Friday, November 11, 2022 5:00 PM

$$\text{Speed} = \frac{\text{distance}}{\text{Time}}$$

50 km in 2 hours

$$\text{Speed} = \frac{50}{2} = 25 \text{ kmph}$$

$$1 \text{ kmph} = \frac{1 \text{ km}}{1 \text{ hr}} = \frac{5 \cancel{10} \cancel{0} \text{ m}}{\cancel{60} \times \cancel{60}} = \frac{5}{18} \text{ m/s}$$
$$\cancel{3}$$

$$1 \text{ kmph} = \frac{5}{18} \text{ m/s}$$

$$1 \text{ m/s} = \frac{18}{5} \text{ kmph}$$

Relative speed.

$$\text{Rel.} = R_A + R_B$$

$$\text{Rel} = R_A + R_B$$

$$\text{Rel} = R_B - R_A$$

(1) Train crossing a pole / man (negligible length)

distance = length of train.

(2) Train crossing a platform.

distance = length of train + length of platform.

(3) Train crossing another train

Distance = length of train 1 + length of train 2

A train running at the speed of 60 km/hr crosses a pole in 9 seconds. What is the length of the train?

A. 120 m
B. 180 m
C. 324 m
(D.) 150 m

$60 \times \frac{5}{18} = \frac{\text{length}}{9}$

$\text{length} = \cancel{60}^{30} \times \frac{5}{\cancel{18}_{3}} \times \cancel{9} = 150\ m$

A train 125 m long passes a man, running at 5 km/hr in the same direction in which the train is going, in 10 seconds. The speed of the train is:

A. 45 kmph
(B.) 50 kmph
C. 54 kmph
D. 55 kmph

$(x - 5) \times \frac{5}{18} = \frac{125}{10}$

$x - 5 = \frac{\cancel{125}^{25}}{\cancel{10}_{2}} \times \frac{\cancel{18}^{9}}{\cancel{5}_{1}} = 45$

$x = 45 + 5 = 50$ kmph

The length of the bridge, which a train 130 metres long and travelling at 45 km/hr can cross in 30 seconds, is:

A. 200 m
B. 225 m
(C.) 245 m
D. 250 m

$\frac{x + 130}{30} = \cancel{45}^{5} \times \frac{5}{\cancel{18}_{2}}$

$x + 130 = \frac{25}{2} \times 30 = \frac{750}{2} = 375$

$x = 375 - 130 = 245m$

Two trains running in opposite directions cross a man standing on the platform in 27 seconds and 17

Two trains running in opposite directions cross a man standing on the platform in 27 seconds and 17 seconds respectively and they cross each other in 23 seconds. The ratio of their speeds is:

A. 1:3
B. 3:2
C. 3:4
D. 7:6

① speeds = x, y. $a:1 \Rightarrow \frac{3}{2}:1 = 3:2$

lengths or distances = $x \times 27$, $y \times 17$ $\quad 27a, 17$

$27x, 17y$.

$\frac{27x+17y}{23} = x+y$ $\quad \frac{27a+17}{23} = a+1$

$27x+17y = 23x+23y$ $\quad 27a+17 = 23a+23$

$4x = 6y \Rightarrow \frac{x}{y} = \frac{6}{4} = \frac{3}{2}$ $\quad 4a = 6$

$a = \frac{6}{4} = \frac{3}{2}$

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distances or lengths are p, q.

Speeds = $\frac{p}{27}, \frac{q}{17}$

$\frac{p+q}{23} = \frac{p}{27} + \frac{q}{27}$

Req ratio = $\frac{\frac{p}{27}}{\frac{q}{17}} = \frac{p}{q} \times \frac{17}{27}$

Two trains of equal length are running on parallel lines in the same direction at 46 km/hr and 36 km/hr. The faster train passes the slower train in 36 seconds. The length of each train is:

A. 50 m
B. 72 m
C. 80 m
D. 82 m

$\frac{x+x}{36} = (46-36) \times \frac{5}{18}$

$2x = 10 \times 5 \Rightarrow x = \frac{10 \times 5}{2}$

C. 80 m
D. 82 m

50

$\frac{2x}{36} = (10)\frac{5}{18} \Rightarrow \quad \frac{x}{18} = 10 \times \frac{5}{18}$

$x = \cancel{18} \times \frac{10 \times 5}{\cancel{18}} = 50$