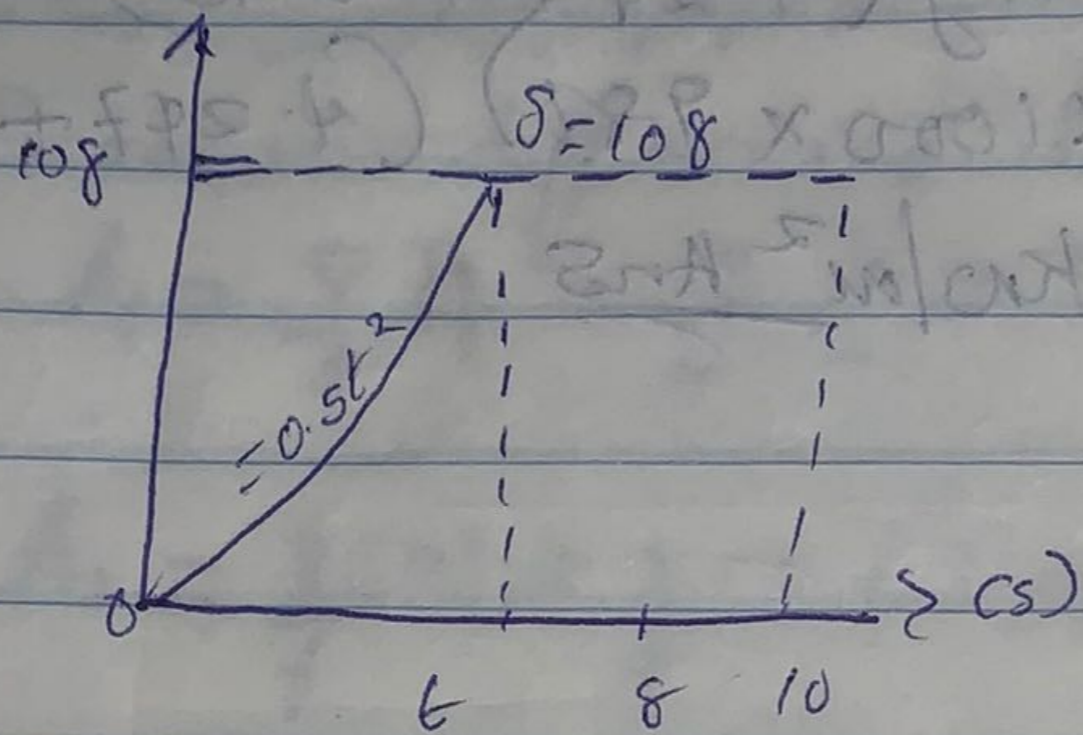


NAME: UMUNWATH CHIN EDU

MAT NO: 18/ENG06/070

DEPT: MECH ENGR

1)



