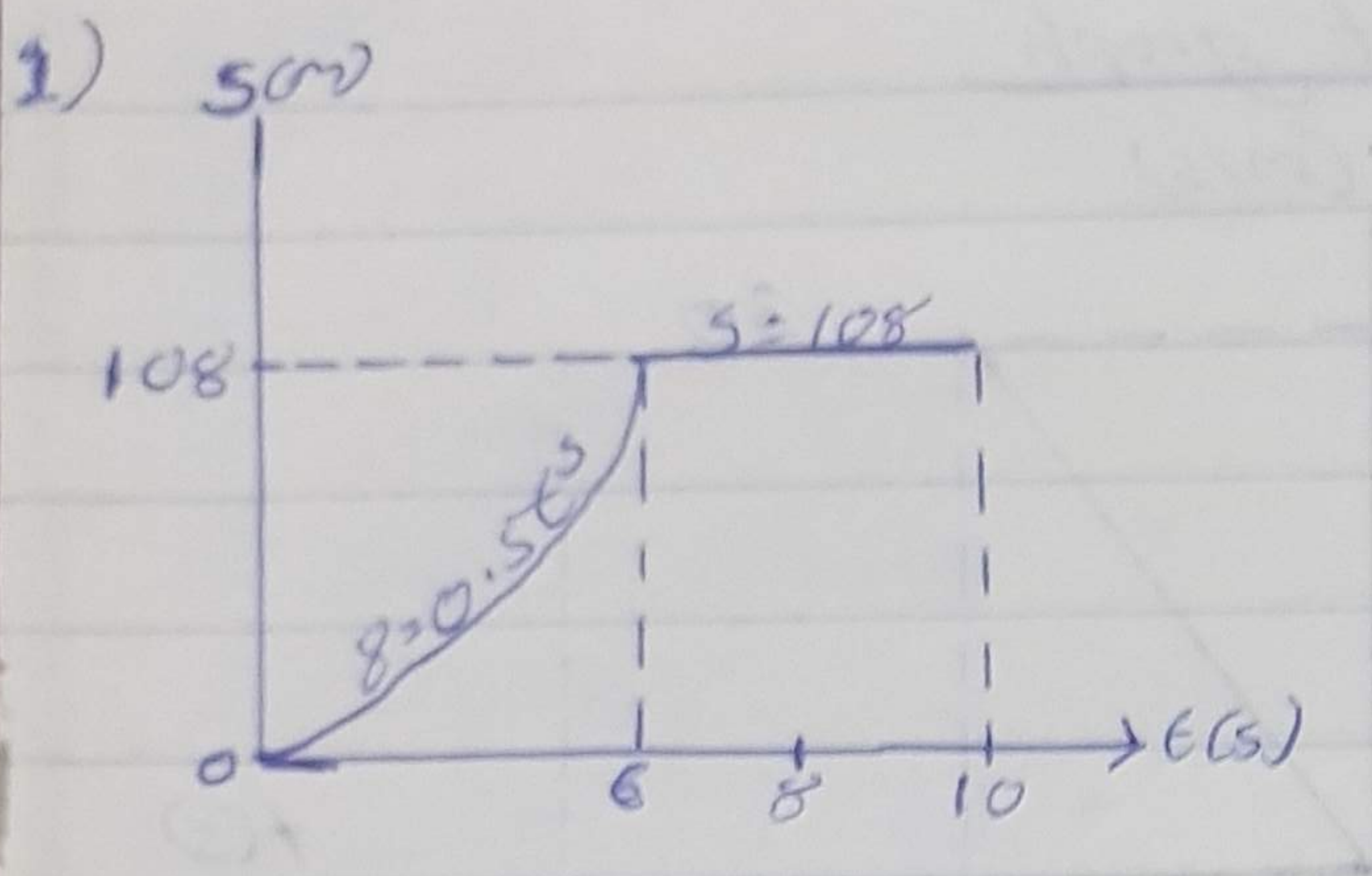


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$$v = ds/dt$$

$$v = 1.5t^2$$

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

