

Tawfiq Azimazi

18/ENG09/001

Aeronautic Engineering

ENG 234

1) (Pg 12-9)

$$s = 0.5t^3 \text{ m}$$

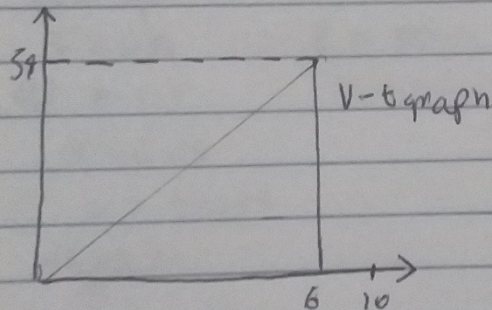
$$v = \frac{ds}{dt}, v = 1.5t^2$$

$$\text{at } t = 6 \quad v = 1.5(6)^2 = 54 \text{ m/s}$$

$$\therefore s_2 = 0.5(6)^3$$

$$= 108 \text{ m}$$

$$v = \frac{ds}{dt} = 0, v = 0 \text{ m/s}$$



2) Given that (Pg 12-10)

$$v = -4t + 80$$

$$s = \int v dt$$

$$s = \int_0^{20} -4t + 80 dt$$

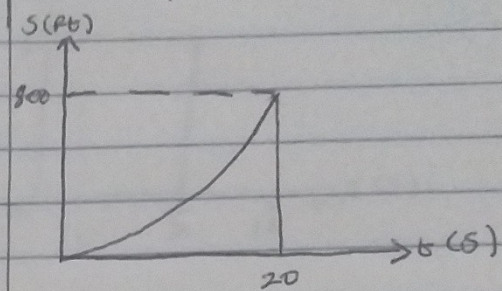
$$s = [-2t^2 + 80t]_0^{20}$$

$$s = [-2(20)^2 + 80(20) - 0]$$

$$s = -800 + 1600$$

$$s = 800 \text{ ft}$$

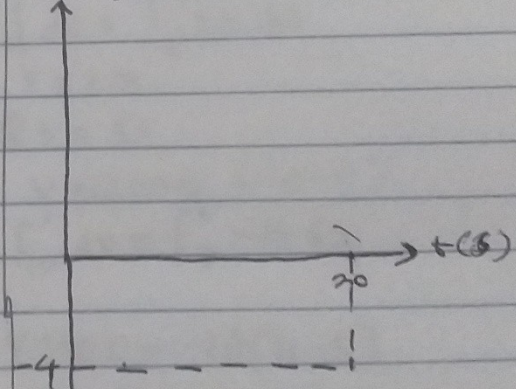
s-t graph



$$v = (-4t + 80) \text{ ft/s}$$

$$a = \frac{dv}{dt} \quad a = -4 + 0$$

$$a = -4 \text{ ft/s}^2$$

a (ft/s<sup>2</sup>)

3) (Pg 12-11)