$$v = ds/dt$$

$$v = 1.5t^2$$

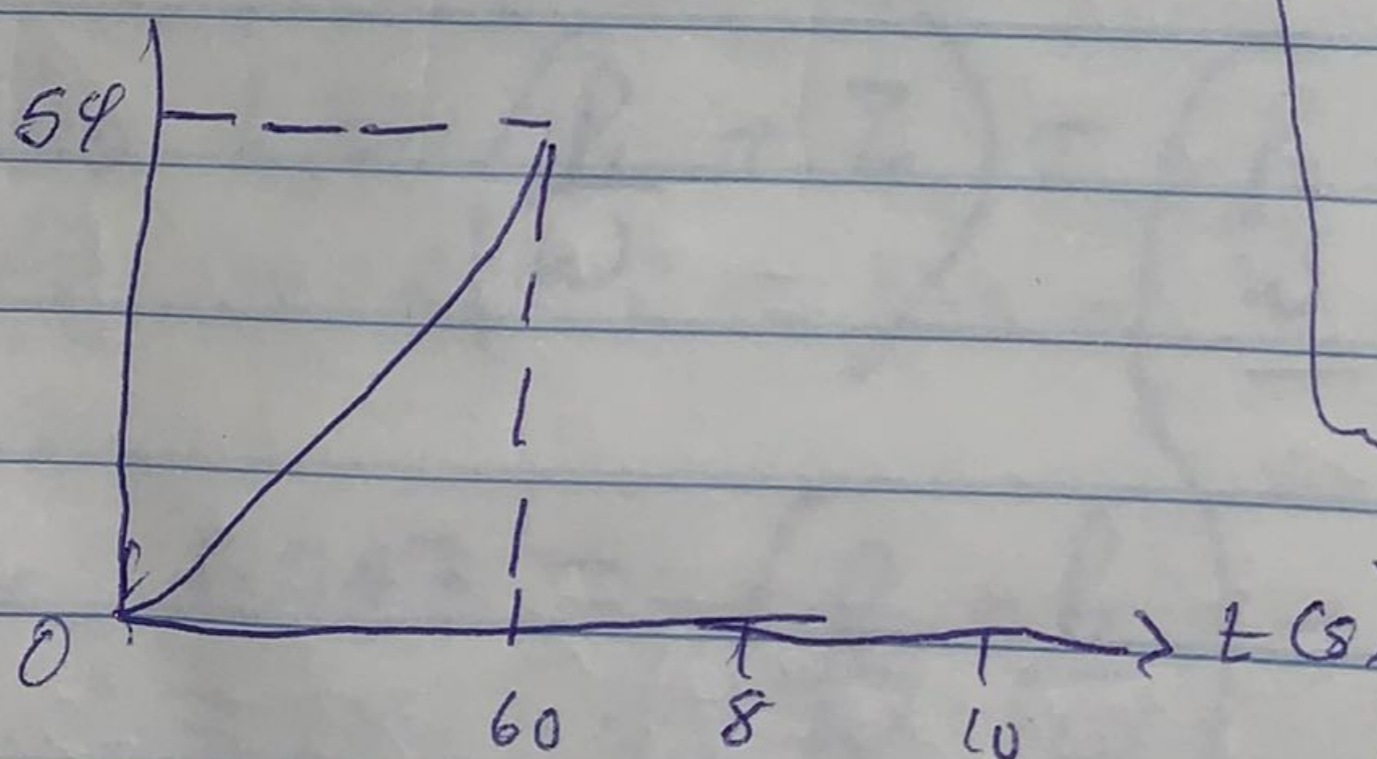
$$v = 1.5 \times 6^2$$

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

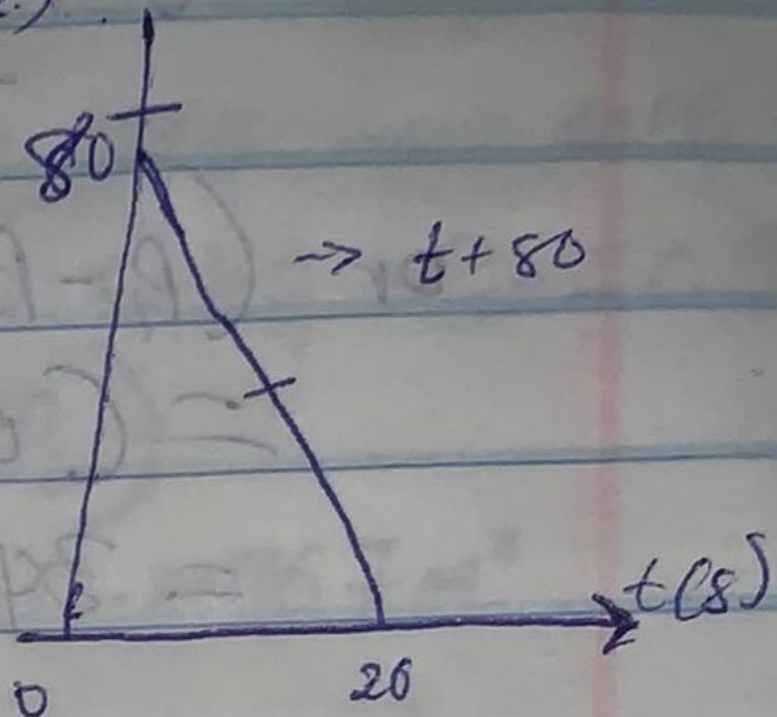
from $t = 6\text{s} - 10\text{s}$, $s = 108$

$$v = 0$$

v-t graph



2)



