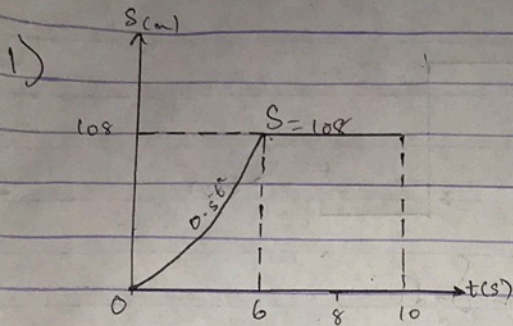


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$$v = \frac{ds}{dt}$$

$$v = 1.5t^2$$

$$\text{at } t = 6\text{s}$$

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

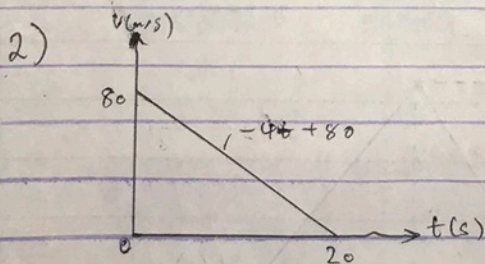
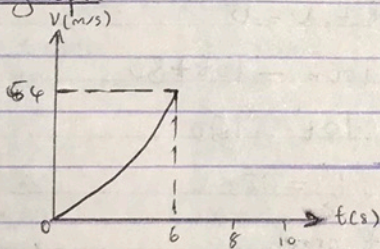
$$= 1.5 \times 36$$

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

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

$$\therefore v = 0$$

v-t graph



i)

$$s = \int v dt$$

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

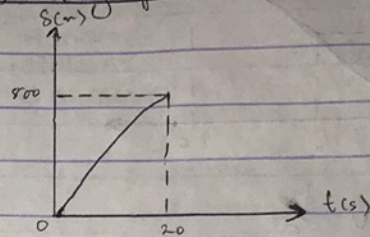
$$s = -2t^2 + 80t$$

$$\text{at } t = 20\text{s}$$

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

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

s-t graph



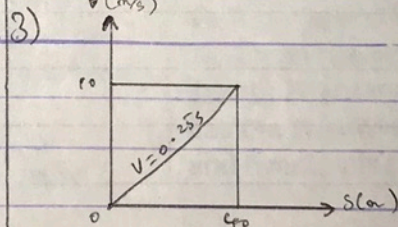
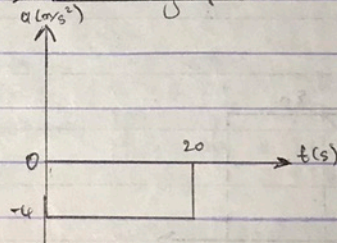
ii) acceleration

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

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

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

a-t graph



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

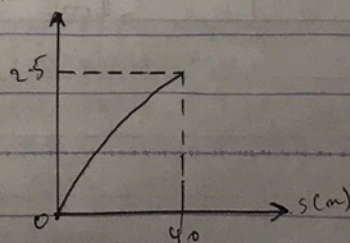
$$v = 0.25s$$

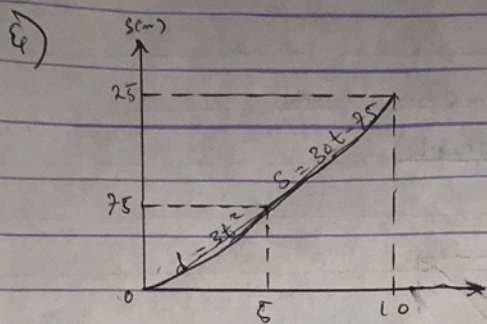
$$a = 10 \times 0.25$$

$$a = 10 \times 0.25$$

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

a-s graph



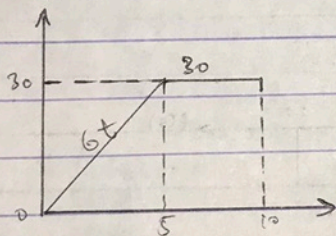


i) $v = \frac{ds}{dt}$
 at $t = 5s$
 $v = 6t = 6 \times 5$
 $= 30 \text{ m/s}$

at $t = 10s$

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

V-t graph



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

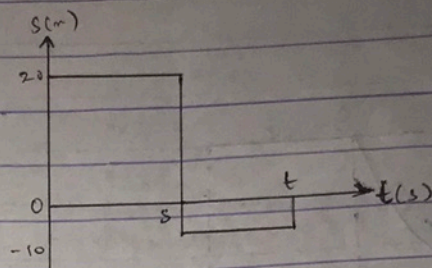
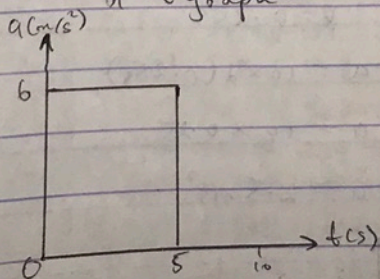
at $t = 5$

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

at $t = 10s$

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

a-t graph



i) $v = \int a dt$

$v = \int 20 dt$

$v = 20t$

at $t = 5s$

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

$5s < t \leq 10s$

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

$v - 100 = -10t \Big|_5^{10}$

$v - 100 = -10t + 50$

$v - 100 = -10t + 50$

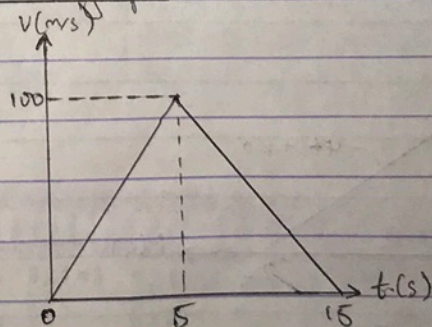
at $t, v = 0$

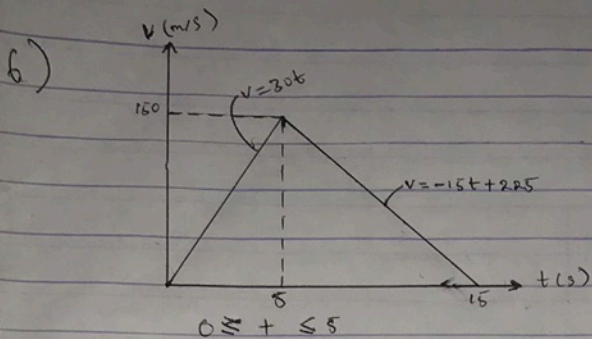
$0 - 100 = -10t + 50$

$10t = 150$

$t = 15s$

V-t graph





$$v = 30t$$

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

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

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

$$s = 15 \times 25$$

$$s = 375 \text{ m}$$

$$s_5 \leq t \leq 15_s$$

$$v = -15t + 225$$

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

$$s - 375 = \frac{-15t^2 + 225t}{2} \Big|_5^{15}$$

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

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

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

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

$$s - 375 = 750 \text{ m}$$

$$s = 1125 \text{ m}$$

