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18/EUG02/081

Computer Engineering

For Figure 12.3(1)

$$V = (4t - 3t^2) \text{ m/s}$$

$$S = \int v dt$$

$$S = \int (4t - 3t^2) dt = 2t^2 - t^3$$

When $t = 4s$

$$S = 2(4)^2 - (4)^3 = 32 - 64$$

$$S = 32 \text{ m}$$

$$2 \quad V = (0.5t^3 - 8t) \text{ m/s}$$

$$A = \frac{dv}{dt}$$

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

$$A = \frac{dv}{dt} \text{ at } t = 2$$

$$1.5(2)^2 - 8 = 6 - 8 = -2 \text{ m/s}$$

3 Rev

$$A = (4t^2 - 2) \text{ m/s}$$

$$v = \int A dt$$

$$v = \int (4t^2 - 2) dt$$

$$4t^3/3 - 2t + C$$

$$S = \int v dt$$

$$= \int \frac{4t^3}{3} - 2t + C dt$$

$$\frac{4t^4}{12} - \frac{2t^2}{2} + Ct$$

$$p = \frac{1}{3}t^4 - t^2 + Ct + k$$

$$\text{When } t = 0 \quad p = -2$$

$$-2 = \frac{1}{3}(0)^4 - (0)^2 + C(0)$$

For

$$k = -2$$

$$\text{When } t = 2, \quad p = 20, \quad k = -2$$

$$20 = \frac{1}{3}(2)^4 - 2^2 + C(2)$$

$$20 = 0.7 + 2C$$

$$C = 9.7$$

$$p = \frac{1}{3}t^4 - t^2 - 9.7t - 2$$

When $t = 4$

$$p = \frac{1}{3}(4)^4 - 4^2 - (9.7 + 4)$$

$$p = 28.7 \text{ m}$$

4)

$$V = (20 - 0.55) \text{ m/s}$$

$$\frac{dt}{ds} = \frac{ds}{v} \text{ and } dt = \frac{dv}{a}$$

$$a = \frac{dv}{dt} \quad \frac{dv}{dt} = \frac{dv}{\frac{ds}{a}} \quad \frac{ds}{dt}$$

$$\frac{dv}{ds} = -0.15, \quad \frac{ds}{dt} = (20 -$$

$$0.55^2)$$

$$A = (-0.15)(20 - 0.55^2)$$

When $s = 15$

$$A = (-0.1 + 15)(20 - 0.05$$

$$(15)^2$$

$$A = -13.125 \text{ m/s}^2$$