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$$1) s = 0.5t^2 \text{ m}$$

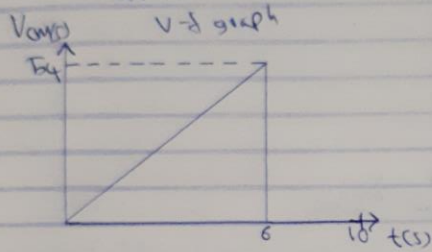
$$v = \frac{ds}{dt} = 1.5t^2 \text{ m/s}$$

$$\text{@ } t=6$$

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

$$s_2 = 108$$

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



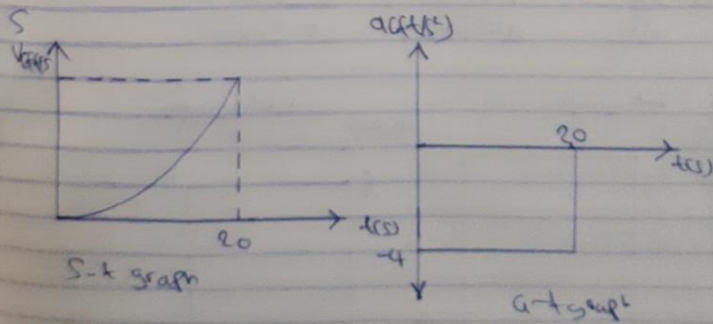
$$2) v = -4t + 80$$

$$a = \frac{dv}{dt} = -4 \text{ m/s}^2; \text{ @ } t=20 \quad a = -4 \text{ m/s}^2$$

$$s = \int v dt; \int_0^{20} (-2t^2 + 80t)$$

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

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



3 $v = 0.25s$

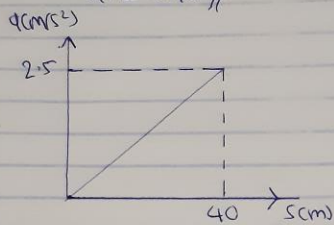
$a = \frac{dv}{ds}$; $a = 0.25s (0.25)$

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

@ $s = 40 \text{ m}$

$a = (0.0625(40))$

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



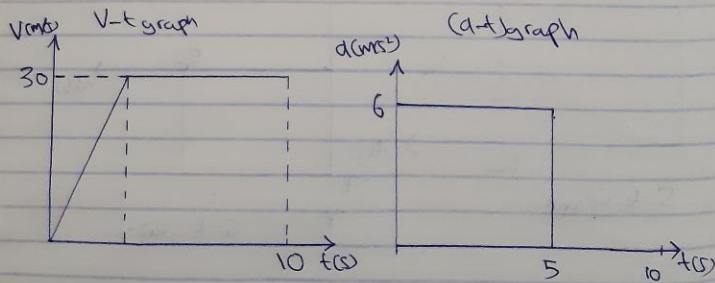
4 $s = 3t^2$; $s = 30t - 7t$

$v = \frac{ds}{dt}$; $6t$; $v = \frac{ds}{dt} = 30 \text{ m/s}$

∴ @ $t = 5$; $v = 30 \text{ m/s}$

$v_1 = 6(5) = 30 \text{ m/s}$

$a = \frac{dv}{dt}$ ∴ $v = 6t$; $v = 30 \text{ m/s}^2$
 $a = 6 \text{ m/s}^2$; $a = 0 \text{ m/s}^2$



$$5 \quad a = 20 \text{ m/s}^2 \quad a = -10 \text{ m/s}^2$$

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

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

$$v = 20t$$

$$\text{@ } t = 5$$

$$v = 100 \text{ m/s}$$

$$\int_{100}^v dv = \int_8^t -10 \cdot dt$$

$$v - 100 = -10(t - 8)$$

$$v - 100 = -10t + 80$$

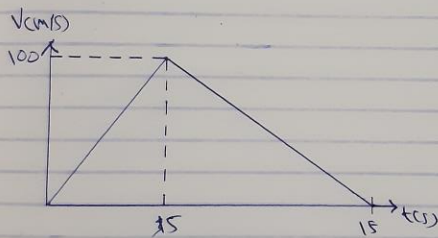
$$v = -10t + 180 \text{ m/s}$$

$$\text{@ } v = 0$$

$$0 = -10t + 180$$

$$-180 = -10t$$

$$t = 18 \text{ s (time for car to come to rest)}$$



$$6 \quad v = 30t$$

$$s = \int v dt = (15t^2)'$$

$$\text{@ } t = 5$$

$$= 15(5)^2$$

$$= 375 \text{ m}$$

$$v = -7.5t + 22.5$$

$$s = \int v dt = -7.5t^2 + 22.5t$$

$$\text{@ } t = t_2 - t_1 = 15 - 5 = 10$$

$$\text{@ } t = 10$$

$$-7.5(10)^2 + (22.5)(40)$$

$$= 1500 \text{ m}$$

$\vec{s} \rightarrow t(s)$

\vec{s} total distance travelled

$$= 375 + 1500 = 1875 \text{ m}$$

