

Force on the body
 constant
 acceleration

① for $0 < t < 10$
 $s = 0.5at^2$

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

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

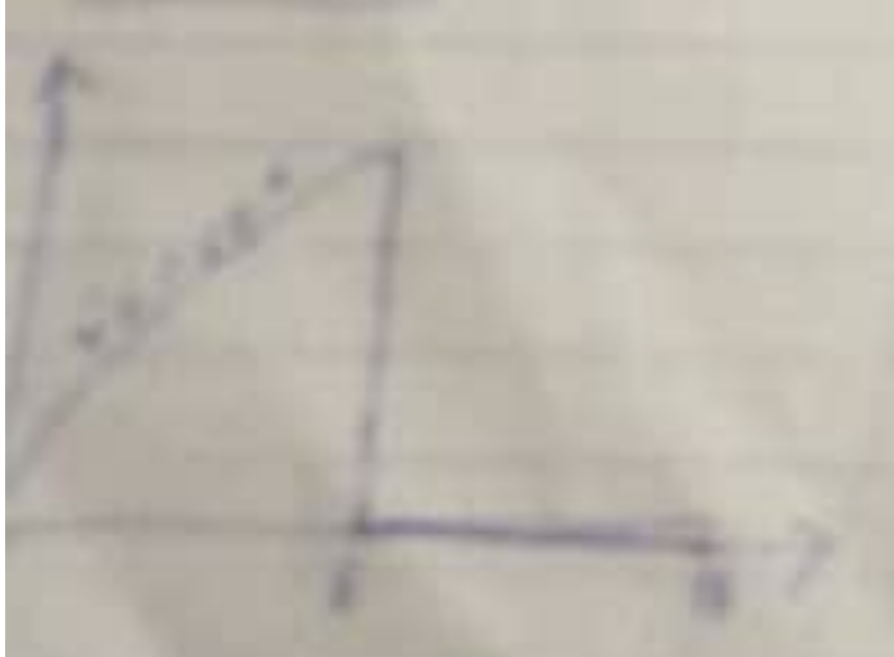
$$v = at$$

$$s = \frac{1}{2}at^2$$

$$v = at$$

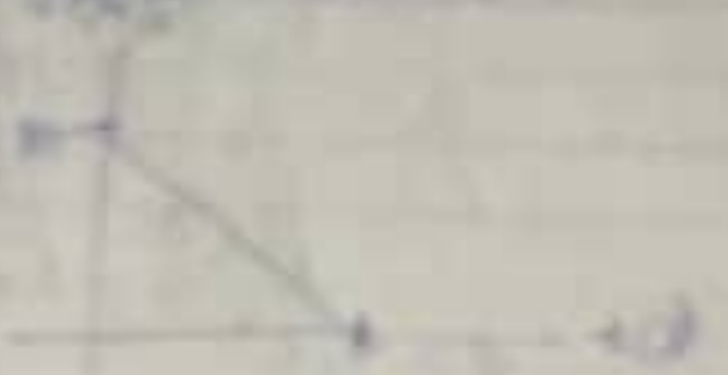
for $0 < t < 10$
 $s = 0.5$
 $v = \frac{ds}{dt}$
 $v = \frac{1}{2}at$
 $a = 0$

