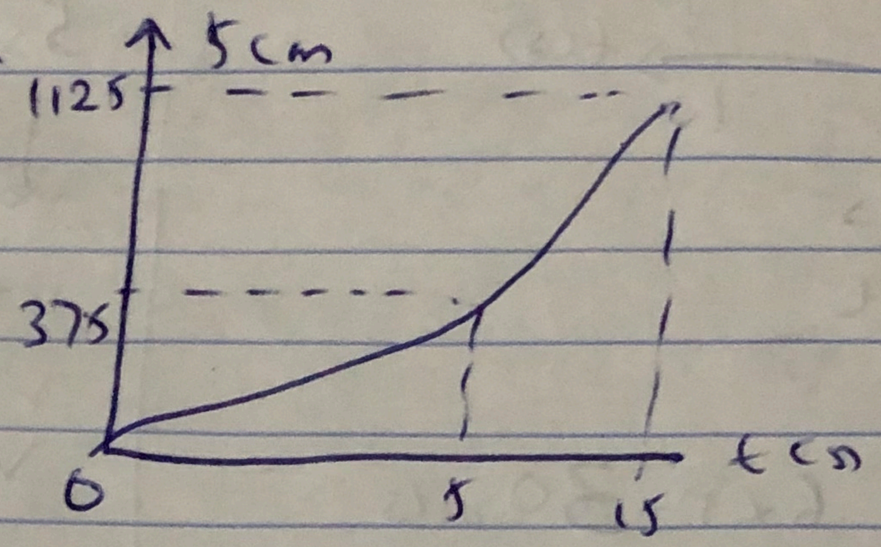
$S = 375 = (-1687.5 + 3375) - (-187.5 + 1125)$

$S = 378 = +1687.5 - 987.5$

$S - 375 = 750$

$S = 1125_m$

S-t graph



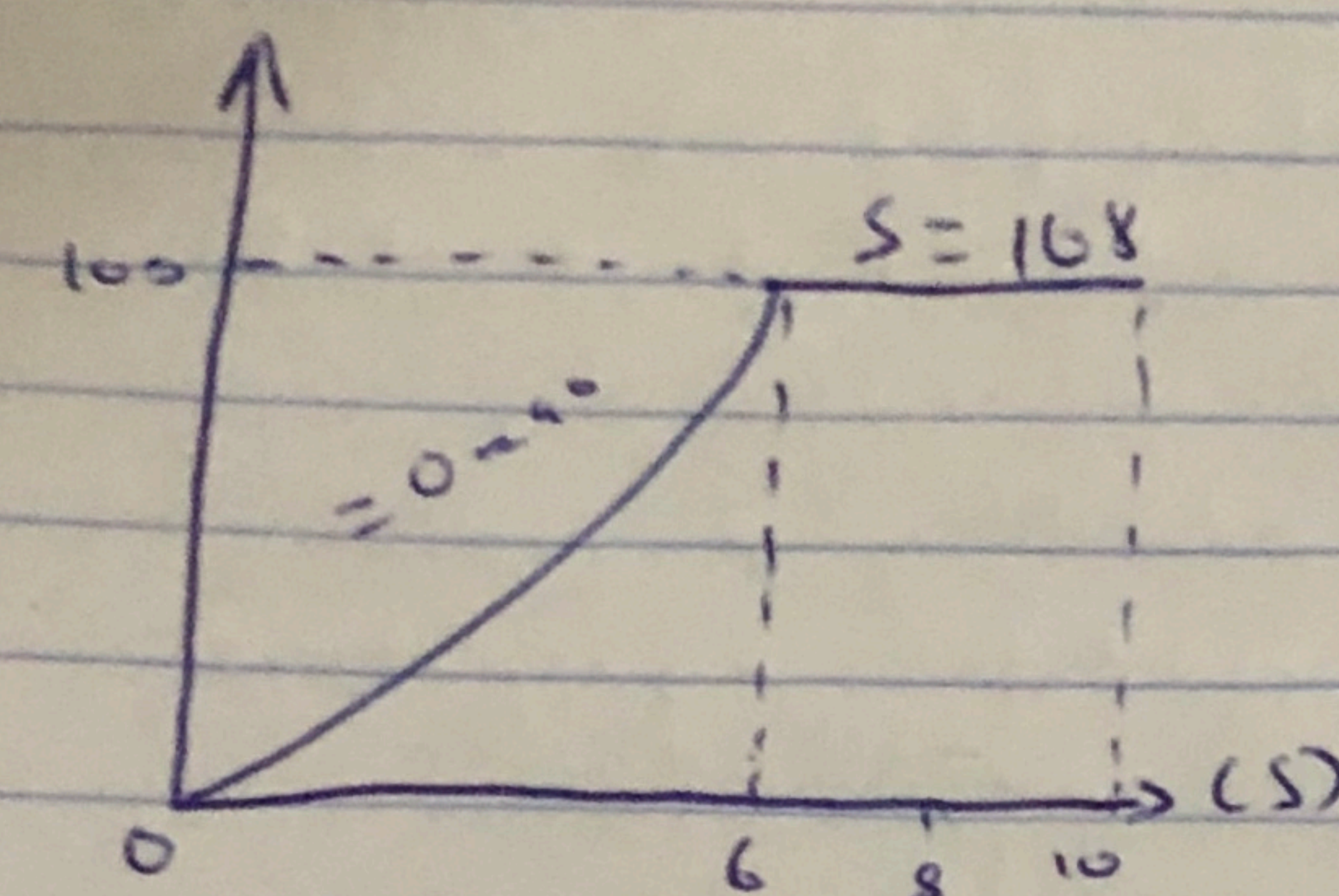
18/ENG02/043

Idoniboyeobu Omiete Opubo

Computer Engineering

200 level

(1)



