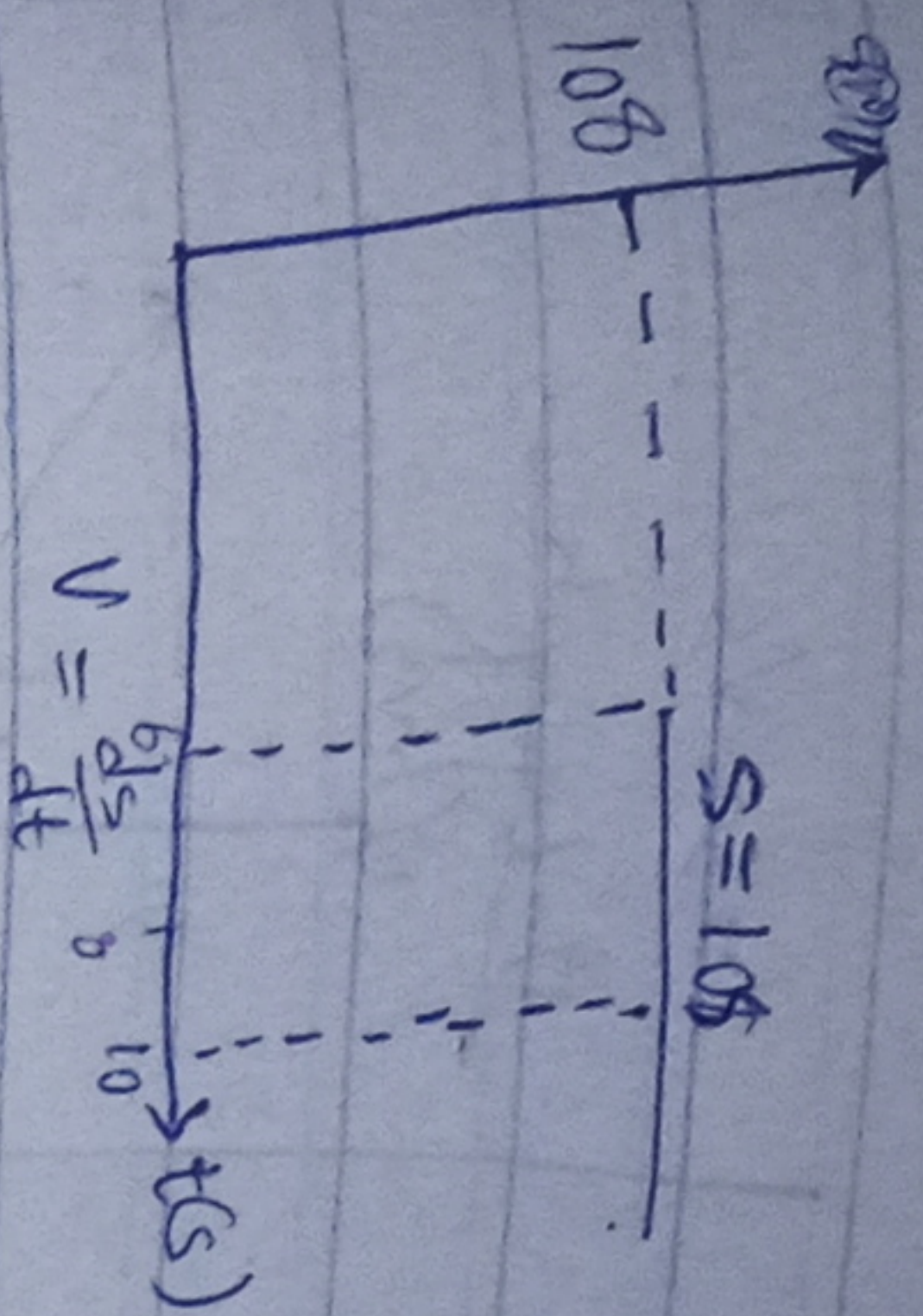


KRANG EFFANUS BASSEY
R01EN08081013
BIOMEDICAL ENGINEERING



$$v = 1.5t^2$$

$$at \ t = 6s$$

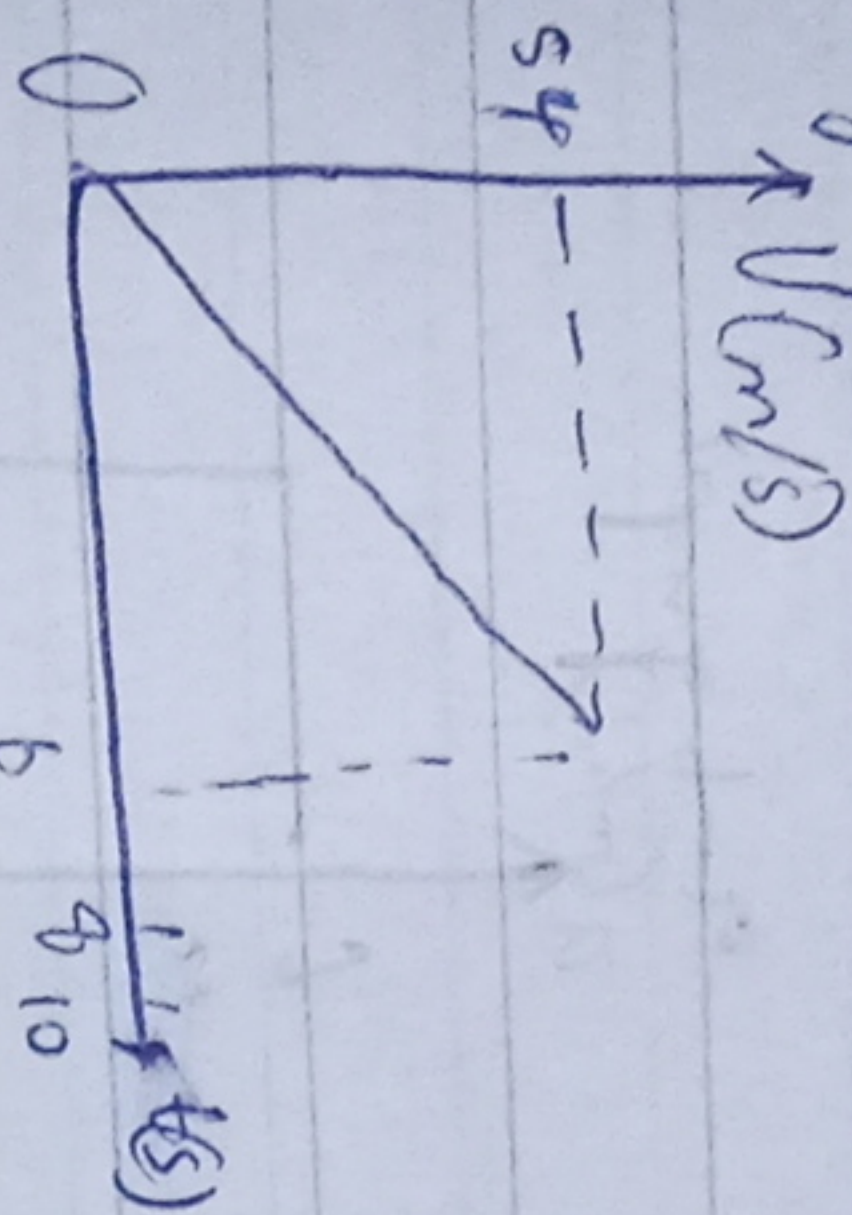
$$v = 1.5 \times 6^2 = 1.5 \times 3.6$$

