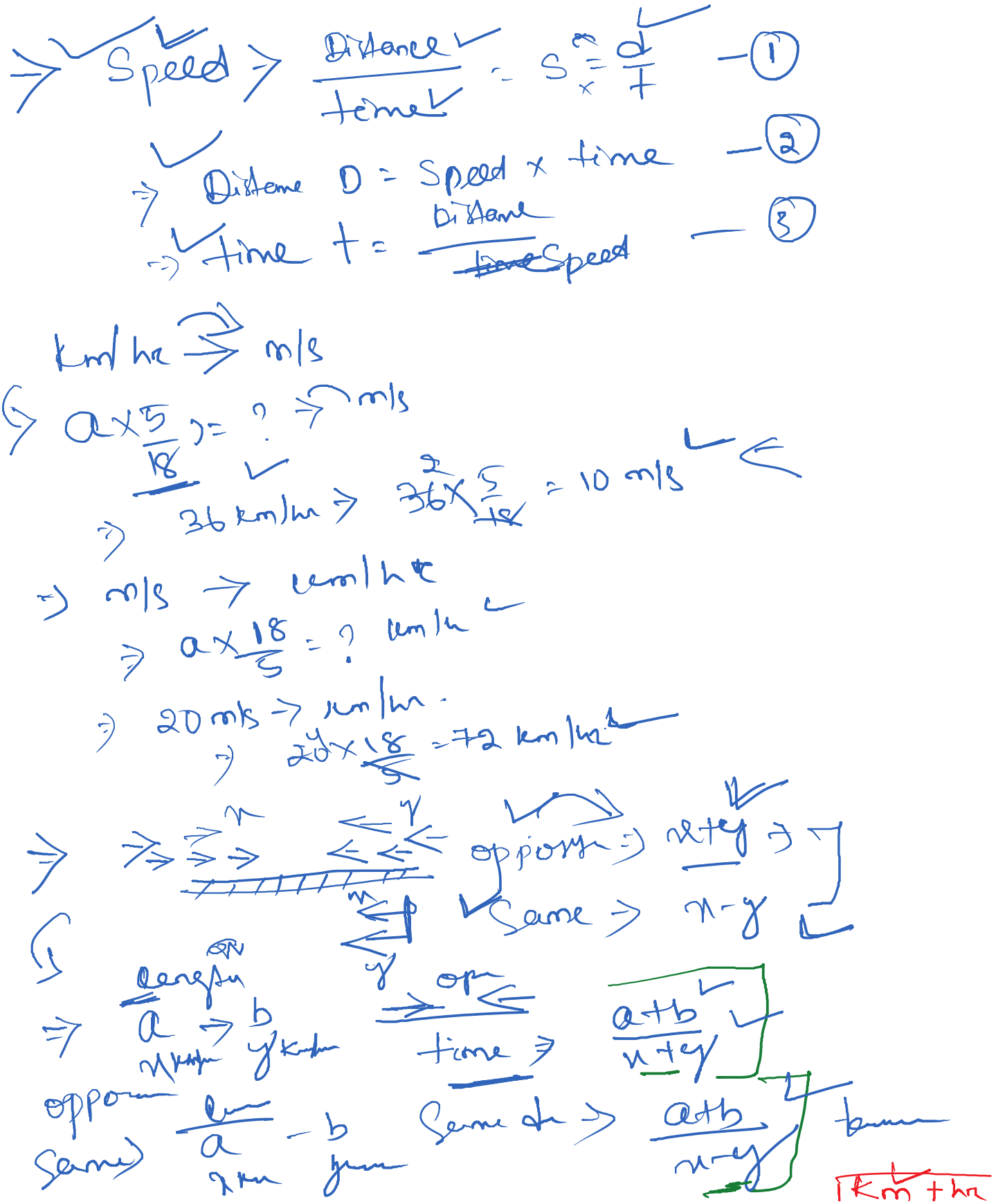
PROBLEMS ON TRAIN



Km + hr
m + sec

A 29 m long train passes a platform which is 100 m long. Find the distance covered by the train in passing the platform

As per the given question the length of the train is 29 m long & the length of the platform is 100 m long

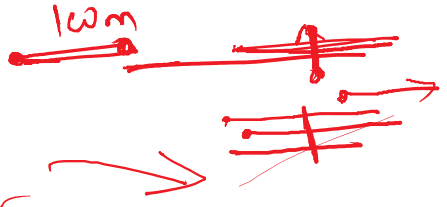
∴ Required distance = length of train + length of platform.