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

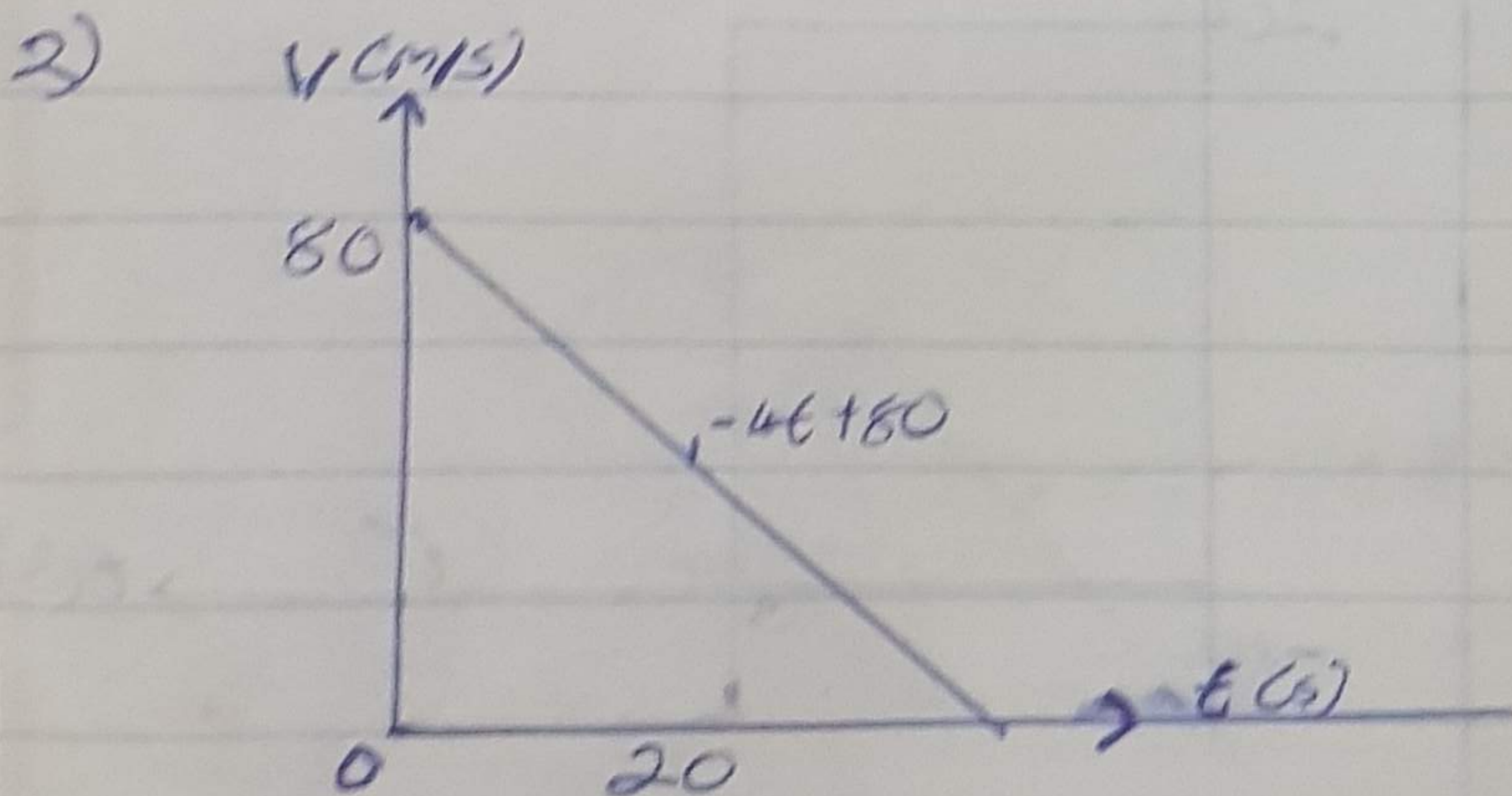
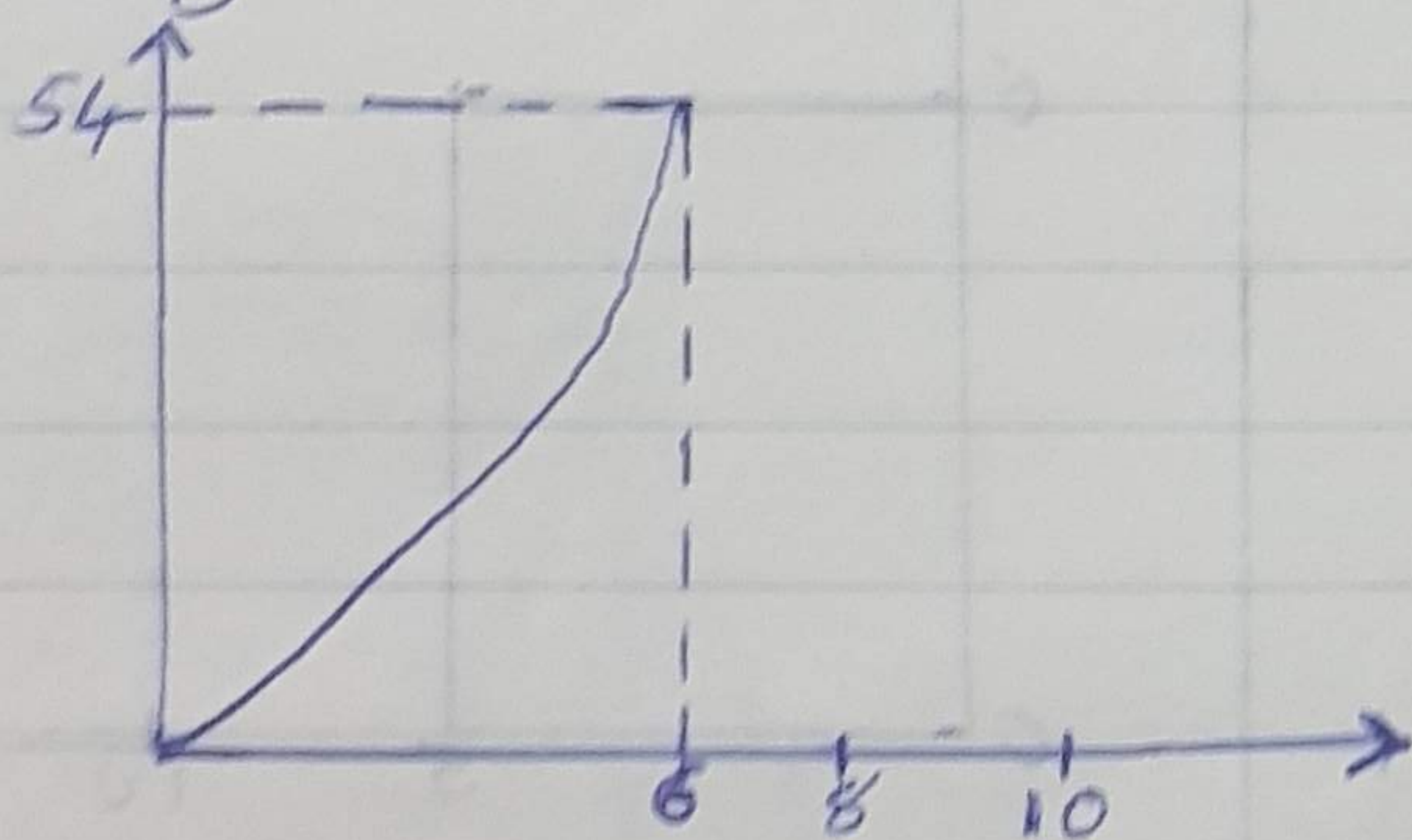
$$= 1.5 \times 36$$