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

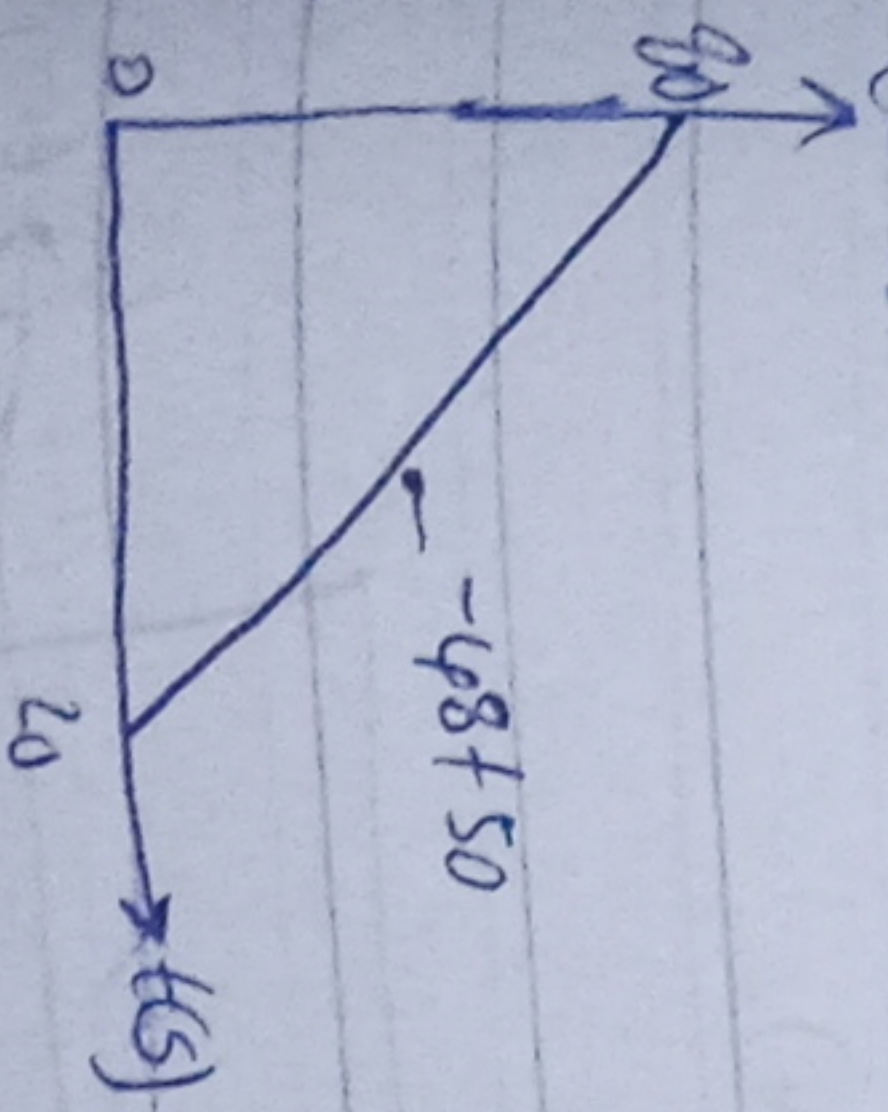
$$6 \text{ sec} - 10 \text{ sec} : s = 108$$

$$\therefore v = 0$$

v-t graph



2) v (m/s)



