

1.) Given that:

$$s = 0.5t^3 \text{ m.}$$

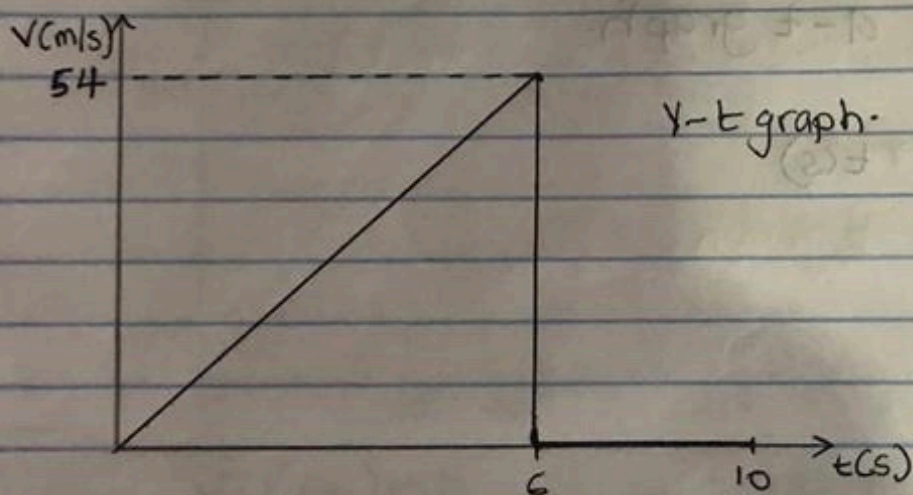
$$v = \frac{ds}{dt}, \quad v_1 = 1.5t^2$$

so at  $t = 6$

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

$$s_2 = 108 \text{ m.}$$

$$v = \frac{ds}{dt} = 0, \quad v = 0 \text{ m/s.}$$



2.) Given that

$$v = -4t + 80$$

$$s = \int v dt$$

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

$$s = [-2t^2 + 80t] \Big|_0^{20}$$

$\therefore$  at  $t = 20$

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

$$s = -800 + 1600$$

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

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

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

$$\text{At } t = 5 \text{ s.}$$

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

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

$$v - 100 = -10(t - 5)$$

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

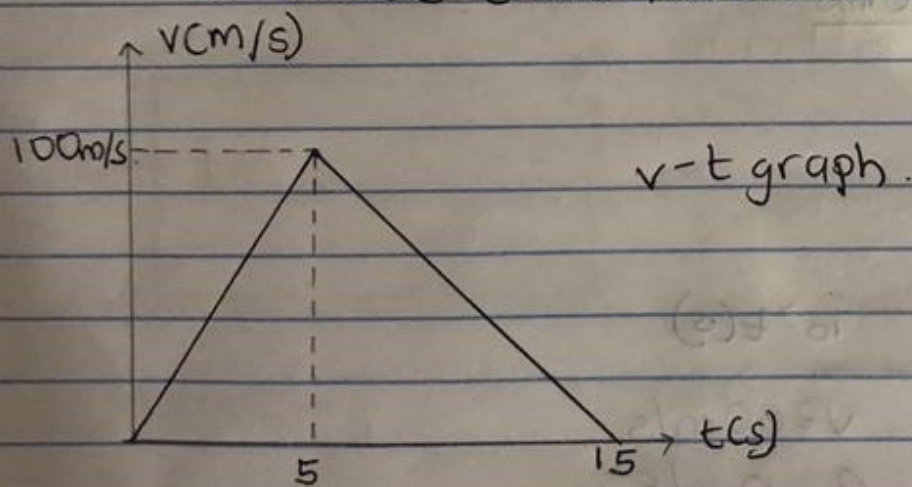
$$v = (-10t + 150) \text{ m/s.}$$

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

$$0 = -10t + 150$$

$$-150 = -10t$$

$t = 15 \text{ sec}$  (time for the car to come rest)



$$6.) v = 30t$$

$$\int ds = \int v dt$$

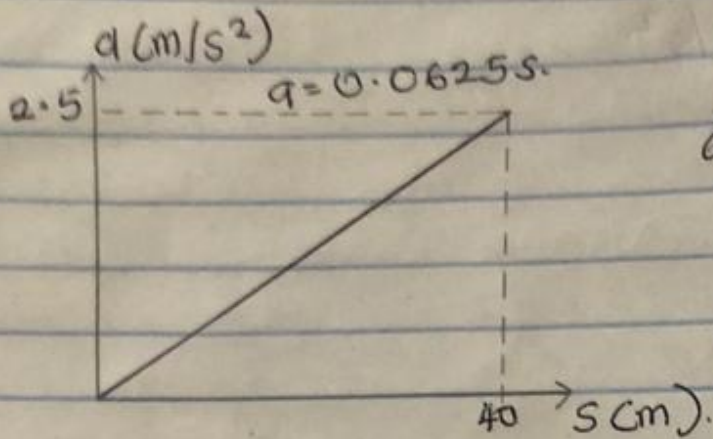
$$\int_0^s ds = \int_0^t (30t) dt$$

$$s = 15t^2$$

$$\text{At } t = 5 \text{ s.}$$

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

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



$a-s$  graph.

