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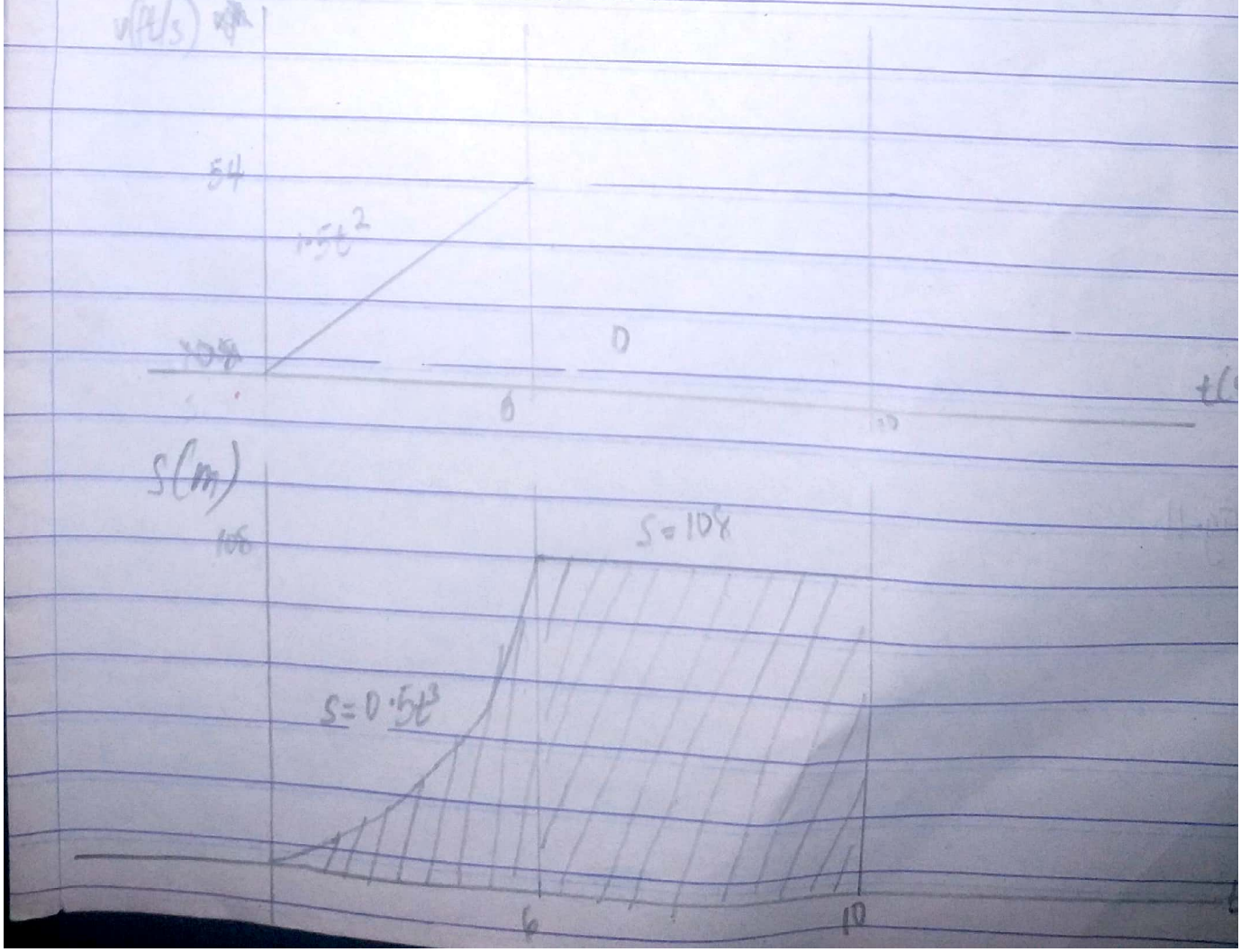
Matric NO - 18/ENG06/028
Dept - Mechanical
Course Code - ENG 234

F12.9

Solution

Solving to get the v-t graph

$0 < t < 6$	$6 < t < 10$
$S = 0.5t^3$	$S = 108$
$v = \frac{ds}{dt}$	$v = \frac{ds}{dt}$
$v = 1.5t^2 m/s$	$v = 0 m/s$