$$v \cdot s = \int v dt = \int (-4t + 90)$$

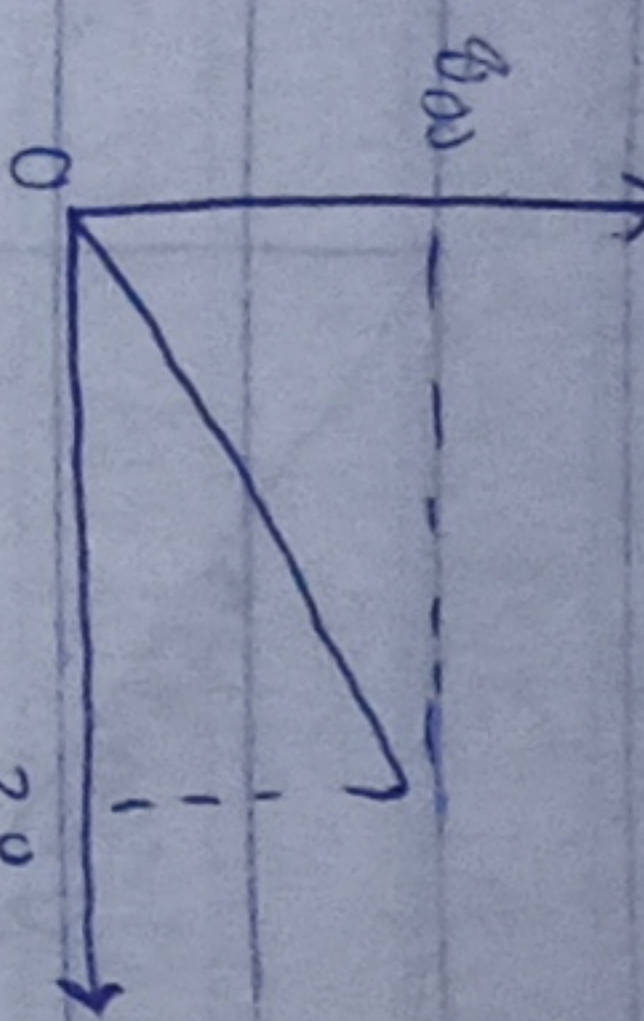
$$s = -2t^2 + 90t$$

$$at \ t = 20s$$

$$s = -2(20^2) + 90(20)$$

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

s-t graph



ii) acceleration

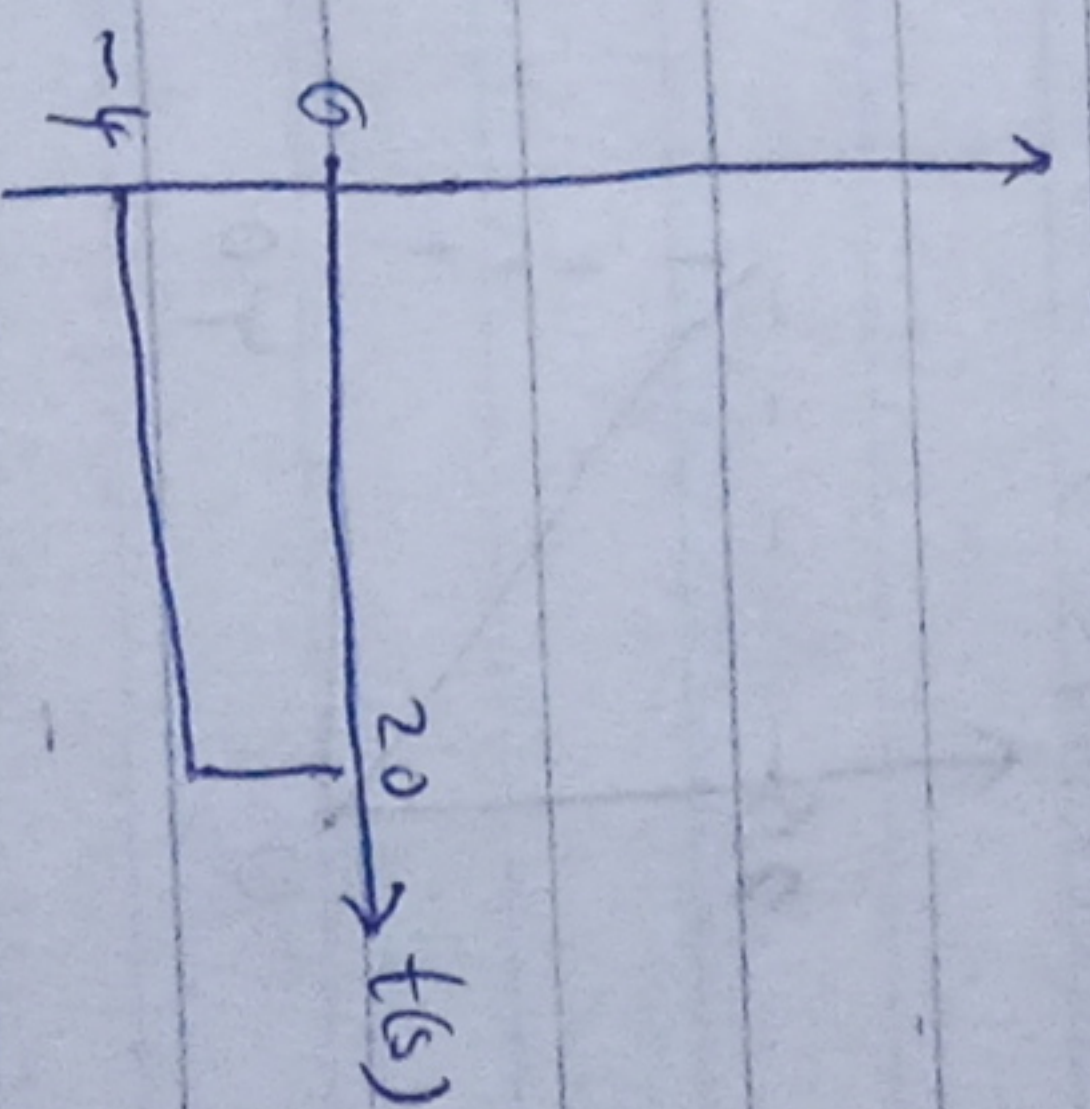
$$a = \frac{dv}{dt} \quad a = -4 \text{ m/s}^2$$

