

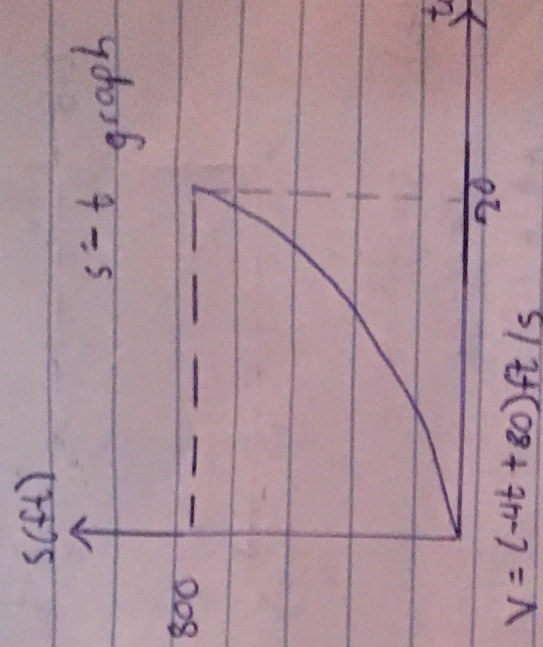
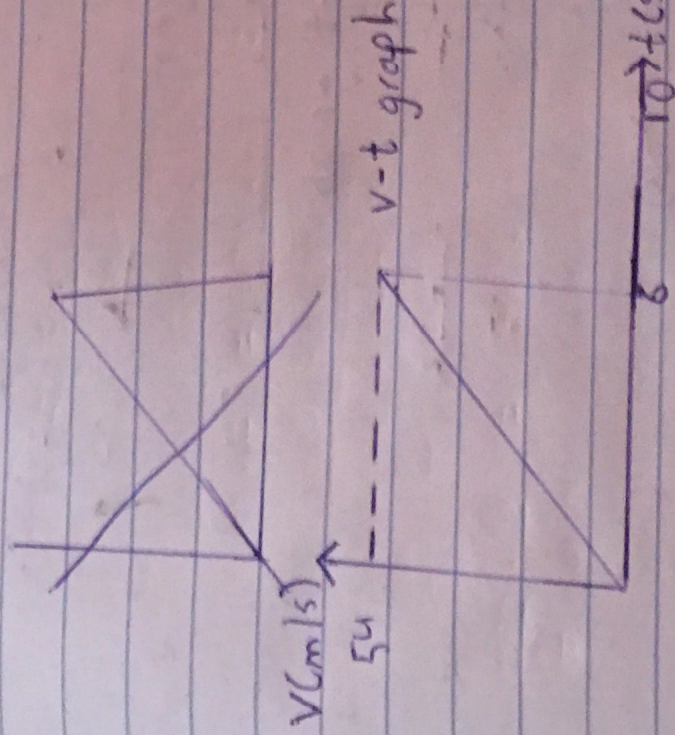
1) Given that  $s = 0.5t^3 \text{ m}$   
 $V = ds/dt, V_1 = 1.5t^2$