$v = ds/dt$

$v = 1.5t$

at = t = 6s

$v = 1.5 \times 6^2$

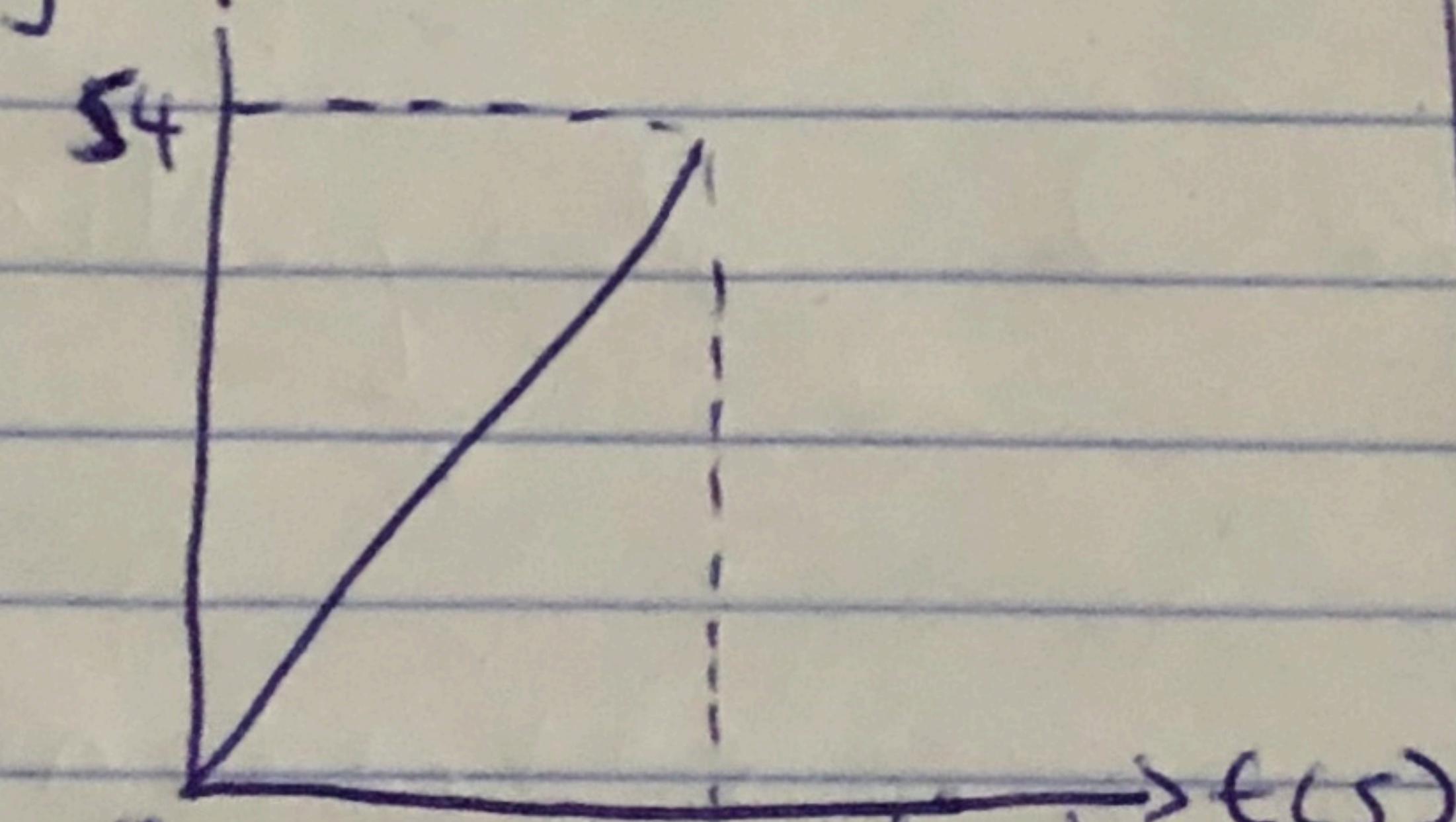
$= 1.5 \times 36$

$v = 54 m/s$

from t = 6s - 10s, S = 108

$v = 0$

v-t graph



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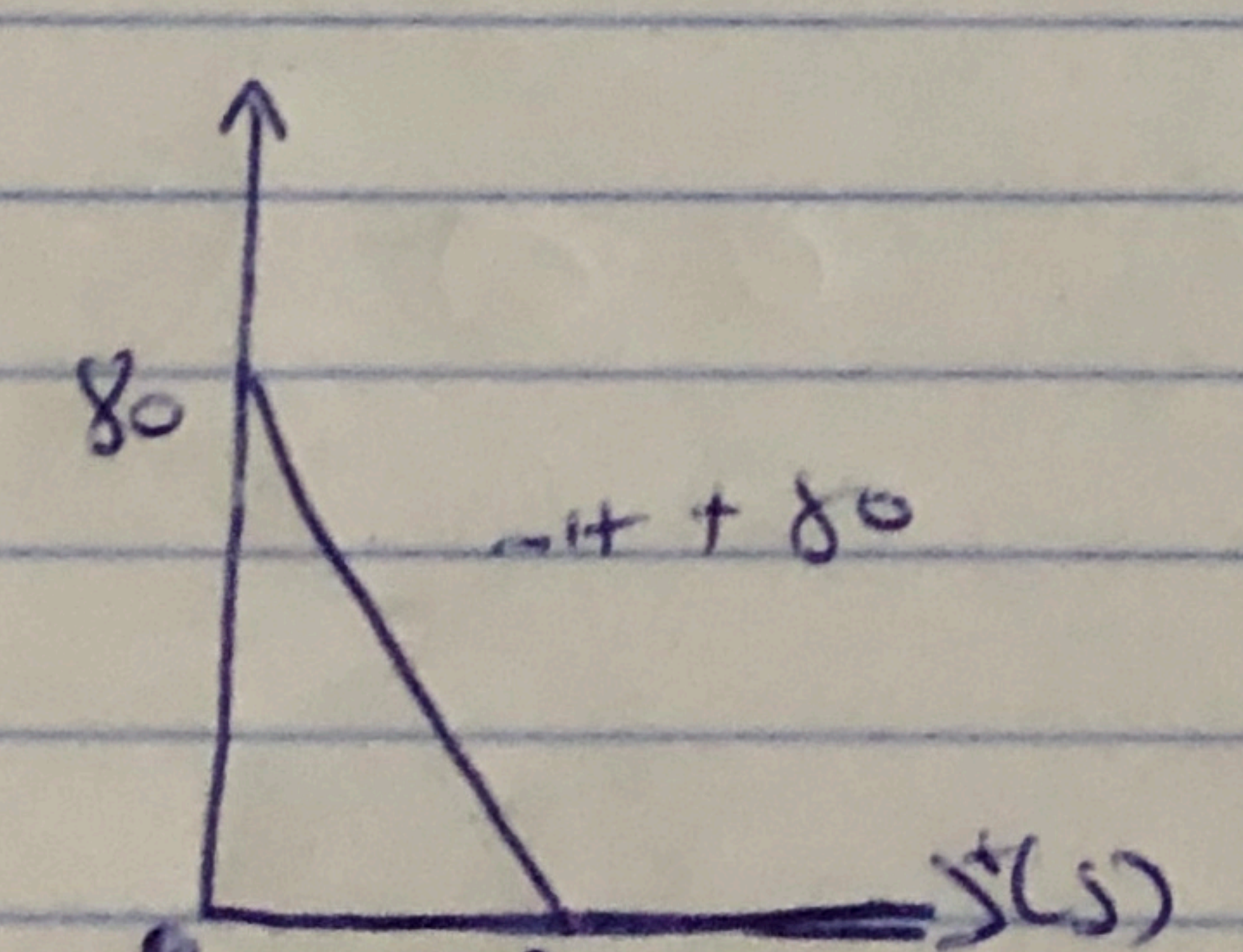


