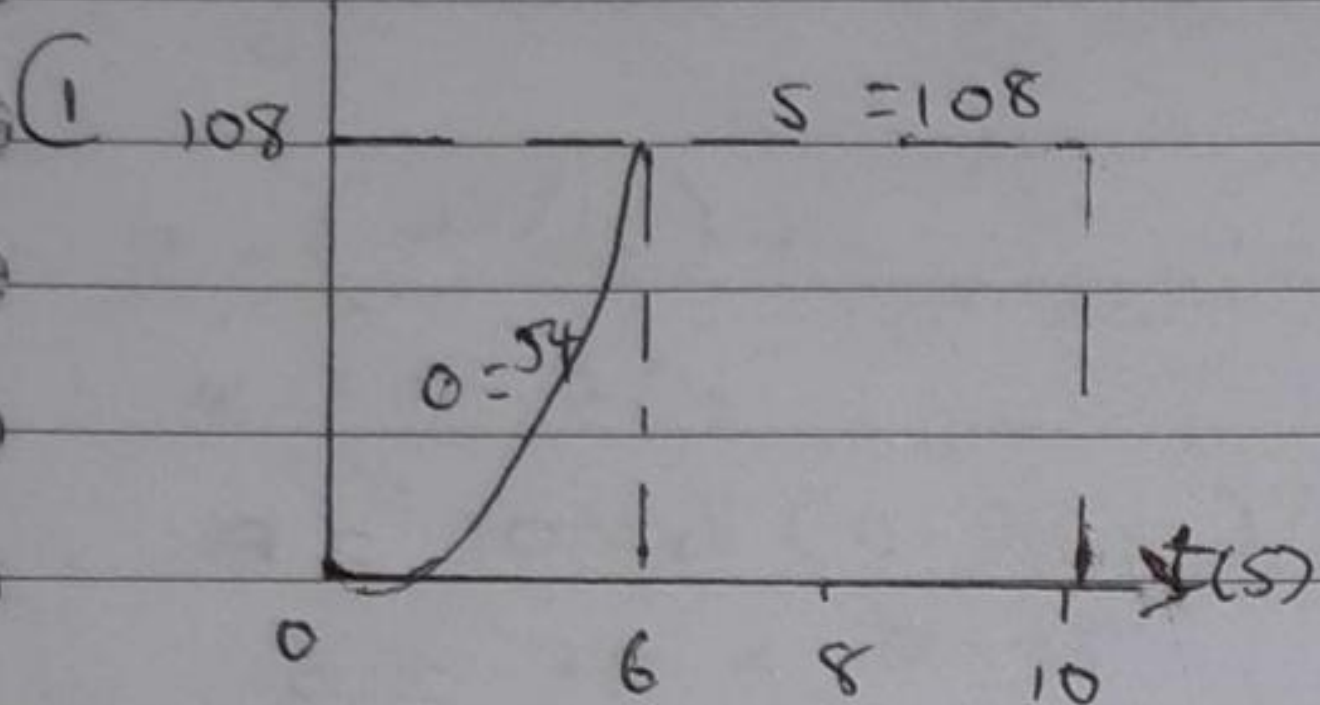


ALFA FATIMA AHMED

18/ENG06/008

CHEMICAL ENGINEERING

ENG 234



$$v = ds/dt$$

$$v = 1.5t^2$$

at $t = 6s$

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

