Ekemiokasi Daniel Anthony
18/ENG06/010
Mechanical Engineering
Mechanics
ENG 234

1.) For figure 12.3 (1)

$V = \langle 4t - 3t^2 \rangle$ m/s

$S = \int V dt$

$S = \int \langle 4t - 3t^2 \rangle dt$

$= 2t^2 - t^3$

when $t = 4s$

$S = 2\langle 4 \rangle^2 - \langle 4 \rangle^3$

$= 32 - 64$

$S = -32m$

2.) For figure 12.4(2)

$V = \langle 0.5t^3 - 8t \rangle$ m/s

$A = dv/dt$

$dv/dt = 3\langle 0.5 \rangle t^2 - 8$

$= 1.5t^2 - 8$

$A = dv/dt \mid_{t=2}$

$= 1.5(2)^2 - 8$

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

3.) For figure 12.7 (3)

$A = \langle 4t^2 - 2 \rangle$ m/s

$V = \int A dt$

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

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

$S = \int V dt$

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

$= 4t^5/12 - 2t^2/2 + Ct$

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

when $t = 0$, $P = 2$

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

$K = -2$

when $t = 2$, $P = 20$, $K = -2$

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

$-20 = 0.7 + 2C$

$C = -9.7$

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

when $t = 4$

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

$P = 28.7$ mm

4.) FOR FIGURE 12.8 (4)

$V = \langle 20 - 0.5S \rangle$ m/s

$dt = ds/v$ and $dt = dv/a$

$a = dv/dt$, $dv/dt = dv/ds \cdot ds/dt$

$dv/ds = -0.15$, $ds/dt = (20 - 0.5S^2)$

$A = (-0.15)(20 - 0.05S^2)$

when $S = 1.5$

~~$A = (-0.15x$~~

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

$A = -13.125 m/s^2$