

Motion Exercise

(1) 2 min 20 s = 140 s

$d = 200 \text{ m}$, Circumference = $2\pi r = \left(2 \times \frac{22}{7} \times 100\right)$

distance covered: $\frac{140}{240} \times 2 \times \frac{22}{7} \times 100 = 2200 \text{ m}$

displacement = $\frac{140}{40} = 3.5 \text{ rounds} = 200 \text{ m}$

(2) Distance A to B = 300 m, In 2 min 30 Sec or 150 Sec
Average Speed = $\frac{300 \text{ m}}{150 \text{ s}} = 2 \text{ m/s}$

Average velocity = $\frac{\text{Displacement}}{\text{time}} = \frac{300 \text{ m}}{150 \text{ s}} = 2 \text{ m/s}$

A to C Distance = 400 m, in 210 Sec & Displacement = 200 m

Average Speed = $\frac{400}{210} = 1.9 \text{ m/s}$

Average velocity = $\frac{200}{210} = 0.95 \text{ m/s}$

3) Average Speed while going to School = 20 km/h
While returning = 30 km/h

Average Speed of trip = $\frac{2v_1 v_2}{v_1 + v_2} = \frac{2 \times 20 \times 30}{20 + 30}$

Average Speed of trip = 24 km/h

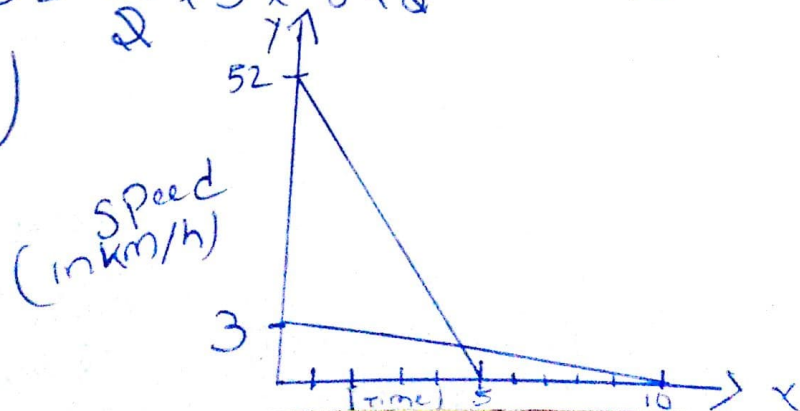
$\rightarrow \frac{1200}{50} = 24 \text{ km/h}$

4) $u = 0$, $a = 3 \text{ m/s}^2$, $t = 8 \text{ s}$

$S = ut + \frac{1}{2} at^2$

$\rightarrow S = \frac{1}{2} \times 3 \times 8 \times 8 = 96 \text{ m}$

5)



- 6) a) B is travelling the fastest.
b) No all were never at the same point.
c) 7 Small unit represent = 4 km

$$\frac{4}{7} = 0.57 \text{ km}$$

$$0.57 \times 5 = 2.85 \text{ km}$$

(d) $0.57 \times 12 = 6.84 \text{ km}$

7) $h \text{ or } S = 20 \text{ m}$ & $a = 10 \text{ m/s}^2$, $u = 0$
 $S = ut + \frac{1}{2}at^2 \Rightarrow 20 = \frac{1}{2} \times 10 \times t^2$

$$\Rightarrow t^2 = \frac{20}{5} = 4 \text{ \& } t = 2$$

$$V = u + at \Rightarrow 0 + 10 \times 2 = 20 \text{ m/s}$$

- 8) a) The car travels = $d = 6 \times 4 = 24 \text{ m}$ in 4 sec
b) From 6 sec to 10 sec graph represent uniform motion of car.