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

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

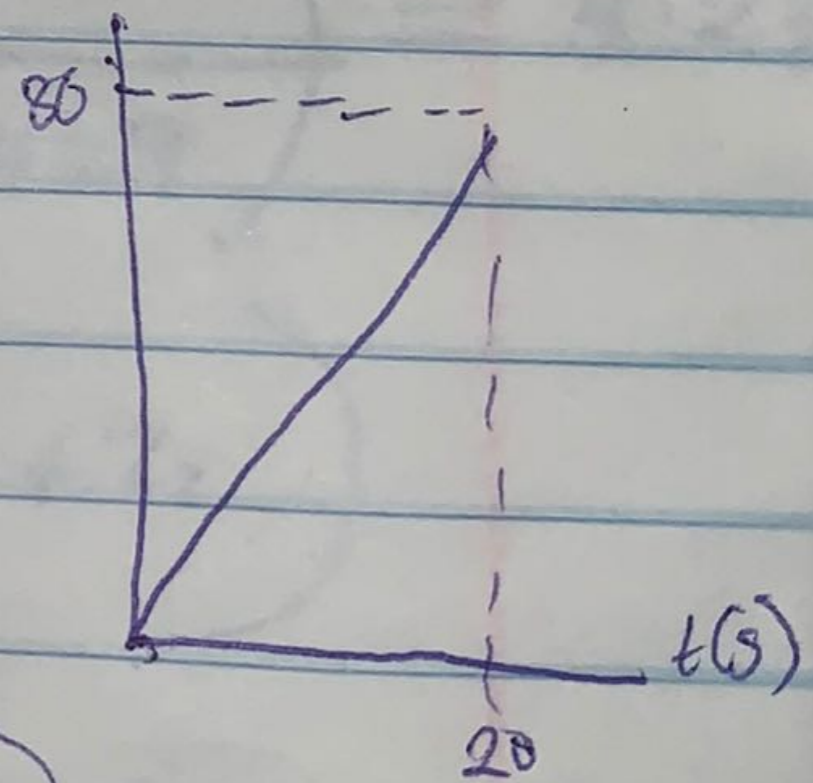
$$s = -2t^2 + 80t$$

at $t = 20\text{s}$

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

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

s-t graph



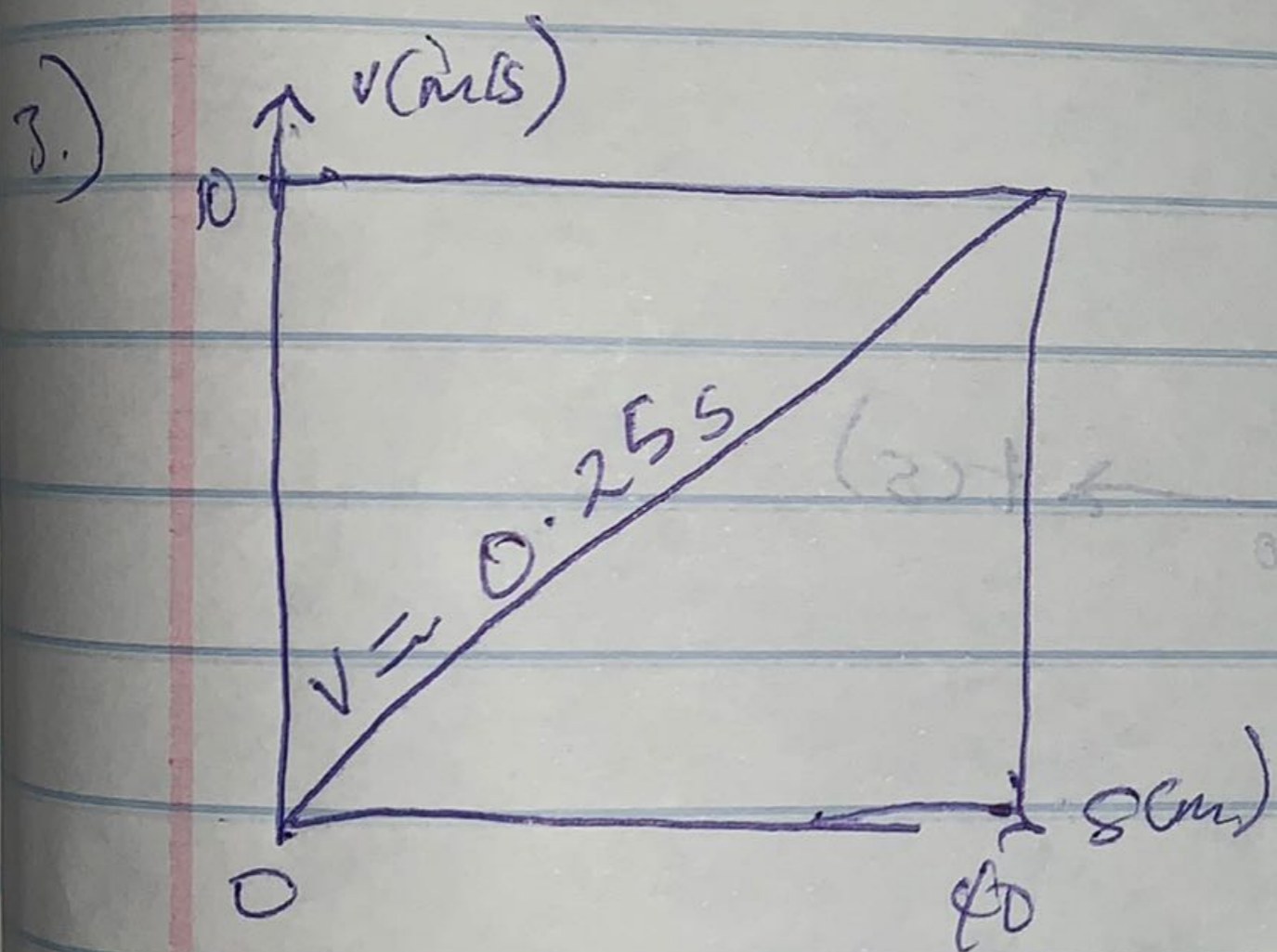
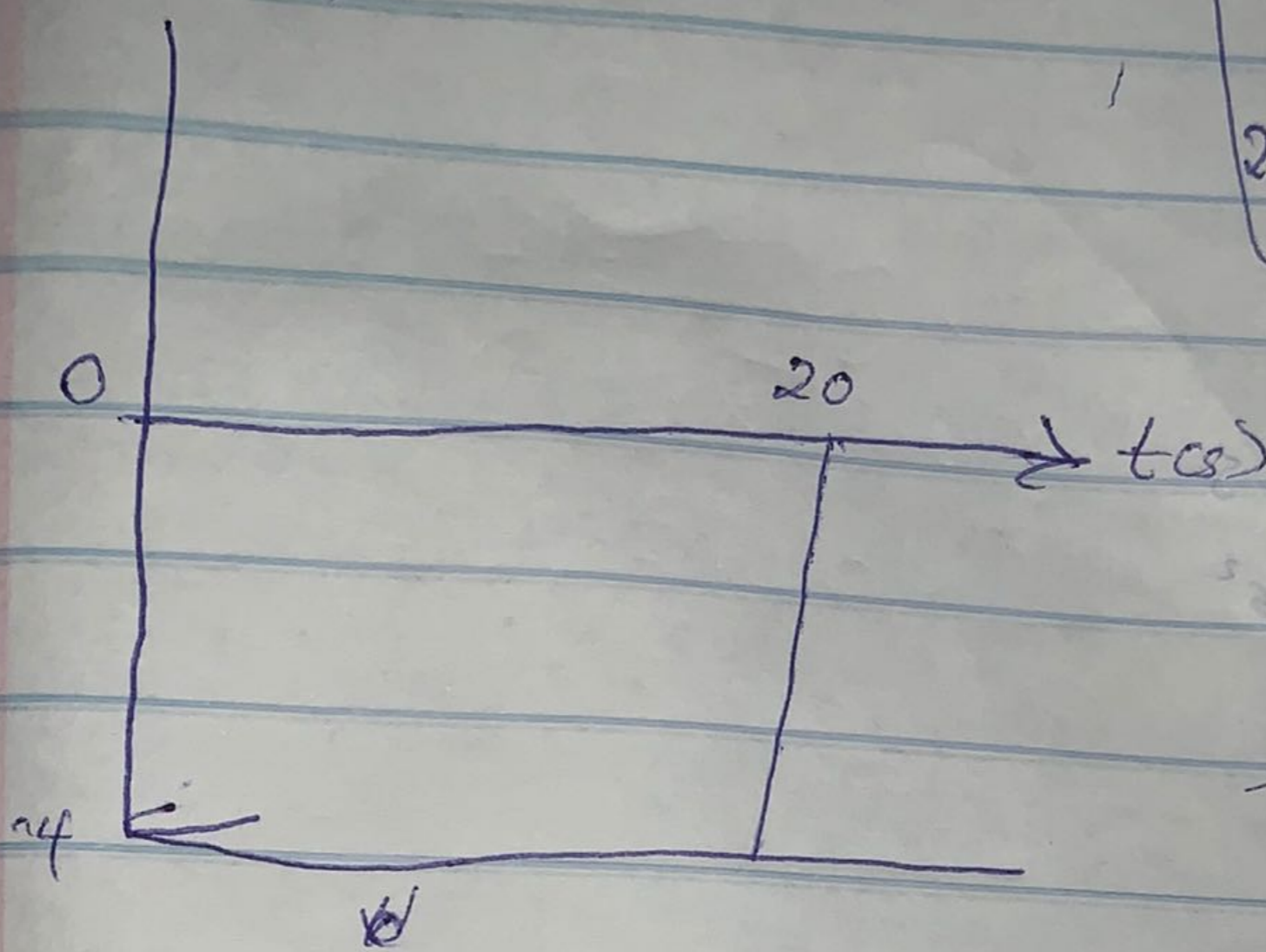
ii) acceleration

$$a = dv/dt$$

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

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

a-t graph
a (m/s²)