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

$$\text{From } t = 6s - 10s, s = 108$$

$$\therefore v = 0$$

v-t graph



i) $s = \int v dt$

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

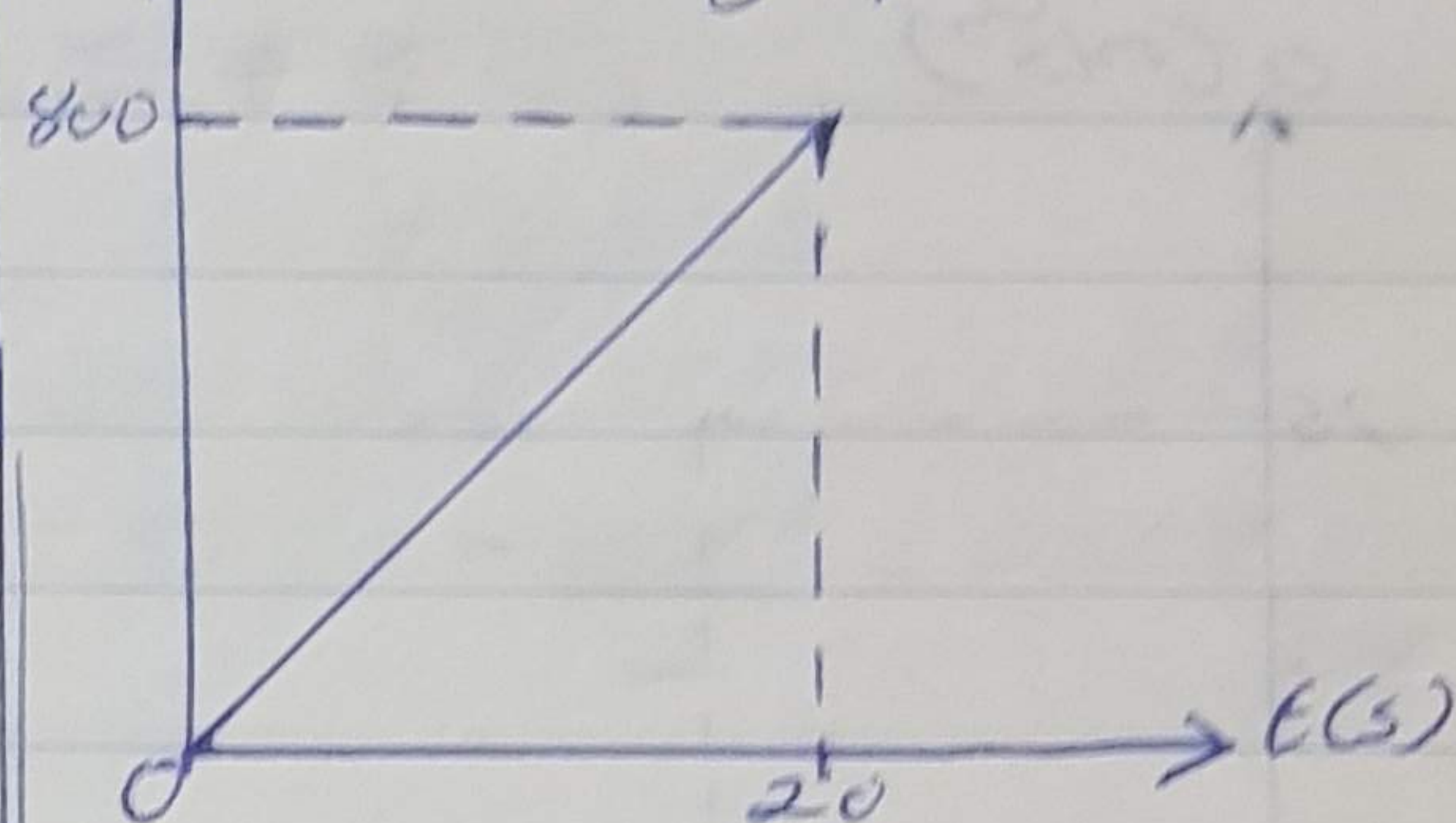
$$s = -2t^2 + 80t$$

