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18/Eng02/051
Computer Engineering

1. For Figure 12.3(b)

$V = (4t - 3t^2)\,m/s$

$S = \int v\,dt$

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

$= 2t^2 - t^3$

When $t = 4s$

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

$= 32 - 64$

$S = -32m$

2. For Figure 12.42(a)

$V = (0.5t^3 - 8t)\,m/s$

$A = dv/dt$

$dv/dt = 3(0.5)t^2 - 8$

$= 1.5t^2 - 8$

$A = dv/dt \,/\, t = 2$

$= 1.5(2)^2 - 8$

$= 6 - 8 = -2m/s$

3. For Figure 12.7(3)

$A = (4t^2 - 2)\,m/s$

$V = \int A\,dt$

$V = \int 4t^2 - 2$

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

$S = \int v\,dt$

$= \int 4t^3/3 - 2t + C$

$= \frac{4t^3}{12} - \frac{2t^2}{2} + C$

$P = 1/3t^4 - t^2 + Ct + K$

When $t = 0$, $P = 2$

$-2 = 1/3(0)^4 - (0)^2 + C(0) + K$

$K = -2$

When $t = 2$, $P = 20$, $K = 2$

$-20 = 1/3(2)^4 - 2^2 + C(2) - 2$

$-20 = -0.7 + 2c$

$C = -9.7$

$P = 1/3t^4 - t^2 - 9.7t - 2$

when $t = 4$

$P = 1/3(4)^4 - 4^2 - (9.7 \times 4) - 2$

$P = 28.7m$

4. For Figure 12.8(4)

$V = (20 - 0.55)m/s$

$dt = \frac{ds}{V}$ ∴ $dt = \frac{dv}{a}$

$a = \frac{dv}{dt}$, $\frac{dv}{dt} = \frac{dv}{ds} \cdot \frac{ds}{dt}$

$\frac{dv}{ds} = 0.1s$, $\frac{ds}{dt} = (20 - 0.55)^2$

$A = (-0.1s)(20 - 0.05s^2)$

when $S = 15$

$A = (-0.1 \times 15)(20 - 0.05(15^2)$

$A = -13.125m/s^2$