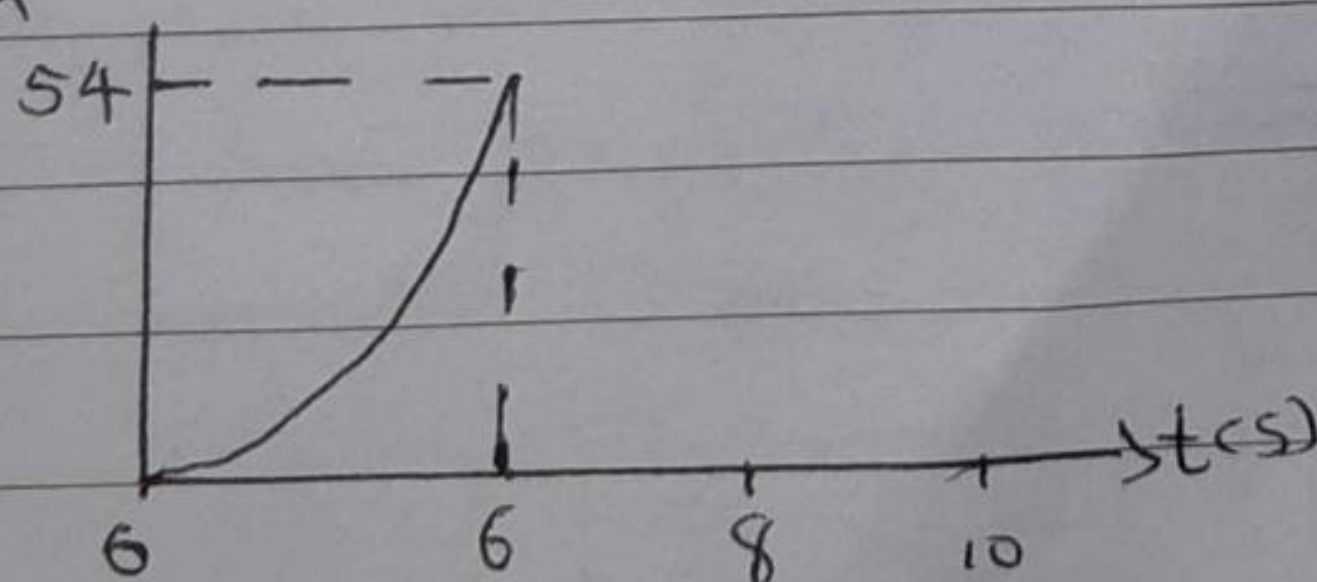
$$v = 1.5 \times 36$$

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

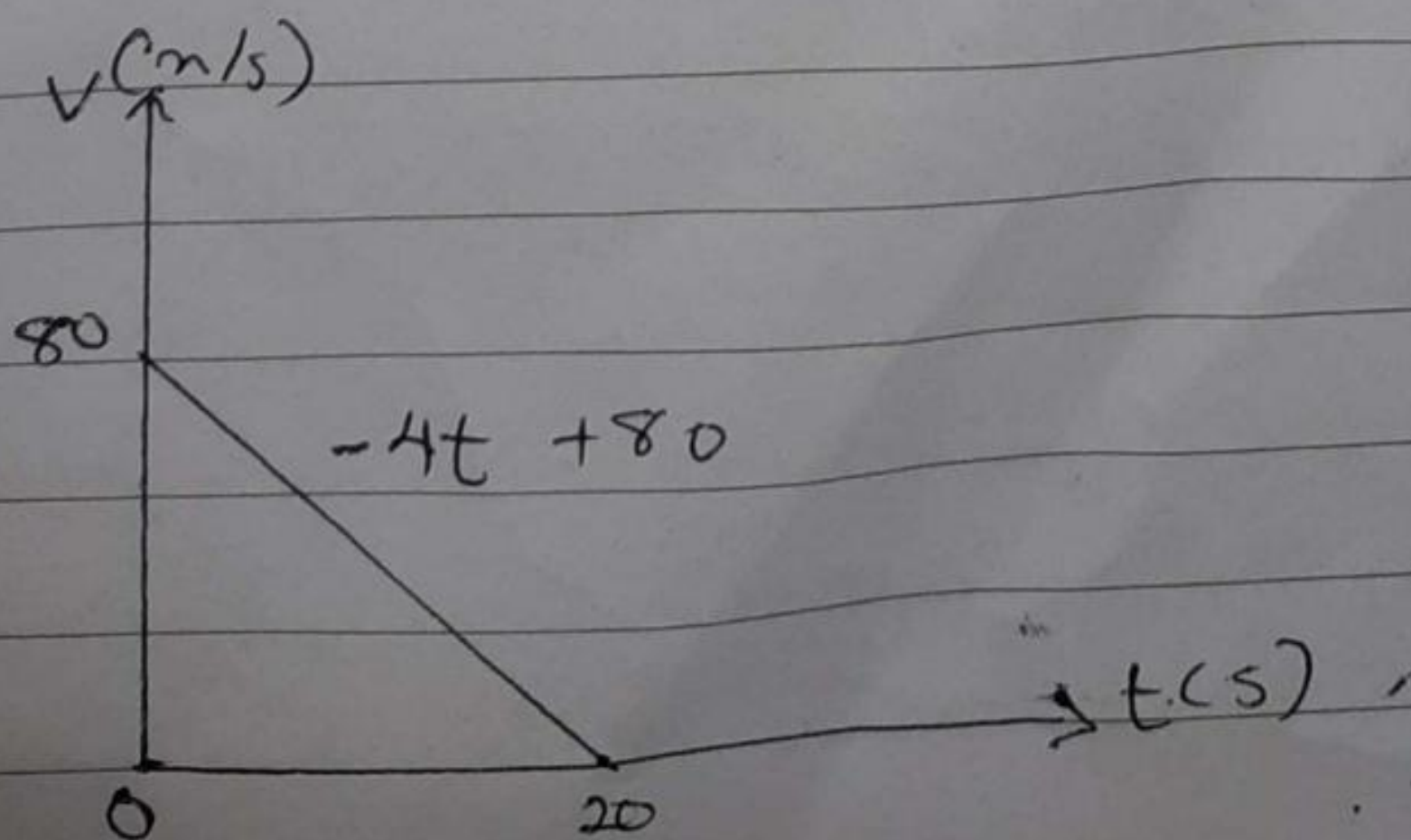
from $t = 6s - 10s$

$$s = 108, v = 0$$

v-t graph



2)