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

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

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

s-t graph



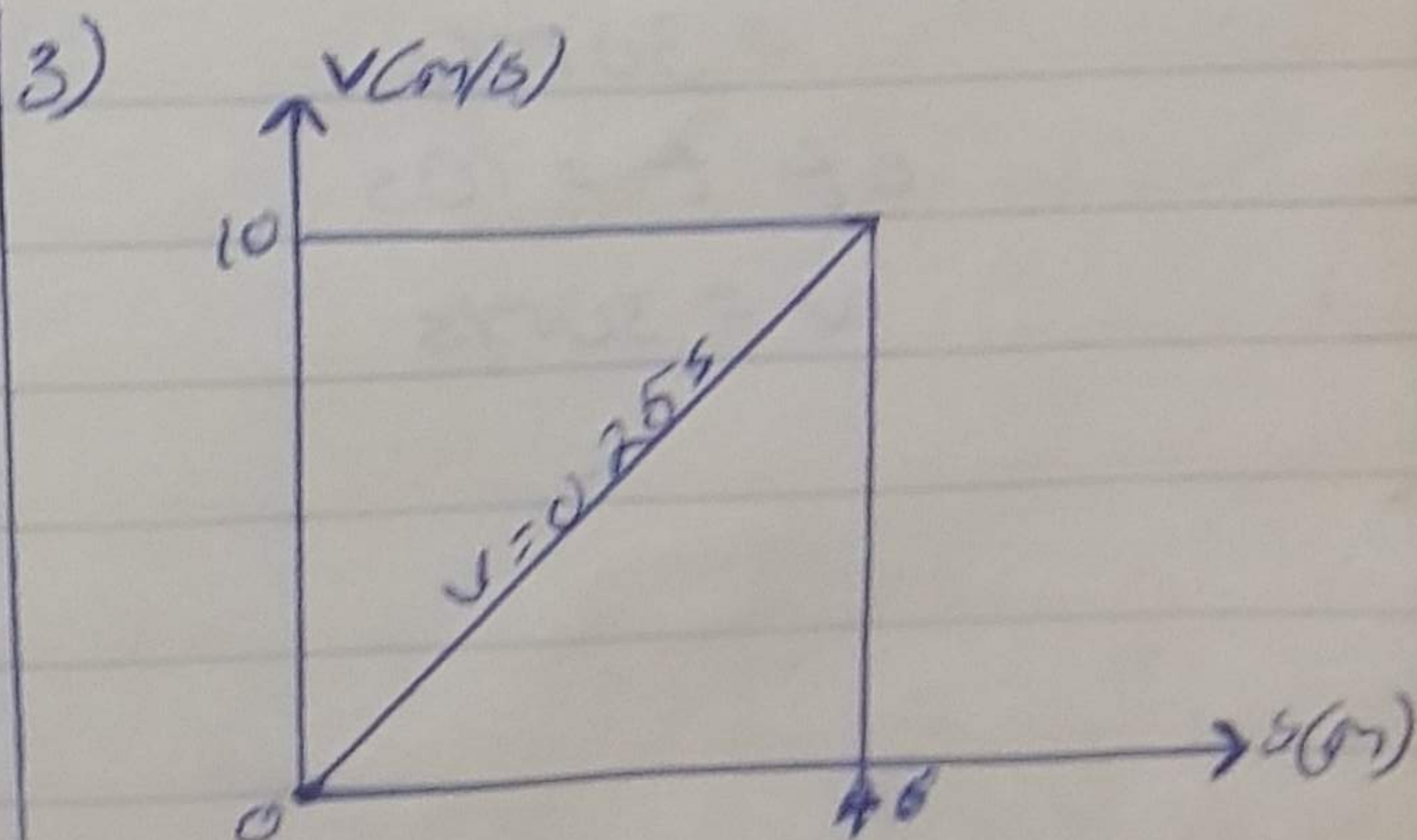
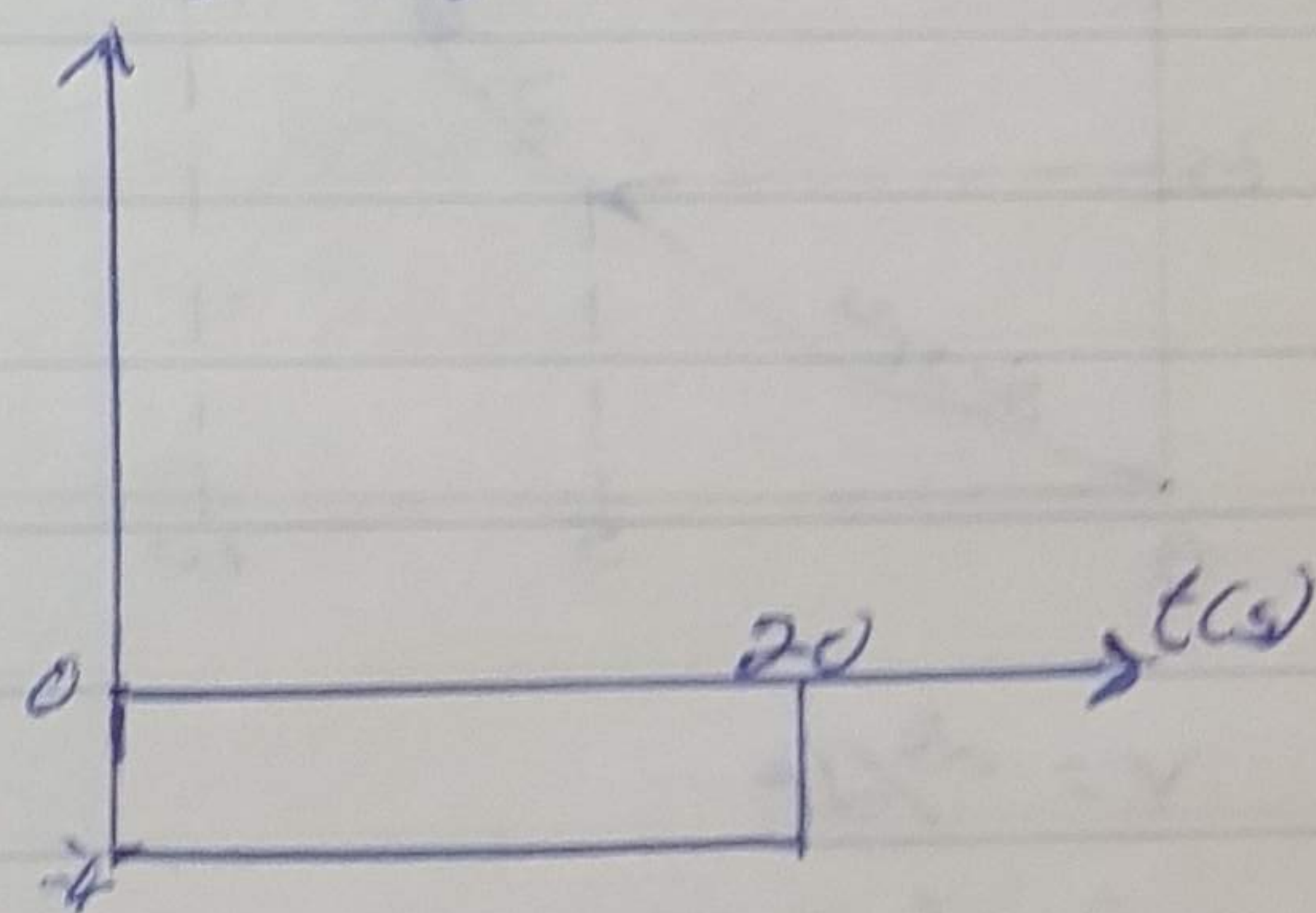
ii) acceleration