(i) $S = \int v\,dt$

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

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

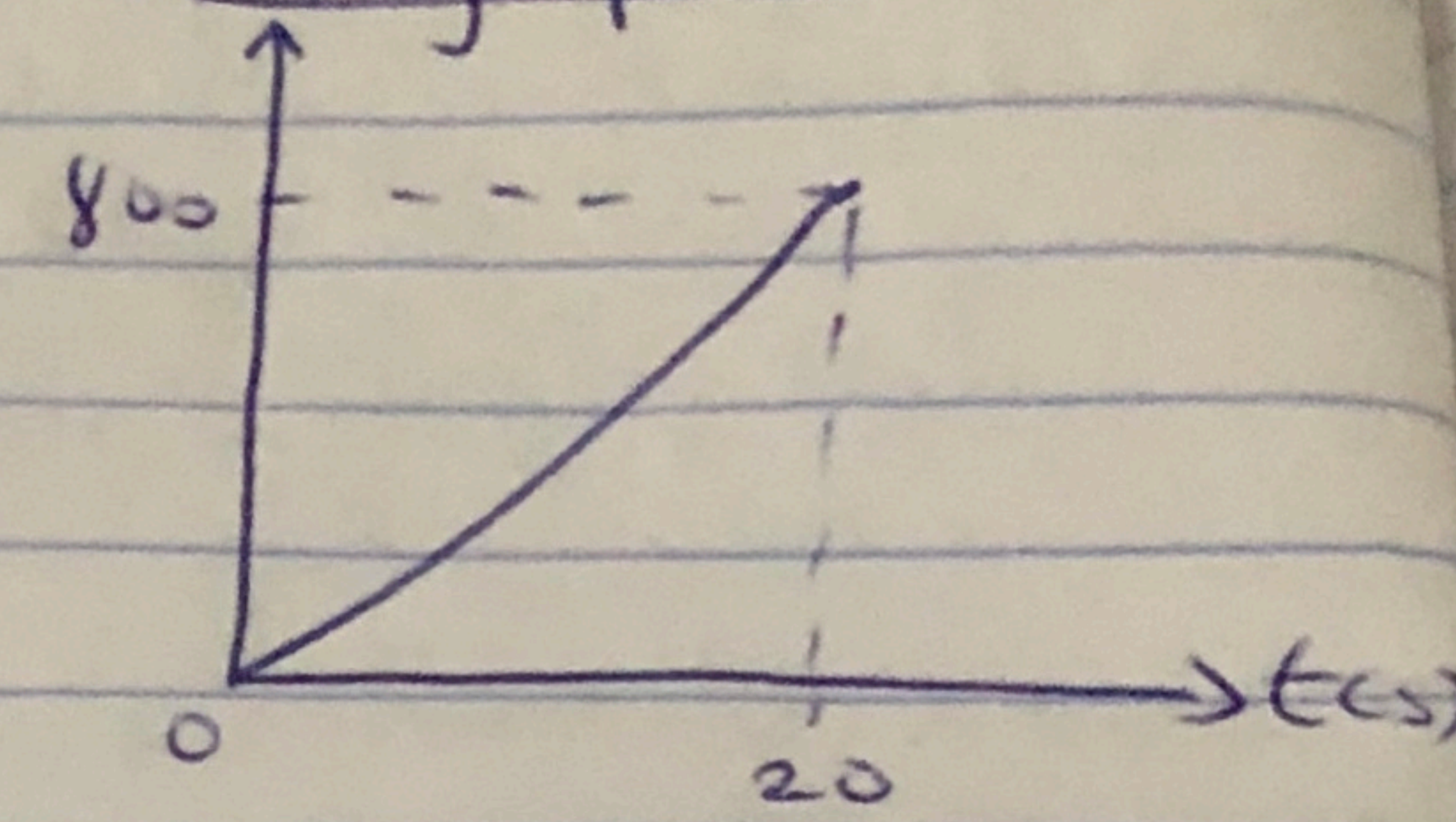
at t = 20s

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

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