F12-10)

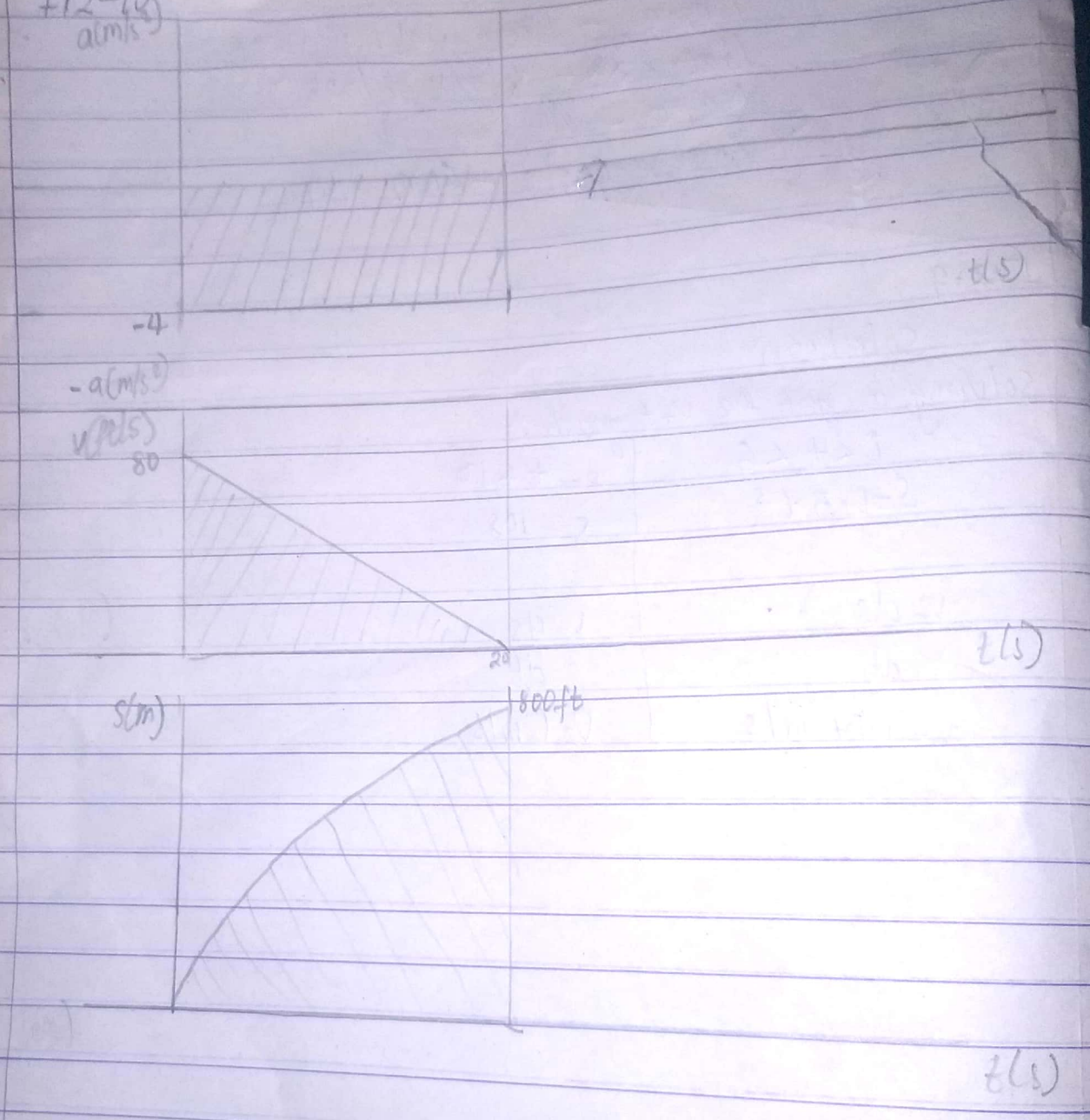


Fig-11

F12-11

$0 < t < 40$

$v = 0.25s$

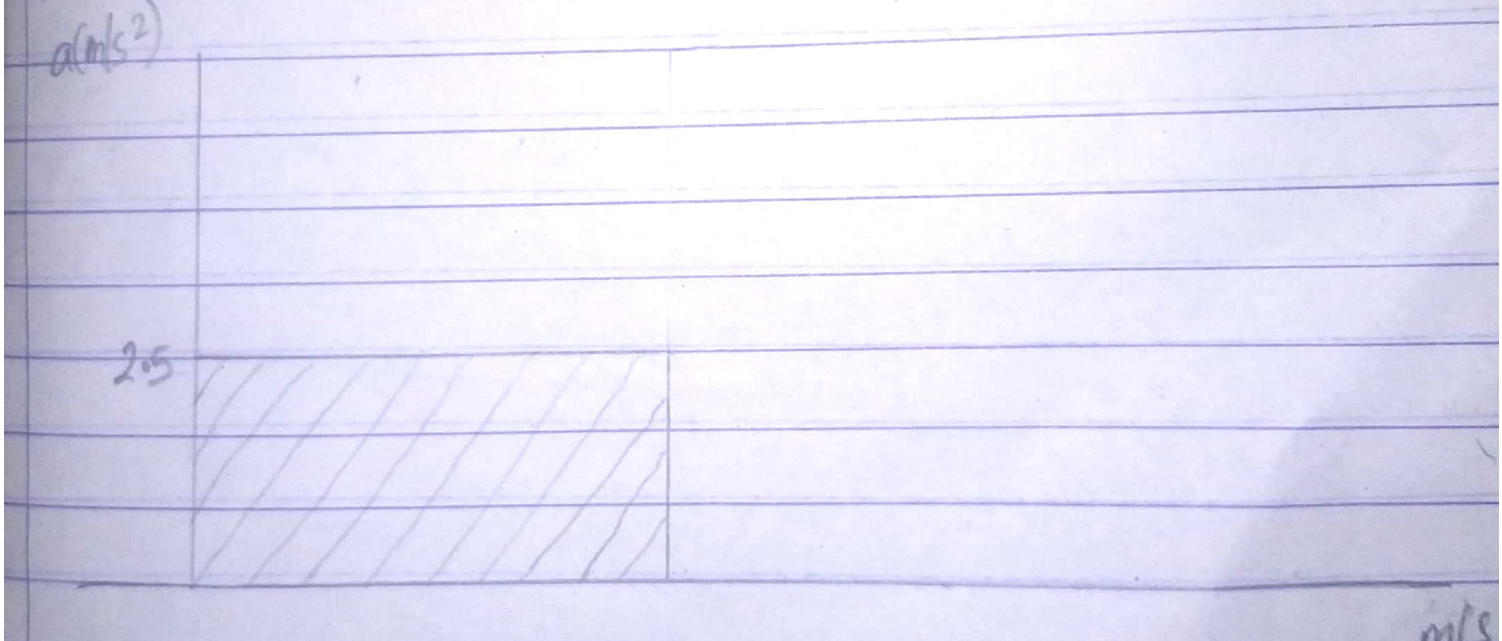
$\frac{dv}{ds} = 0.25$

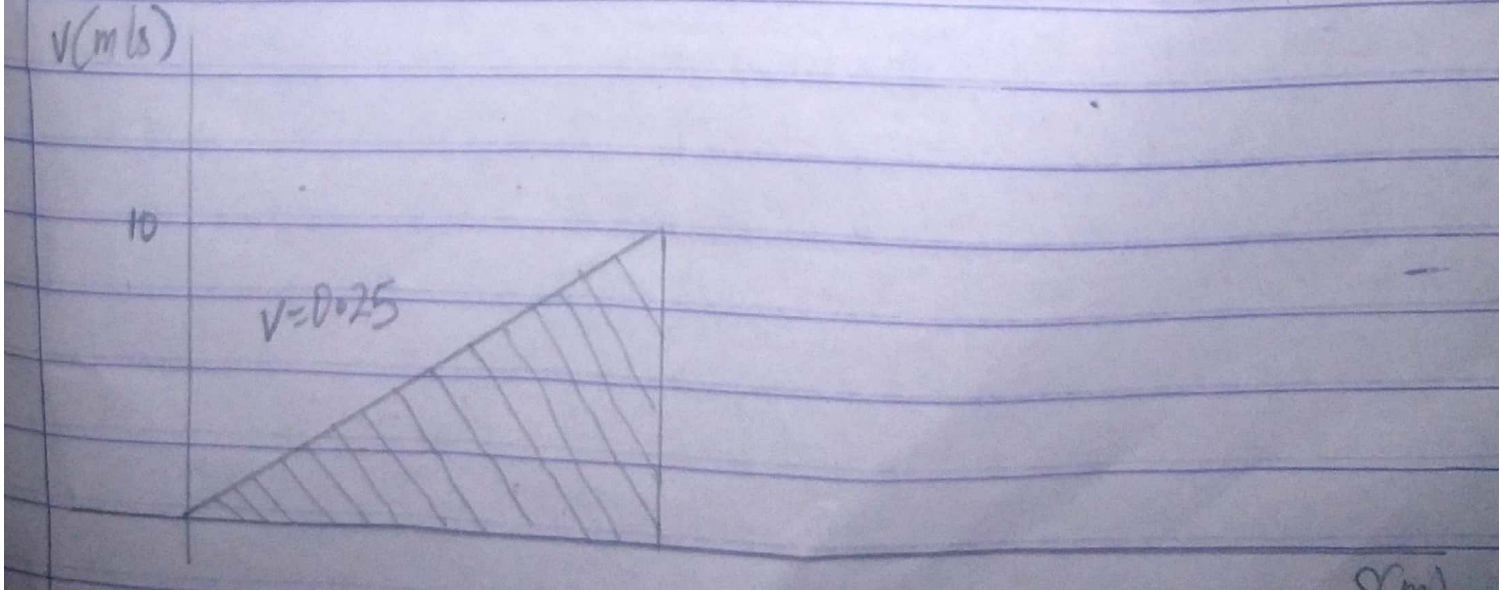
$dv = 0.25ds$

$ads = vdv$