$$a = dv/dt$$

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

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

a-t graph
 $a \text{ (m/s}^2\text{)}$



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

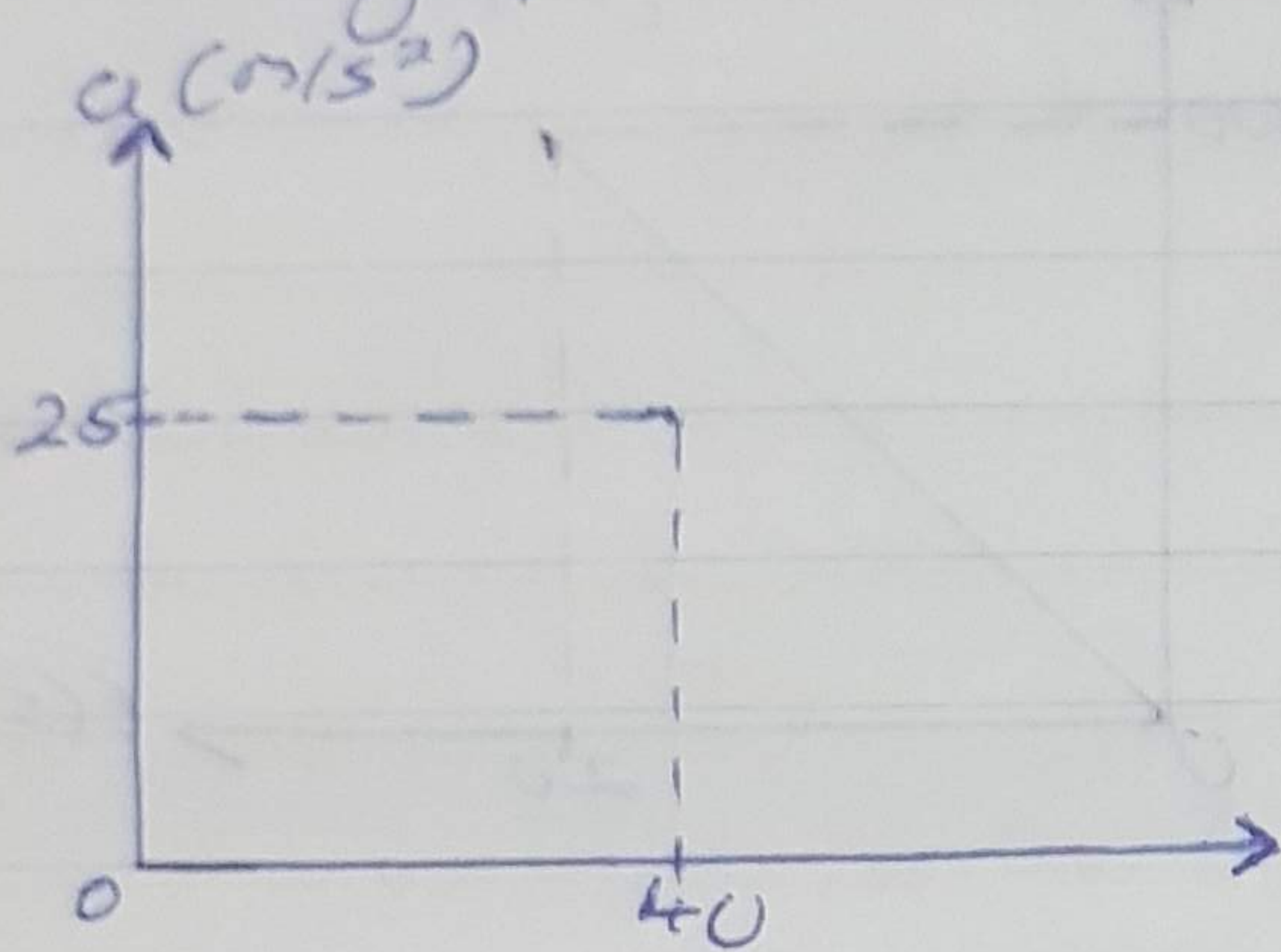
$$v = 0.25s$$

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

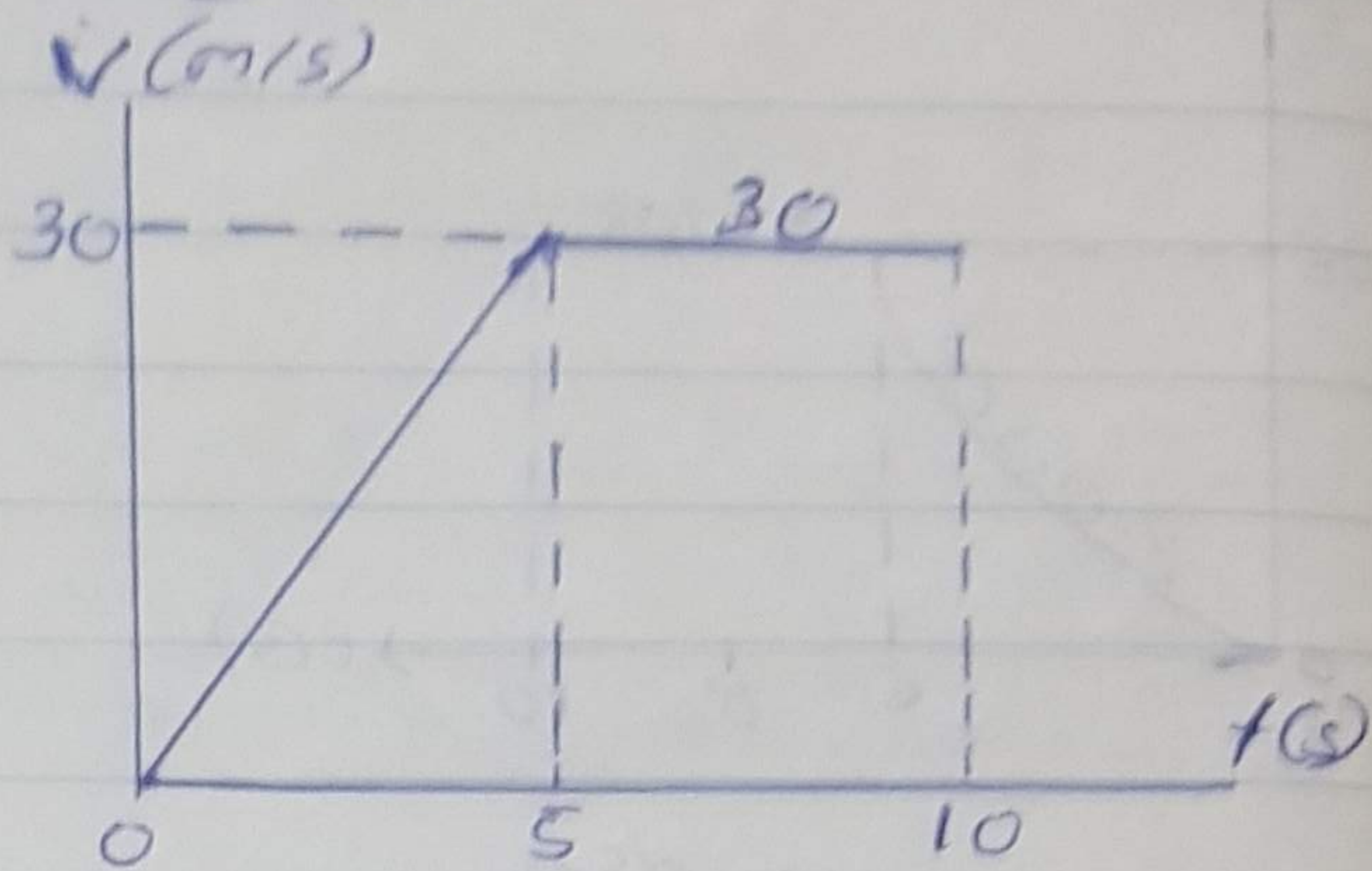