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

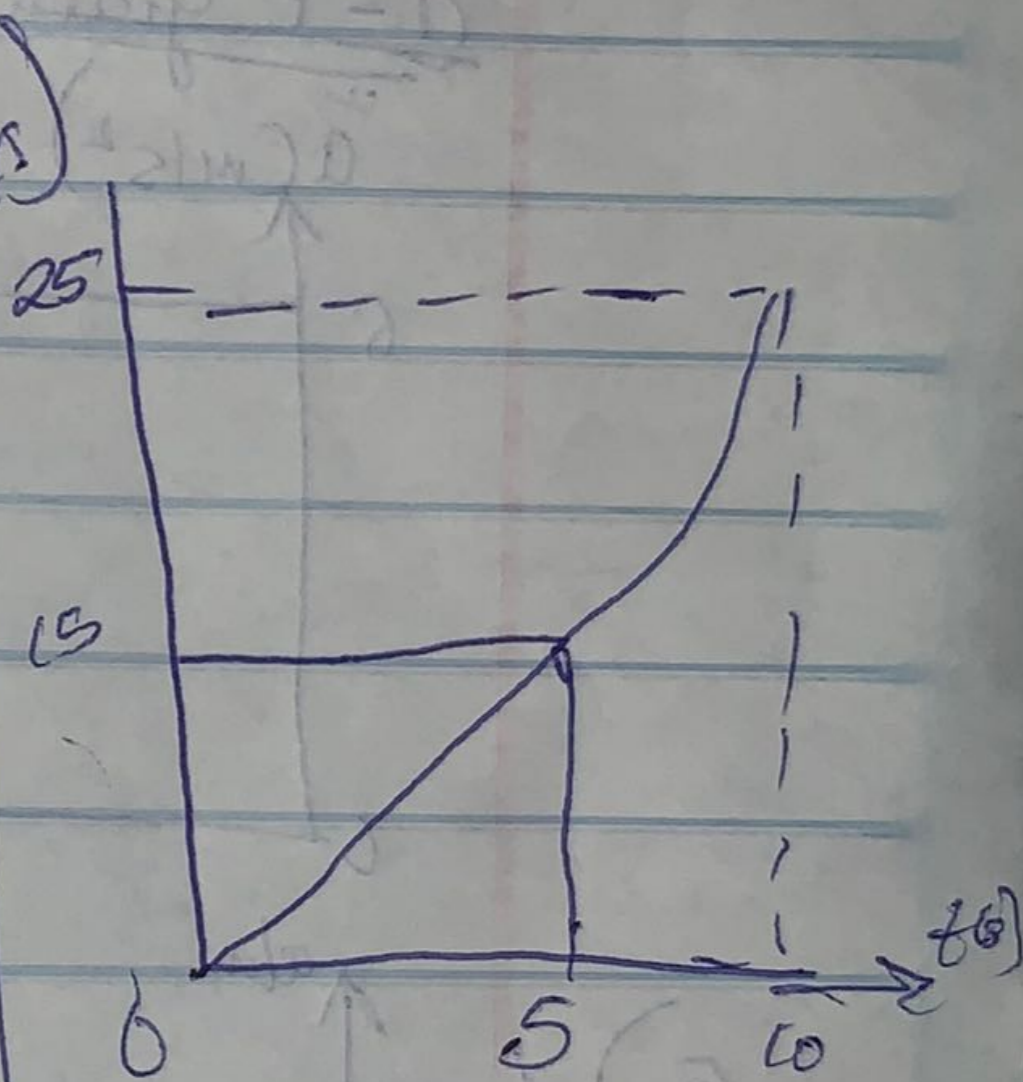
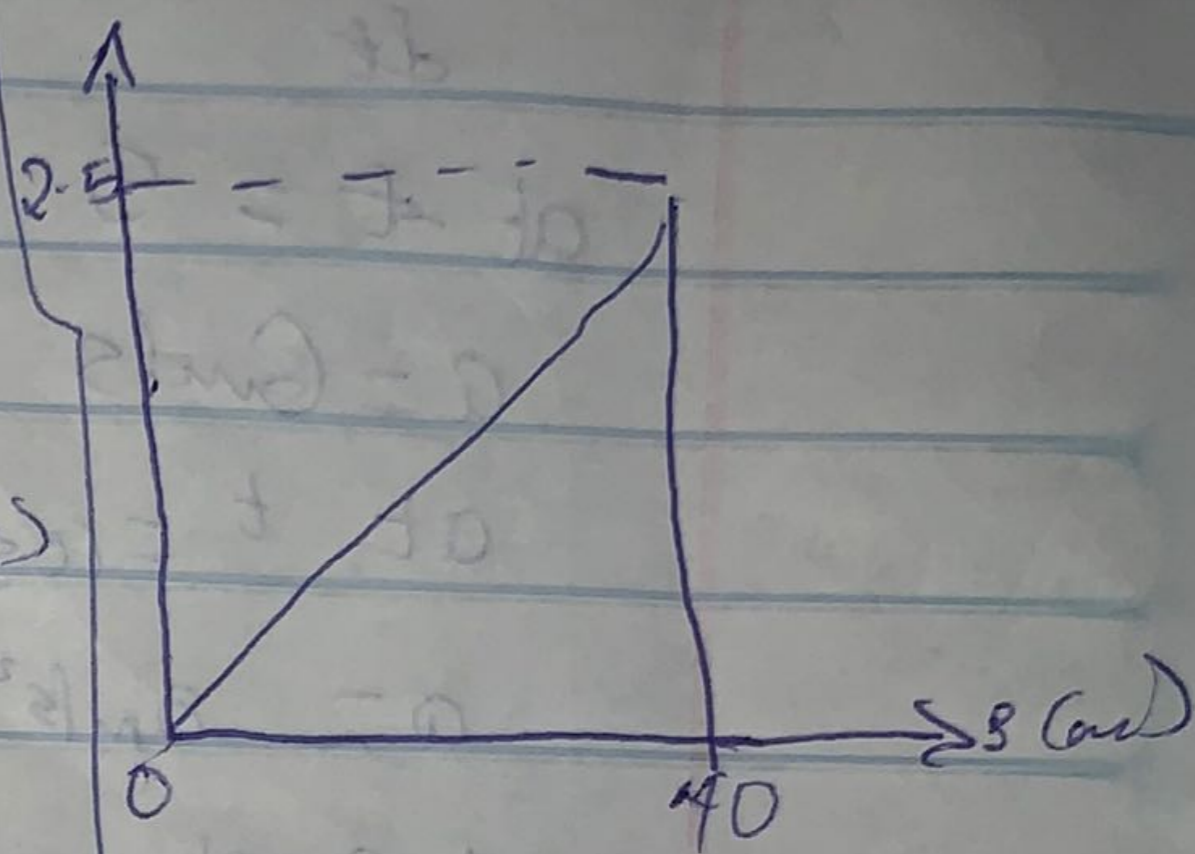
$$v = 0.25s$$

