

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

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

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

$$v = 20t$$

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

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

$$\int_{100}^0 dv = \int_5^t -10 dt$$

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

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

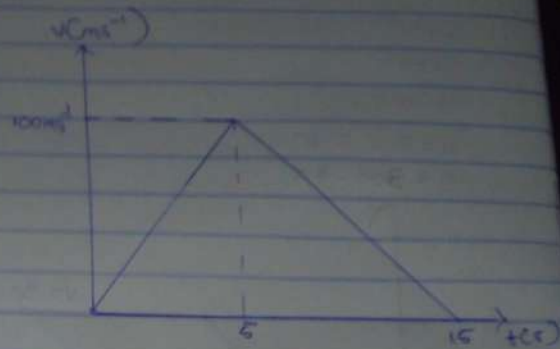
$$v = (-10t + 150) \text{ m/s}$$

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

$$0 = -10t + 150$$

$$-150 = -10t$$

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



V-t graph

$$(6) \quad v = 30t$$

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

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

$$s = 15t^2$$

$$\text{at } t = 5 \text{ s}$$

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

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

$$a) a = 3t^2$$

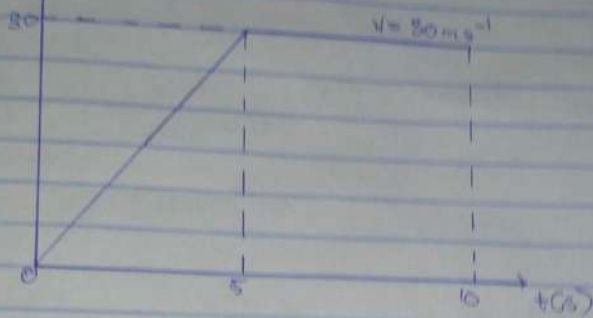
$$v = at$$

at $t = 5$

$$v = 6 \times 5 = 30 \text{ ms}^{-1}$$

$$a = 3 \times 5 = 15$$

$v(\text{ms}^{-1})$



$v-t$ graph

$$v = (6t) \text{ ms}^{-1}$$

$$v = (3t) \text{ ms}^{-1}$$

$$v = 30 \text{ ms}^{-1}$$

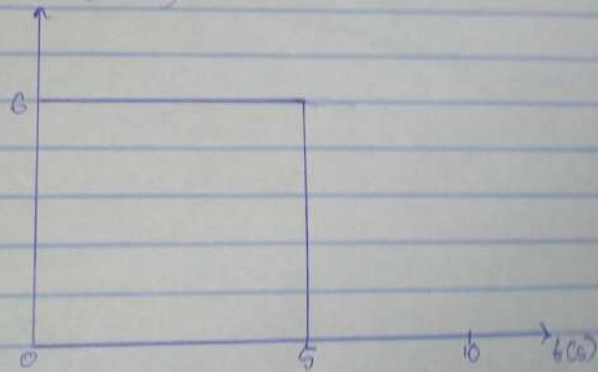
$$v = 30 \text{ ms}^{-1}$$

$$a = 6 \text{ ms}^{-2}$$

$$a = 0 \text{ ms}^{-2}$$

$$a = 6 \text{ ms}^{-2}$$

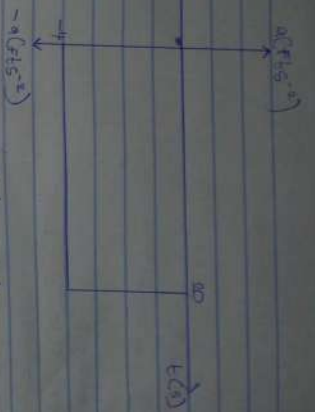
$a(\text{ms}^{-2})$



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

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

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



③ $v = (0.25s) \text{ m/s}$

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

$$a = 0.25 \text{ s}^{-1}$$

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

$$\text{at } s = 40 \text{ m}$$

$$a = (0.0625 \times 40) = 2.5 \text{ m/s}^2$$



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① Given that

$$S = 0.5t^3 \text{ m}$$

$$V \frac{ds}{dt}, V_1 = 15t^2$$

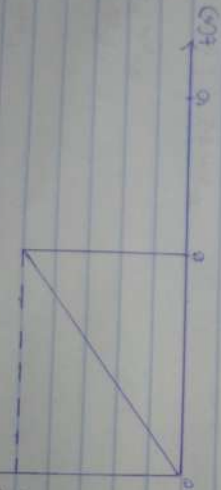
$$\text{at } t = 6$$

$$V = 15(6)^2 = 54 \text{ ms}^{-1}$$

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

$$V = \frac{ds}{dt} = 0 \text{ ms}^{-1}$$

$V(\text{ms}^{-1}) \uparrow$



② $v = -4t + 80$

$$S = \int v dt$$

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

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

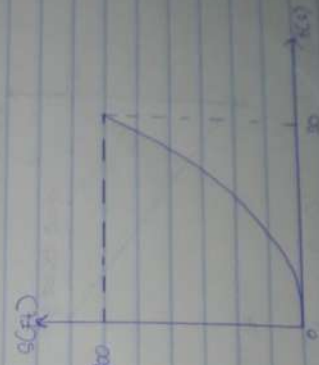
$$S = \left[-2(20)^2 + 80(20) \right]$$

$$S = -800 + 1600$$

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

$$S = -800 + 1600$$

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



S-t graph