$$a = 10 \times 0.25$$

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

a-s graph



v-t graph



$$1) a = \frac{dv}{dt}$$

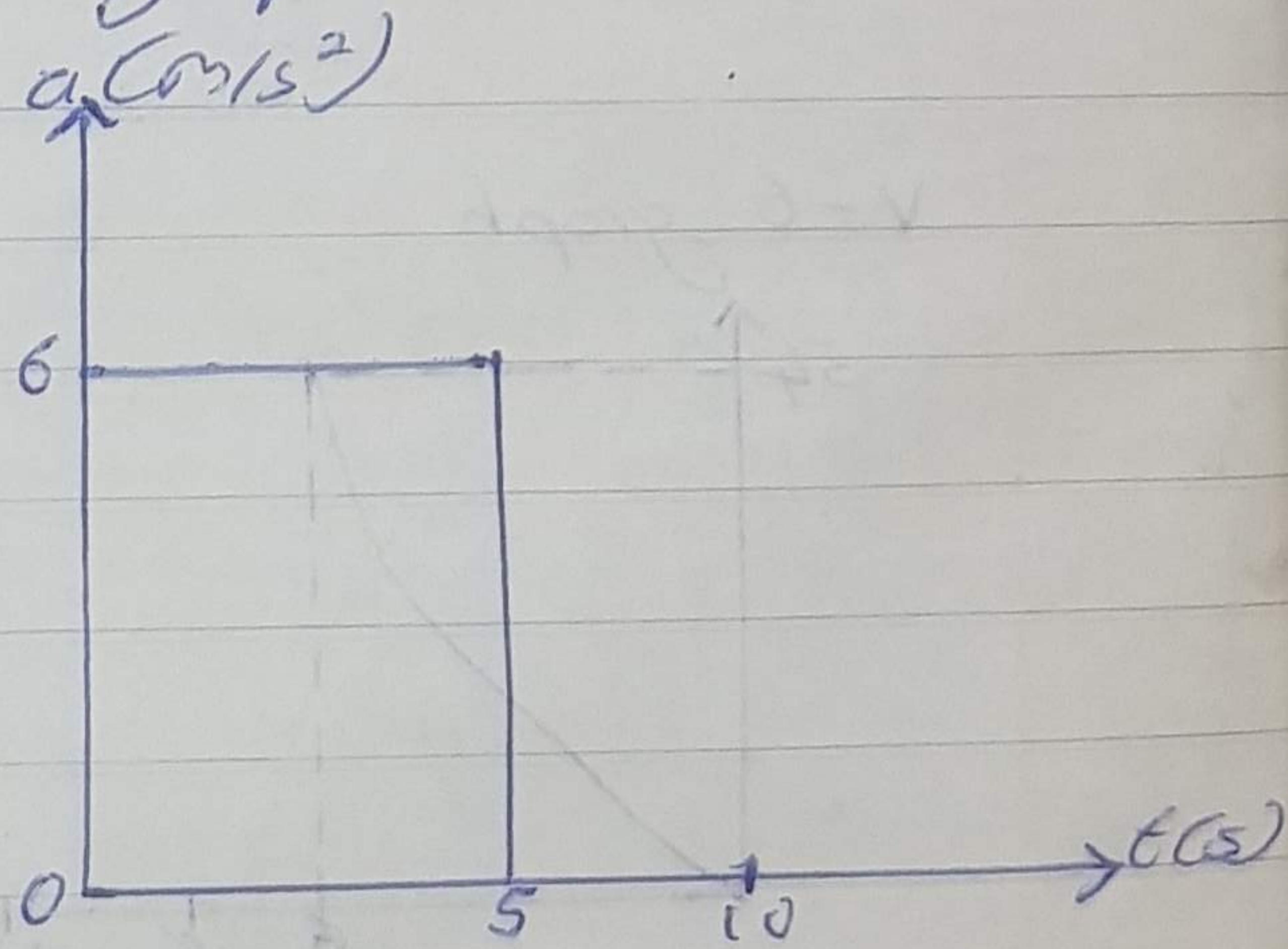
$$\text{at } t = 5,$$

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

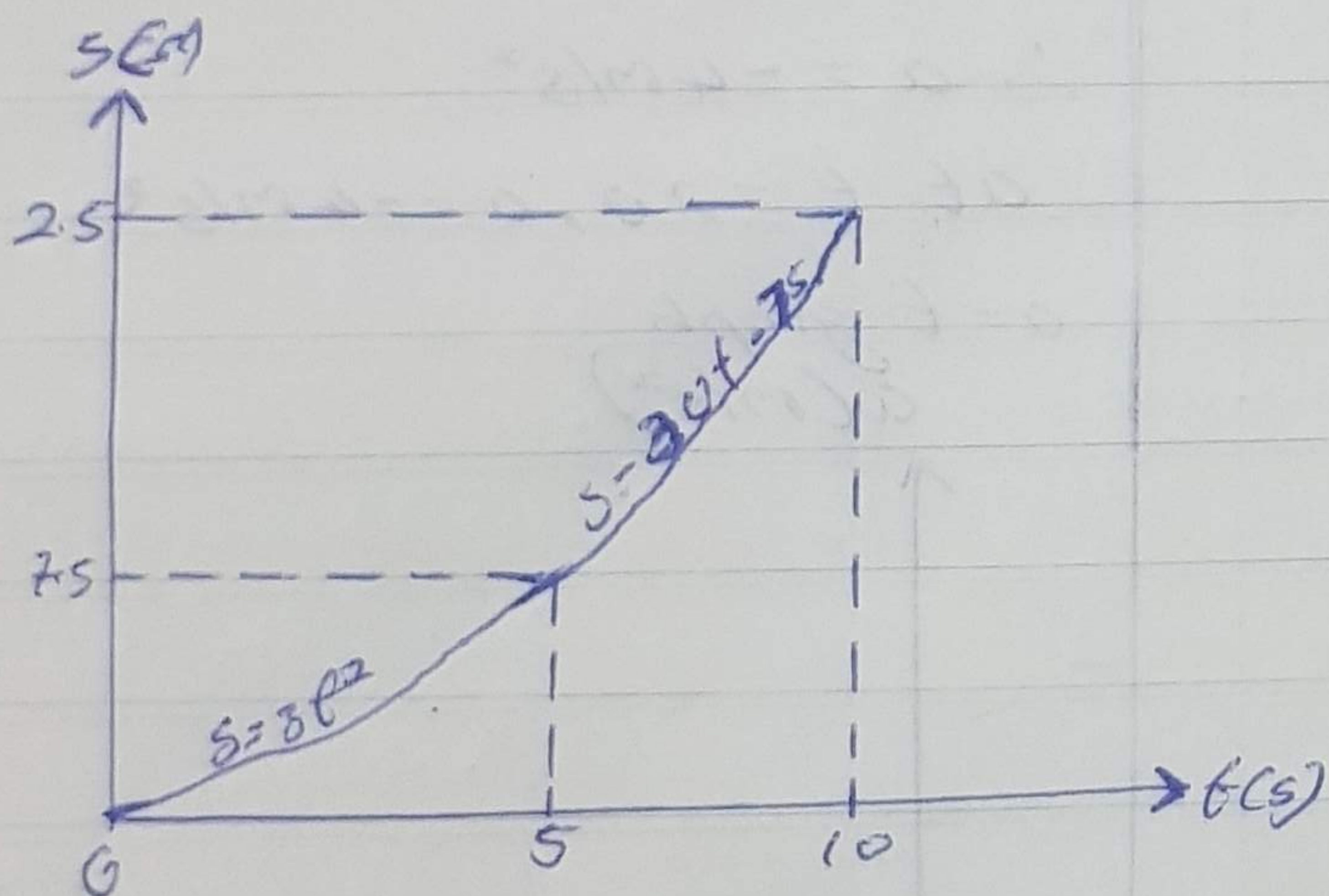
$$\text{at } t = 10s$$

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

a-t graph



4)