$$at \ t = 20s$$

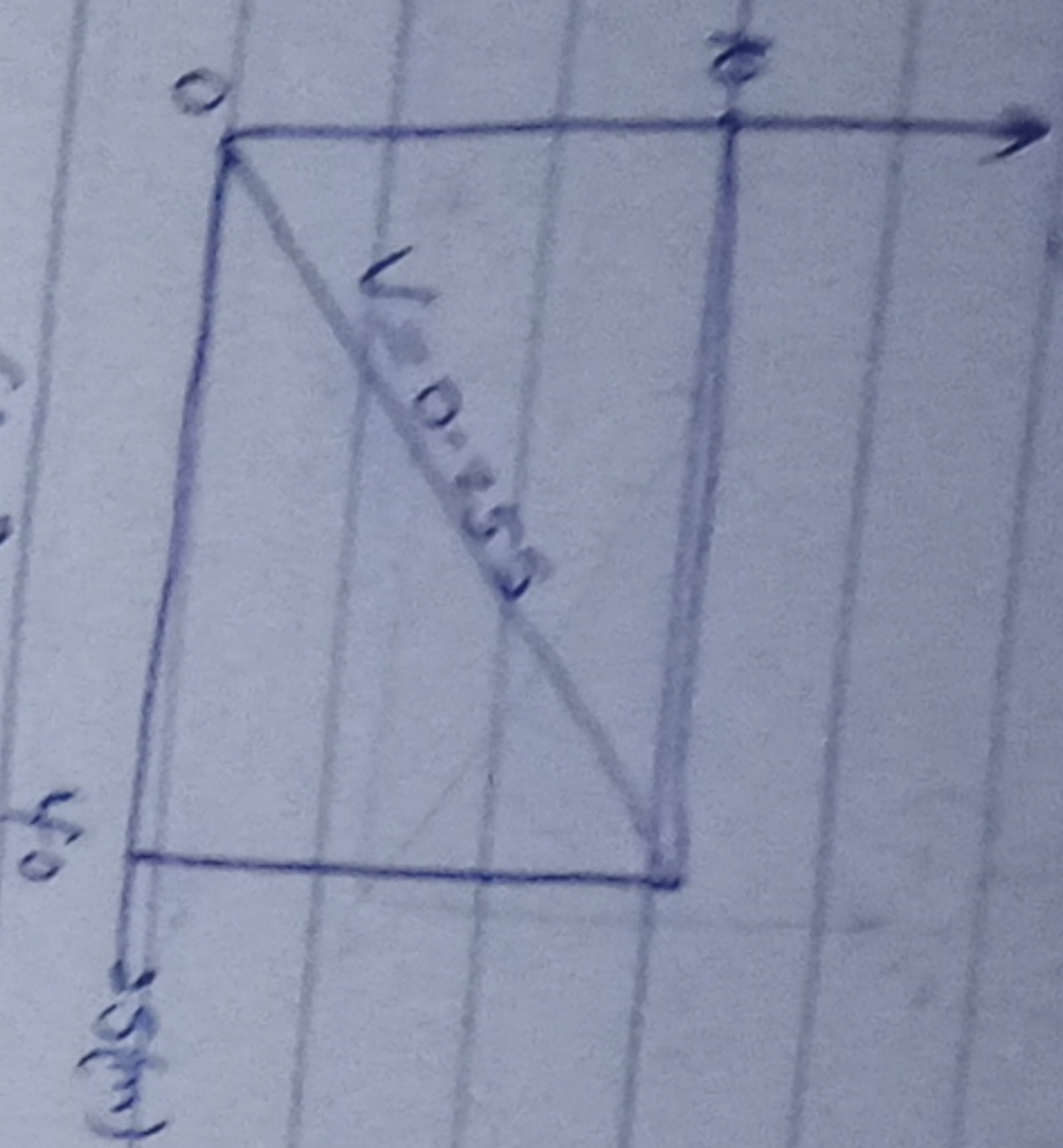
$$a = -4 \text{ m/s}^2$$

a-t graph

(always)



