

B to C

$$D = 100 \text{ m}$$

$$T = 10 \text{ sec}$$

$$S = \frac{100}{10} \text{ m/sec}$$

A to B

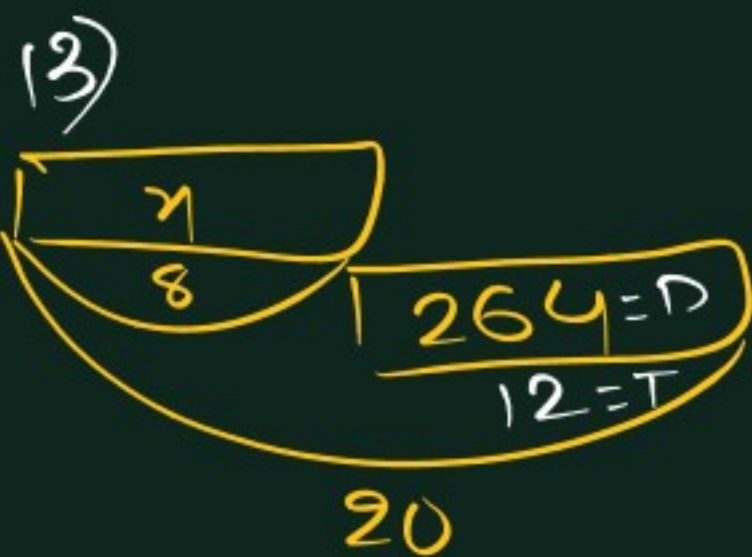
$$D = 8$$

$$T = 15 \text{ sec}$$

$$S = 10 \text{ m/sec}$$

$$D = 150 \text{ m}$$

10	$\times 10$	100
15	$\times 10$	150

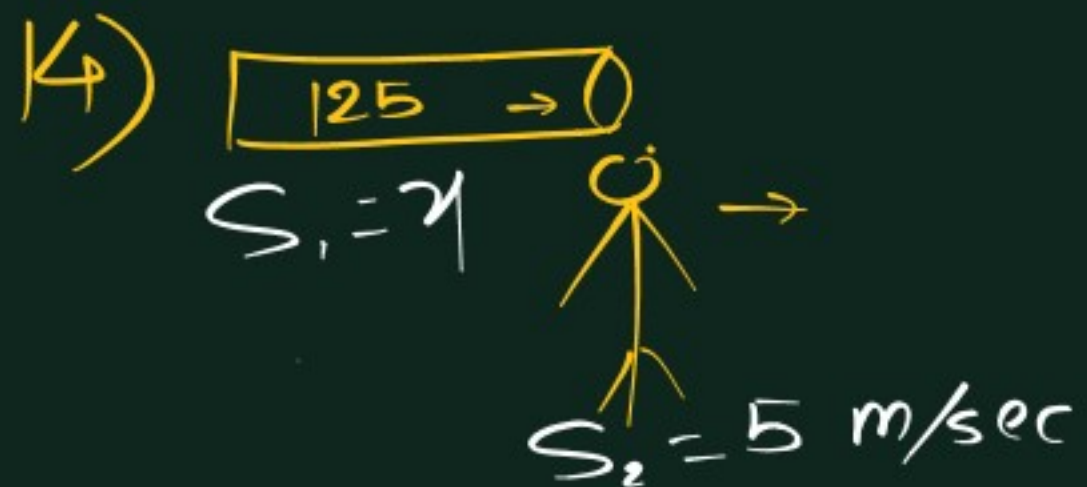


$$D = 264$$

$$T = 12$$

$$S = 22 \text{ m/sec}$$

$$S = 22 \times \frac{18}{5} = 79.2 \text{ kmph}$$



$$D = 125 \text{ m}$$

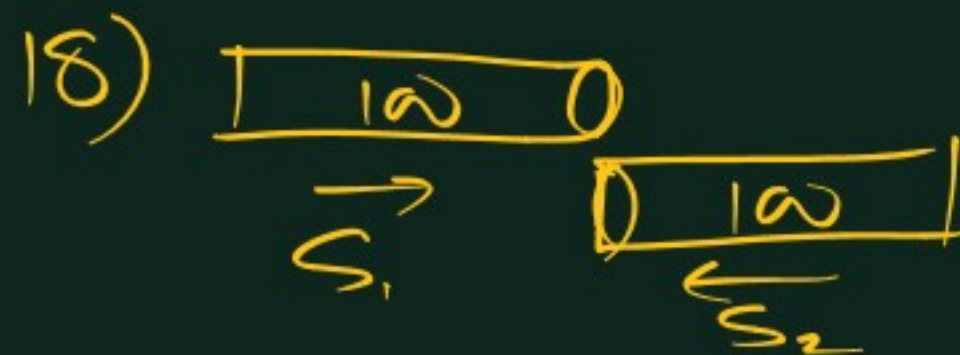
$$T = 10 \text{ sec}$$

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

$$\lambda - 5 = \frac{125}{10} = 12.5$$

$$\lambda = 17.5 \text{ m/sec}$$