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

$$a = 10 \times 0.25$$

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

a - graph



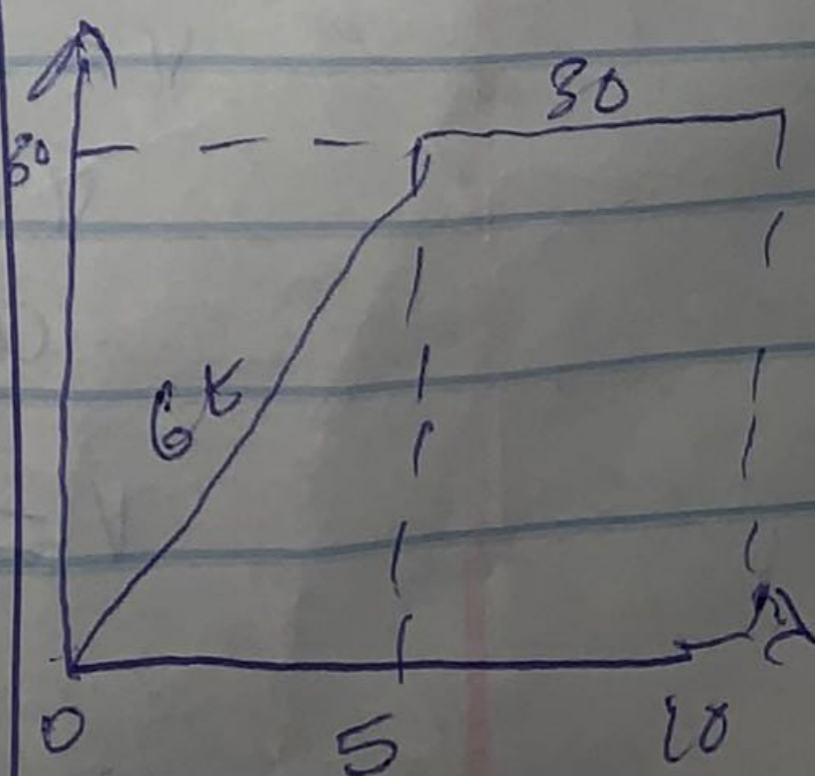
at t = 5s

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

at t = 10s

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

v-t graph



$$ii.) \quad a = \frac{dv}{dt}$$

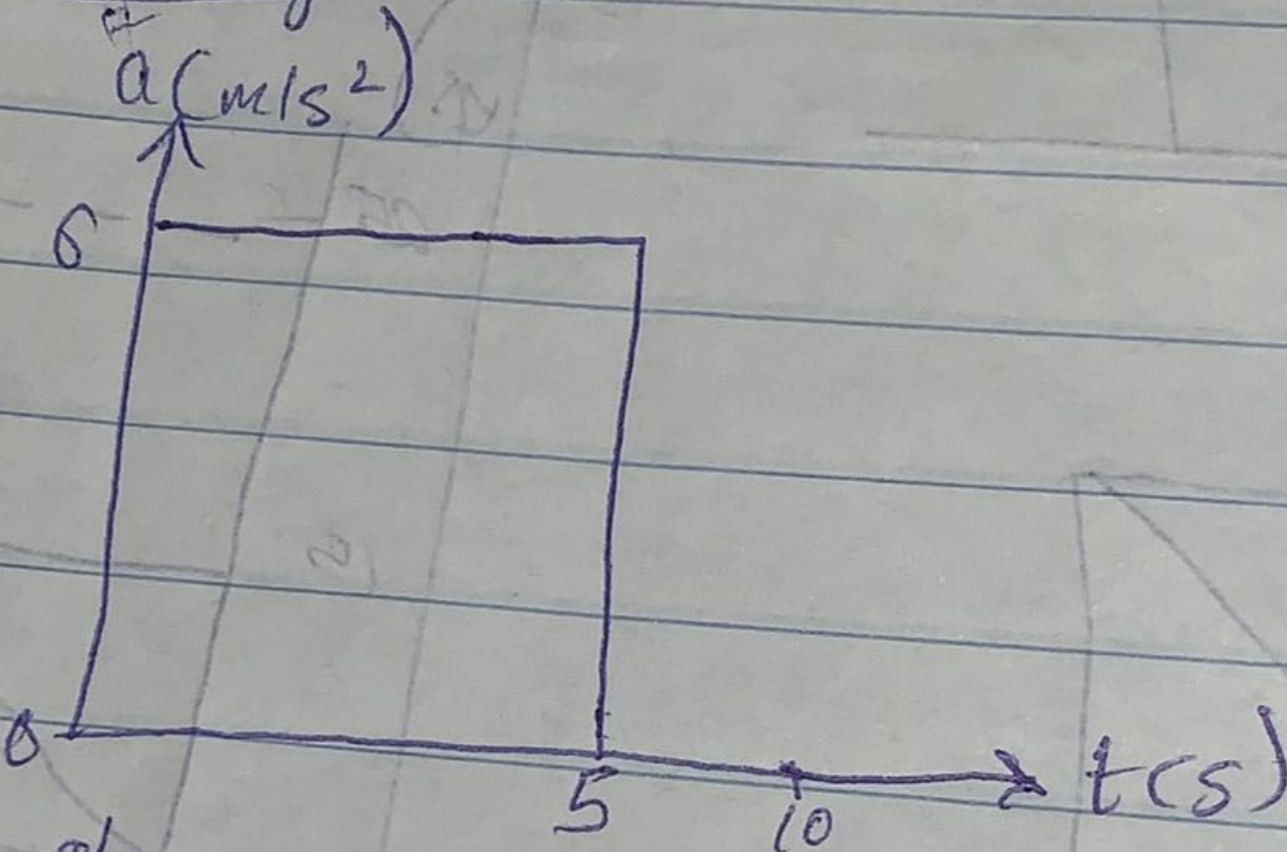
$$\text{at } t = 5$$

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

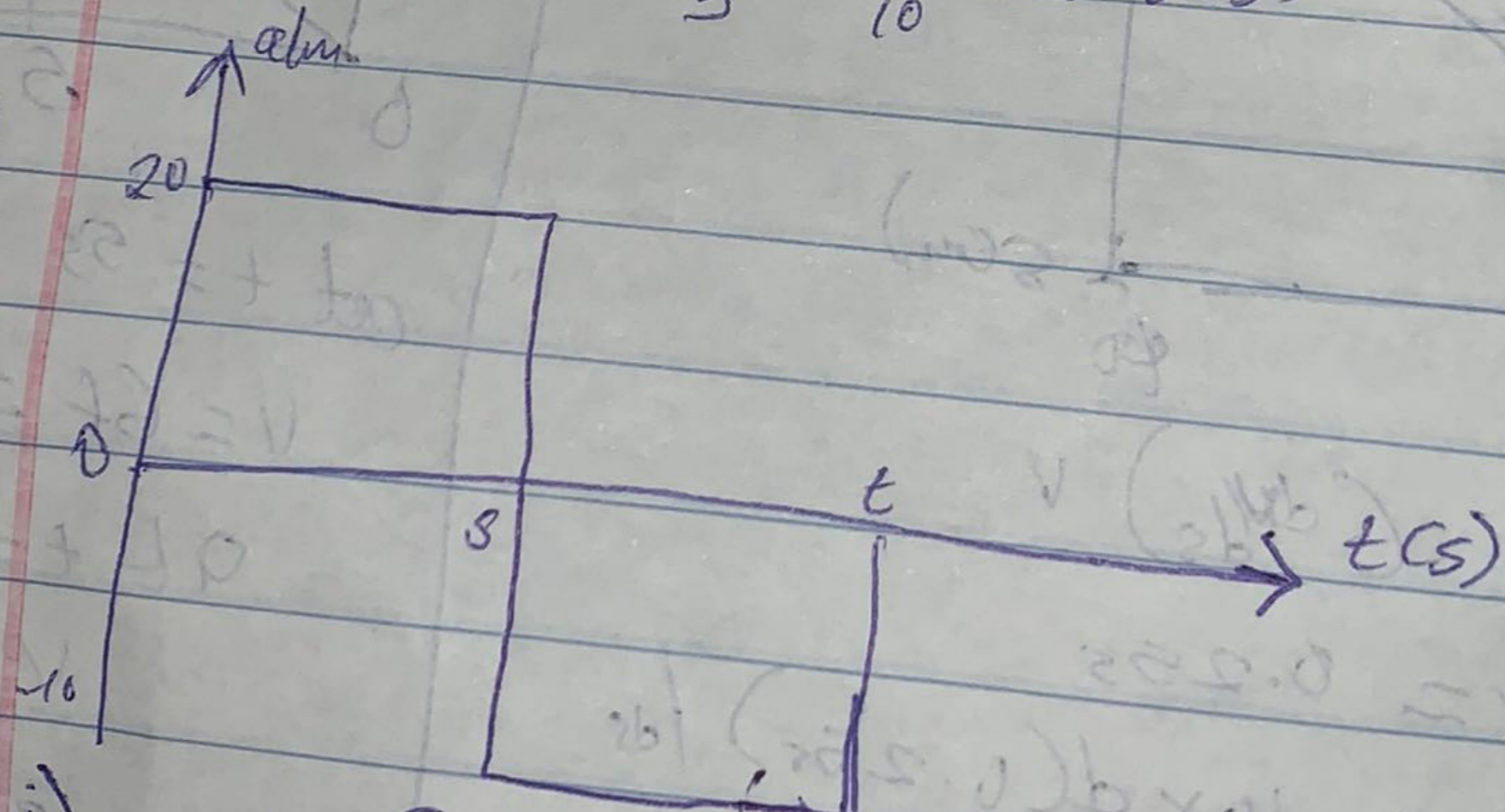
$$\text{at } t = 10$$

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

a-t graph



5.)



