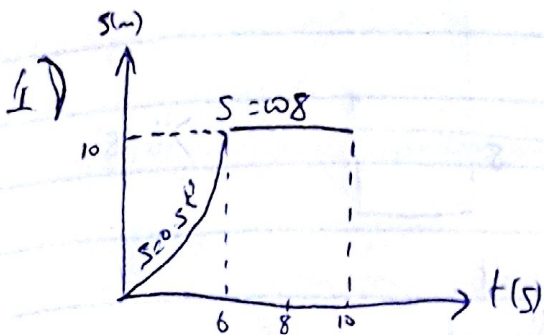


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$$v = \frac{ds}{dt}$$

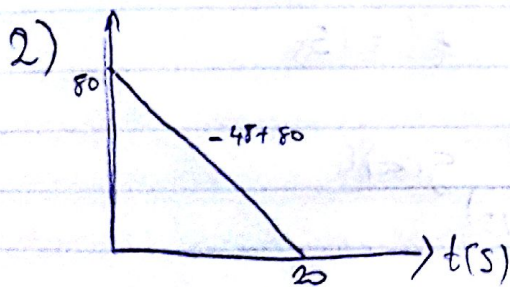
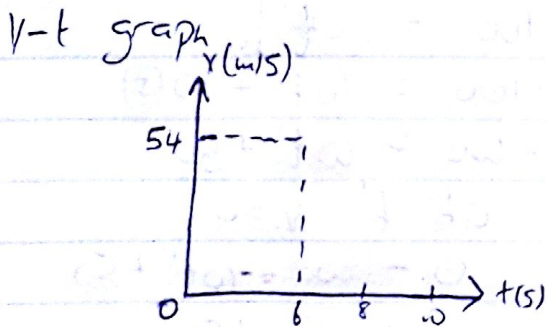
$$v = 1.5 \times 6^2$$

$$= 1.5 \times 36$$

$$= 54 \text{ m/s}$$

from $t = 6\text{s} - 10\text{s}$, $s = 108$

$$\therefore v = 0$$



i

$$s = \int v dt$$

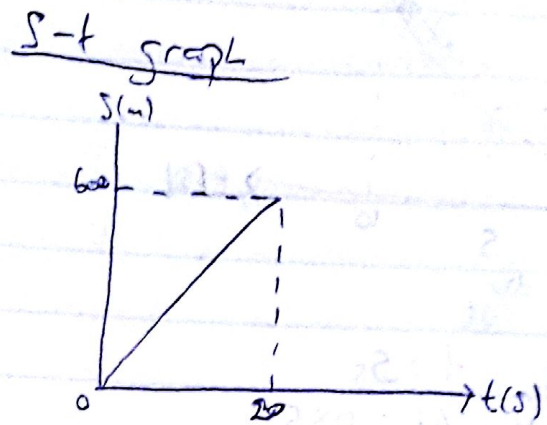
$$s = \int (-4t + 80) dt$$

$$s = -2t^2 + 80t$$

at $t = 20\text{s}$

$$s = -2(20)^2 + 80(20)$$

$$s = 1600 - 800 = 800\text{m}$$



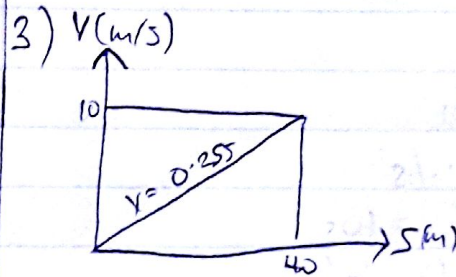
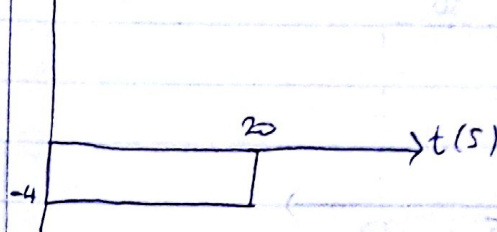
ii) acceleration