$$1) v = \frac{ds}{dt}$$

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

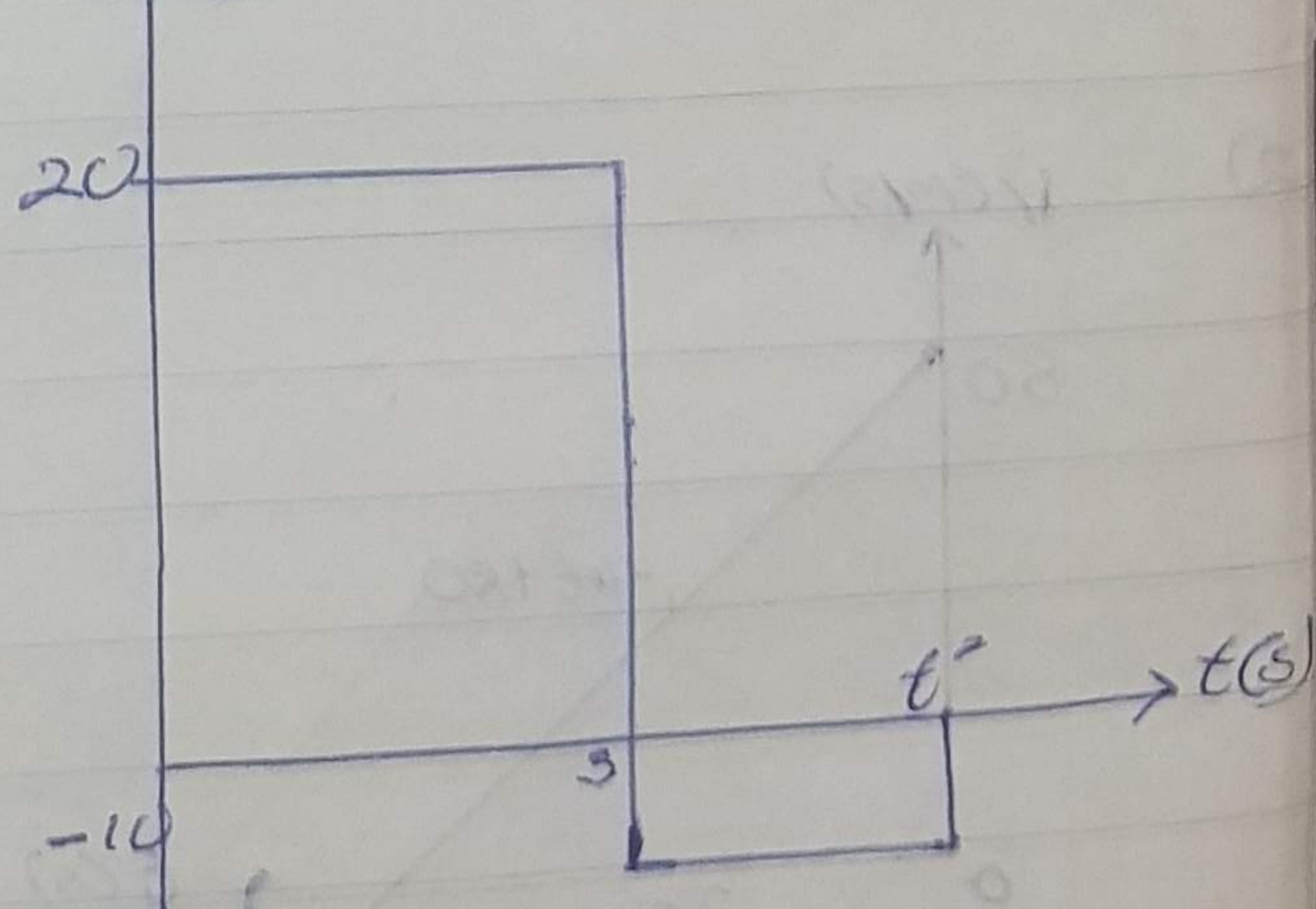
$$v = 6t = 6 \times 5$$

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

$$\text{at } t = 10s$$

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

5) a(s)



