

ABINLIANDE SIMPLA
CIVIL
ISHN6031012

Q) $s = 0.5t^3$
 $\frac{ds}{dt} = 1.5t^2 \text{ m/s}$
 $t = 6 \text{ s}$
 $v = 1.5(6)^2$
 $= 54 \text{ m/s}$
When $s = 108$
 $\frac{ds}{dt} = 0 = v$

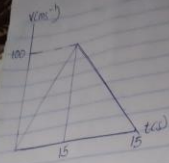
Fig 2.10
 $v = -4t + 80 \text{ ms}^{-1}$
 $a = \frac{dv}{dt} = -4 \text{ ms}^{-2}$
At $t = 20 \text{ s}$, $a = -4 \text{ ms}^{-2}$

Speed
 $\int v dt$
 $\int (-4t + 80)$
 $s = -2t^2 + 80t$
 $s = -2t^2 + 80t$
At $t = 20 \text{ s}$
 $s = 2(20)^2 + 80(20)$
 $= 2(400) + 1600$
 $= 800 + 1600$
 $= 2400 \text{ m}$
 800 m

2.11
 $v = 0.25t$
at $t = 0.25$
 $a = 0.25 \text{ (0.25)}$
 $a = 0.25 \text{ (0.25)}$
at $t = 0.25$
 $a = 0.25 \text{ (0.25)}$
 $a = 0.25 \text{ (0.25)}$
 $a = 0.25 \text{ (0.25)}$

Fig 2.13
 $a = 20 \text{ ms}^{-2}$, $a = 10 \text{ ms}^{-2}$
 $s = \int v dt$
 $\int_0^t v dt = \int_0^t 20t dt$
 $v = 20t$
At $t = 5 \text{ s}$
 $v = 20(5) = 100 \text{ ms}^{-1}$
 $\int_{100}^v dv = \int_5^t -10 dt$
 $v - 100 = -10(t - 5)$
 $v - 100 = -10t + 50$
 $v = -10t + 150$
At $v = 0$
 $0 = -10t + 150$
 $10t = 150$
 $t = 15 \text{ s}$

2.12
Q) $s = 3t^2$
 $v = \frac{ds}{dt} = 6t$
at $t = 6 \text{ s}$
 $v = 6(6)$
 $= 36 \text{ ms}^{-1}$
at $t = 10 \text{ s}$
 $v = 6(10)$
 $= 60 \text{ ms}^{-1}$
Q) $s = 30t - 75$
 $v = \frac{ds}{dt}$
 $v = 30 \text{ ms}^{-1}$



$$v = 30t$$

$$s = \int v dt = \int 30t dt$$

$$= 15t^2$$

$$\text{At } t = 15$$

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

$$= 3375 \text{ m}$$

$$v = -15t + 225$$

$$s = \int v dt$$

$$= -15t^2 + 225t$$

$$\text{At } t = 30 - t_1$$

$$= 30 - 15 = 15 \text{ s}$$

$$= -15(15)^2 + 225(15)$$

$$= 1350 \text{ m}$$

Total distance travelled

$$3375 + 1350$$

$$= 4725 \text{ m}$$