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

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

at $t = 20\text{s}$, $a = -4 \text{ m/s}^2$

a-t graph



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

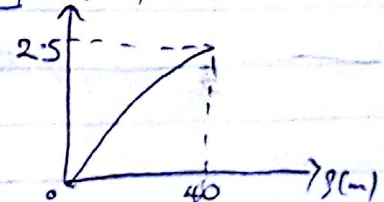
$$v = 0.25s$$

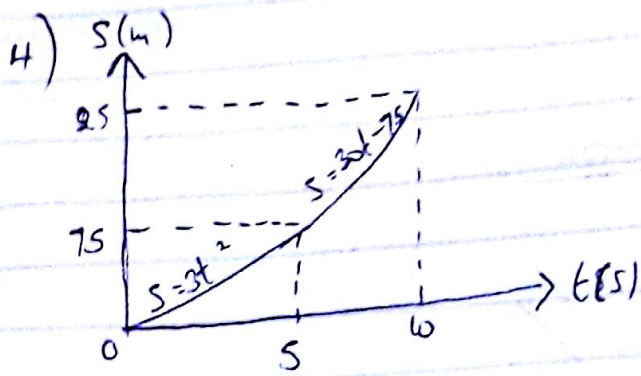
$$a = 10 \times 0.25$$

$$a = 60 \times 0.25$$

$$a = 2.5 \text{ m/s}^2$$

a-s graph

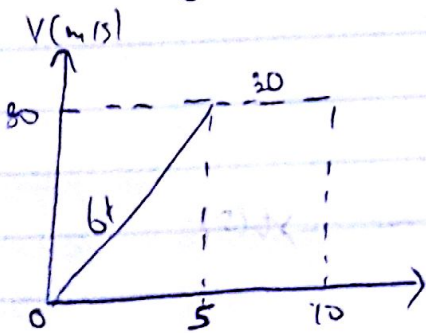




(i) $v = \frac{ds}{dt}$
 at $t = 5s$
 $v = 6t = 6 \times 5 = 30 \text{ m/s}$

at $t = 10s$
 $v = 30 \text{ m/s}$

V-t graph



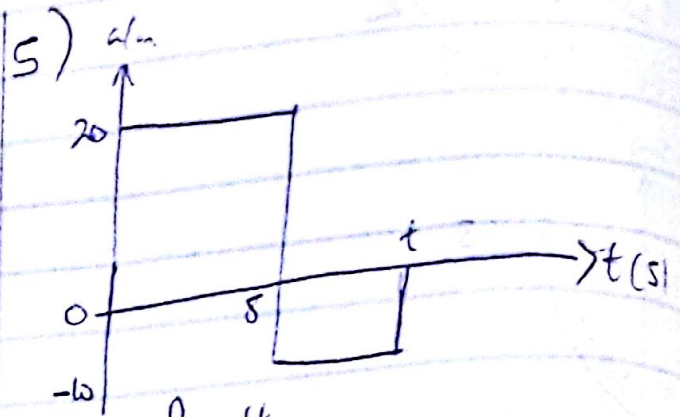
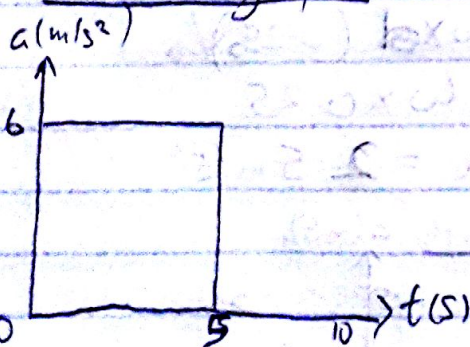
(ii) $a = \frac{dv}{dt}$
 at $t = 5s$

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

at $t = 10s$

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

a-t graph



(i) $v = \int a dt$

$v = \int 20 dt$

$v = 20t$

at $t = 5s$

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

$5s < t < 10s$

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

$v - 100 = -10t' \Big|_5^t$

$v - 100 = -10t' + 50$

$v - 100 = -10t' + 50$

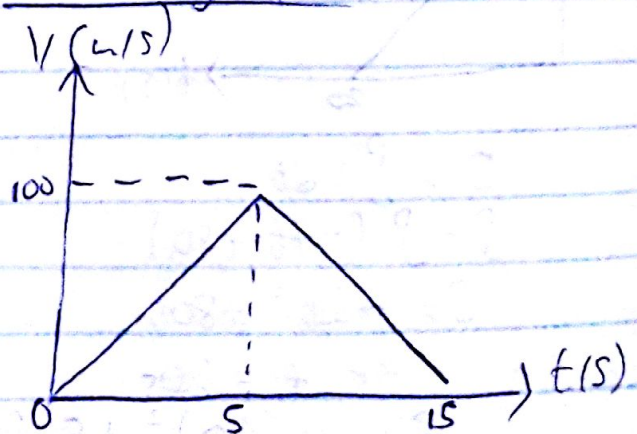
at $t' = 10s$ $v = 0$

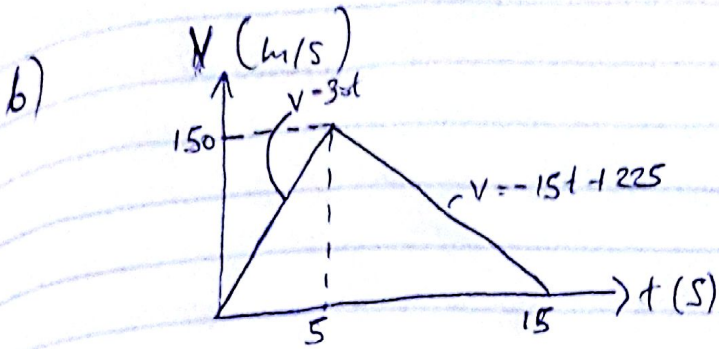
$0 - 100 = -10t' + 50$

$10t' = 150$

$t' = 15s$

V-t graph





$$0 \leq t \leq 5_s$$

$$v = 30t$$

$$\int_0^5 ds = \int_0^5 30t dt$$

$$s = 15t^2 \Big|_0^5$$

$$s = 15(5)^2 - 15(0)^2$$

$$s = 15 \times 25$$

$$s = 375_m$$

$$5_s \leq t \leq 15_s$$

$$v = -15t + 225$$

$$\int_{375}^s ds = \int_5^{15} (-15t + 225) dt$$

$$\int -375 \quad -\frac{15t^2}{2} \quad 225t \quad \Big|_5^{15}$$

$$s - 375 = \left[\frac{-15(15^2)}{2} + 225(15) \right] - \left[\frac{15(5)^2}{2} + 225(5) \right]$$

$$s - 375 = \left[\frac{-15 \times 225}{2} + 3375 \right] - \left[\frac{-15 \times 25}{2} + 1125 \right]$$

$$s - 375 = (-1687.5 + 3375) - (-187.5 + 1125)$$

$$s - 375 = +1687.5 - 937.5$$

$$s - 375 = 750$$

$$s = 1125_m$$

s-t graph