v-t graph



$\frac{1}{2}at^2$
 $\frac{1}{2} \times 10 \times 10$
 $= 50$

② $v = -4t + 80$
 constant velocity
 from the graph
 at $t=0$



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

$$ds = v dt$$

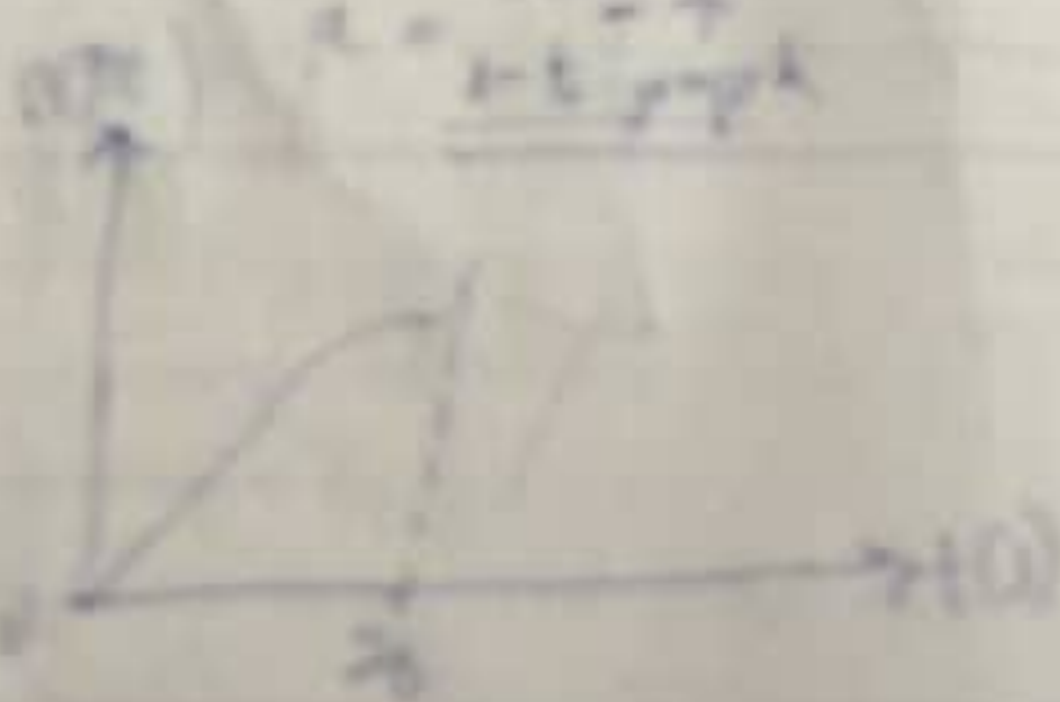
$$s = \int v dt$$

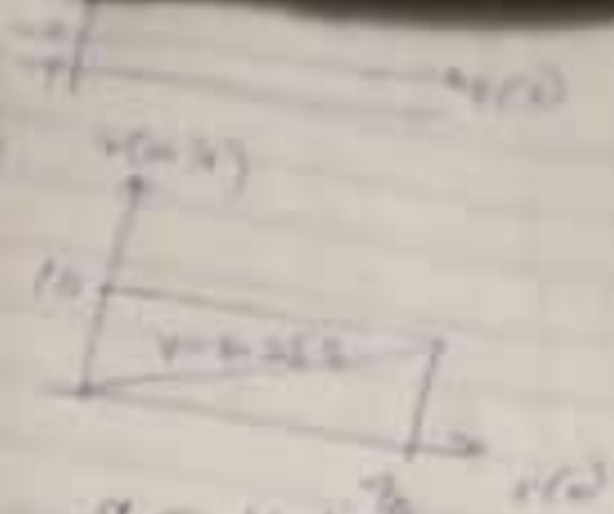
$$s = \int (-4t + 80) dt$$

$$s = \left[-2t^2 + 80t \right]_0^{20}$$

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