$ads = (0.25s)(0.25ds)$

$a = 0.0625s$





F12-12

$0 \leq t \leq 5$

$s = 3t^2$

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

$v = 6t \text{ m/s}$

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

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

$5 \leq t \leq 10$

$s = 30t - 75$

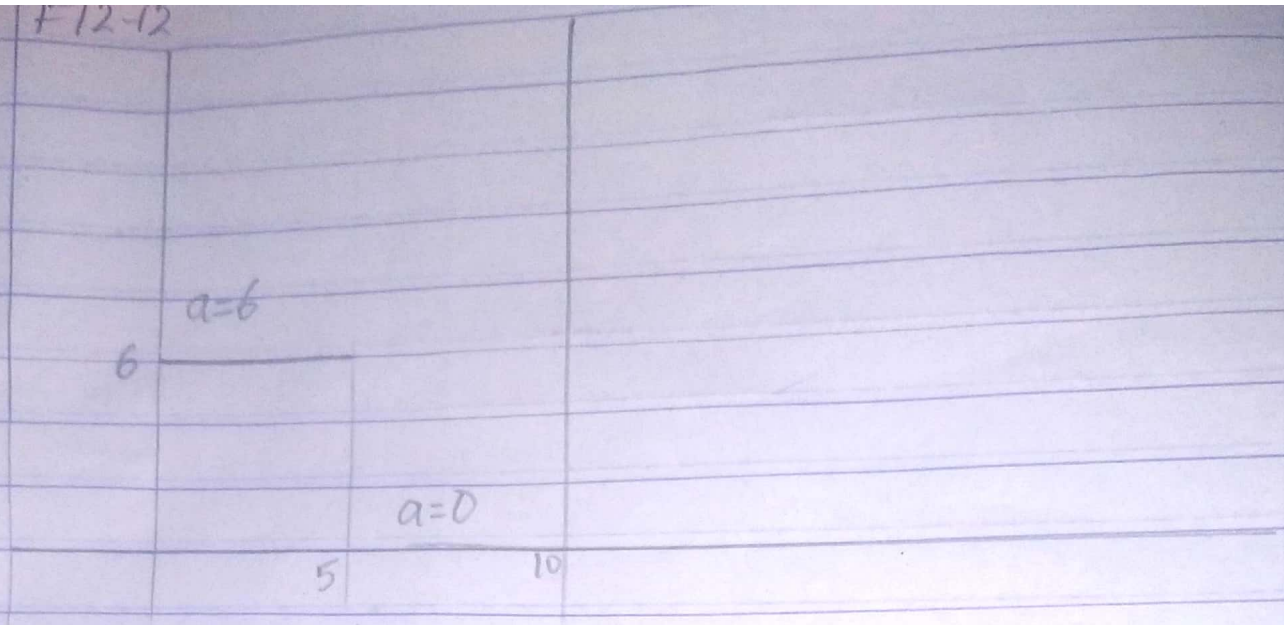
$v = \frac{ds}{dt}$

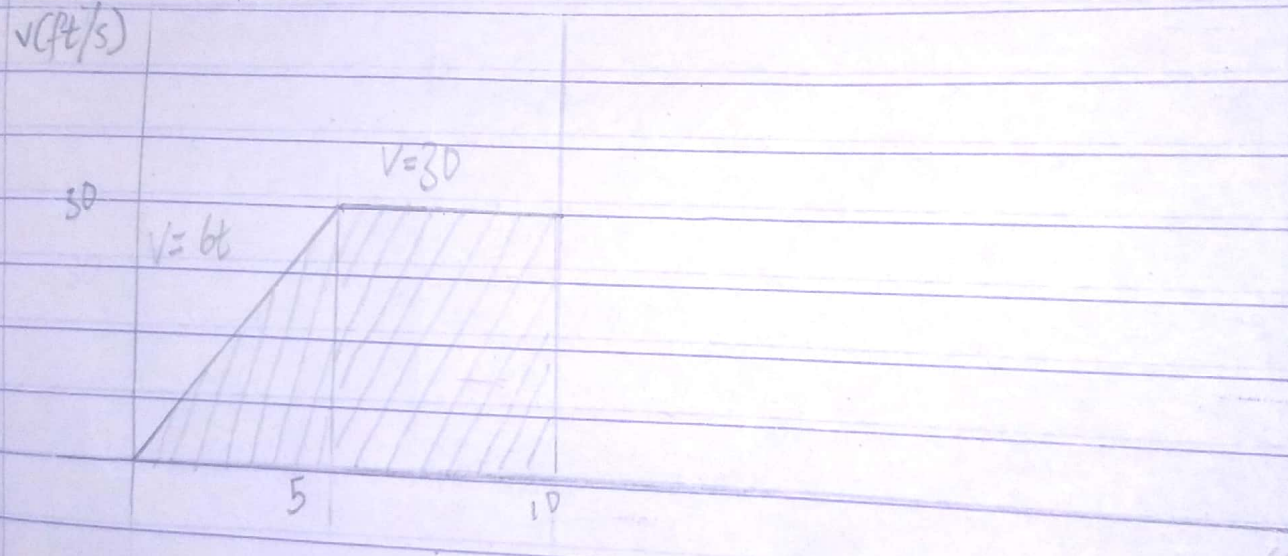
$v = 30 \text{ m/s}$

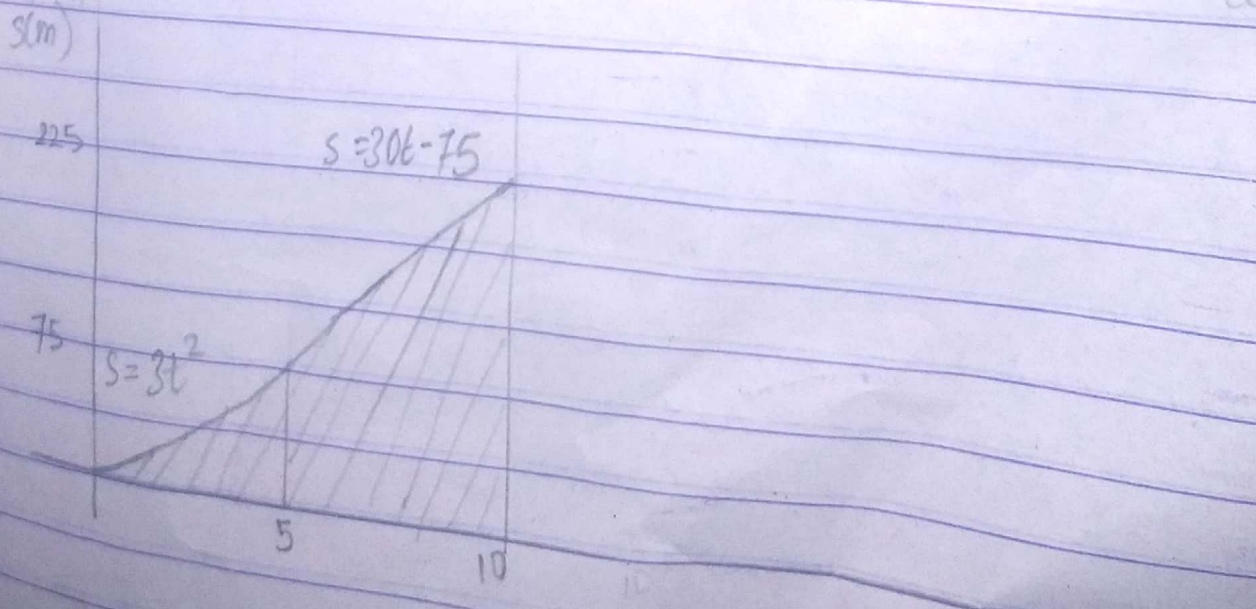
$a = \frac{dv}{dt}$