$$i) v = \int a dt$$

$$v = \int 20 dt$$

$$v = 20t$$

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

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

$$5s < t \leq t'$$

$$\int_{100}^v dv = \int_5^{t'} -10 dt$$

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

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

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

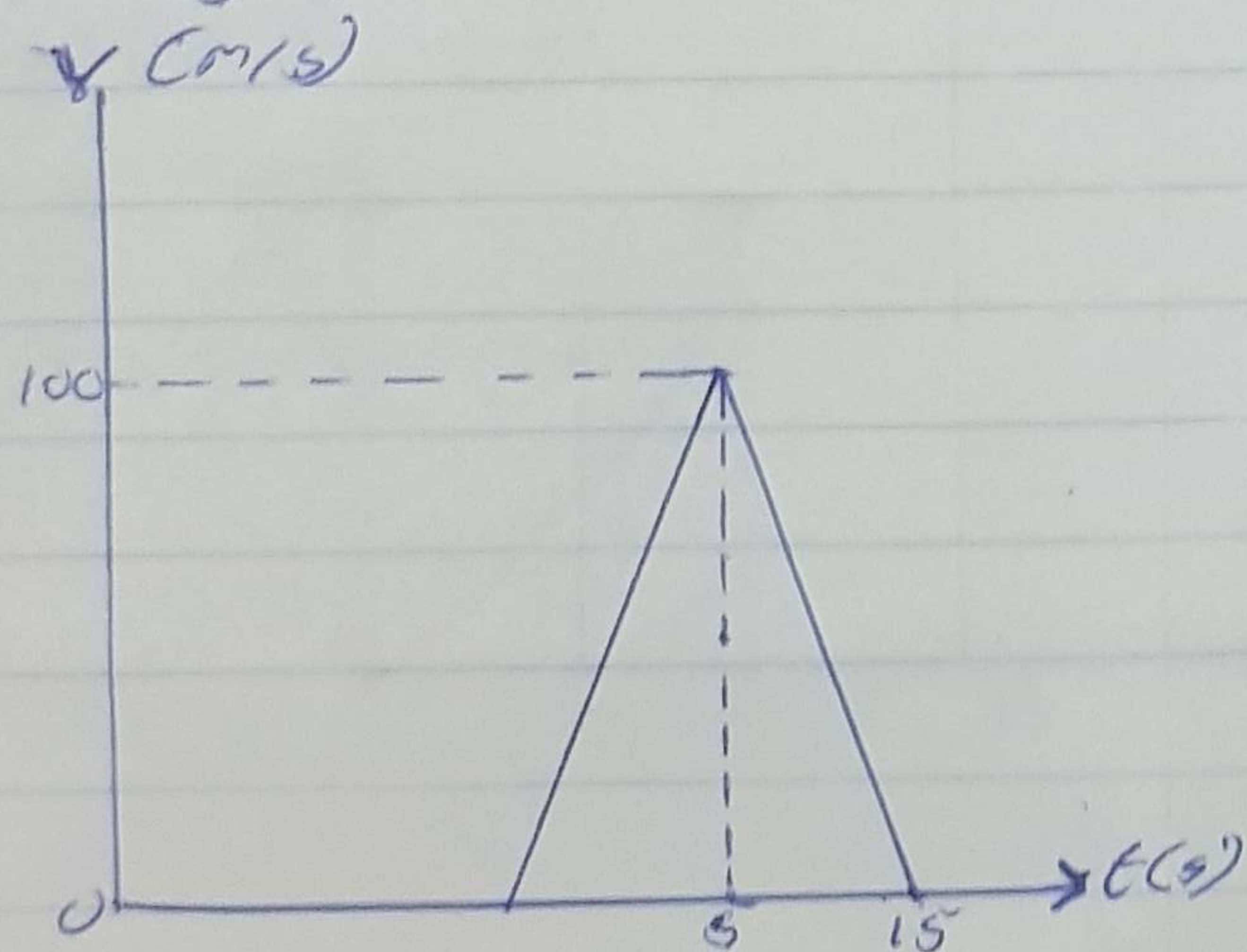
$$\text{at } t', v = 0$$

$$0 - 100 = 10t' + 50$$

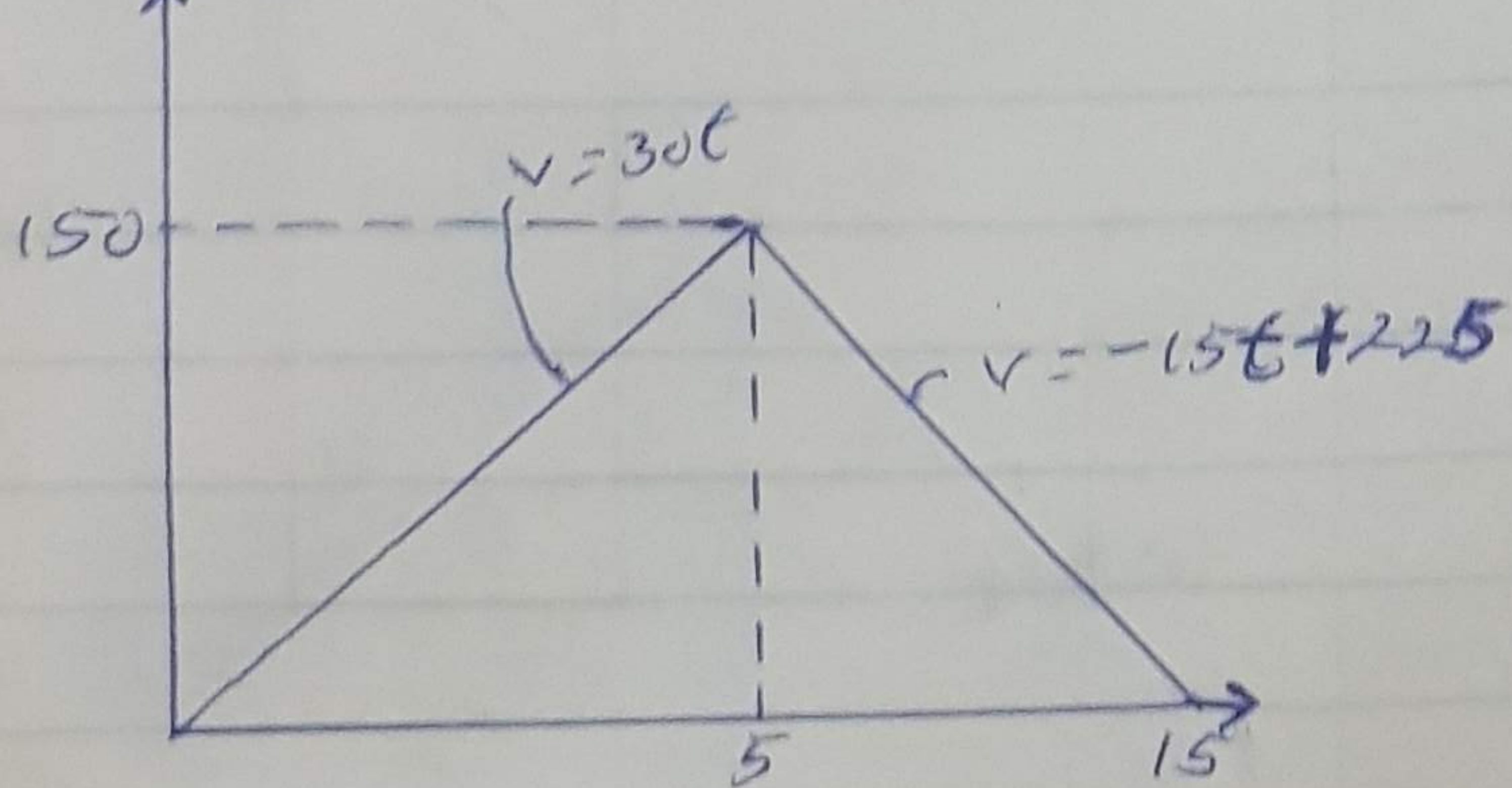
$$10t' = 150$$

$$t' = 15s$$

v-t graph



6) v-t graph



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

$$v = 30t$$

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

$$s = 15t^2/5$$

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

$$s = 15 \times 25$$

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

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

$$v = -15t + 225$$

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

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

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

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

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

$$s - 375 = +1687.5 - 937.5$$

$$s - 375 = 750$$

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