

a) the average velocity of the man during the first two seconds.

$$V_{avg} = \frac{x_2 - x_1}{t_2 - t_1}$$

For the first two seconds; $t_1 = 0$, $t_2 = 2\,s$

$$\Rightarrow x_2 = 5 \times 2 + 10 \times (2)^2 = 10 + 40 = 50\ m$$

$$x_1 = 0$$

$$\Rightarrow V_{avg} = \frac{50 - 0}{2 - 0} = 25\ m/s$$

b) the acceleration of the man at t = 3.0 s.

$$a = \frac{dv}{dt} \quad ; \quad v = \frac{dx}{dt}$$

$$v = 5 + 20t$$

$$a = 20\ m/s^2 \quad \text{for all times}$$

$$\rightarrow \text{At } t = 3.0, \quad \boxed{a = 20\ m/s^2}$$