$S = 1600 - 800 = 800m$

St graph



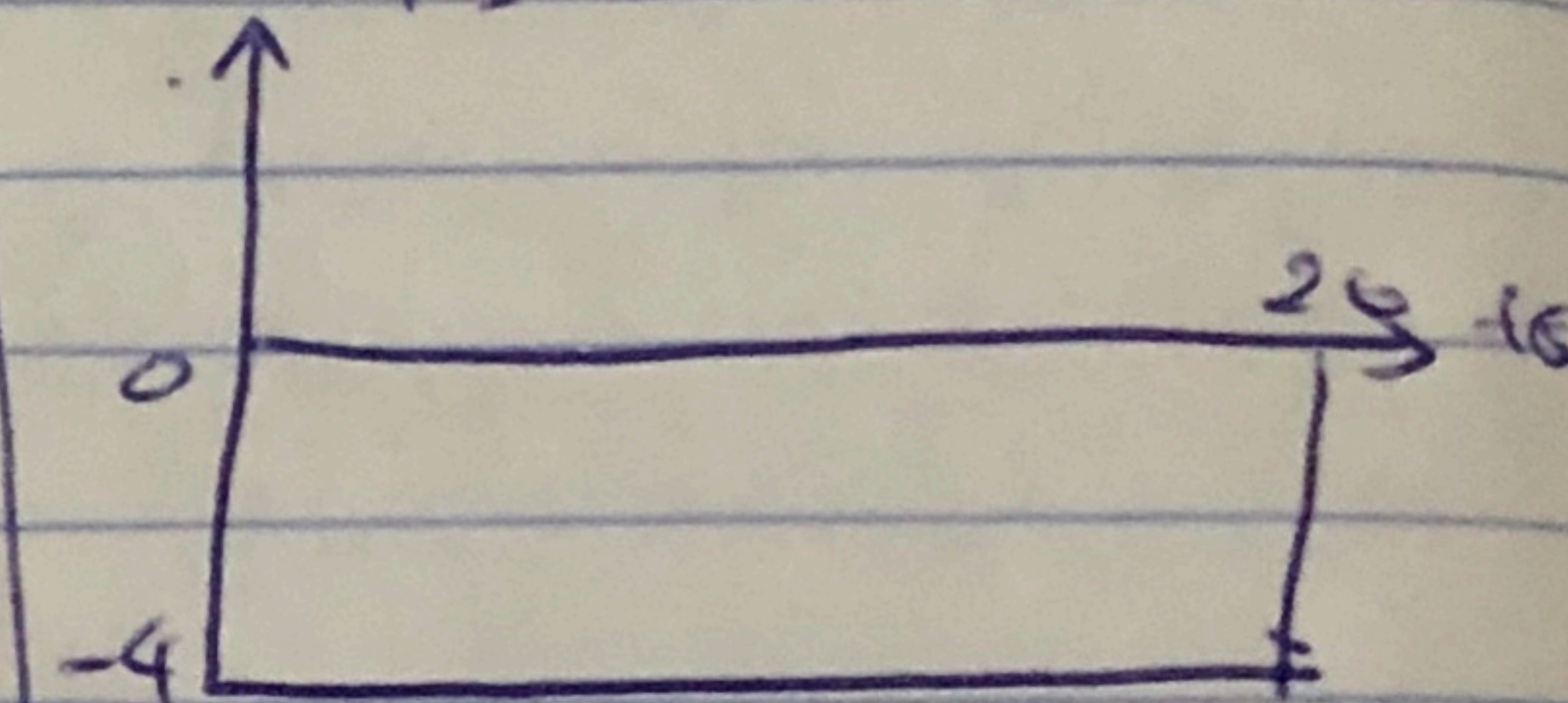
ii acceleration

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

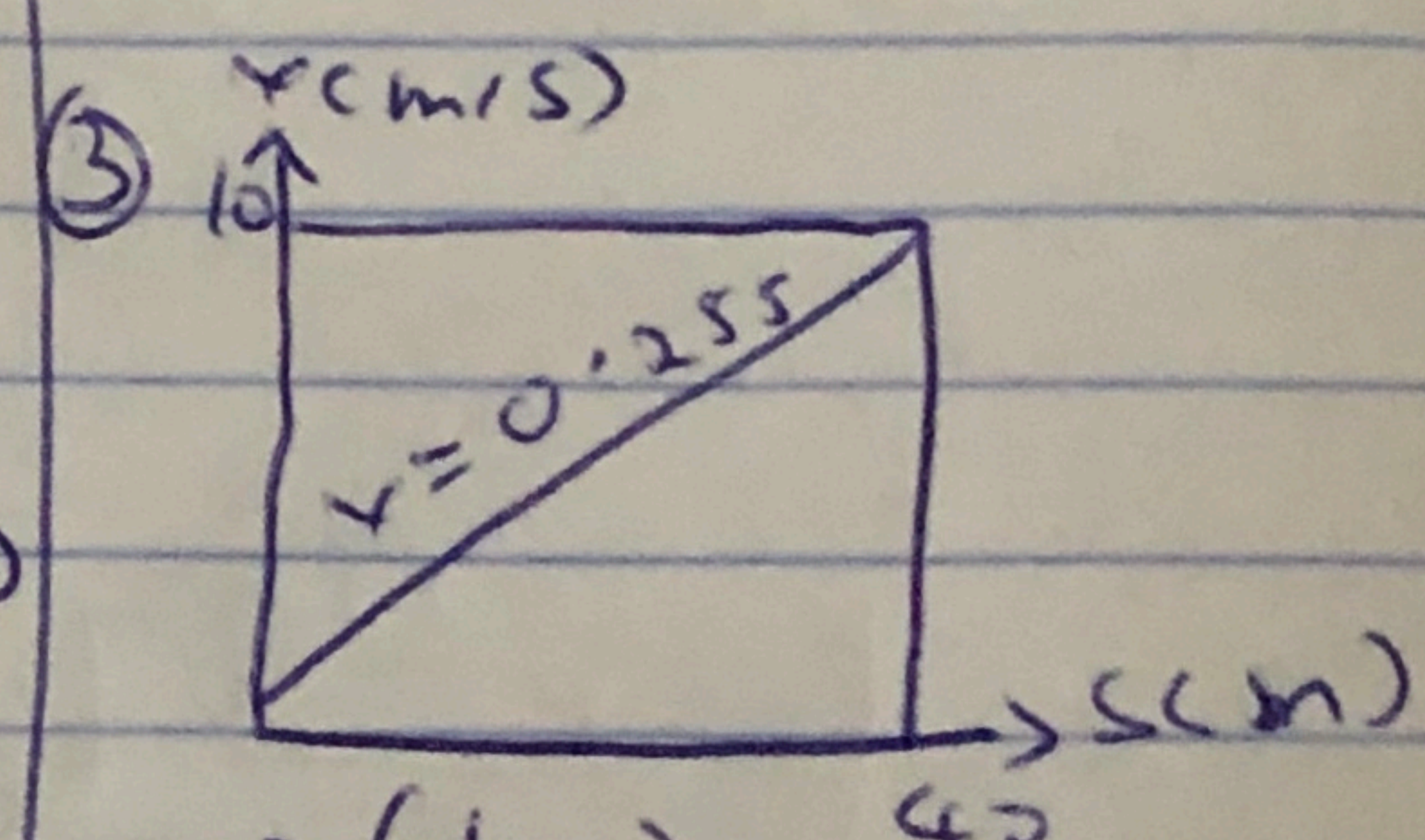
$a = -4 m/s^2$

at t = 20s, $a = -4 m/s^2$

a-t graph



(3)