3) $V(m/s)$



$$a = \left(\frac{dv}{dt}\right) = 0$$

$$v = 0.25s$$

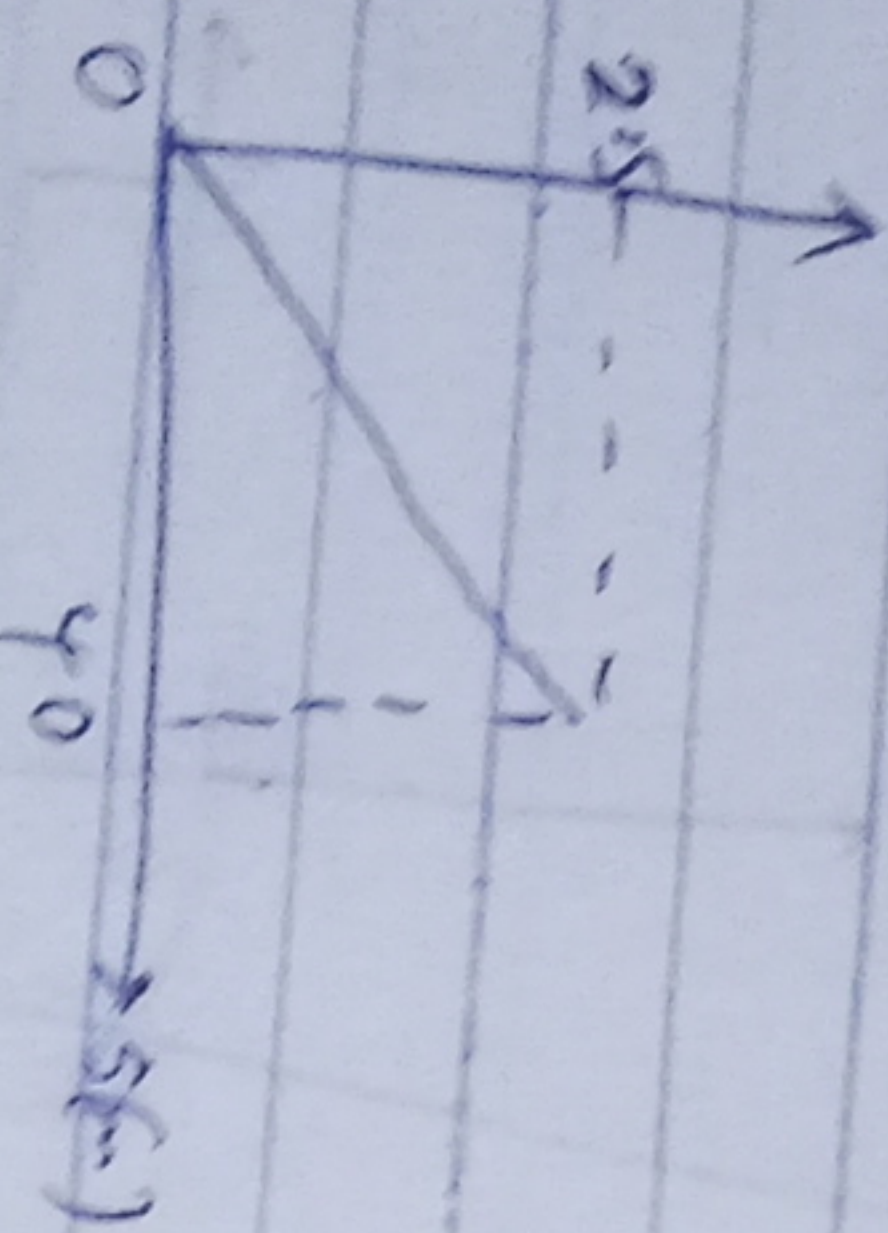
$$q = 10 \times d(0.25s)/ds$$

$$q = 10 \times 0.25$$

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

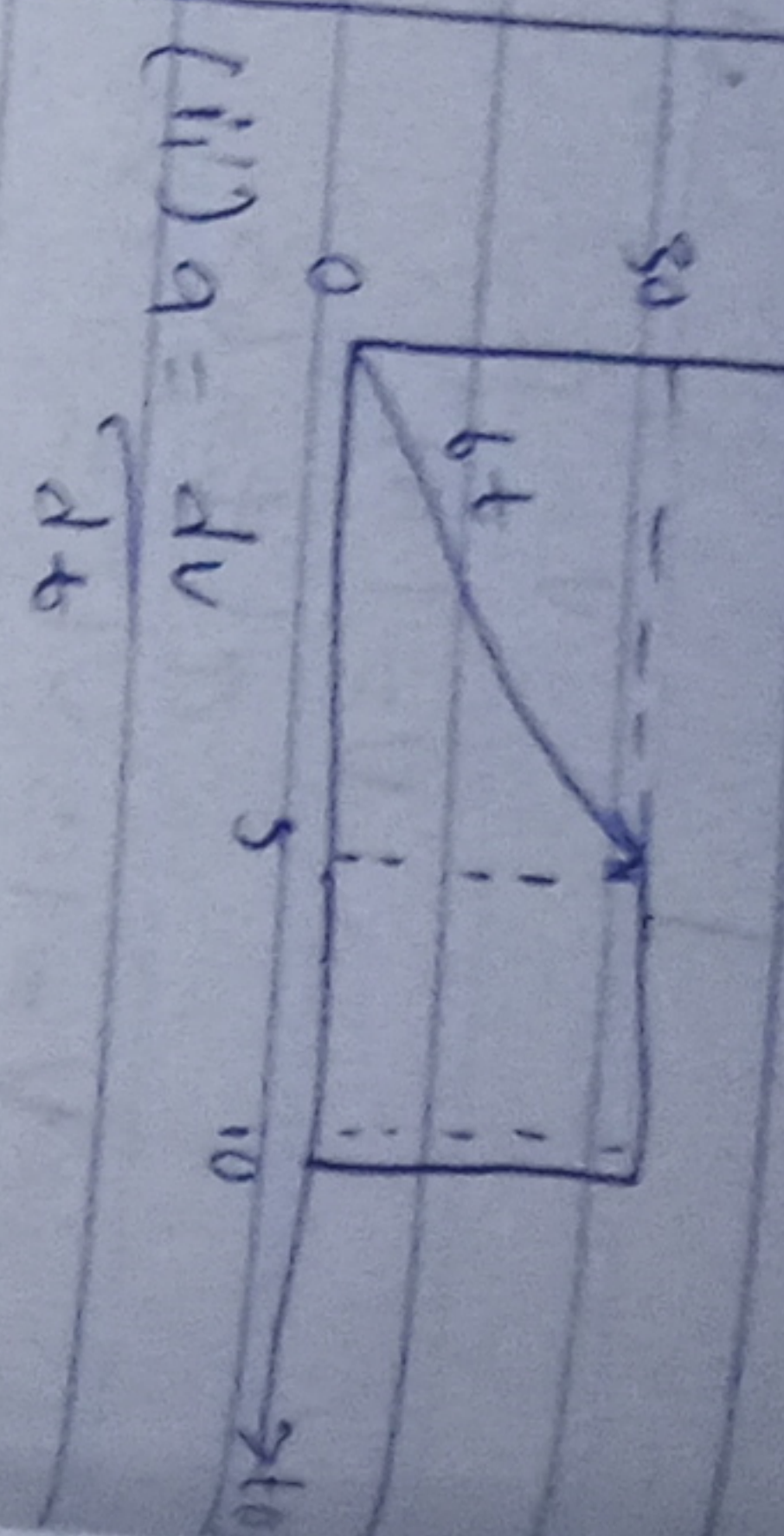
$$a-t \text{ graph}$$

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



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

$V-t$ graph
(m/s)