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

$$v = \int 20 dt$$

$$v = 20t$$

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

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

$$5s < t \leq 15$$

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

$$v - 100 = -10t \Big|_s^t$$

$$v - 100 = -10t^2 + 10(s)$$

$$v = 100 = -10t^2 + 50$$

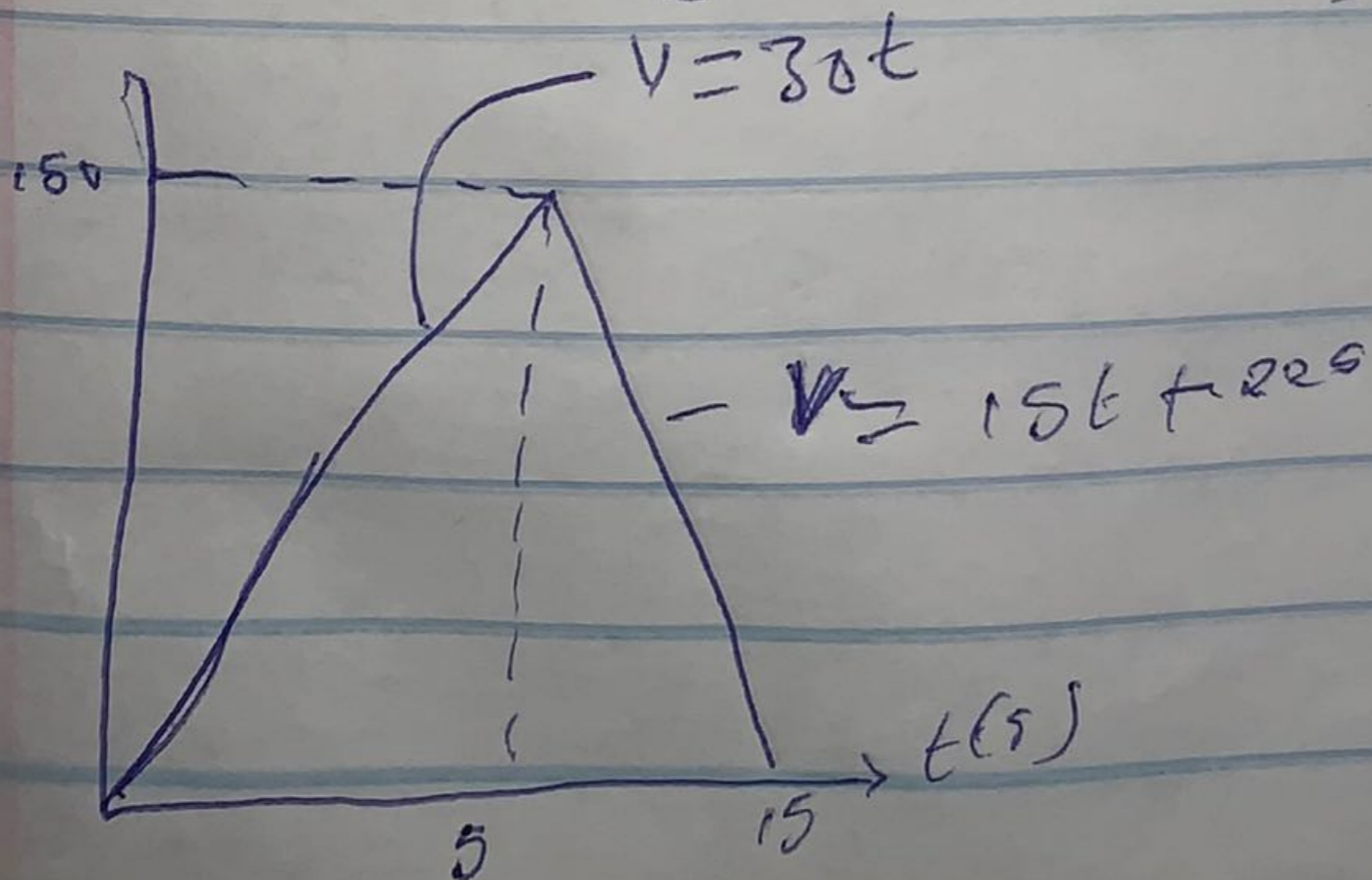
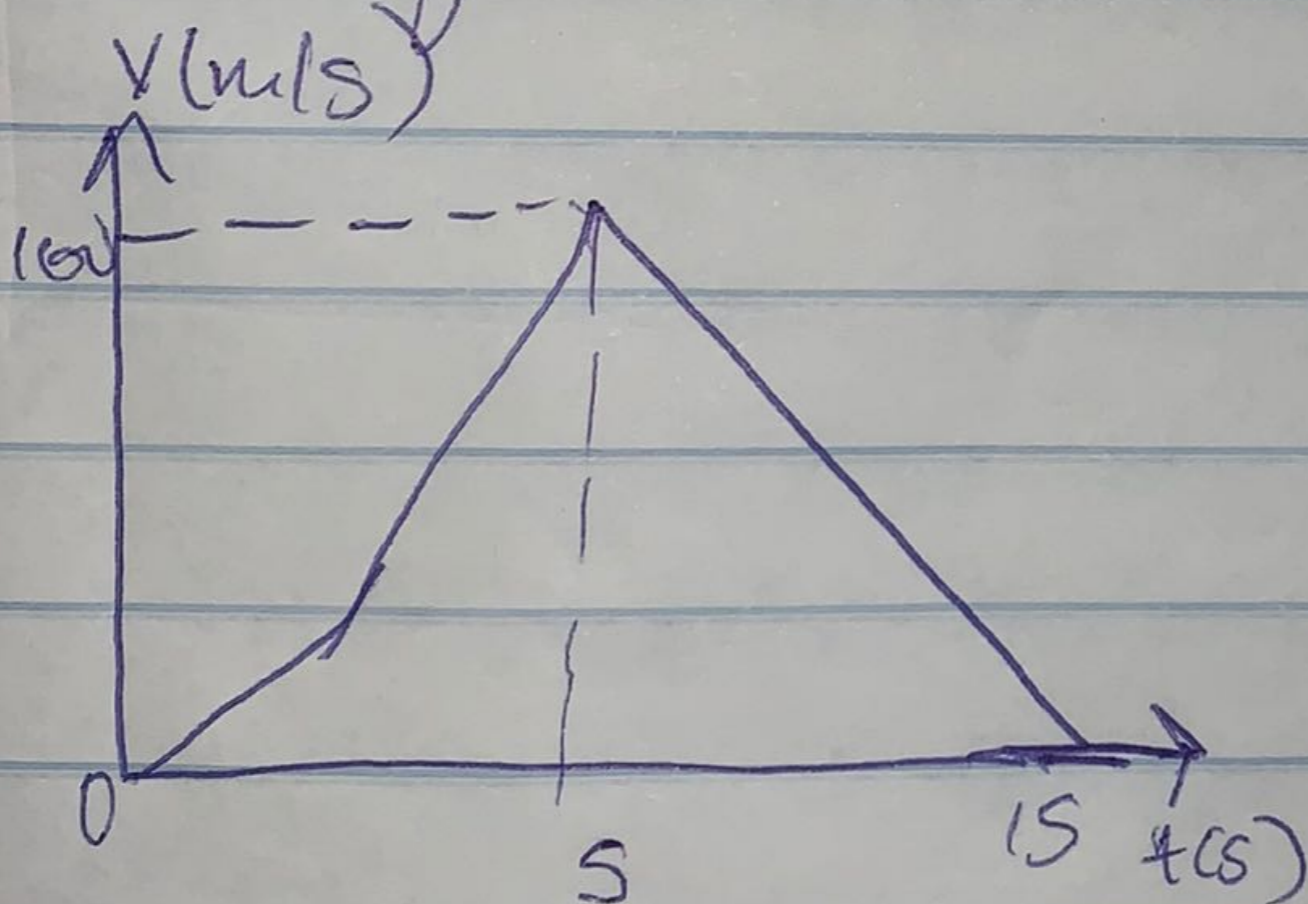
$$\text{at } v = 0$$