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

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

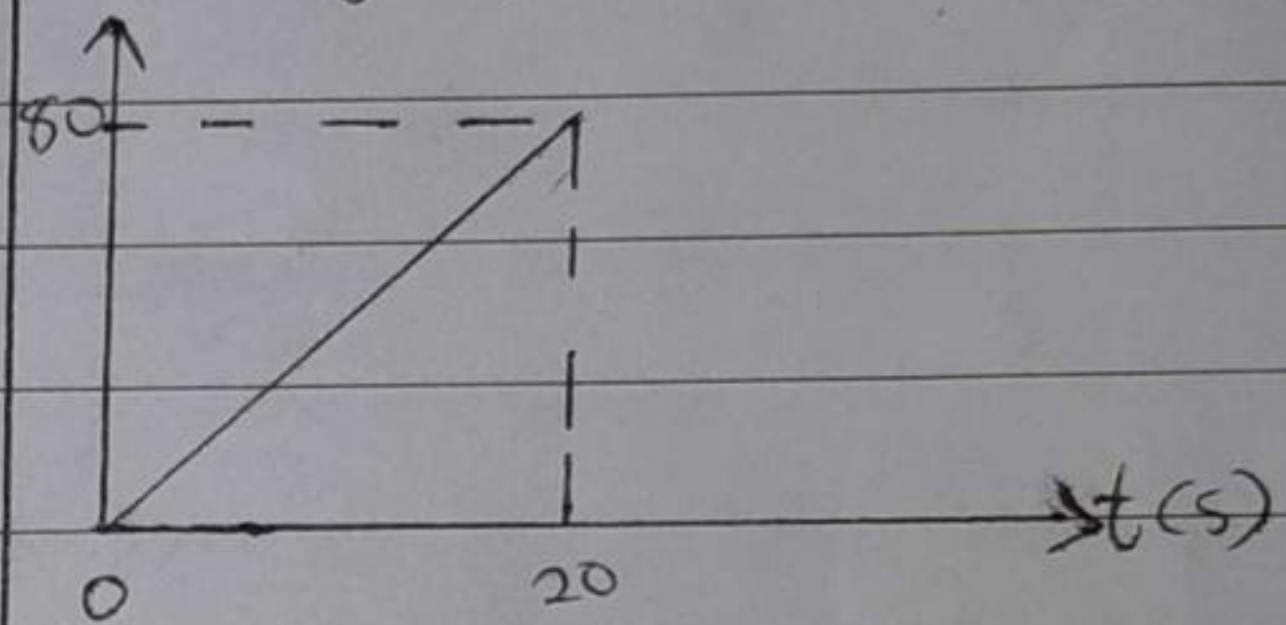
$$s = -2t^2 + 80t$$

at $t = 20s$

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

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