$$v = (0.255) \text{ m/s}$$

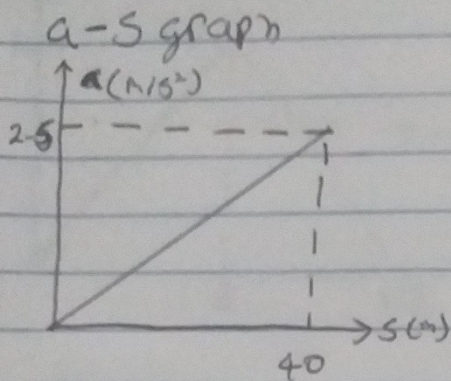
$$a = v \left( \frac{dv}{ds} \right)$$

$$a = 0.255 (0.25)$$

$$a = (0.0625) \text{ m/s}^2$$

$$s = 40 \text{ m}$$

$$a = (0.0625 \times 40) = 2.5 \text{ m/s}^2$$



4) (F12-12) Given that

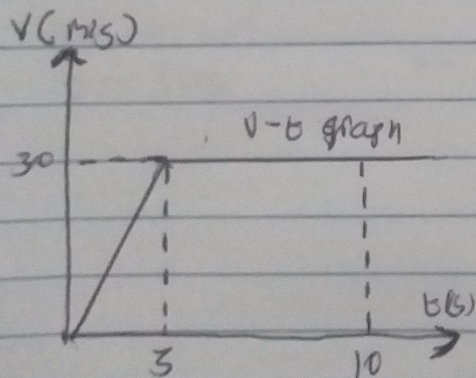
$$s = 3t^2 \quad s = 30t - 75$$

$$v = 6t \quad v = 30 \text{ m/s}$$

a)  $t = 5$

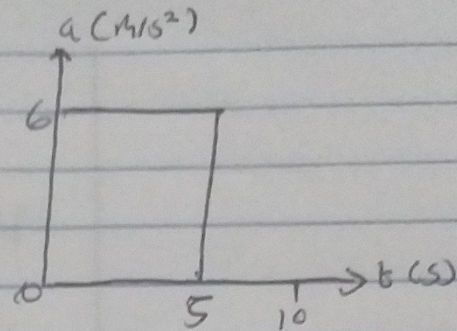
$$v = 6 \times 5$$

$$v = 30 \text{ m/s}$$



$$v = (6t) \text{ m/s} \quad v = 30 \text{ m/s}$$

$$a = 6 \text{ m/s}^2 \quad a = 0 \text{ m/s}^2$$



5) F12-13 given that  
 $a = 20 \text{ m/s}^2$        $a = -10 \text{ m/s}^2$

$$\int dv = \int a \cdot dt$$

$$\int_0^v dv = \int_0^t 20 \cdot dt$$

$$v = 20t$$

@  $t = 5$

$$v = 100 \text{ m/s} \quad (20 \times 5)$$

$$\int_{100}^v dv = \int_5^t -10 \cdot dt$$

$$v - 100 = -10(t - 5)$$

$$v = [-10t + 150] \text{ m/s}$$

a)  $v = 0$

$$0 = -10t + 150$$

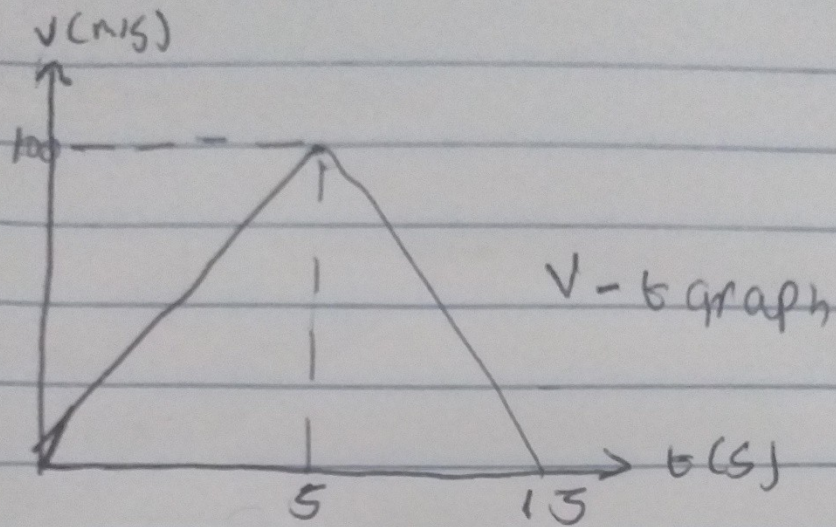
$$-150 = -10t$$

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



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6)

$$v = 30t$$

$$\int ds = \int v dt$$

$$\int_0^3 ds = \int_0^t (30t) dt$$

$$s = 15t^2$$

a)  $t = 5s$

$$s = 15(5)^2$$

$$s = 375$$