

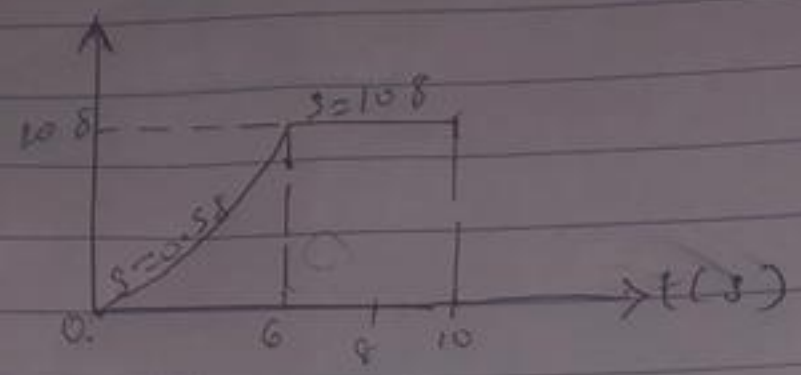
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$$v = \frac{ds}{dt}$$

$$v = 1.5t^2$$

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

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

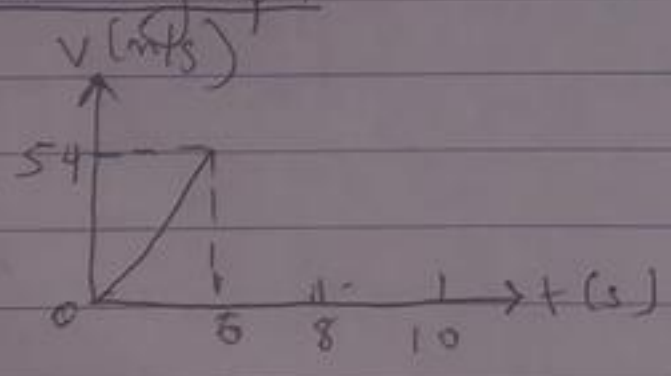
$$= 1.5 \times 36$$

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

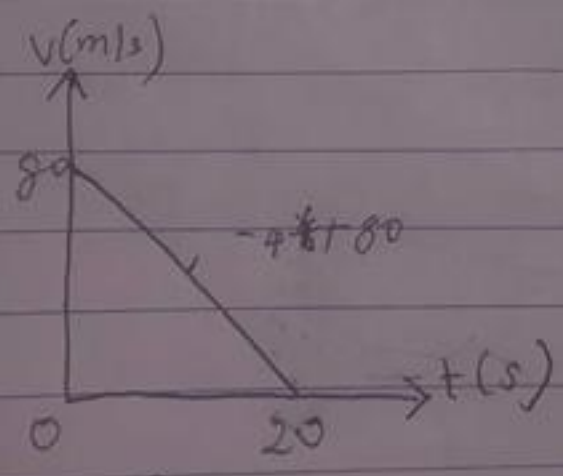
from $t = 6 \text{ s} - 10 \text{ s}$; $s = 10.8$

$$\therefore v = 0$$

v-t graph



2)



i)

