Problems on trains.

distance = speed × time

$T = D/S$.

$S = D/T$,

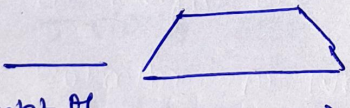
1) 2 trains lenght 126m and 119m towards each other speed is 12m/s and 23m/s. time needed by the trains to cross each other?

$$\text{time} = \frac{\text{distance}}{\text{time}}$$

$$= \frac{126+119}{12+23}.$$

$$= \frac{245}{35} \Rightarrow 7s$$

2) tram passes pole in 8seconds. tram crosses bridge (200m) in 28 seconds. lenght and speed of tram?



$$\frac{D}{T} = \frac{D}{T}.$$

$$\frac{D}{8} = \frac{200+D}{28}.$$

$$28D = 1600 + 8D.$$

$$D = 80m$$

$S = D/T$.

$= 80/8$

$= 10m/s$

3) Tram lenght 150m passes a platform of 250m lenght in 56 seconds. Time required to pass 270m lenght?

distance = lenght of tram + lenght of platform.

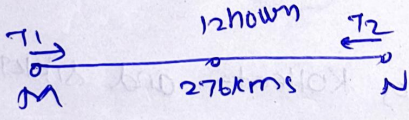
$$\frac{D}{T} = \frac{D}{T}$$

$$\frac{150+550}{56} = \frac{150+250}{T}$$

$$T \times 700 = 56 \times 400$$

$$T = 32$$

4) M and N are 276kms apart. A tram from M and other from N comming towards each other. meet after 12hours. Tram from M to N is slower by 14km/hr. speed of slower tram?



$$D_1 + D_2 = 276.$$

$$12x + (x+14)12 = 276.$$

$$12x + 12(x+4) = 276\ 23$$

$$2x + 14 = 23.$$

$$x = 9/2$$

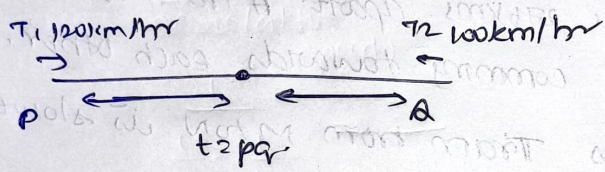
$$= 4.5 \text{km/hr}.$$

5) From p and q tram starts moving towards each other. speeds are 120km/hr and 100km/hr. when two trams meet each other, one tram has covered 40km more than other tram. Find distance between p and q?

1 hr = T_1 = 120km
T_2 = 100km
→ 20.

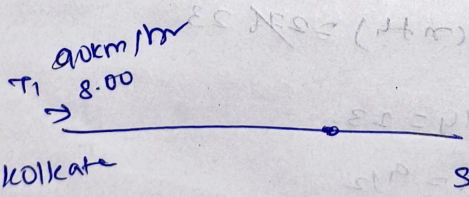
$DT_1 + DT_2 = PQ$.

2 hour = T_1 = 240
T_2 = 200.
→ 40km s.



$PQ = (100 \times 2) + (120 \times 2)$
$= 440km$

6) Two trams A and B leaves Kolkata and Sikkim at 8.00pm and 8.30pm and run at 90km/hr and 120km/hr. At what distance two trams will meet?



T2
→
120km/hr
8.30pm.

$S \times T2 = S \times T$.
↳ half an hour less

$90 \times T = 120 \times (T - 0.5)$

$\frac{3}{90T} = \frac{4}{120} \times (T - 0.5)$

$3T = 4T - 2 \Rightarrow T = 2hrs$.

7) tram overtakes two boys running at speed of 8km/hr and 16km/hr in the same direction as tram. the tram completely passes them in 36s and 40s. lenght of tram=?

$S_1 \times T_1 = S_2 \times T_2$

$(S-8) \times \frac{36}{60\times60}$ (seconds to hours) $= (S-16) \times \frac{40}{60\times60}$.

$S/8 \quad 9S - 72 = 10S - 160.$

$S = 88 \text{ km/hr}$

sub value of S:

$= (88-16) \times \frac{40}{60\times60}$.

$= \frac{72\times40}{60\times60}$

$= 4/5 \rightarrow 0.8\text{km} \Rightarrow 800\text{m}$

8) with stoppage, the speed of tram is 36km/hr however without stoppage it is 40km/hr. find out how many minutes does the tram stop/hour?

1hour

36km/hr

40km/hr] 4km.

$T = D/S.$

$= \frac{4}{40\text{km}}$ hr.

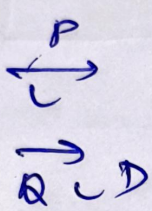
1hr → 60min

1/10 → ?

$= \frac{60\times1}{10}$

= 6mins

P and Q moving in same direction. equal length and cross pole in 5s and 6s. In how much time would they cross each other?



$S = D/T$

$S_1 = L/5$

$S_2 = L/6$.

relative speed (moving trains) $= \frac{L}{5} - \frac{L}{6}$.

$T = \frac{D}{S(\text{relative speed})}$

$= \frac{2L}{\frac{L}{5} - \frac{L}{6}} \Rightarrow \frac{2L}{L/30}$.

$= \frac{2L \times 30}{L}$

$= 60$ s