$$(ii) a = \frac{dv}{dt}$$

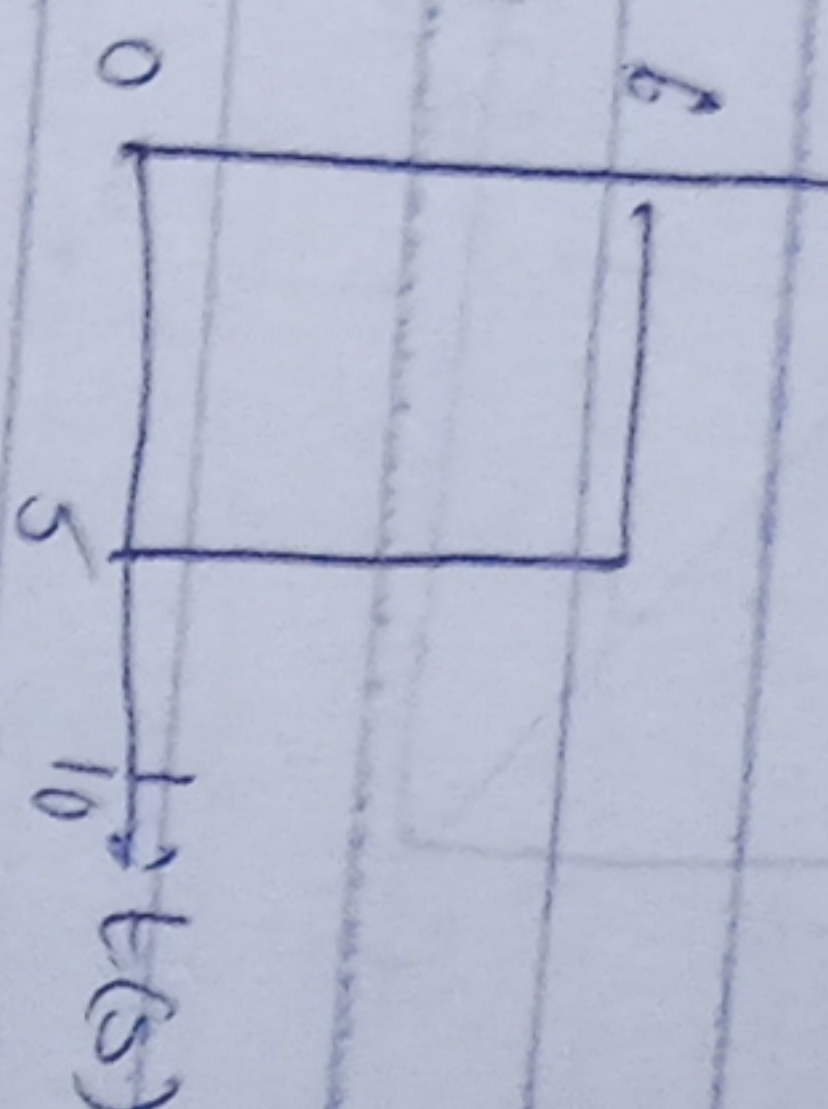
$$q t = 5s$$

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

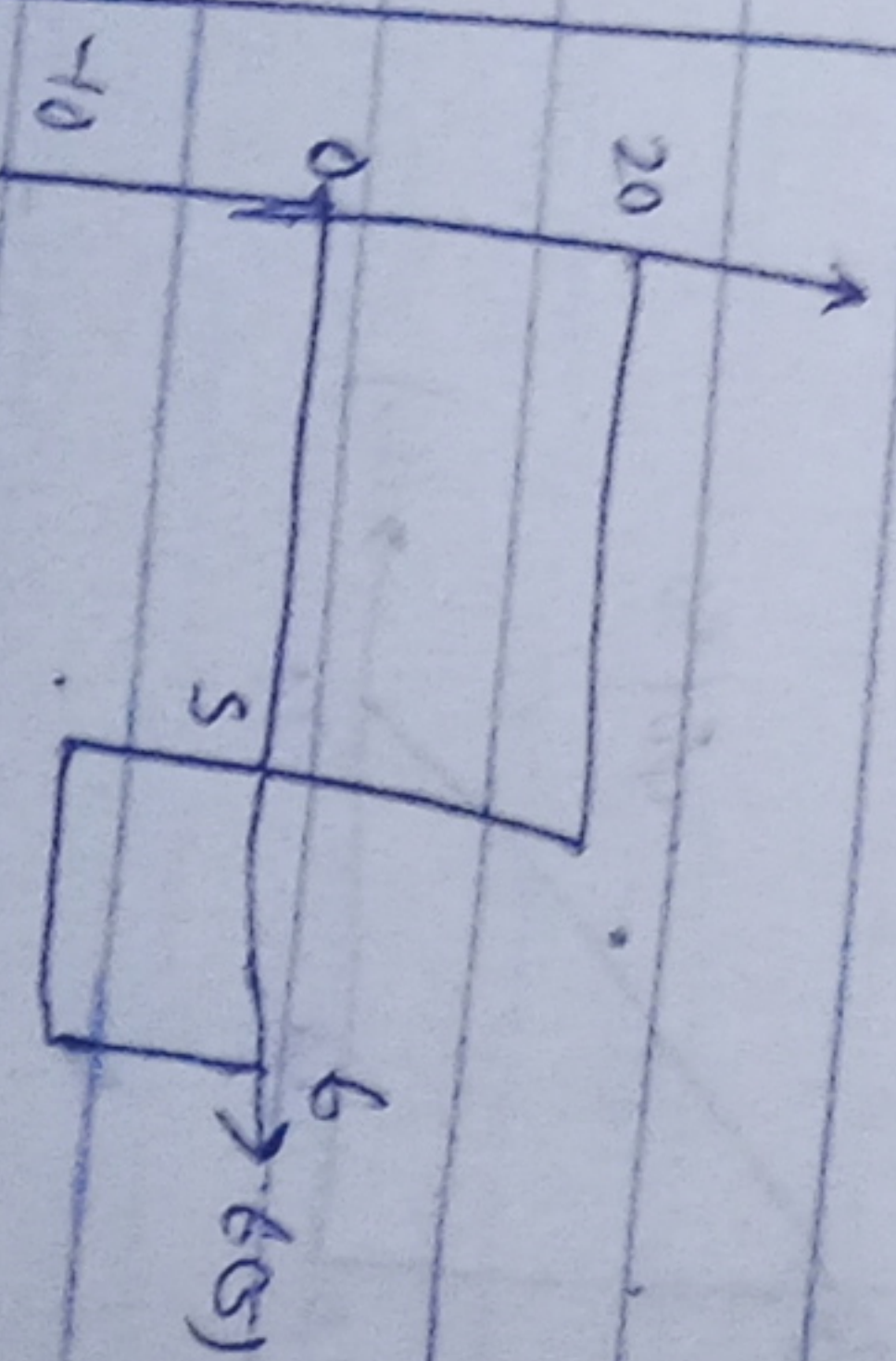
$$a t = 10s$$

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

$a-t$ graph
(m/s^2)