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

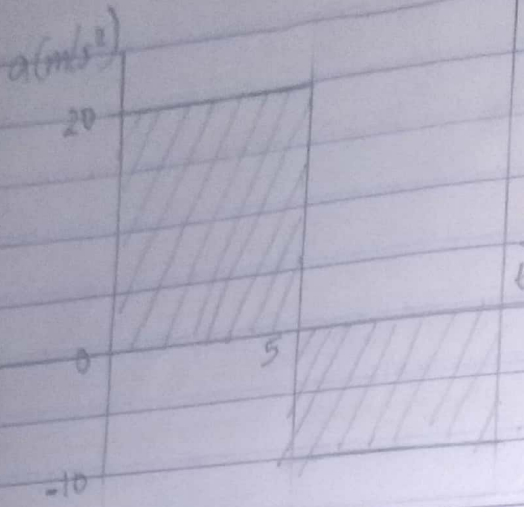
F 12-13

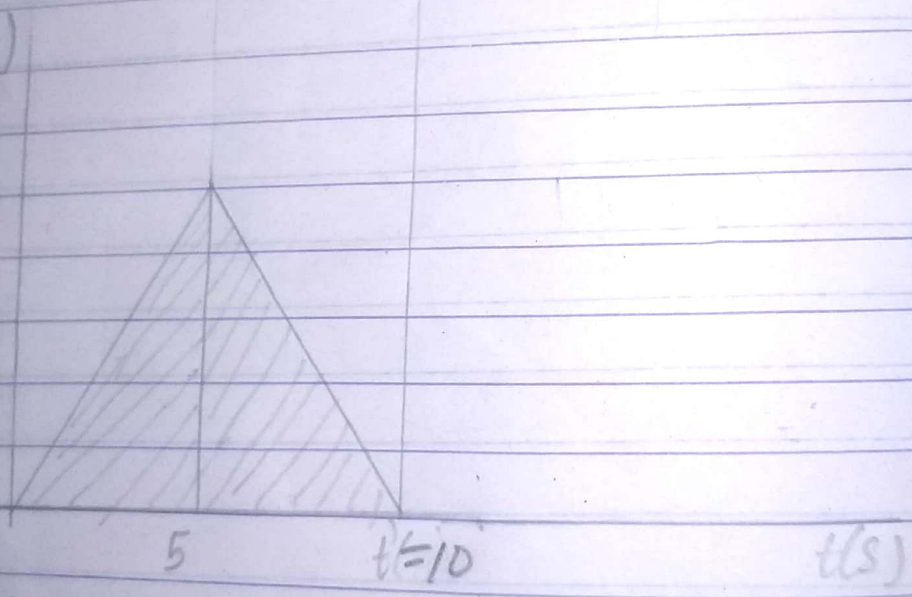






F12-13





To get $t' = 10$

We know that $20 \times 5 = 100 \text{ ft/s}^2$ which is the highest point of acceleration before it starts decelerating

Therefore de-accelerating starts from 100 ft/s^2 (Removing the negative sign of de-acceleration)

$10t' = 100$

$t = 10$

F12-

6

v(ft/s)

50

s(m)

225

75

s=

F12-14