$$S_1 = \lambda = 17.5 \times \frac{18}{5} = \underline{63 \text{ kmph}}$$



$$D = 200 \text{ m}$$

$$T = 8 \text{ sec}$$

$$S_1 + S_2 = \frac{200}{8} = 25 \text{ m/sec}$$

$$S_1 + S_2 = 90 \text{ kmph} \leftarrow \boxed{\times 18 \times 5}$$

$$\frac{S_1}{S_2} = \frac{1}{2}$$

$$S_1 = 30$$

$$\boxed{S_2 = 60}$$



22)

$$\boxed{\frac{1}{4} = 0.25} \quad \underline{3\frac{1}{2} = \frac{7}{2} = 3.5}$$

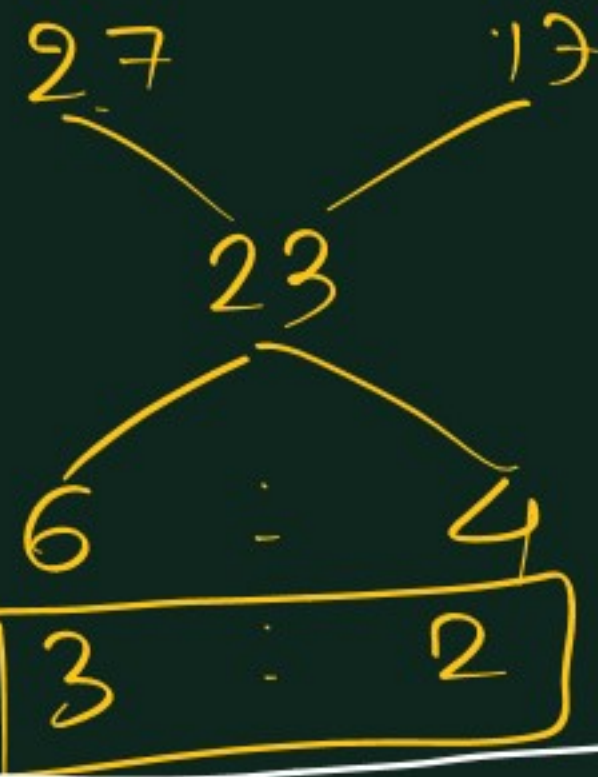
$$D = 0.25 + 3.50 = 3.75 \text{ miles}$$

$$S = 75 \text{ mph}$$

$$T = \frac{D}{S} = \frac{3.75}{75} = 0.05 \text{ hrs}$$

$$T = 0.05 \times 60 = \boxed{3 \text{ min}}$$

23)