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

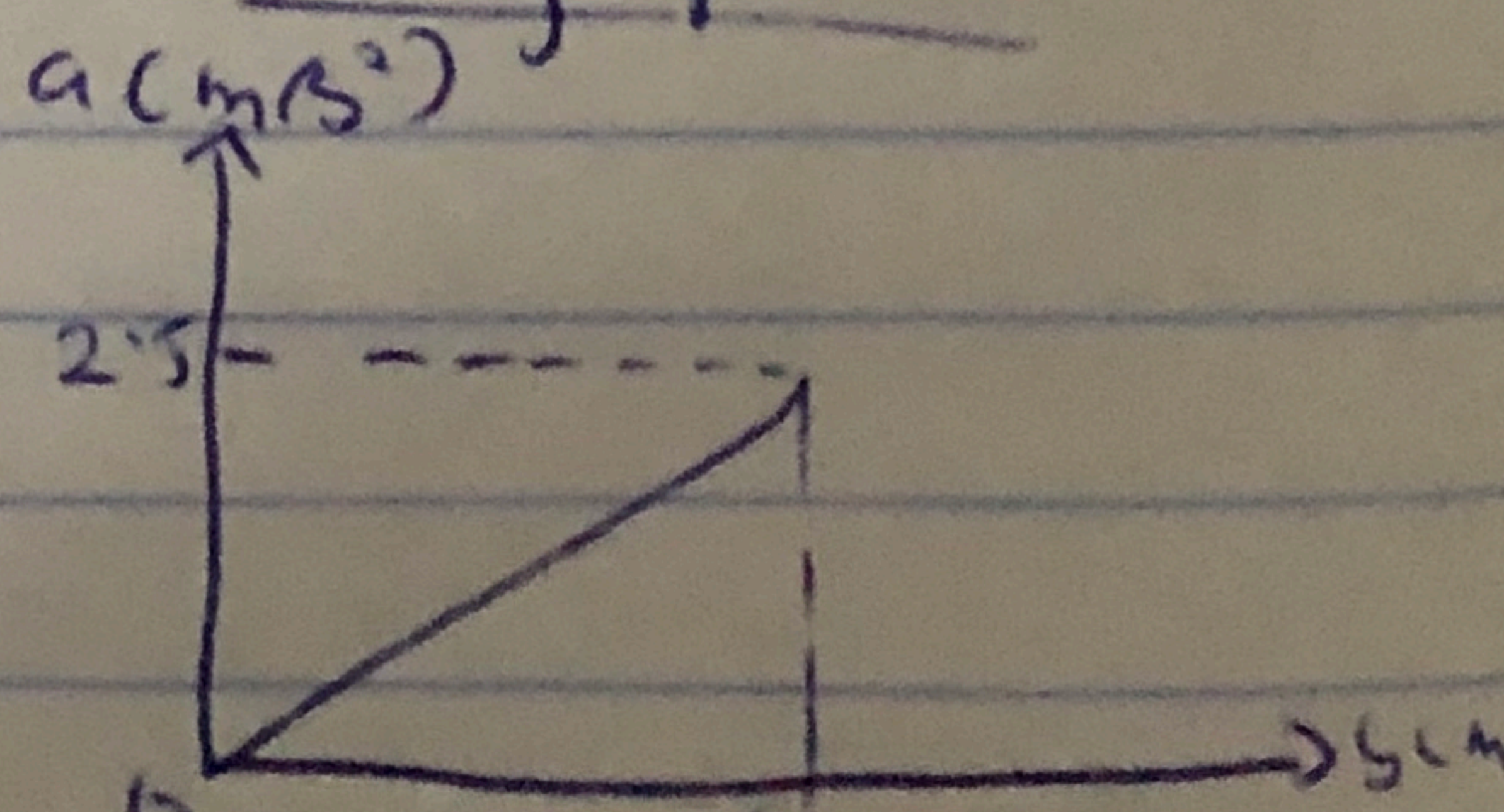
$v = 0.25s$

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

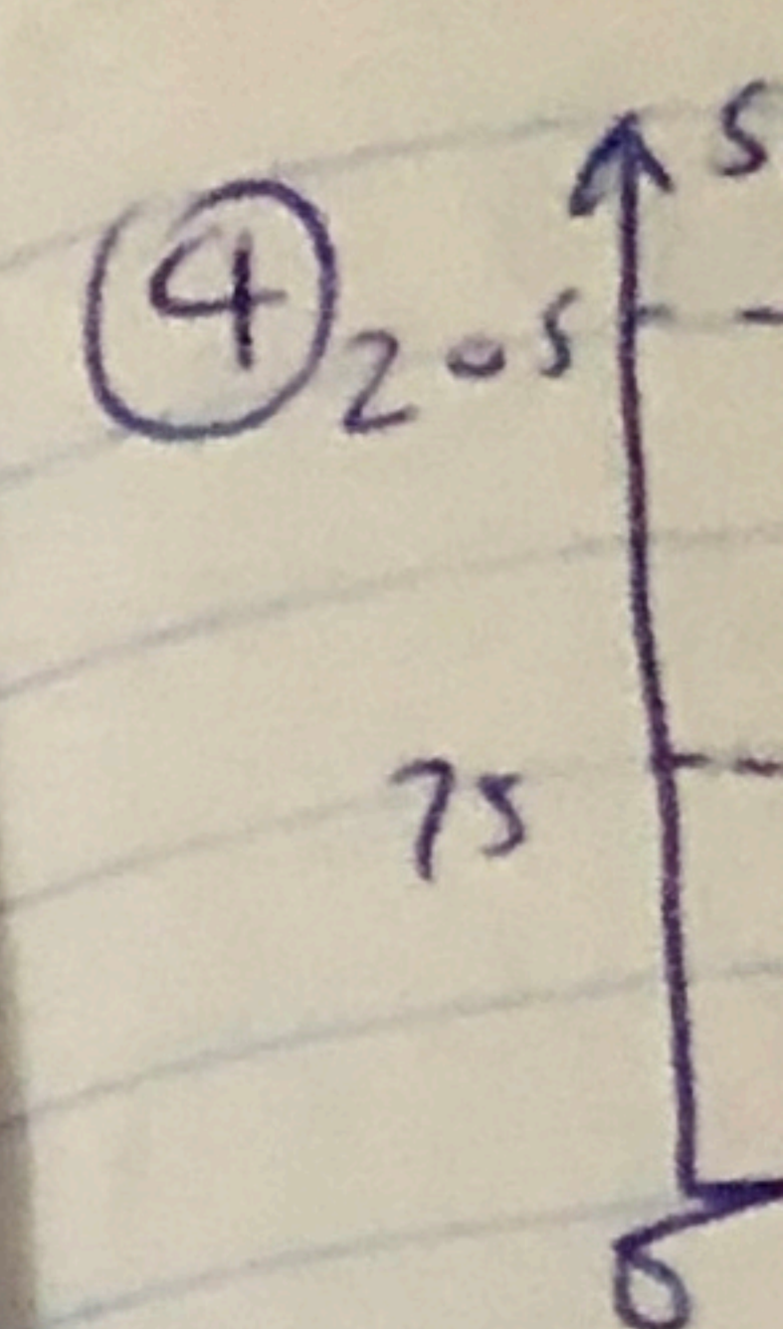
$a = 10 \times 0.25$

$a = 2.5 m/s^2$.

a-s graph



(4)

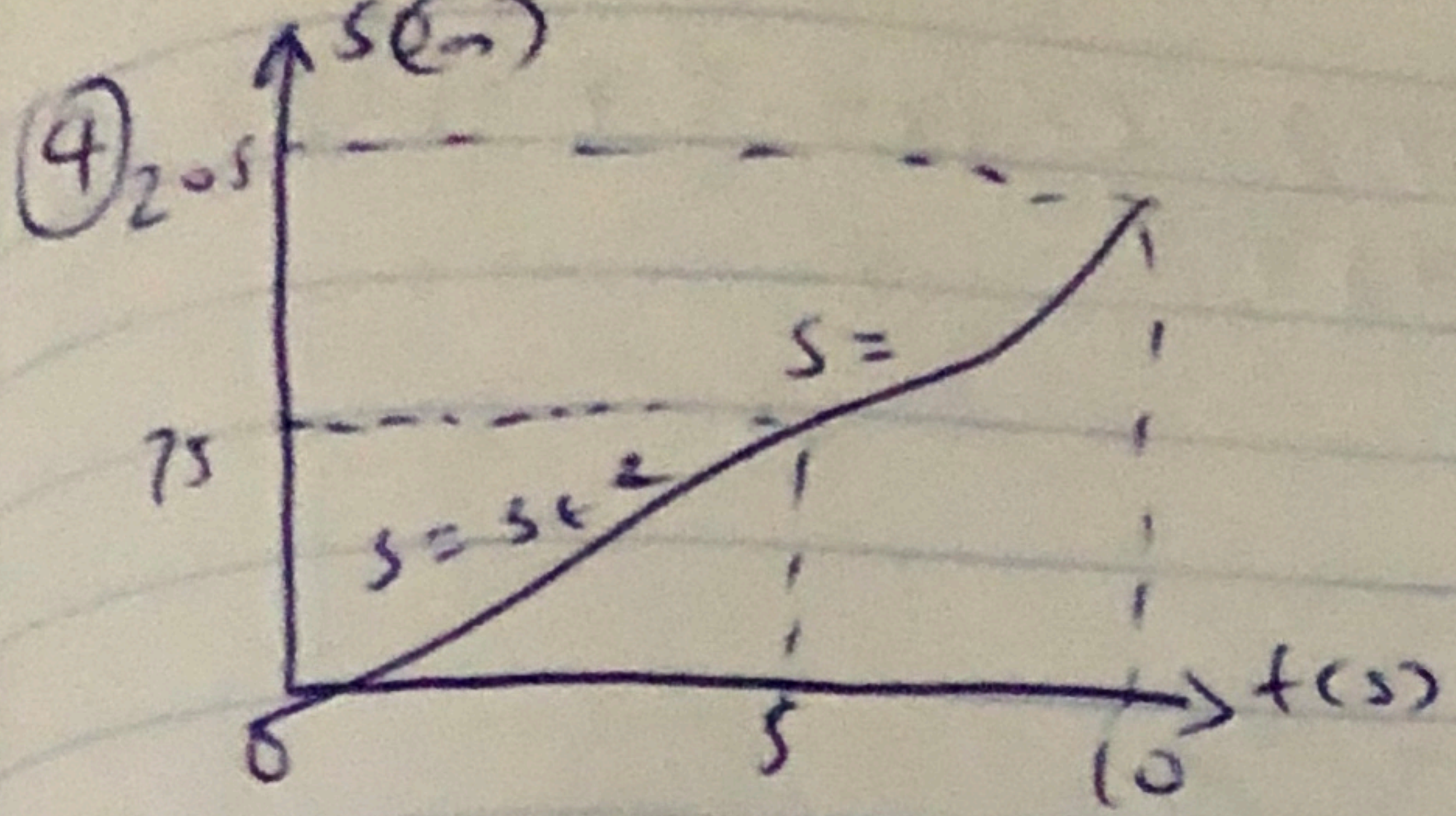


a

ii

(5)