s-t graph



ii) Acceleration

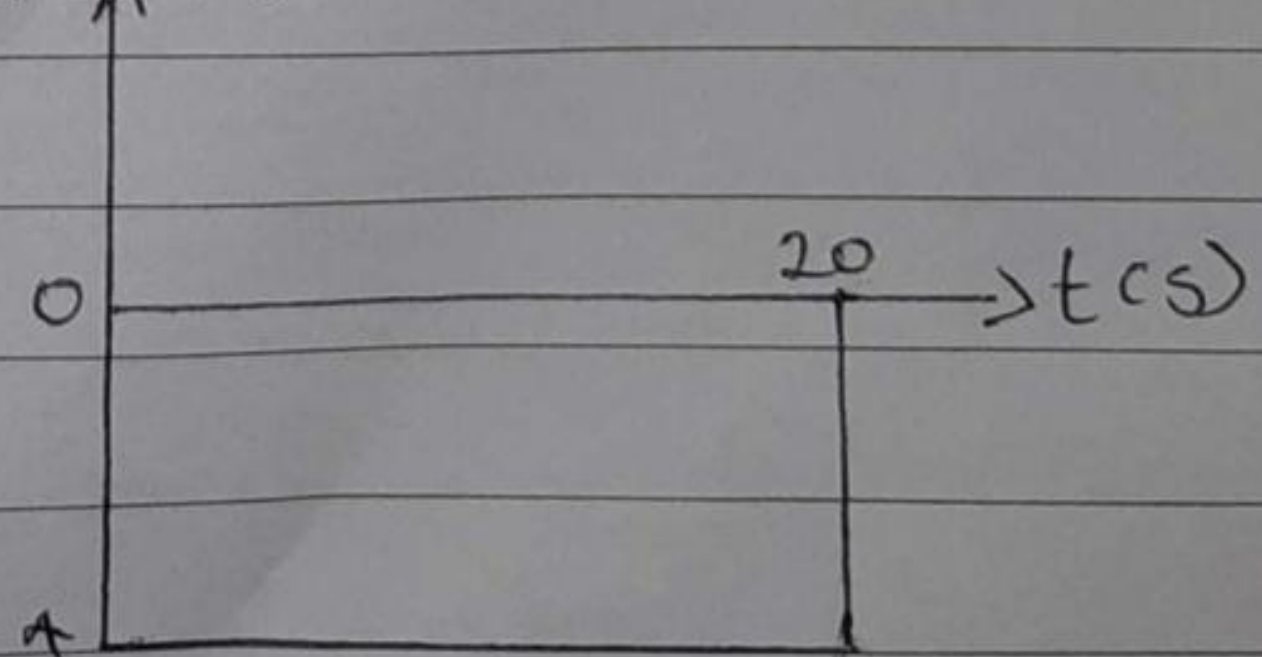
$$a = dv/dt$$

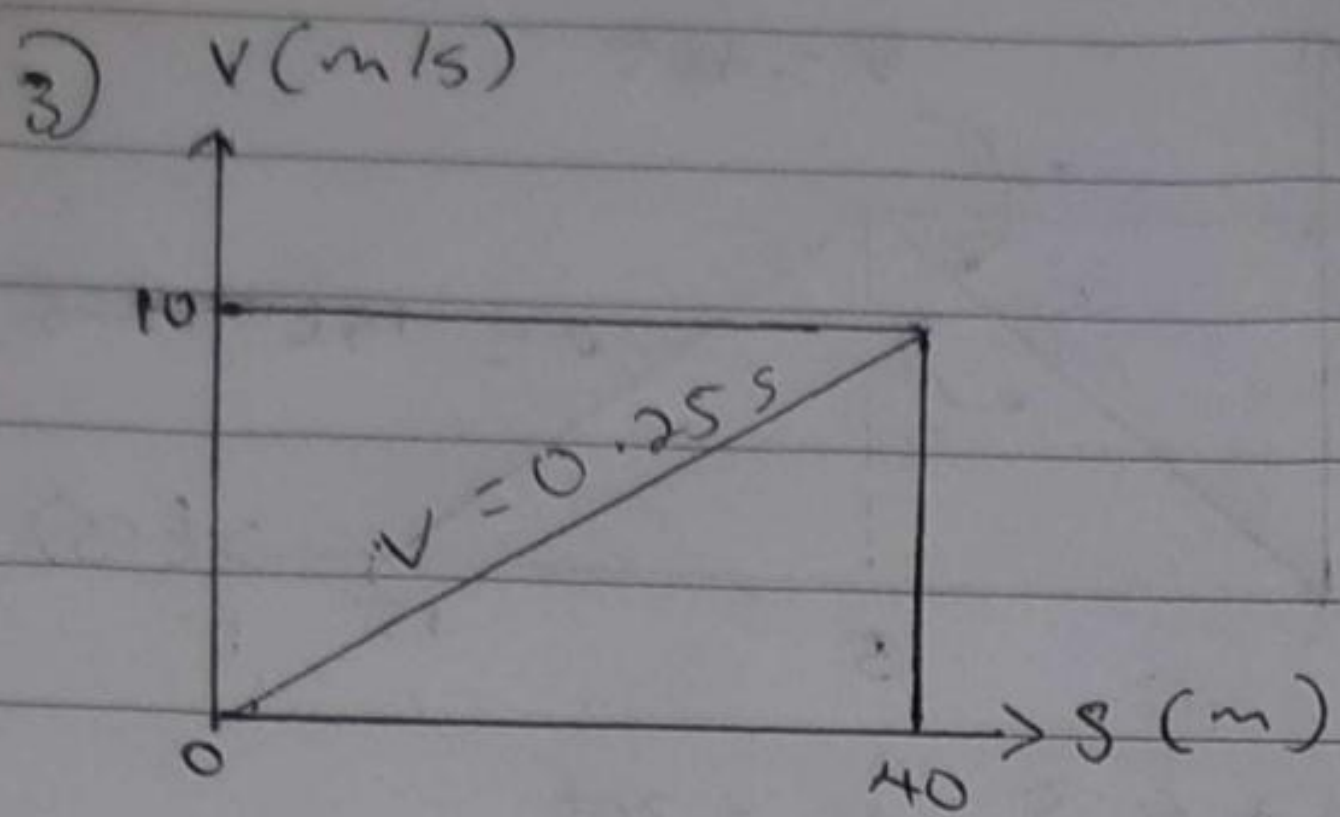
$$a = -4 \text{ m/s}^2$$

at $t = 20s$

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

a-t graph