$a = \frac{dv}{dt}$
 $a = \frac{d}{dt}(-4t + 80)$
 $a = -4$
t-t graph





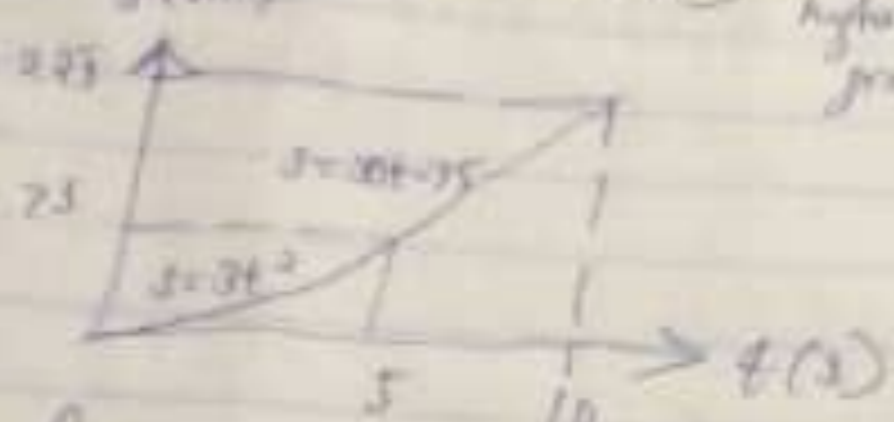
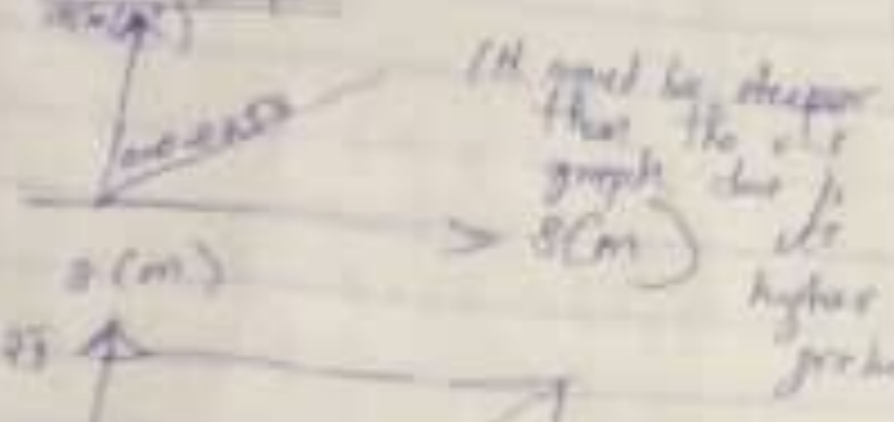
$$a = v \frac{dv}{ds}$$

$$\frac{dv}{ds} = 0.25$$

$$a = 0.25(0.25)$$

$$a = 0.625 \text{ s}$$

a-t graph



for $0 \leq t \leq 5$

$$s = 3t^2$$

$$v = \frac{ds}{dt} = 6t$$

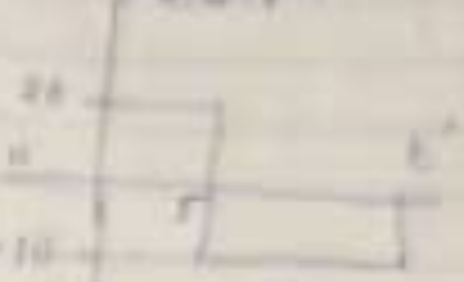
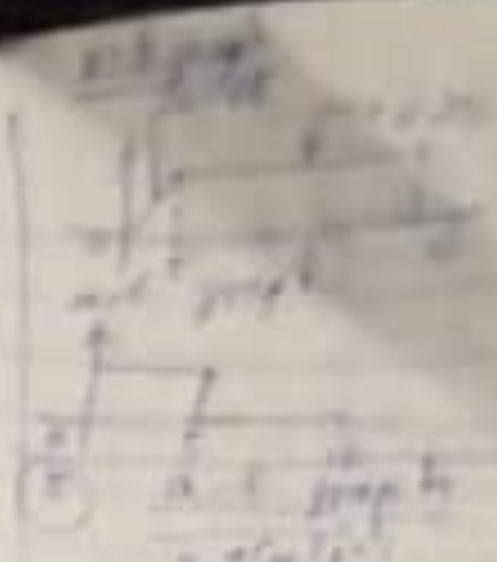
$$a = \frac{dv}{dt} = 6$$