④



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

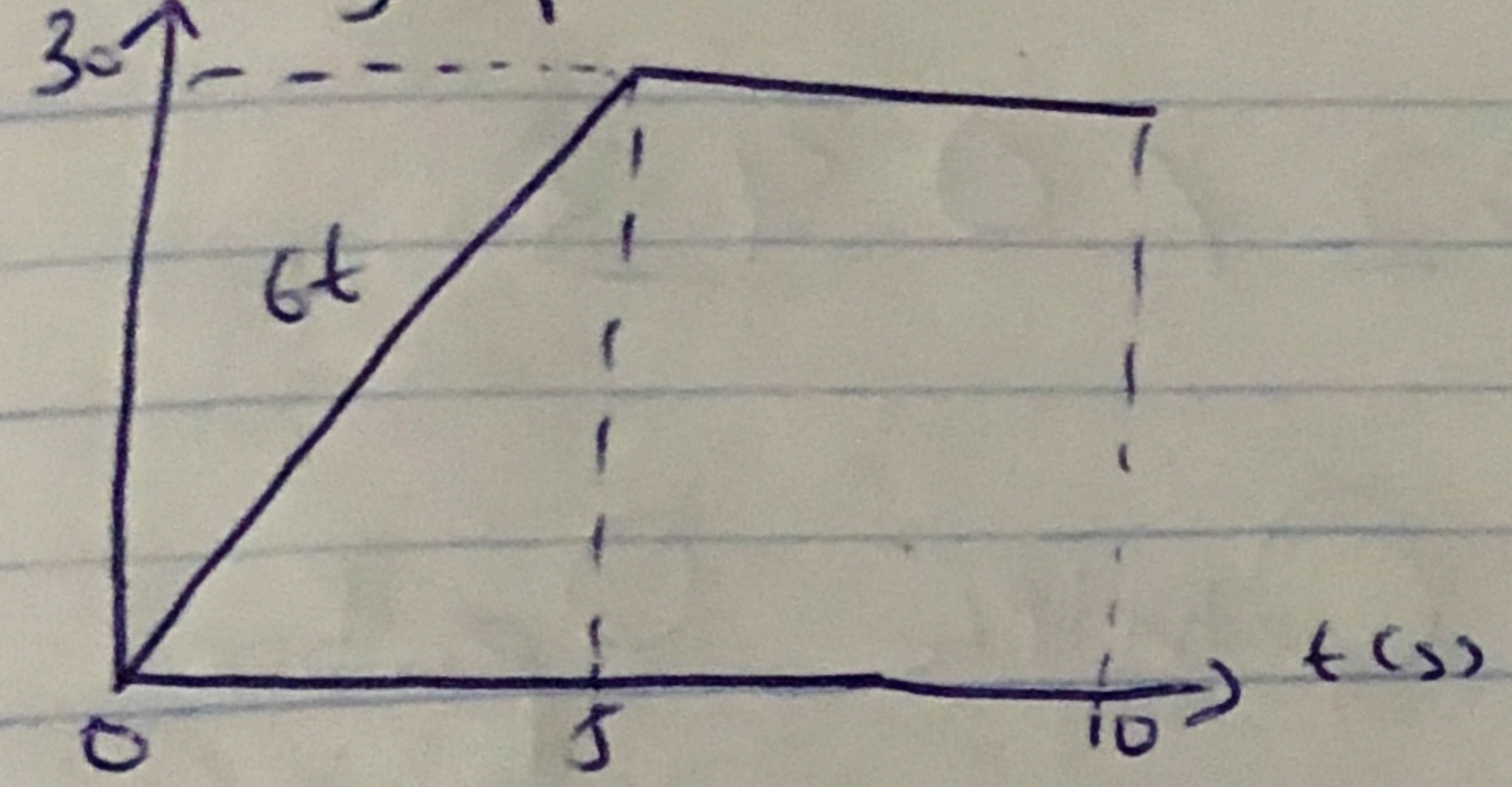
at $t = 5s$

$v = t\,t = 6 \times 5 = 30\ m/s$

at $t = 10s$

$v = 30\ m/s$

v-t graph