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

$$v = 0.25 s$$

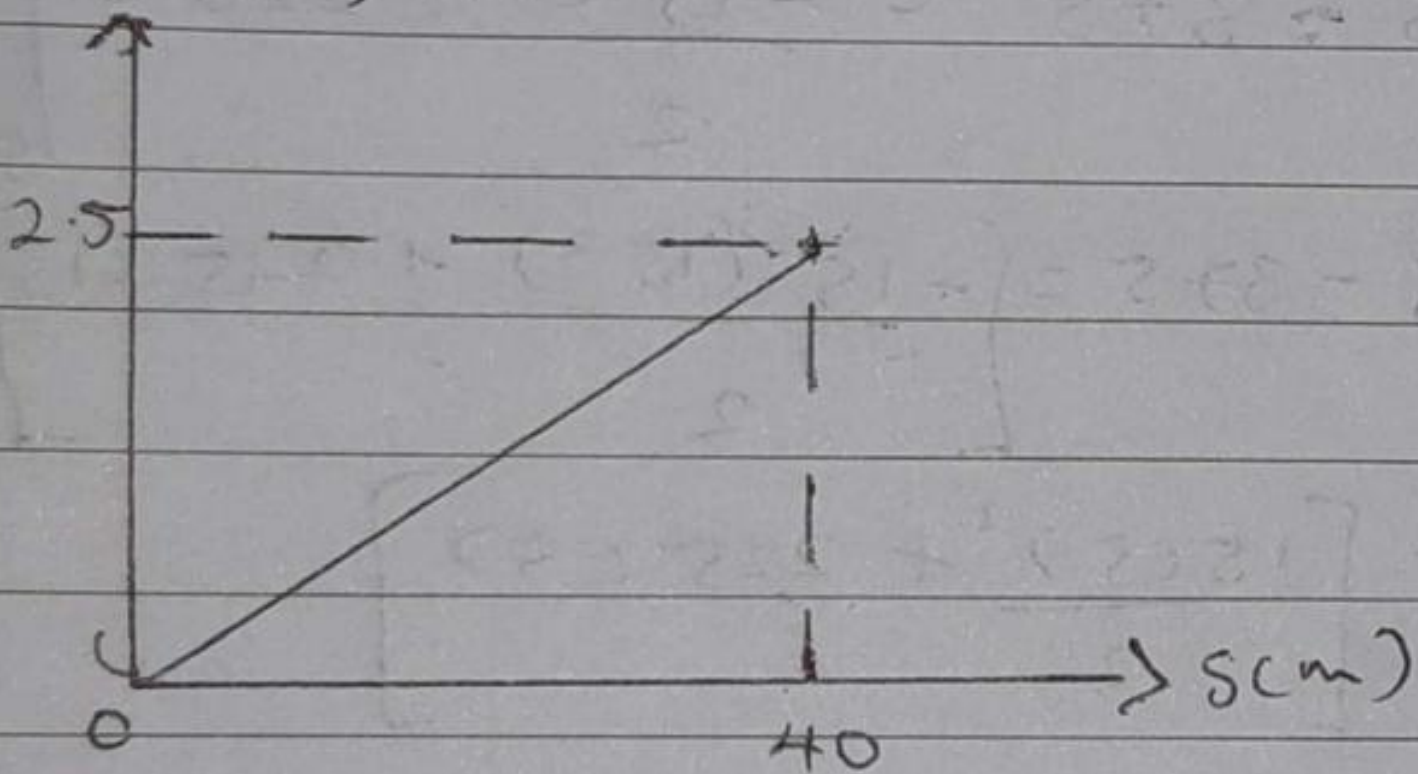
$$a = 10 \times \frac{d(0.25 s)}{ds}$$

$$a = 10 \times 0.25$$

$$a = 2.5 m/s^2$$

$a-s$ graph

$a(m/s^2)$



4) $s(m)$

225

75

$$s = 3t^2$$

0

5

10

$t(s)$

