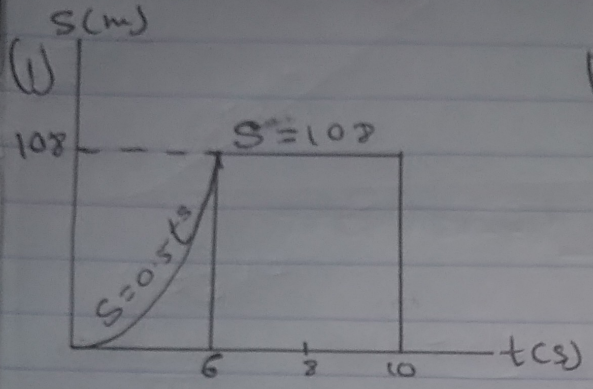
JOHN EDWIN AKPAN
18/ENG06/033
MECHANICAL ENG.
MECHANICS II (ENG 234).



F12-9

$V = \frac{ds}{dt}$ $\quad V_0 = \frac{ds}{dt} = 1.5t^2$

$0 \leq 6 < 6s, \quad S = 0.5t^3$

$V = \frac{ds}{dt} = 1.5t^2 \, m/s$

$6 < t \leq 10; \quad S = 108$

$V = \frac{ds}{dt} = 0$

$V = 1.5(6)^2 = 54 \, m/s$

~~F12-13~~ F12-13

Construct V-t graph

$0 \leq t \leq t'$

t' = time taken by Car

V-t graph

$V = 0$

$t = 0$

$0 \leq t < 5; \quad a = 20 ms^2$

$\int_0^t 20 \, dt \quad V = 20t$

When $t = 5$, $V = 20(5)$

$= 100 m/s$

$5s < t \leq t' \quad a = -10 m/s^2$

Continuación de F12-13

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

$$v = (-10t + 150)$$

$$v = 0$$

$$0 = -10t + 150$$

$$10t = 150$$

$$t = 15 s$$

F12-14

$$0 \le t \le 150$$

$$v = 150 m/s$$

$$\int_{0}^{5} ds = \int_{0}^{t} 30t\,dt$$

$$s = (15t^2) m$$

When $t = 5 s$

$$s = 15(5)^2 = 375 m$$

$$5s \le t \le 15s ; \quad ds/(t - 15)dt$$

$$= \int_{375 m}^{s}$$

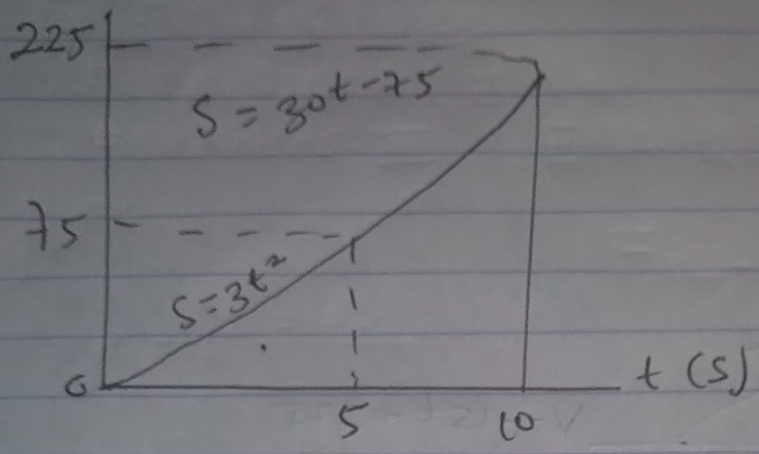
$$s - 375 = 15t$$

$$s = 15t + 375$$

$$s = 15(15) + 375$$

$$s = 600 m$$

F 12 - 12



$S = 3t^2$

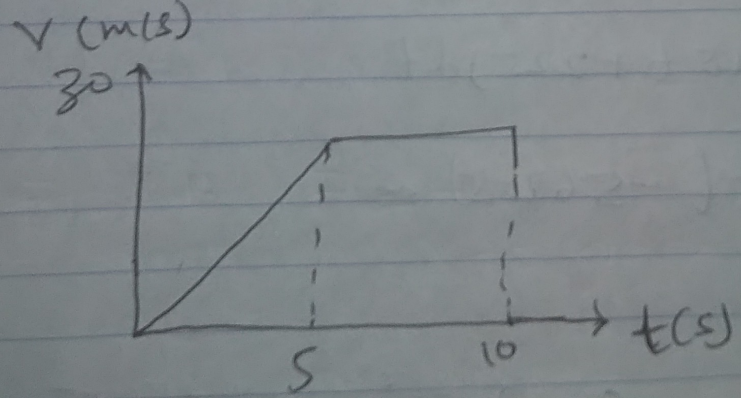
$V = \frac{ds}{dt}$ $\quad V_0 = \frac{ds}{dt} = 6t$

$0 \leq t < 5s$, $S = 3t^2$

$\therefore V = \frac{ds}{dt} = 6t \text{ m/s}$

$5s < t \leq 10$, $S = 30t - 75$

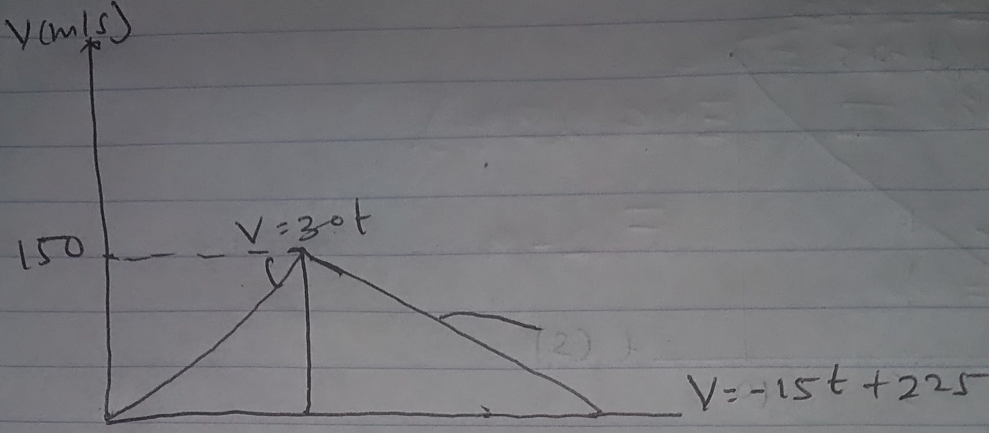
$V = \frac{ds}{dt} = 30 \text{ m/s}$



$V = \frac{ds}{dt} = \frac{225 - 75}{10 - 5}$

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

F12-14



$0 \le t \le 5s$

$v = 30t$

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

$s = (15t^2)\,m$

When $t = 5\,s$

$s = 15(5)^2 = 375\,m$

$5s \le t \le 15s$

$v = (-15t + 225)\,m/s$

$$\int_{375m}^{s} ds = \int_{5s}^{t} (-15t + 225)\,dt$$

$s = (-7.5t^2 + 225t - 562.5)\,m$

$s = 1125\,m$ //