

[12.3] $v = (4t - 3t^2)$ m/s
to find position
 $v = \frac{ds}{dt} = [4t - 3t^2]$

$$\int_0^b ds = \int_0^t (4t - 3t^2) dt$$

$$s \Big|_0^4 = 2t^2 - t^3 \Big|_0^4$$

$s = 2t^2 - t^3$, when $t = 4$ sec

$$s = 2(4)^2 - (4)^3$$

$$s = 2(16) - 64$$

$$s = 32 - 64$$

$$s = -32 \text{ m}$$

[12.4] $v = (0.5t^3 - 8t)$ m/s to find acceleration

$$a = \frac{dv}{dt} = (3 \times 0.5)t^2 - 8 \Rightarrow a = 1.5t^2 - 8$$

$$a = 1.5(2)^2 - 8$$

$$a = (1.5 \times 4) - 8$$

$$a = 6 - 8 \quad \text{at } t = 2 \text{ m}$$

$$a = -2 \text{ m/s}^2 \text{ [deceleration]}$$

$$v = \frac{dv}{ds}$$

$$v = (20 - 0.05s^2) \text{ m/s}^2$$

$$s = 15 \text{ m}$$

determine the acceleration

$$a = \frac{dv}{ds} = 0.15 \frac{dv}{ds}$$