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

at $t = 5s$

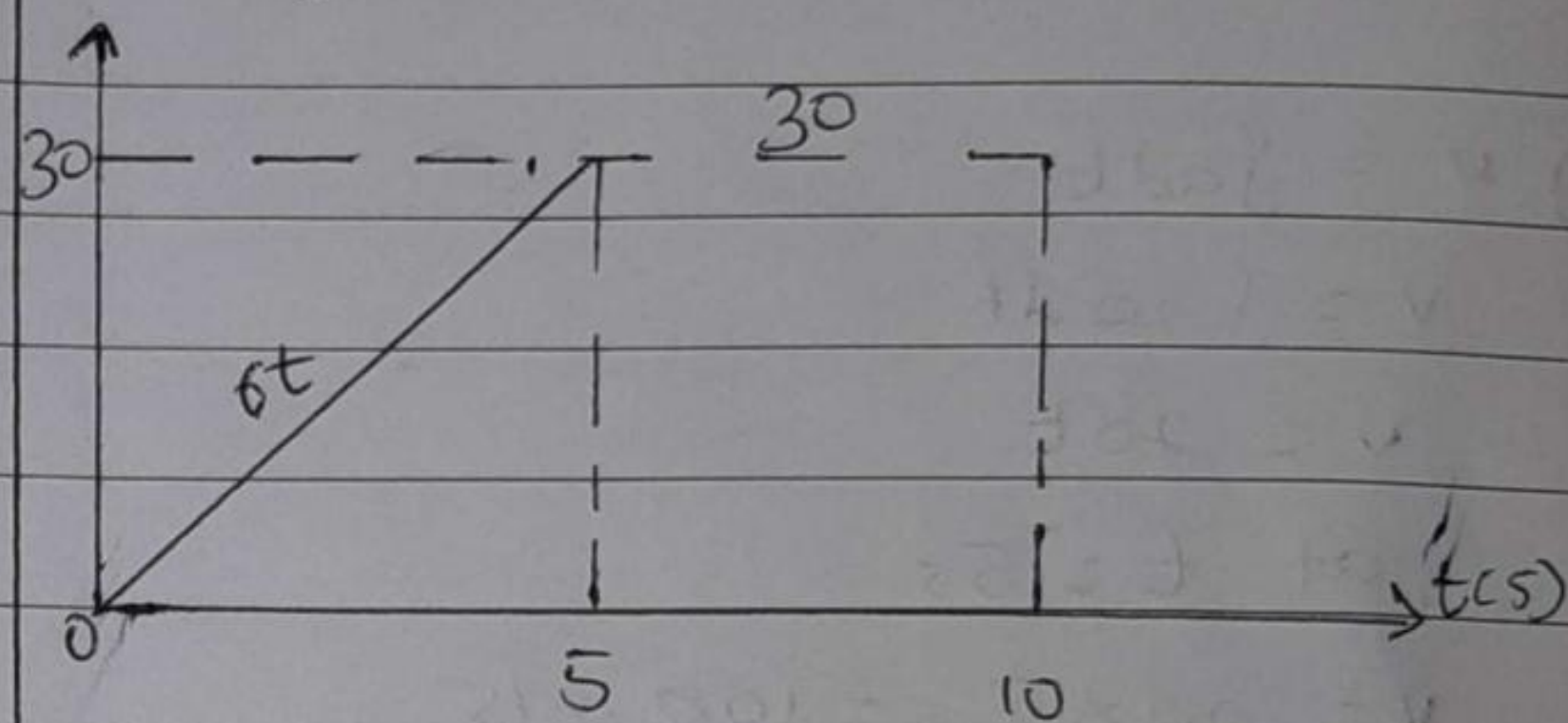
$$v = 6t$$

$$v = 6 \times 5$$

$$v = 30 m/s$$

at $t = 10s$

$v-t$ graph



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

at $t = 5s$

$$a = 6 m/s^2$$

(at $t = 10s$)

