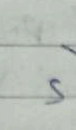
Boat & Streams

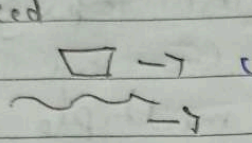


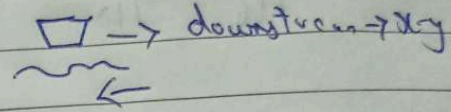
$D = S \times T$ $S = D/T$

$T = D/S$

we need to calculate speed of river + speed of boat

Speed





1) what will be the boat speed in still water & speed of river, if the boat takes 12 hrs to row 48 Km upstream and 8 hrs to row the same in down stream

$U_s = S = \frac{D}{T} = \frac{48}{12} = 4\ Km/h.$ $D_s = \frac{48}{8} = 6\ Km/h$

$x - y = 4$ — ①

$x + y = 6$ — ②

$x - y + x + y = 10$

$x = 5\ Km/h$ boat

$y = 1\ Km/h$ river

2] Simran takes twice as long to swim up as to swim down the river has a speed of 12 Km/h. in still water. what is river's sp..

$x = 12$

$T_U = 2T_D$

$\frac{D}{x+y} = 2 \times \frac{D}{x+y}$

$3y = 2$

$3y = 12$

$y = 4$

3] It takes P 1hr to row to a place and to come back. If the river is running at 2.4 Km/hr and P has a speed of 12 Km/hr in still water, what distance is place from P's starting Point

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

$T_U + T_D = 1$

$\frac{D}{x-y} + \frac{D}{x+y} = 1$

$\frac{14.4D + 9.6D}{9.6 * 14.4} = 1$

$D = 5.76$ Km

4.) An ocean current flows at a rate of 1.5 Km/h. A shark can swim in still water at rate 4.5 Km/hr. what is the average speed for entire distance travelled, if shark swim from India to australia

$$\text{Avg} = \frac{\text{Total D}}{\text{T.T}} = \frac{2D}{\text{T.T}} = \frac{D+D}{\text{T.T}}$$

$$\text{T.T} = \frac{D}{3} + \frac{D}{6} = \frac{D}{2}$$

$$2D / D/2 = 4 \text{ Km/hr}$$

$x+y=6$
$x-y=3$

5.) Ajay takes 4hrs more while upstreaming the downstream. His speed in still water is 10 Km/hr. The speed of stream is 2 Km/hr. what is the distance

$$\text{TU} = 4 + \text{hr}$$

$$\frac{D}{x-y} = 4 + \frac{D}{x+y}$$

$$\frac{D}{8} = 4 + \frac{D}{12}$$

$$D = 96 \text{ Km}$$

$x+y=12$
$x-y=8$

6.) Raj ... 14 Km ... of ...

7.)

6) Ray swims 26 km downstream in some time as 14 km upstream. what is his speed if speed of river is 3 km/h.

$$T = T$$

$$\frac{D_u}{S_u} = \frac{D_D}{S_D}$$

$$\frac{14}{x-y} = \frac{26}{x+y}$$

$$40y = 12x \qquad \frac{x}{y} = \frac{10}{3} \qquad y = 3$$

$$\frac{x}{3} = \frac{10}{3} \Rightarrow x = 10 \text{ Km/h}$$

7) Ratio of Guddi's swimming speed in still water to speed of river is 7:1. She swims 4.2 Km up the river in just 14 min. How much time will Guddi take to swim 15.9 Km down the ri

$$x : y = 7 : 1 \qquad \frac{x}{y} = \frac{7}{1} \qquad x = 7y$$

$$D = 4.2 \text{ Km}$$

$$T = 14 \text{ min}$$

$$v_s = \frac{D}{T} = \frac{4.2}{14} = 0.3 \text{ Km/h}$$

$$x - y = 0.3$$

$$7y - y = 0.3 \qquad y = 0.05 \text{ Km/min}$$

$$x = 7y = 0.35 \text{ Km/min}$$

Downstream

$D = 18.4$ km $S : x+y$

0.35 to 0.05

0.40 km/h.

$T_D = D/S = \frac{18.4}{0.4} = 46$ min

8.) Find the ratio of swimming speed of Ray in still water to speed of river if ratio of time taken to go 10 km upstream to time taken to go 10 km downstream 11 : 5

$$\frac{T_U}{T_D} = \frac{11}{5} \qquad \frac{D/S_U}{D/S_D} = \frac{11}{5}$$

$$\frac{10/x-y}{10/x+y} = \frac{11}{5} : \frac{x+y}{x-y} = \frac{11}{5}$$

$$\frac{x}{y} = \frac{8}{3}$$

9.) Ray swims for 6½ hours while going 24 km downstream and 36 km upstream. But he takes 6 hours to swim 36 km down stream and 24 km upstream. what is rate of river flow?

$T_D + T_U = 6\frac{1}{2} = 13/2$ $\quad T_D + T_U = 6$

$\frac{24}{DS} + \frac{36}{US} = \frac{13}{2}$ $\quad \frac{36}{DS} + \frac{24}{US} = 6$ — (B) $\times 3$

$\frac{48}{DS} + \frac{72}{US} = 13$ — (A) $\quad \frac{108}{DS} + \frac{72}{US} = 18$

$\frac{108}{DS} + \frac{72}{US} - \frac{48}{US} - \frac{72}{US} = 18 - 13$ $\quad \frac{48}{12} + \frac{72}{US} = 13$

$DS = 12\,km/h$ $\quad 4 + \frac{72}{US} = 13$

$US = 8$

$x + y = 12$

$x - y = 8$

$2x = 20$ $\quad x = 10$

$y = 2$