$$s = \int v dt$$

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

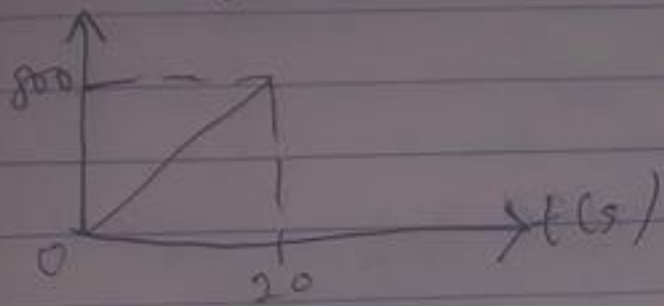
$$s = -2t^2 + 80t$$

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

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

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

s-t graph



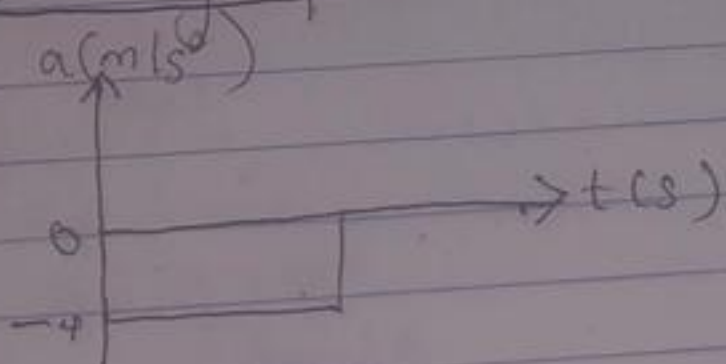
ii) Acceleration

$$a = dv/dt$$

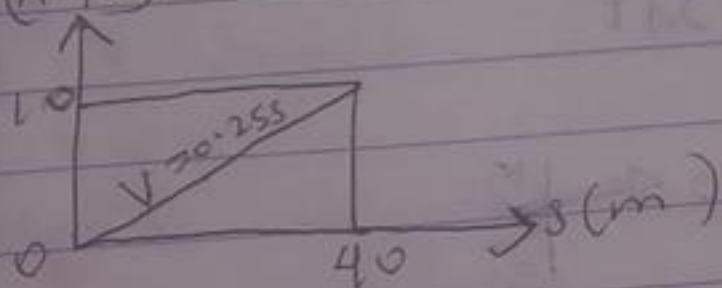
$$\therefore a = -4\text{ m/s}^2$$

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

a-t graph



3) $v(m/s)$



$$a = (dv/ds)v$$

$$v = 0.25s$$

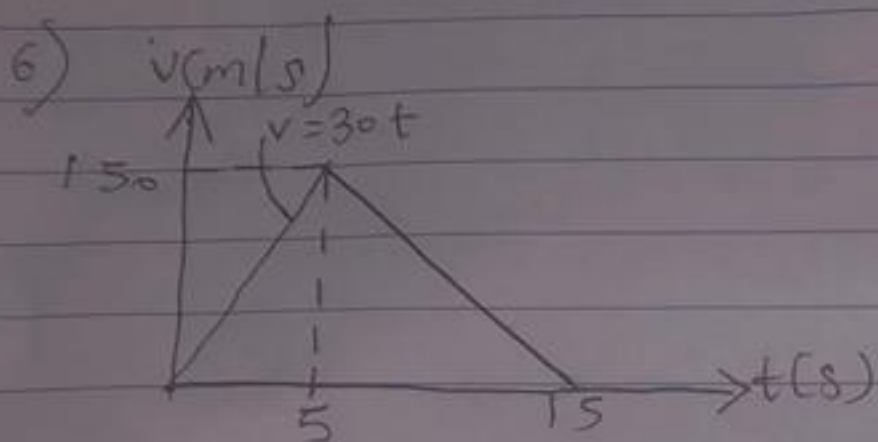
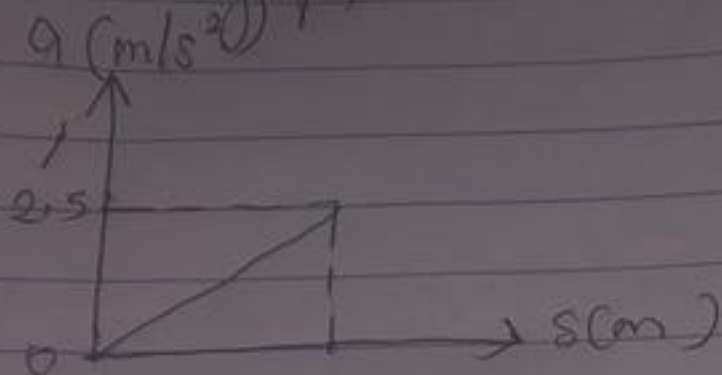
$$a = 10 \times d(0.25s)/ds$$

