

ADIGEB PETER LIPEITUNIM

18/ENGO2/010

COMPUTER ENGINEERING  
MECHANICS

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

$$s = \int v dt$$

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

$$= 2t^2 - t^3$$

when  $t = 4$

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

$$= 32 - 64$$

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

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

$$= \frac{1}{3}t^3 - t^2 + ct + k$$

when  $t = 0, P = 2$

$$-2 = \frac{1}{3}(0)^3 - (0)^2 + c(0) + k$$

$$k = -2$$

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

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

$$-20 = -0.7 + 2c$$

$$c = -9.7$$

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

when  $t = 4$

$$P = \frac{1}{3}(4)^3 - 4^2 - (9.7 \times 4) - 2$$

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

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

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

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

$$= 1.5t^2 - 8$$

$$A = \frac{dv}{dt} = 2$$

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

$$= 6 - 8$$

$$= -2 \text{ m/s}$$

(4)  $v = (20 - 0.55t) \text{ m/s}$

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

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

$$\frac{dv}{ds} = 0.15, \frac{ds}{dt} = (20 - 0.55t^2)$$

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

when  $s = 15$

$$A = (-0.1 \times 15)(20 - 0.55(15)^2)$$

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

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

$$v = \int A dt$$

$$v = \frac{4t^3}{3} - 2t + c$$

$$s = \int v dt$$

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