5) $d(m/s)$



$$i) V = \frac{ds}{dt}$$

$$V = \int 20 dt$$

$$V = 20t$$

$$q t = 5s$$

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

$$5s < t \leq 10$$

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

$$V - 100 = -10t$$

$$V - 100 = -10t$$

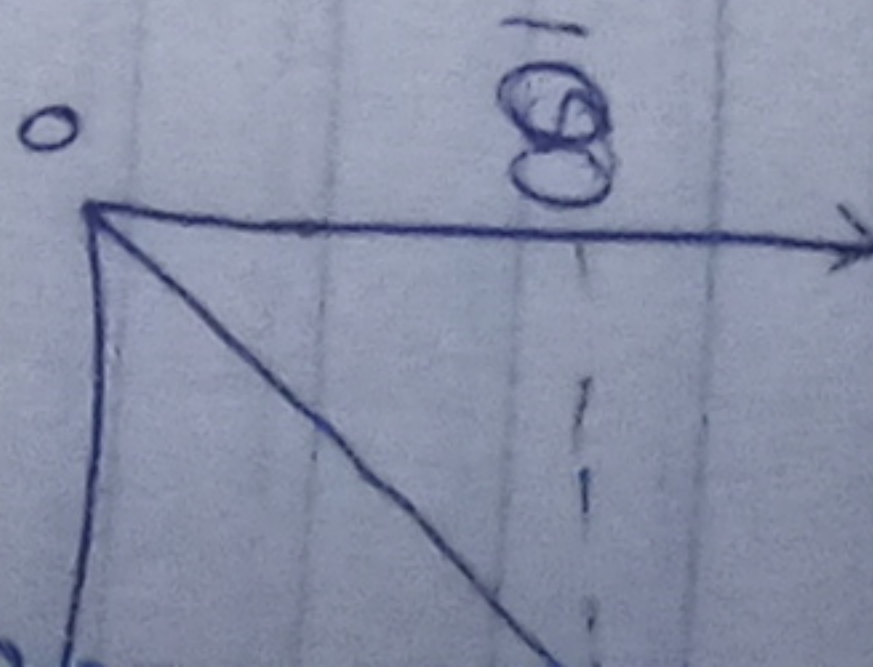
$$a t = -10$$

$$0 - 100 = -10t$$

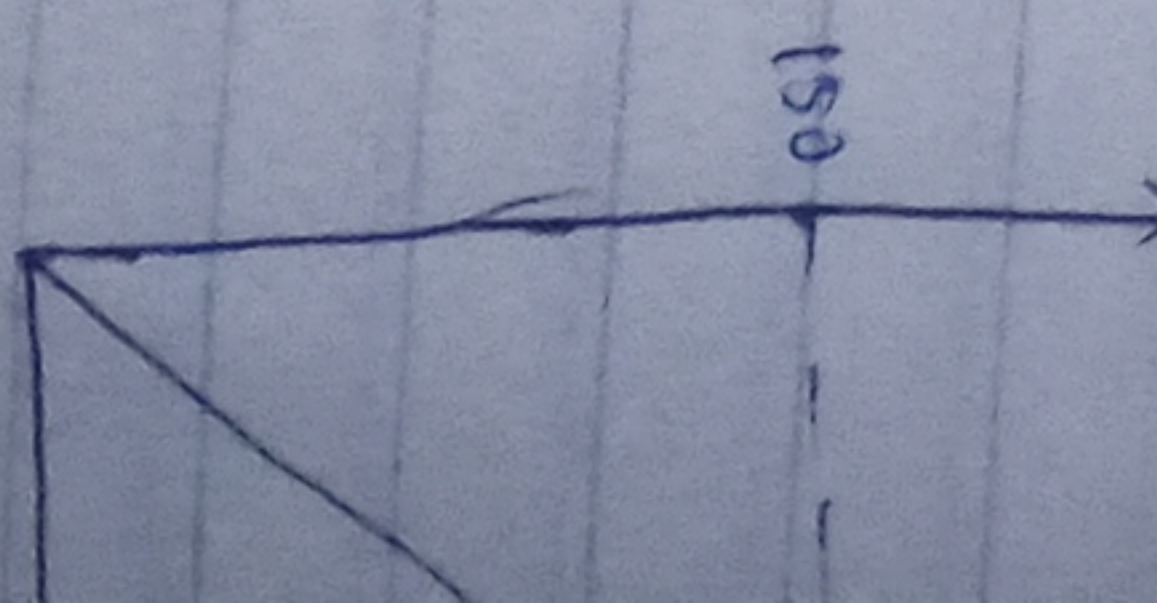
$$10t = 100$$

$$t = 10$$

$V-t$ graph
(m/s)



6) $V(m/s)$



$$0 \leq t \leq 15$$

$$\int_0^s ds = \int_0^t V dt$$

$$s = 15t$$

$$s = 15 \times 15 = 225$$

$$s = 315$$

$$5s < t \leq 15$$

s(t)