$$a = 10 \times 0.25$$

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

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a-s graph



$$0 \leq t \leq 5s$$

$$v = 30t$$

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

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

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

$$s = 15 \times 25$$

$$s = 375m$$

$$5s \leq t \leq 15s$$

$$v = -15t + 225$$

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

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

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

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

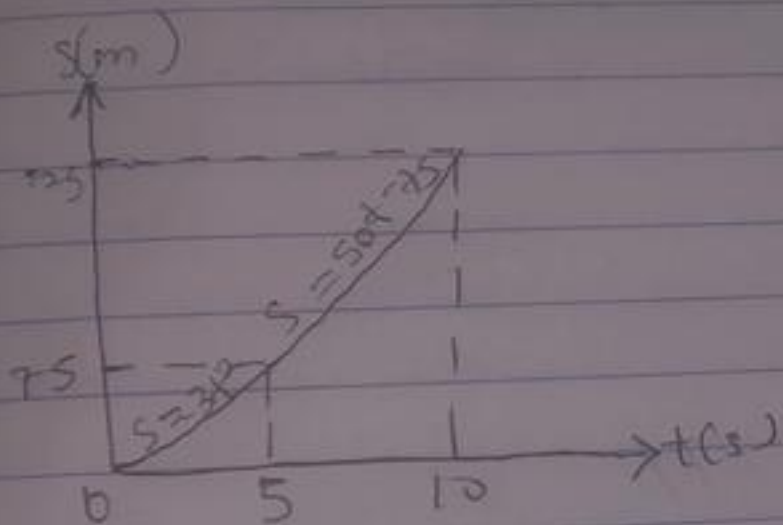
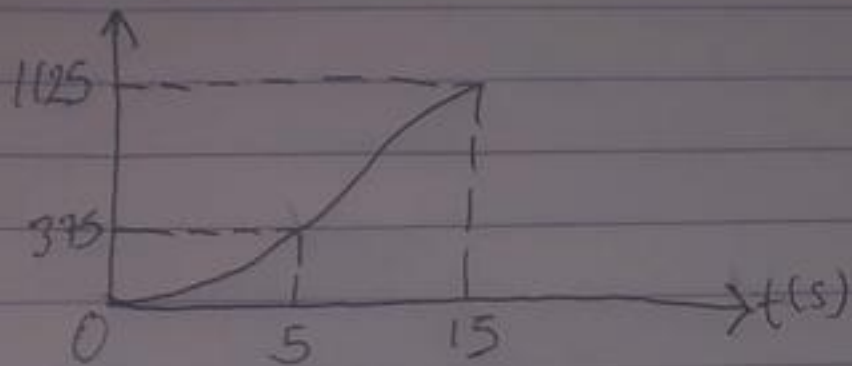
$$s - 375 = (-1687.5 + 3375) - (-187.5 + 1125)$$

$$S - 375 = +1687.5 - 937.5$$

$$S - 375 = 750$$

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

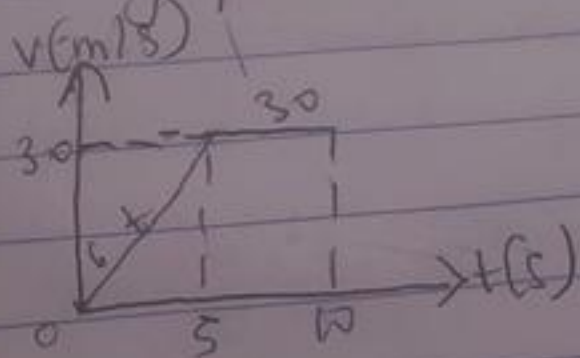
S-t graph



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

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

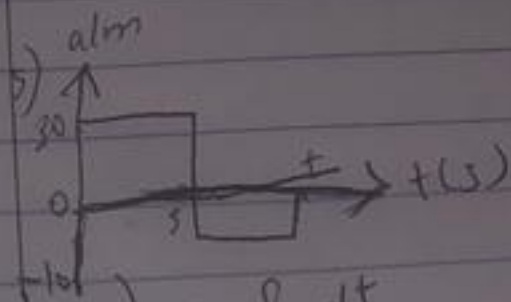
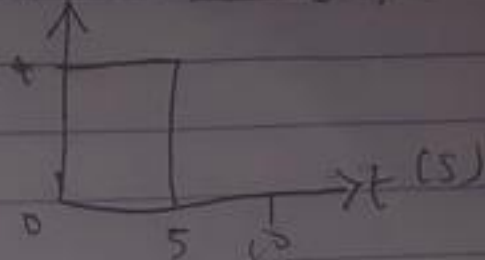
v-t graph



ii) $a = dv/dt$
 at $t = 5 \text{ s}$
 $a = 6 \text{ m/s}^2$

at $t = 10 \text{ s}$
 $a = 0 \text{ m/s}^2$

a-t graph



i) $v = \int a dt$

$$v = \int 20 dt$$

$$v = 20t$$

at $t = 5 \text{ s}$

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

$$5 \text{ s} \leq t \leq 10 \text{ s}$$

$$\int_m^v dv = \int_5^t -10 dt$$

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

$$v - 100 = -10t' + 10(5)$$

$$v - 100 = -10t + 50$$

at t ; $v = 0$

$$0 - 100 = -10t + 50$$

$$10t = 150$$

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

v-t graph