4.)  $s = 3t^2$

$v = 6t$

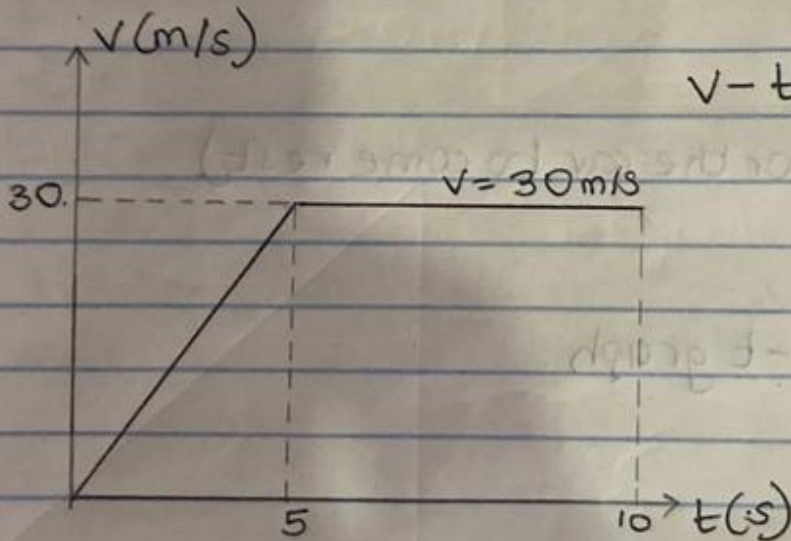
At  $t = 5$

$v = 6 \times 5$

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

$s = 30t - 75$

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



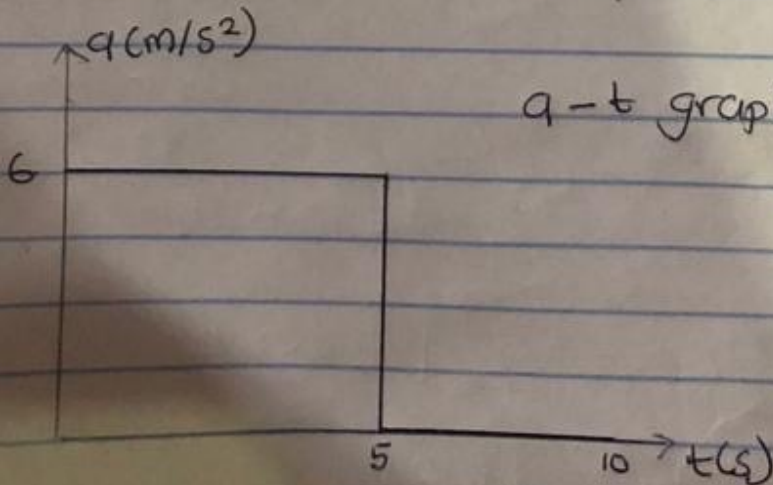
$v-t$  graph

$v = (6t) \text{ m/s}$

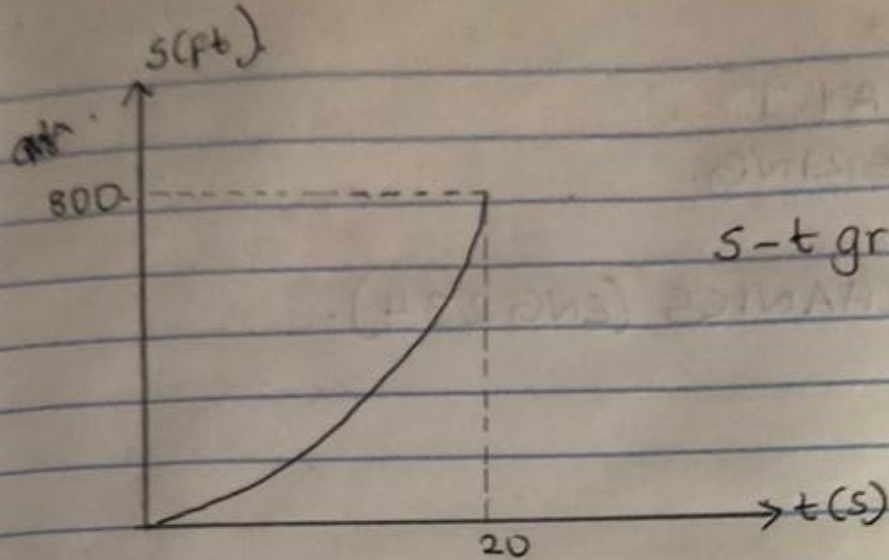
$a = 6 \text{ m/s}^2$

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

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



$a-t$  graph.



s-t graph.

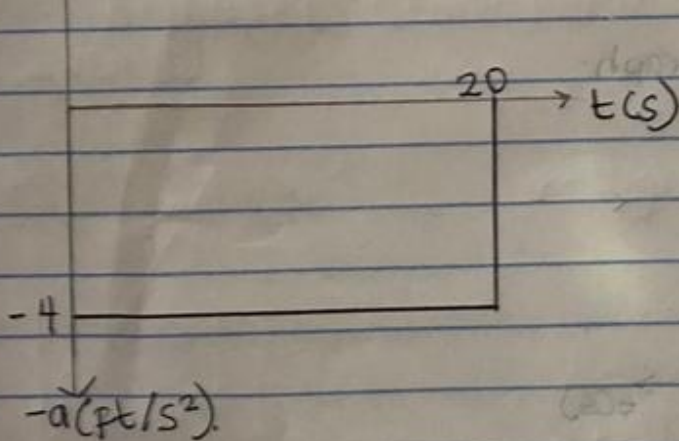
$$v = (-4t + 80) \text{ ft/s.}$$

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

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

$$\uparrow a (\text{ft/s}^2)$$

a-t graph.



3.)  $v = (0.25s) \text{ m/s.}$

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

$$a = 0.25s (0.25)$$

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

At  $s = 40 \text{ m.}$

$$a = (0.0625 \times 40)$$

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