$$0 - 100 = -10t^2 + 50$$

$$10t = 150$$

$$t = \underline{\underline{15s}}$$

V-t graph



$$0 \leq t \leq 5$$

$$v = 30t$$

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

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

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

$$s = 15 \times 25$$

$$s = 375m$$

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

$$v = -15t + 225$$

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

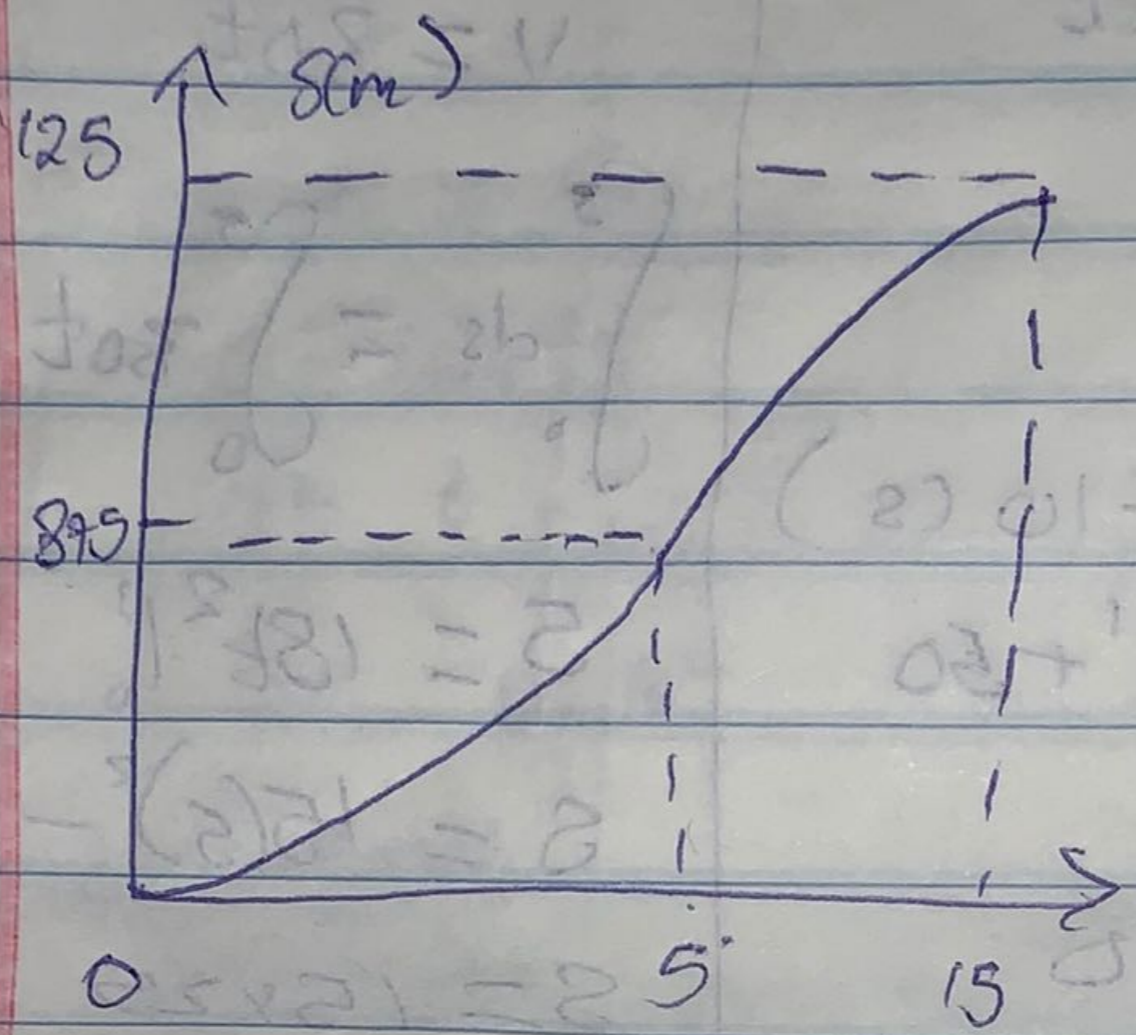
$$s - 375 = \left. \frac{-15t^2}{2} + 225t \right|_5^{15}$$