⇒ 29 + 100 = 129 m

100 + 29 ⇒ 129

A train 100 m long is running at the speed of 30 km / hr. Find the time taken by it to pass a man standing near the railway line. (S.S.C. 2001)

As per the given question the length of the train is 100 m long



& the Speed is 30 km/hr

we Convert km/hr to m/s. ⇒ $30 \times \frac{5}{18} = \frac{25}{3}$ m/s

Distance moved in passing the standing man = 100 m

Now we found the

Required time = $\frac{100}{\frac{25}{3}} = 100 \times \frac{3}{25}$ $\left[\because \frac{D}{S}\right]$

= 12 sec

∴ The time taken by train to pass the man is 12 sec

man is 12 sec

Two trains of lengths 80 m and 90 m are moving in opposite directions at 10 m/s and 7 m/s, respectively. Find the time taken by the trains to cross each other

$\frac{x+y}{u+v}$

As per the question

the length of 1st train is 80 m $x=$

& the length of 2nd train is 90 m $y=$

& the speed of the 1st train & second train is $u=10$ m/s & $v=7$ m/s

According to the formula we found the required time of two trains to cross each other.

$\Rightarrow$ Reqd time $= \frac{x+y}{u+v} \Rightarrow \frac{80+90}{10+7}$

$\Rightarrow \frac{170}{17} = 10$ s

$\therefore$ The required time is 10 sec

A train passes a standing man in 6 s and a 210 m long platform in 16 s. Find the length and the speed of the train

According to the question

A train passes a standing man in 6 sec.

& 210 m long platform in 16 sec

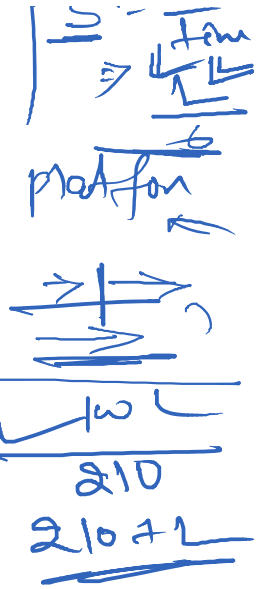
Let the length of the train is L

$S = \frac{D}{time}$

$\Rightarrow$

... crossing a

As the speed while crossing a standing man & while crossing the platform remains same, the



According to the given

$$\Rightarrow \frac{L}{6} = \frac{L+210}{16} \rightarrow$$

$$\Rightarrow 16L = 6L + 1260$$

$$\Rightarrow 10L = 1260$$

$$L = \frac{1260}{10} = 126 \text{ m}$$

The length of the train is 126 m

$\therefore$ The speed of the train

$$\Rightarrow \frac{D}{T} = \frac{126}{6} = 21 \text{ m/s}$$

$\therefore$ The speed of the train is 21 m/s

A goods train runs at the speed of 72 kmph and crosses a 250 m long platform in 26 seconds. What is the length of the goods train ? **(Bank P.O. 2003)**

As per the given question

The speed of the goods train $S = 72$ km/hr.

Now we convert km/h to m/s

$$\Rightarrow 72 \times \frac{5}{18} = 20 \text{ m/s}$$

$\therefore$ The length of the platform is 250 m

The length of the train by to pass the platform is

the time taken by train to pass the platform in 26 sec.