when  $t = 6$

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

$$S_2 = 108 \text{ m}$$

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

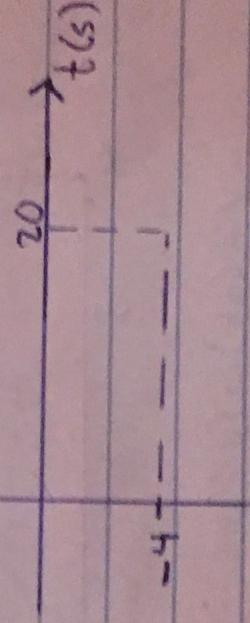


$$a = \frac{dv}{dt}$$

$$a = -4ft/s^2$$

$$a = -4ft/s^2$$

a-t graph



2) Given that

$$V = -4t + 80$$

$$S = \int V dt$$

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

$$= \left[ -2t^2 + 80t \right]_0^{20}$$

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

$$= -800 + 1600$$

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

3)  $V = 0.25s$

$$a = V \frac{dv}{ds}$$

$$a = 0.25s(0.25)$$

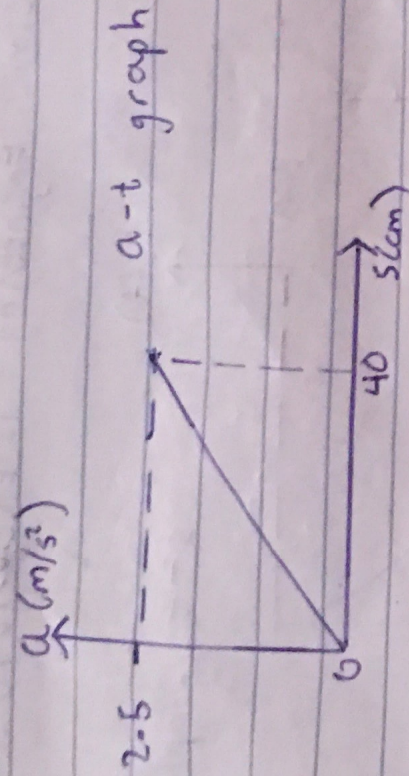
$$a = 0.0625s \text{ m/s}^2$$

At  $s = 40 \text{ m}$

$$a = 0.0625 \times 40$$

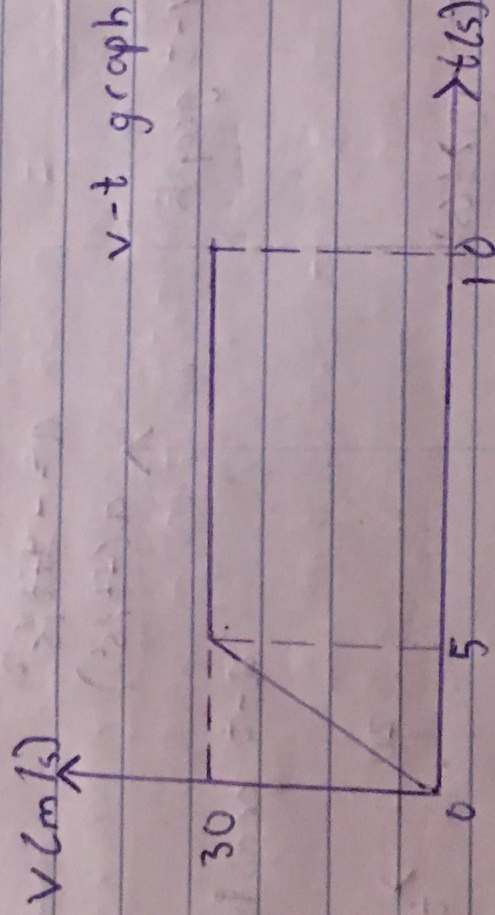
$$a = 2.5 \text{ m/s}^2$$





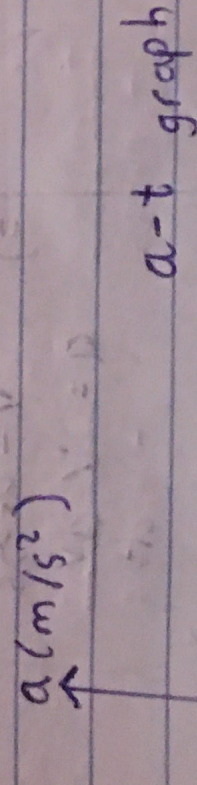
40.)  $S = 3t^2$   $S = 30t - 15$   
 $\therefore V = 6t$   $V = 30 \text{ m/s}$

At  $t = 5$   
 $V = 6 \times 5$   
 $= 30 \text{ m/s}$



$V = (6t) \text{ m/s}$   
 $a = 6 \text{ m/s}^2$

$V = 30 \text{ m/s}$   
 $a = 0 \text{ m/s}^2$



$(6 \times 5 + (0 \times 5)) = 30$   
 $30 \text{ m/s}$



4)  $a = 20 \text{ m/s}^2$   $a = -10 \text{ m/s}^2$

$$\int_0^t dv = \int_0^t a dt$$

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

$$v = 20t$$

5)  $v = \int 20 dt$   
 $v = 20t$   
 at  $t = 5 \text{ s}$

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

$5 \text{ s} < t \leq t'$

$\int_{100}^{v'} dv = \int_0^{t'} -10 dt$

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

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

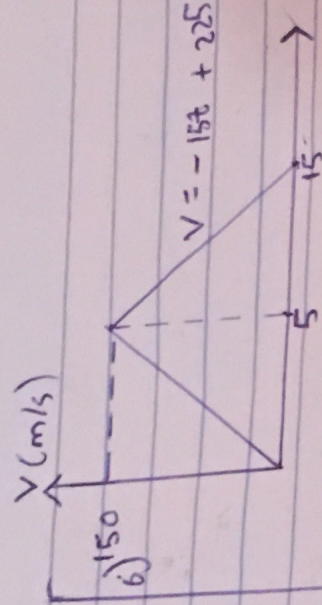
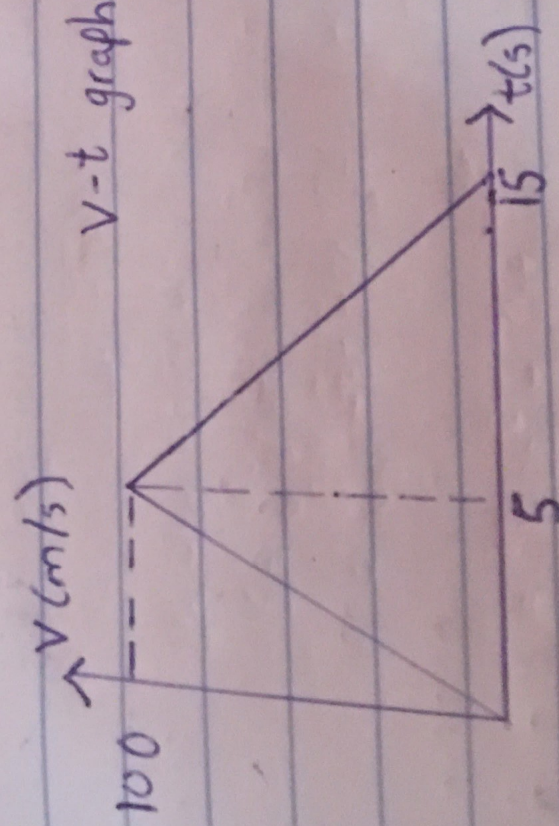
at  $t' = 0, v = 0$

$0 - 100 = 10t' + 50$

$10t' = 150$

$t' = 15 \text{ s}$

It takes 15 seconds for the car to come to rest



$0 \leq t \leq 5$

$v = 30t$

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

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

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

$= 15 \times 25$

$= 375 \text{ m}$

~~$s_1 = t$~~

$5 \leq t \leq 15 \text{ s}$

$v = -15t + 225$

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

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

$85 - 375 = \left[ \frac{-15 \times 225}{2} + 3375 \right] - \left[ \frac{-15 \times 25}{2} + 1125 \right]$

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

$s - 375 = 750$

$s = 750 + 375$

$s = 1125 \text{ m}$