$$a = 10 m/s^2$$

$a-t$ graph

$a(m/s^2)$

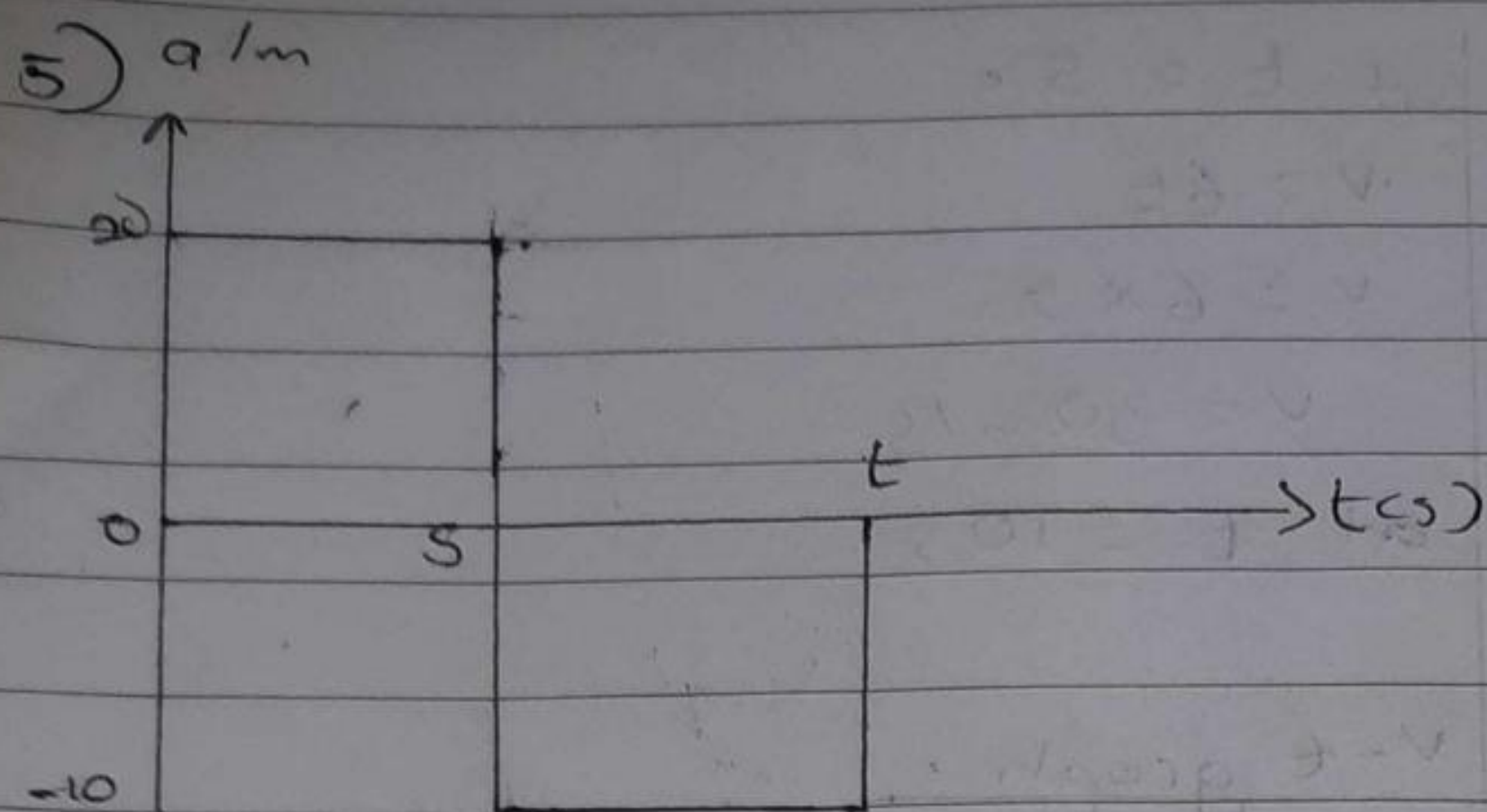
6

0

5

10

$t(s)$



i) $v = \int a dt$

$v = \int 20 dt$

$v = 20t$

at $t = 5s$

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

$5s \leq t \leq t$

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

$v - 100 = -10t \Big|_5^t$

$v - 100 = -10t^{(1)} + 10(5)$

$v - 100 = -10t^{(1)} + 50$

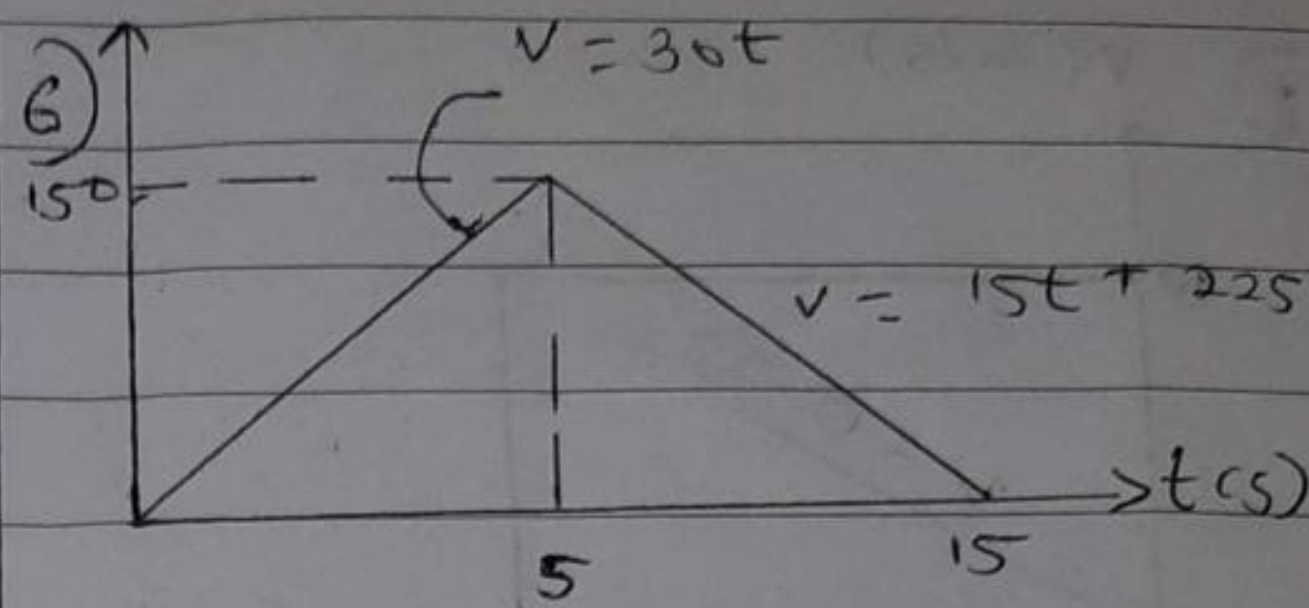
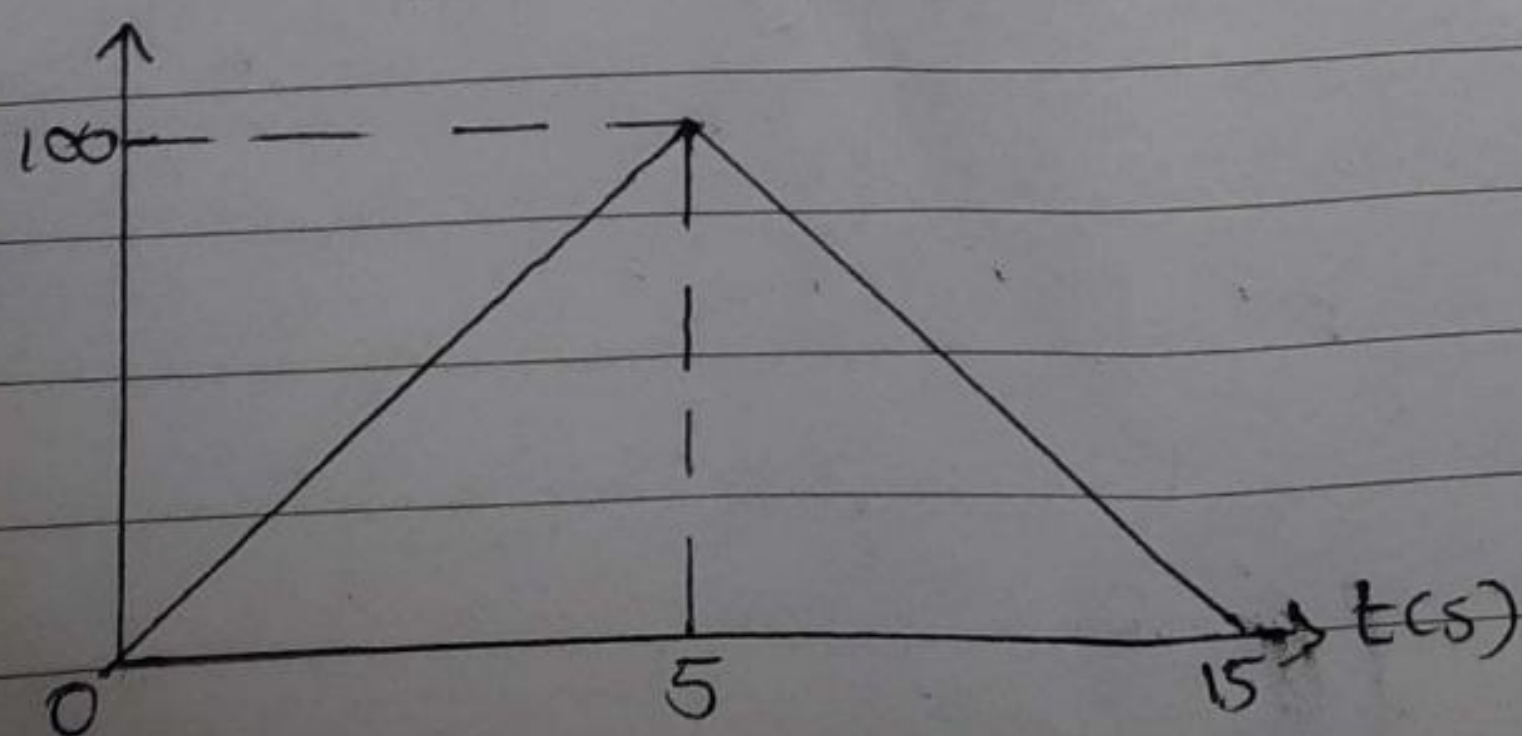
at t' , $v = 0$

$0 - 100 = -10t + 50$

$10t = 100 + 50$

$t = 15$

$v-t$ graph



$0 \leq t \leq 5, v = 30t$

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

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

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

$s = 15 \times 25 = 375 \text{ m}$

$5s \leq t \leq 15s$

$v = -15t + 225$

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

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

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

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

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

$- (-187.5 + 1125)$

$s - 375 = 750$

$s = 1125 \text{ m}$

$s-t$ graph