$$v-100 = -10t / \frac{v}{s}$$

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

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

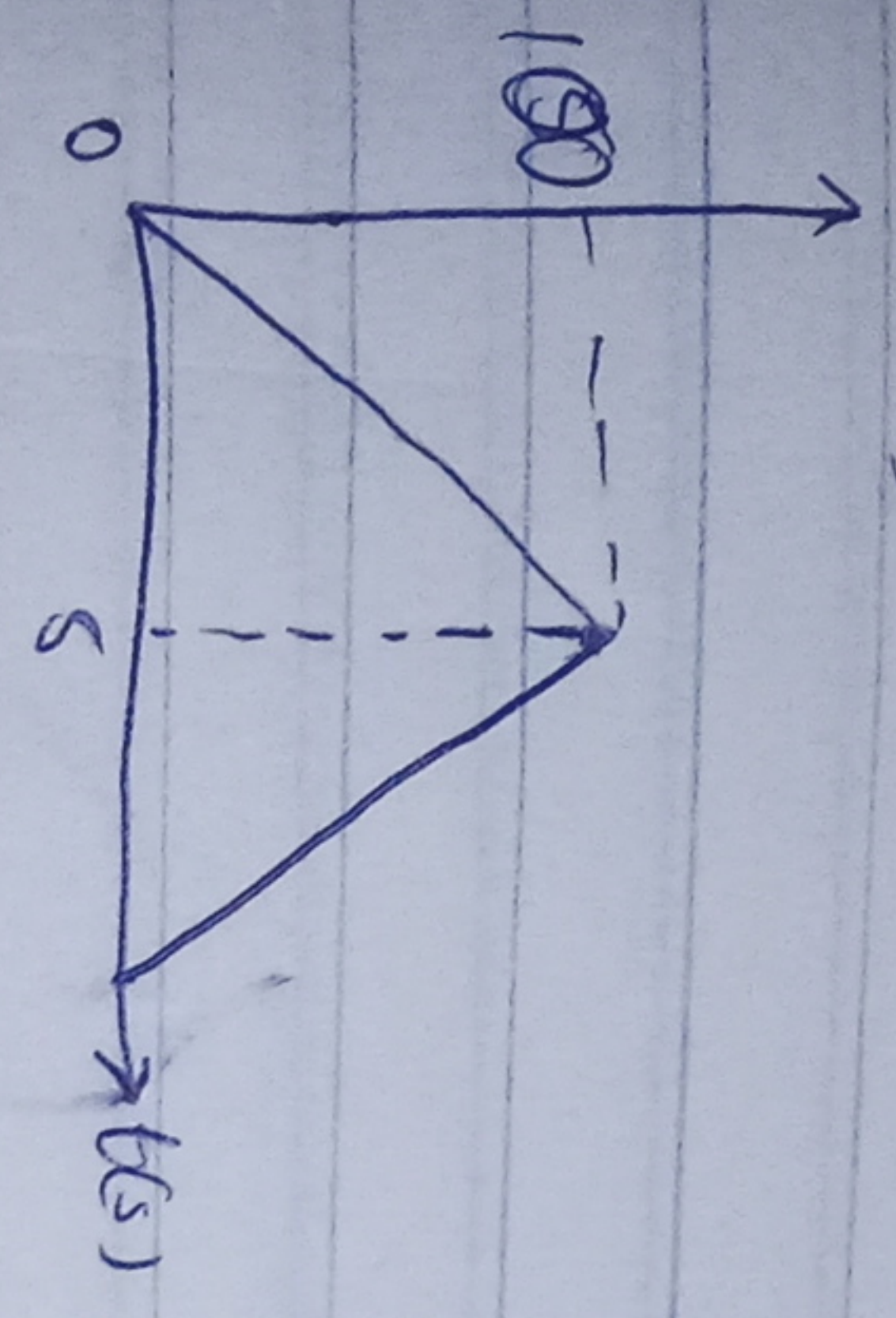
$$at t; v = 0$$

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

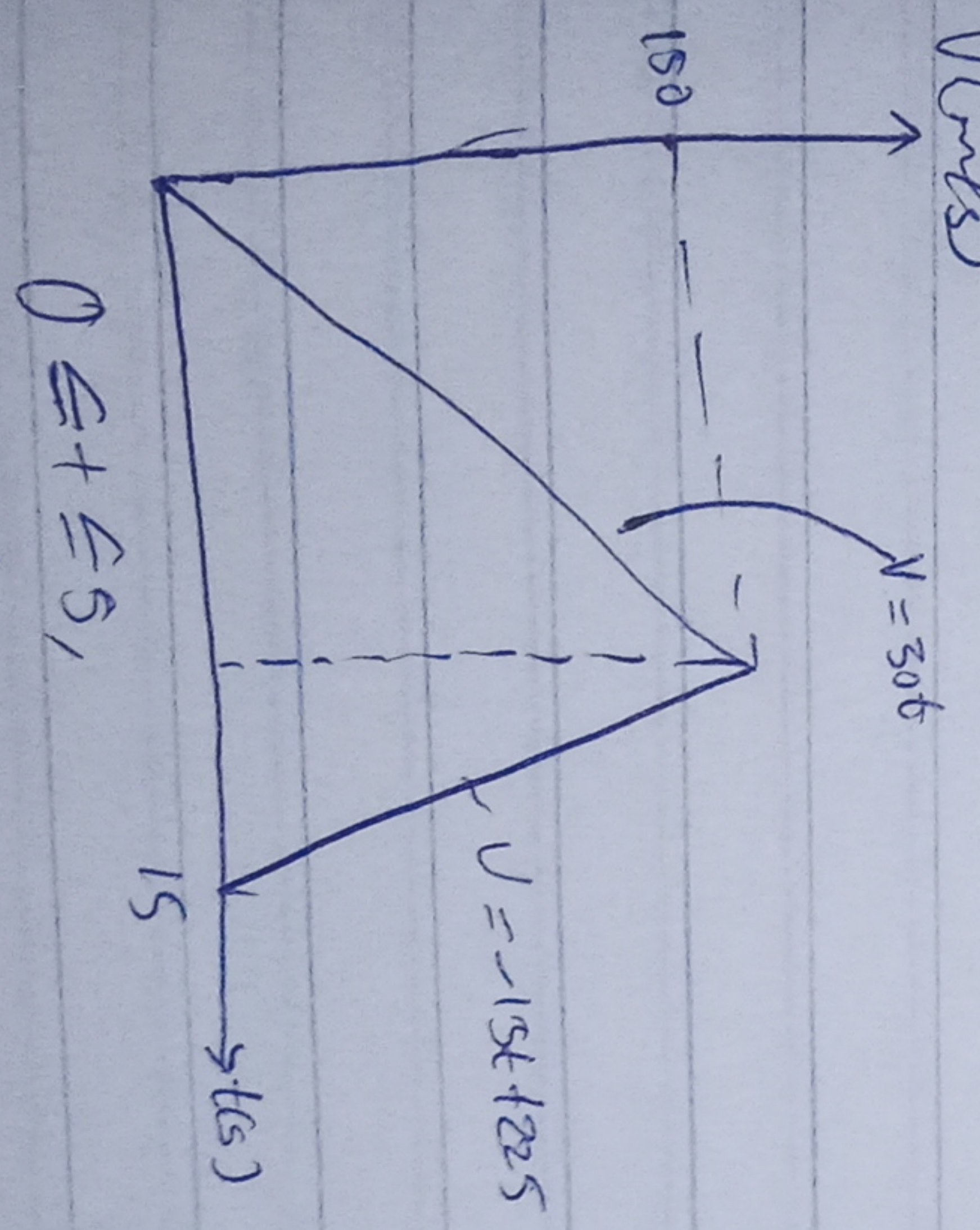
$$10t' = 100$$

$$t = 15s$$

v-t graph
V(m/s)



b) V(m/s)



$$0 \leq t \leq 5,$$

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

$$s = 15t^2$$

$$s = 15(5)^2 = 15(25)$$

$$s = 15 \times 25$$

$$s = 375m$$

$$8.5 \leq t \leq 15s$$

$$v = -15t + 225$$

$$\int_1^5 ds = \int_5^{15} (-15t + 225) dt$$

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

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

$$\left[\frac{-15(225)}{2} + 3375 \right] - \left[\frac{-15(25)}{2} + 1125 \right]$$

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

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

$$s - 375 = 716.25 - 937.5$$

$$s = 1125m$$

s-t graph