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

at $t = 5$

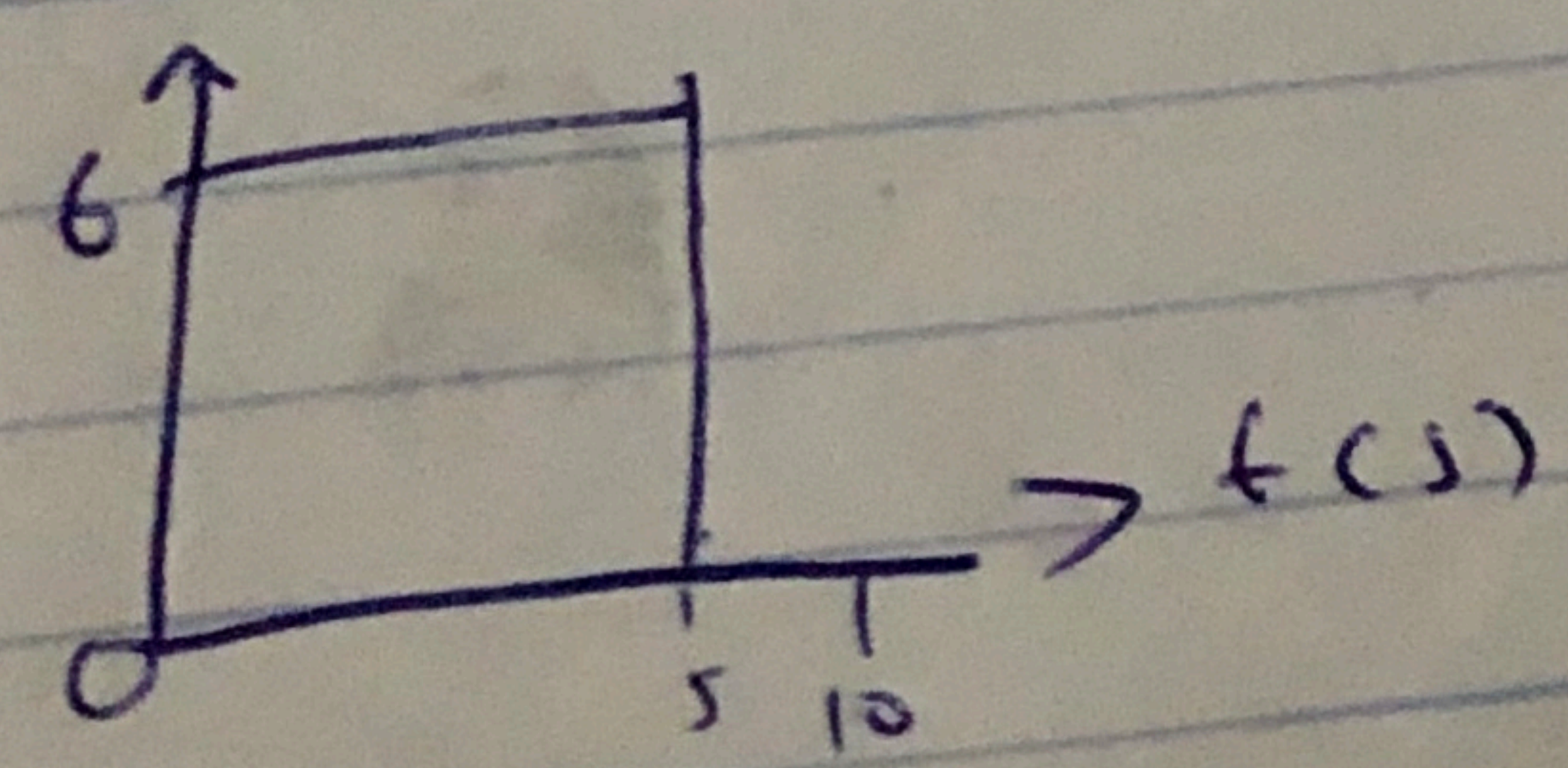
$a = 6\ m/m^2$

at $= t = 10s$

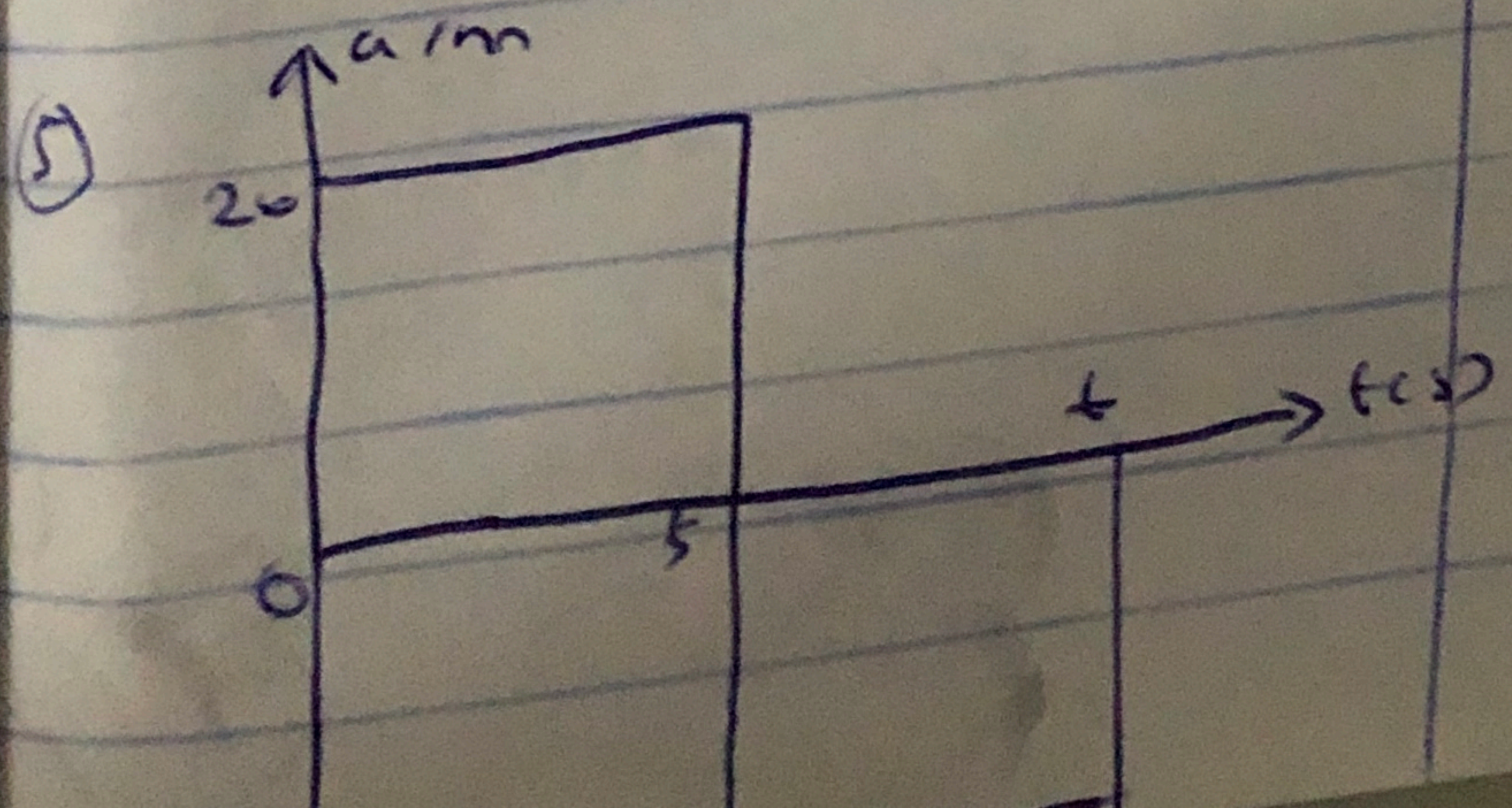
$a = 0\ m/s^2$

a-t graph

a (m/s²)