Now we can take

Let the length of the train is $= x\,m^2$

$\frac{250}{x+250}$

∴ According to the question

$\Rightarrow \frac{x+250}{26} = 20 \Leftrightarrow \boxed{S = \frac{D}{Time}}$ — formula.

$\Rightarrow x + 250 = 20 \times 26$

$\Rightarrow x = 520 - 250$

$x = 270$

∴ The length of the train is 270 m

A train 125 m long passes a man, running at 5 kmph in the same direction in which the train is going, in 10 seconds. The speed of the train is : (A.A.O. Exam, 2003)

As per the given question

the length of the train is 125 m

& speed of the train is 5 km/h $\Rightarrow 5 \times \frac{5}{18} = \frac{25}{18}$ m/s

man.

Speed of the train relative to man

$\Rightarrow \frac{125}{10}$ m/s $\Rightarrow \frac{25}{2}$ m/s

Let the speed of the train be x km/h $\Rightarrow x \times \frac{5}{18}$

$\Rightarrow \frac{5x}{18}$ m/s

$x - 25$

Let the speed of the train

$\therefore$ the relative speed $= \frac{5x}{18} - \frac{25}{18}$ $\Rightarrow \frac{5x}{18}$ m/s

$\Rightarrow \frac{5x}{18} - \frac{25}{18} = \frac{25}{2} \Rightarrow$

$\Rightarrow \cancel{\frac{5x - 25}{18}}$ $\frac{5x}{18} = \frac{25}{2} + \frac{25}{18} = \frac{225+25}{18} = \frac{250}{18}$

$\Rightarrow \frac{5x}{18} = \frac{250}{18} = x = \frac{250}{5} = 50$ m/s

$\therefore$ The speed of the train is 50 m/s

Two trains, each 100 m long, moving in opposite directions, cross each other in 8 seconds. If one is moving twice as fast the other, then the speed of the faster train is :

As per the given question

The length of of the two trains each 100 m long

is moving in opposite direction

is crossing each other in 8 sec

Let the speed of slower train be x m/s

Then the speed of faster train be $2x$ m/s

Relative speed $= x + 2x = 3x$ m/s

$\therefore$ According to the given.

$\Rightarrow \frac{100+100}{} = 3x$ $\quad s = \frac{D}{T}$

$\Rightarrow \frac{100+100}{8} = 3x$ $\quad \Leftarrow \left| \; S = \frac{D}{T} \right.$

$\Rightarrow \frac{200}{8} = 3x$

$\Rightarrow x = \frac{200}{8 \times 3} = \frac{25}{3}$ m/s

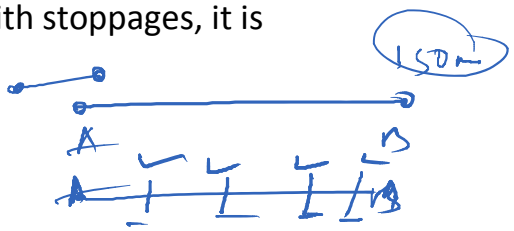
the we found the speed of faster train

$\Rightarrow 2x \Rightarrow 2 \times \frac{25}{3} = \frac{50}{3}$ m/s

$\frac{50}{3} \times \frac{18}{5} = 60$ km/h

$\therefore$ the speed of the faster train is 50/3 m/s or 60 km/h

Without stoppages, the speed of a train is 150 km/h and with stoppages, it is 100 km/h. How many minutes, does the train stop?



As per the given question the train turns without stoppages, the speed of the train is 150 km/h.

& with stoppages its speed of the train is 100 km/h

the difference of speed is 150 − 100 = 50 km

$\therefore$ Time taken to cover 50 km $\left(\text{time} = \frac{D}{\text{Spd}} \right.$

$\Rightarrow \frac{50}{150} = \frac{5}{15}$ hr $= \frac{1}{3}$ hr

$\Rightarrow \frac{1}{3} \times 60 = 20$ min

$\Rightarrow \frac{1}{3} \times 60 = 20$ min

$\therefore$ The time taken to cover 20 km is 20 min