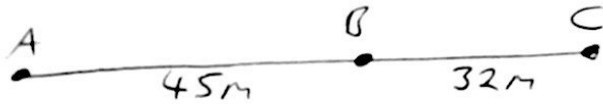


# 5 APP MATHS SOLUTIONS 16/9/19

①



$$\begin{aligned} a &= 2 \\ \underline{A \text{ to } B} \\ t &= 5 \\ s &= 45 \end{aligned}$$

$$\begin{aligned} s &= ut + \frac{1}{2}at^2 \\ 45 &= u(5) + \frac{1}{2}(2)(5)^2 \\ 45 &= 5u + 25 \\ 20 &= 5u \\ 4 &= u \end{aligned}$$

$$\begin{aligned} \underline{A \text{ to } C} \\ u &= 4 \\ a &= 2 \\ s &= 77 \\ t &= ? \end{aligned}$$

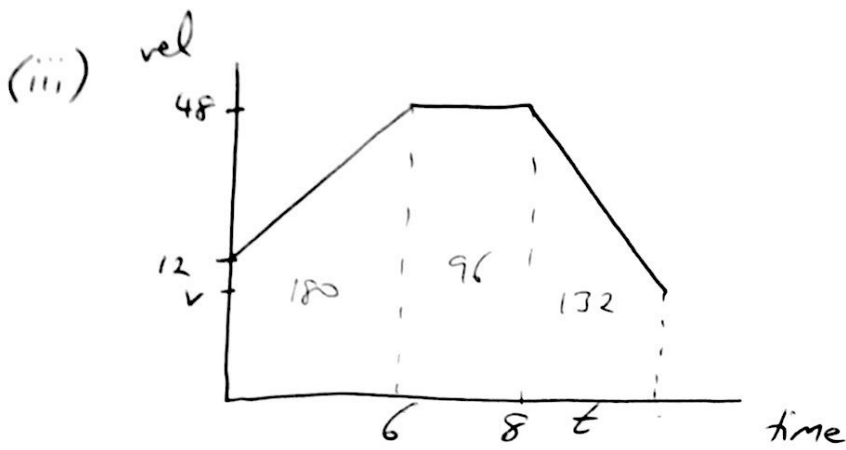
$$\begin{aligned} s &= ut + \frac{1}{2}at^2 \\ 77 &= 4t + \frac{1}{2}(2)t^2 \\ 0 &= t^2 + 4t - 77 \\ 0 &= (t - 7)(t + 11) \\ \boxed{t = 7s} & \text{ or } \cancel{t = -11} \end{aligned}$$

② (i)  $u = 12$   
 $v = 48$   
 $t = 6$   
 $a = ?$

$$\begin{aligned} v &= u + at \\ 48 &= 12 + a(6) \\ 36 &= 6a \\ \boxed{6 \text{ m/s}^2 = a} \end{aligned}$$

(ii)  $s = ?$

$$\begin{aligned} s &= \frac{1}{2}(u + v)t \\ &= \frac{1}{2}(12 + 48)(6) \\ &= \boxed{180 \text{ m}} \end{aligned}$$



(iv) Total distance = 408 m

distance while accelerating = 180 m

distance at constant speed =  $2(48) = 96$  m

$$\therefore \text{distance while decelerating} = 408 - 180 - 96$$

$$= 132 \text{ m}$$

While decelerating

$u = 48$

$a = -7.5$

$s = 132$

$v = ?$

$$v^2 = u^2 + 2as$$

$$= 48^2 + 2(-7.5)(132)$$

$$= 324$$

$$\boxed{v = 18 \text{ m/s}}$$

(v)  $t = ?$

$$v = u + at$$

$$18 = 48 - 7.5t$$

$$7.5t = 30$$

$$t = 4$$

$$\therefore \text{Total time} = 8 + 4 = \boxed{12 \text{ seconds}}$$