⑤



i $v = \int a\,dt$

$v = \int 20\,dt$

$v = 20t$

$v = 20 \times 5 = 100\ m/s$

$5s < t \leq t$

$\int_{100}^{v} dv = \int_{5}^{t} -10\,dt$

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

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

$v = 100 = -10t + 50$

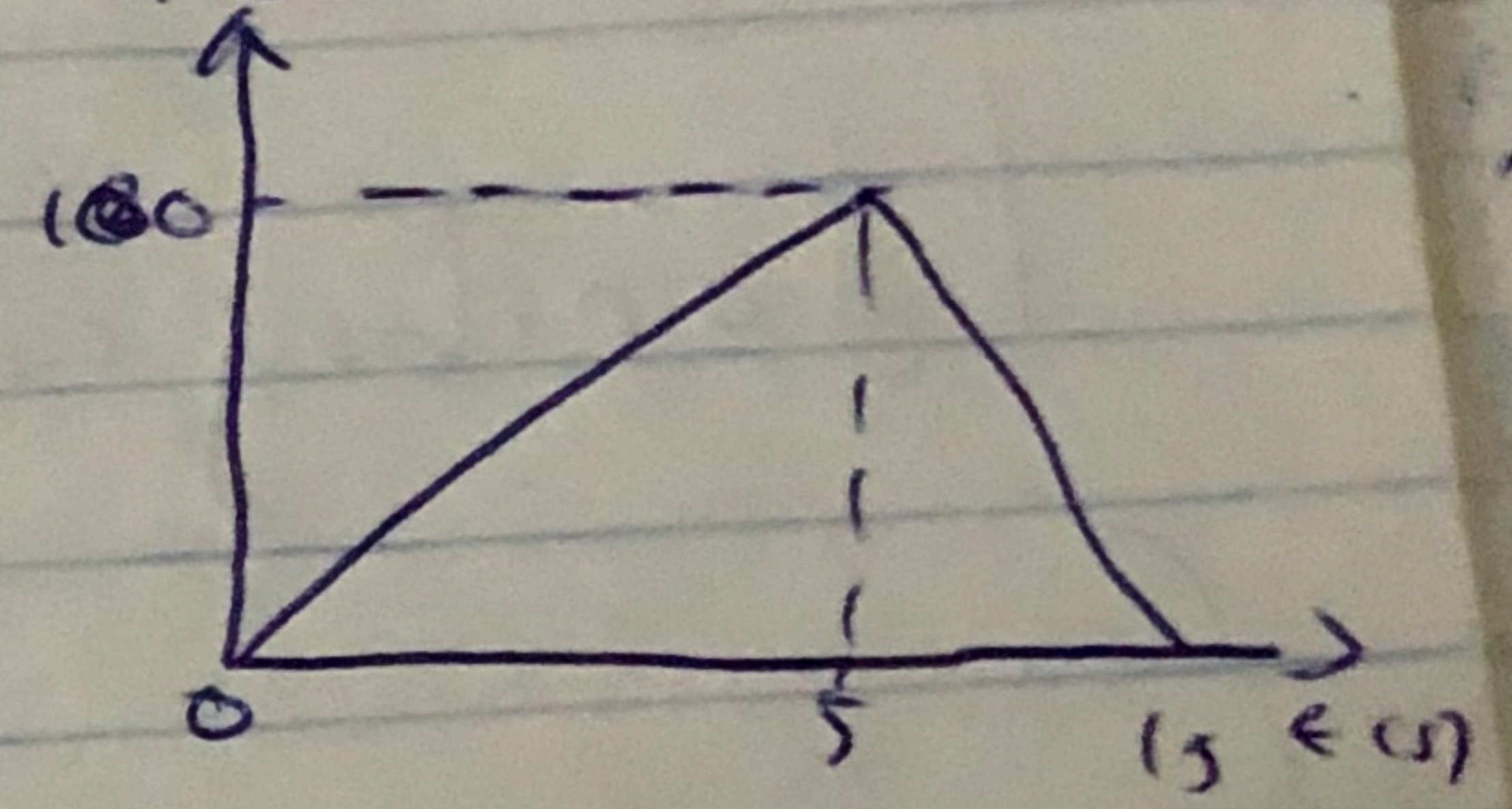
at t, $v = 0$

$0 = 100 = -10t + 50$

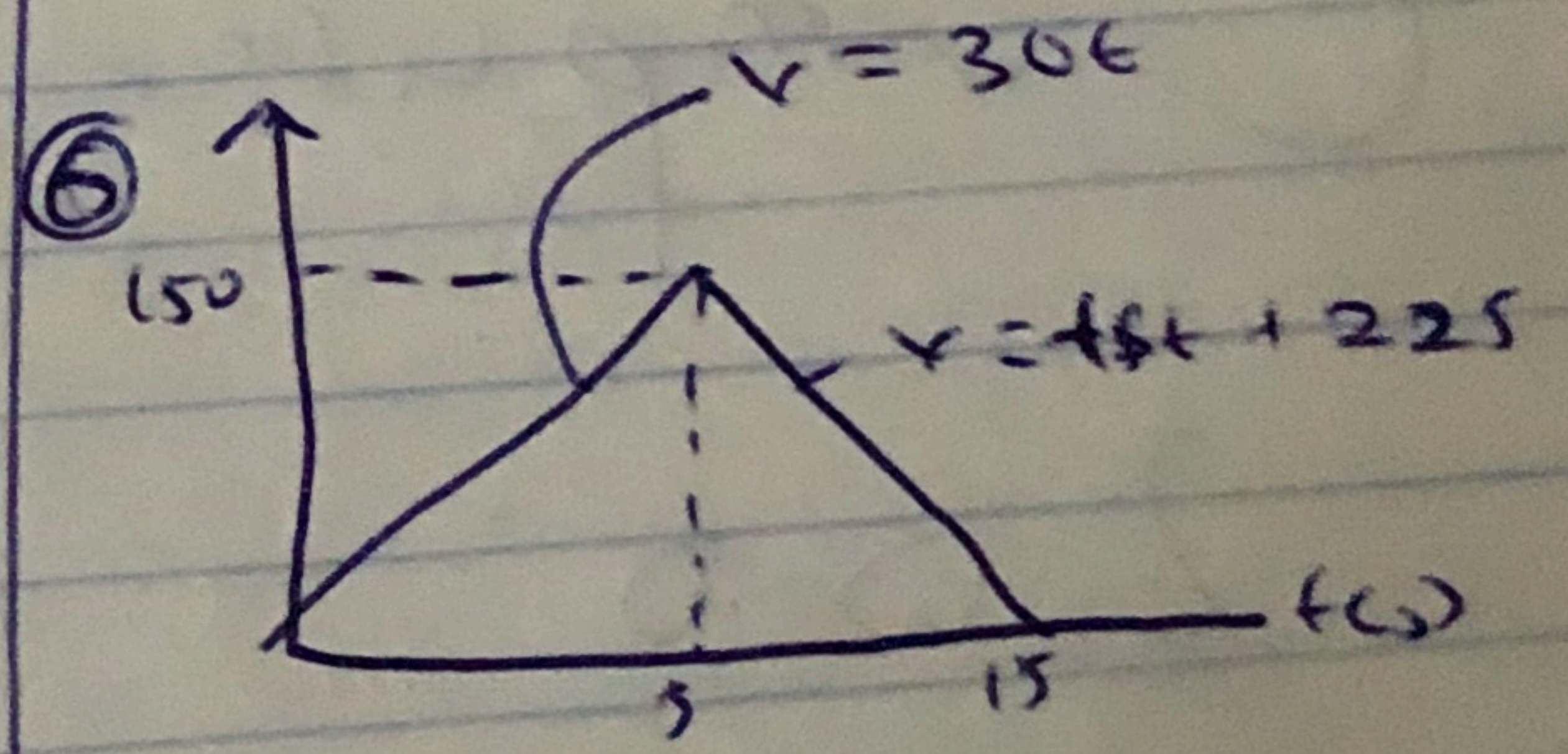
$10t = 150$

$t = 15s$

v-t graph



⑥



$0 \leq t \leq 5,$

$v = 30t$

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

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

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

$s = 15 \times 25$

$s = 375m$

$5s \leq t \leq 15s$

$v = -15t + 225$

$\int_{325}^{s} ds = \int_{5}^{t} (-15t + 225)\,dt$