25)

$$D = 999$$

$$S = 55.5$$

$$\boxed{\text{Time} = 1.20 \text{ am}}$$

$$T = \frac{999}{55.5} = 18 \text{ hrs}$$

$$\text{Total} = (18) + [1.20 \text{ min}] = \underline{19 \text{ hr } 20 \text{ min}}$$

$$28) S_1 = 11 \text{ m} \quad S_2 = 7 \text{ m}$$

$$T_1 = y = \underline{\underline{14}} \quad T_2 = \underline{\underline{22}}$$

$$\underline{S_1 \times T_1 = S_2 \times T_2}$$

$$11 \times y = 7 \times \underline{\underline{22}}$$

$$y = 14$$

$$26) \frac{L_1}{L_2} = \frac{5}{3} = \frac{P_1}{P_2} \quad \frac{S_1}{S_2} = \frac{6}{5}$$

$$\frac{T_1}{T_2} = \frac{\left(\frac{5}{6}\right)}{\left(\frac{3}{5}\right)} = \frac{5}{6} \times \frac{5}{3} = \frac{25}{18}$$

$$29) \begin{array}{l} D = 3584 \quad T = 56 \text{ hr} \quad S = 64 \text{ km/hr} \\ \text{1440 km} \quad \text{1608 km} \quad \text{1536 km} \\ \text{24 hr} \quad \text{24 hr} \quad \text{18 hr} \\ S_3 = 67 \text{ km/hr} \end{array}$$

$$S_3 - S = 67 - 64$$

$$= \boxed{3 \text{ km/hr}}$$



Still Water

$$S = \text{speed of Boat}$$



$$\begin{aligned}\text{Speed of Boat} &= 20 \text{ kmph} \\ \text{Time} &= 5 \text{ hr} \\ D &= 20 \times 5 = 100 \text{ km}\end{aligned}$$

## BOAT & STREAM

Flowing Water

Downstream

$$S = \text{Speed of (Boat + Stream)}$$



$$\begin{aligned}\text{Speed of Boat} &= 20 \text{ kmph} \\ \text{Speed of stream} &= 5 \text{ kmph} \\ \text{Eff SP} &= 25 \text{ kmph} \\ T &= 5 \text{ hr}\end{aligned}$$

$$D = 125 \text{ km}$$

Upstream

$$S = \text{Speed of (Boat - Stream)}$$



$$\begin{aligned}\text{Speed of Boat} &= 20 \text{ kmph} \\ \text{Speed of stream} &= 5 \text{ kmph} \\ \text{Eff S} &= 20 - 5 = 15 \text{ kmph} \\ T &= 5 \text{ hr} \\ D &= 15 \times 5 = 75 \text{ km}\end{aligned}$$



$$\text{Boat} = 15 \text{ kmph}$$

$$\text{Stream} = 3 \text{ kmph}$$

$$\rightarrow \text{Down} = 18 \text{ kmph}$$

$$\rightarrow \text{UP} = 12 \text{ kmph}$$

$$\checkmark \text{ Boat} = \frac{\text{Down} + \text{UP}}{2}$$

$$\checkmark \text{ Stream} = \frac{\text{Down} - \text{UP}}{2}$$

$$\text{Boat} = x$$

$$\text{Stream} = y$$

$$\text{Down} = x + y = 25 \text{ km}$$

$$\text{UP} = x - y = 3 \text{ kmph}$$

$$x = \text{Boat} = \frac{25 + 3}{2} = 14$$

$$y = \text{Stream} = \frac{25 - 3}{2} = 11$$

$$\frac{\text{Down}}{\text{UP}} = \frac{5x}{3x} = \frac{25}{15}$$

$$\text{Boat} = 20 \text{ kmph} \quad \text{St} = r = 5 \text{ kmph}$$

$$\frac{8x}{2} = 20 \mid 4x = 20 \quad (x = 5)$$

$$\checkmark \text{ Down} = 15$$

$$\checkmark \text{ UP} = 7$$

$$\text{Boat} = \frac{15 + 7}{2} = 11$$

$$\text{Stream} = \frac{15 - 7}{2} = 4$$

$$\frac{B}{S} = \frac{5}{2} = \frac{20}{8}$$

$$\text{Down} = 28 \quad \text{UP} = 12$$