for $5 < t \leq 10$

$$s = 30t - 75$$

$$v = \frac{ds}{dt} = 30$$

$$a = \frac{dv}{dt} = 0$$



for $0 \leq t \leq 5$

$$a = 20$$

$$v = \int a dt$$

$$v = [20t]_0^5$$

$$v = 20t$$

for $5 < t \leq 10$

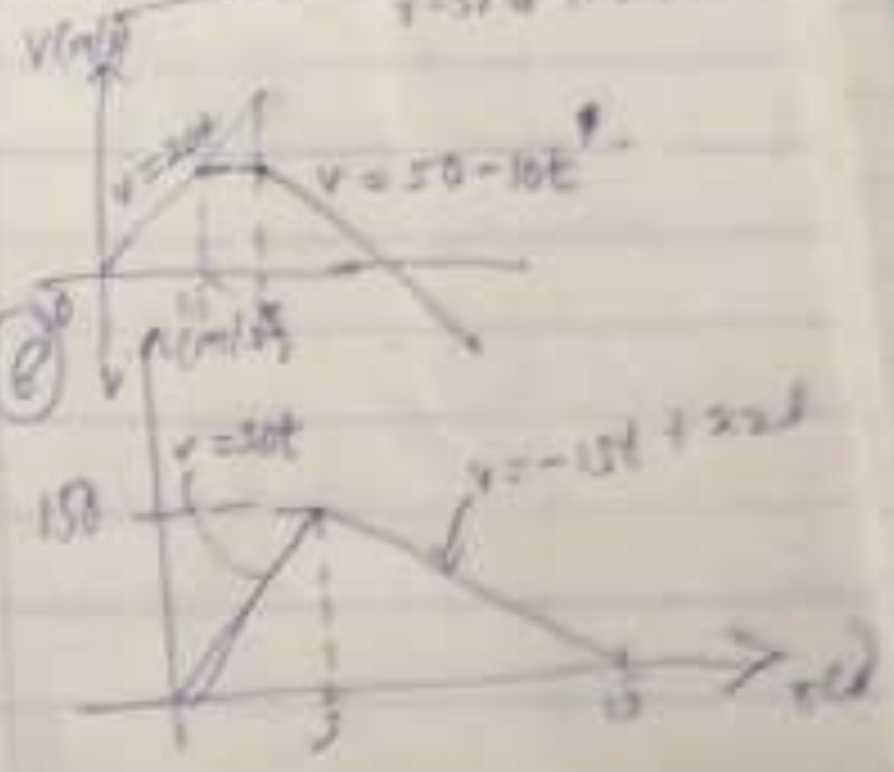
$$a = -10$$

$$v = \int -10 dt$$

$$v = [-10t]_5^{10}$$

$$v = (-10(10) - (-10(5)))$$

$$v = -10t + 50$$





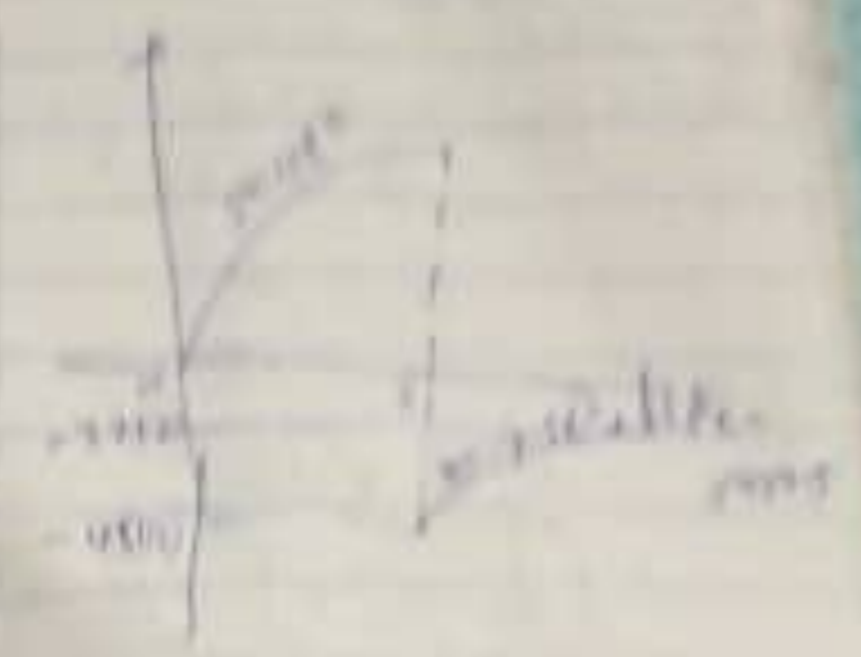
(1) 12000

$$s = \int_0^t v dt$$

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

$$s = \frac{30t^2}{2}$$

$$s = 15t^2$$



$$5 \leq t \leq 15$$

$$s = \int_5^{15} (225 - 15t) dt$$

$$s = \left[-7.5t^2 + 225t \right]_5^{15}$$

$$s = (-7.5(15)^2 + 225(15)) - (-7.5(5)^2 + 225(5))$$

$$s = -5625 + 3375 - (-187.5 + 1125)$$

$$s = -2250$$