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

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

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

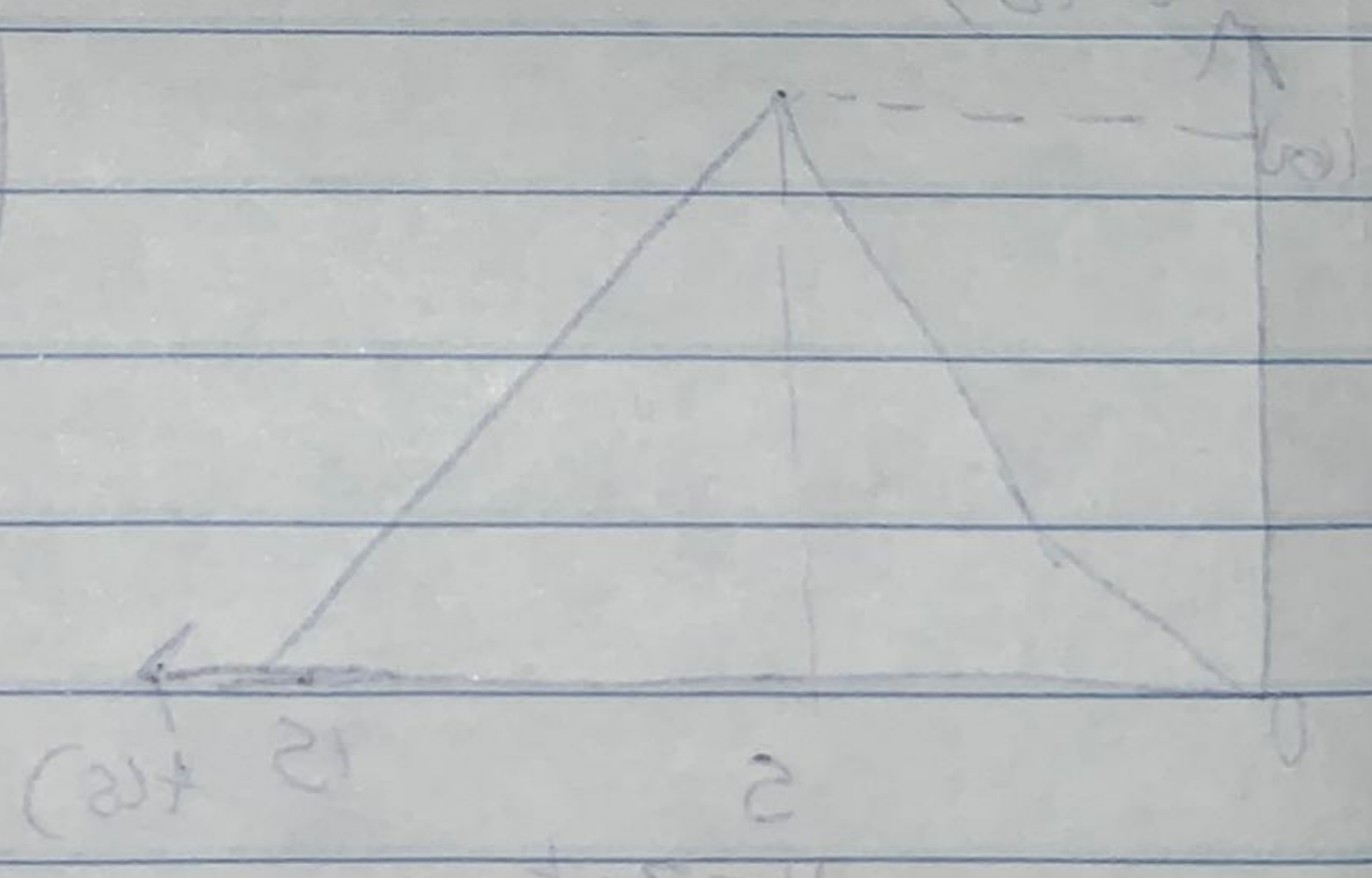
S-t graph



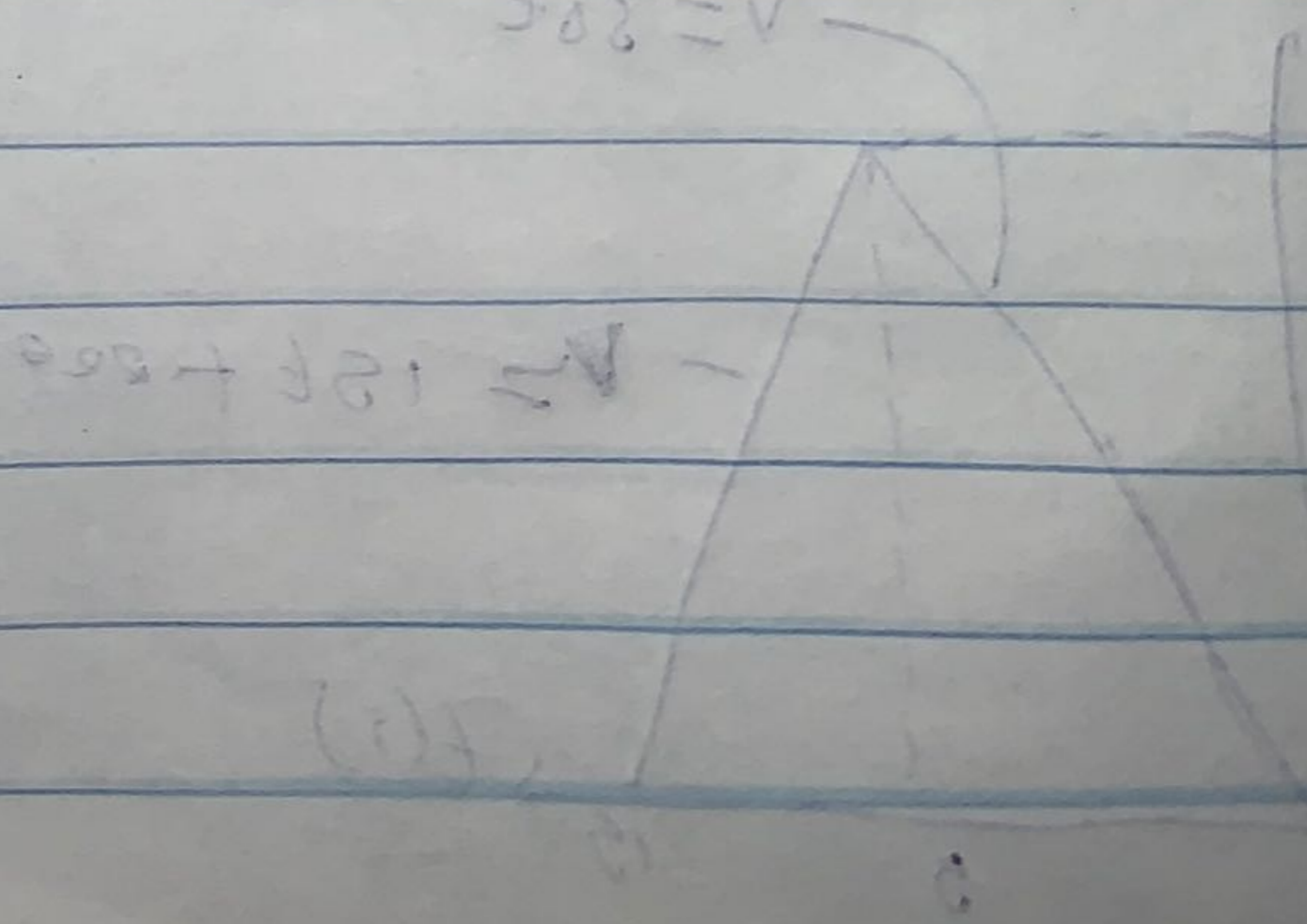
$v = \frac{ds}{dt}$

$(s) = \int v dt$
 $(v) = \frac{ds}{dt}$

$\int v dt = s$
 $\frac{ds}{dt} = v$



$\int v dt = s$
 $\frac{ds}{dt} = v$



$\int v dt = s$
 $\frac{ds}{dt} = v$