Boats and Streams: 8 Important Shortcuts & Tricks Explained with Examples

Stream: Moving water of the river is called stream.
Still Water: If the water is not moving then it is called still water.
Upstream: If a boat or a swimmer moves in the opposite direction of the stream then it is called upstream.
Downstream: If a boat or a swimmer moves in the same direction of the stream then it is called downstream.

Points to remember

i. When speed of boat or a swimmer is given then it normally means speed in still water.
ii. If speed of boat or swimmer is x km/h and the speed of stream is y km/h then,
Speed of boat or swimmer upstream = (x − y) km/h
Speed of boat or swimmer downstream = (x + y) km/h
iii. Speed of boat or swimmer in still water is given by
= 1/2(Downstream + Upstream)
Speed of stream is given by
= 1/2(Downstream - Upstream)

Some Shortcut Methods

Trick-1:

A man can row certain distance downstream in t1 hours and returns the same distance upstream in t2 hours. If the speed of stream is y km/h, then the speed of man in still water is given by

= y*(t2 + t1) / (t2 - t1)

Ex: A man can row certain distance downstream in 2 hours and returns the same distance upstream in 4 hours. If the speed of stream is 5 km/h, then the speed of man in still water ?
a. 15 b. 10 c. 12 d. 20
Sol: = 5*(4+2)/(4-2) = 15 km/hr

Trick-2:

A man can row certain distance downstream in t1 hours and returns the same distance upstream in t2 hours. If the speed of stream is y km/h, then the speed of man in still water is given by

= y*(t2 - t1) / (t2 + t1)

Ex : Ramesh can row a certain distance downstream in 6 hours and returns the same distance in 9 hours. If the speed of Ramesh in still water is 12 kmph. Find the speed of the stream?

a. 2.4 b. 10 c. 1.2 d. 20

Sol : Speed of the stream =

12 (9-6) /(9+6)

= 2.4 kmph

Trick-3:

A man can row in still water at x km/h. In a stream flowing at y km/h, if it takes him 't' hours to row to a place and come back, then the distance between two places is given by

= [t*(x^2 - y^2)]/(2 * x)

Ex: A man can row in still water at 4 km/h. In a stream flowing at 2 km/h, if it takes him '5' hours to row to a place and come back, then the distance between two places ?

a. 15 b. 10 c. 12 d. 7.5

Sol : [5*(16-4)]/(2*4)=7.5 km

Trick-4:

A man can row in still water at x km/h. In a stream flowing at y km/h, if it takes t hours more in upstream than to go downstream for the same distance, then the distance is given by

= [t*(x^2 - y^2)]/(2 * y)

Ex: A man can row in still water at 4 km/h. In a stream flowing at 2 km/h, if it takes 3 hours more in upstream than to go downstream for the same distance, then the distance swims by person ?

a. 15 b. 9 c. 12 d. 7.5

Sol : [3*(16-4)]/(2*2)=9 km

Trick-5:

A man can row in still water at x km/h. In a stream flowing at y km/h, if he rows the same distance up and down the stream, then his average speed is given by

= (x^2 - y^2)/x

= (Downstream * Upstream)/man speed in still water.

Ex: A man can row in still water at 4 km/h. In a stream flowing at 2 km/h, if he rows the same distance up and down the stream, then his average speed ?

a. 6 b. 9 c. 3 d. 7.5

Sol : (16-4)]/4 = 3 km/hr

Trick-6:

A man can row a distance 'D' upstream in t1 hrs. If he rows the same distance down the stream in t2 hrs. then speed is given by

Stream speed = [D*(t1-t2)]/(2*t1*t2)

Ex: A man can row a distance 30 km upstream in 5 hrs. If he rows the same distance down the stream in 3 hrs. then speed of stream ?

a..8 b. 4 c. 2 d. 6

Sol : [30*(5-3)]/(2*5*3)= 2 km/hr

Trick-7:

A man can row a distance 'D' upstream in t1 hrs. If he rows the same distance down the stream in t2 hrs. then speed is given by

Man speed = [D*(t1+t2)]/(2*t1*t2)

Ex: A man can row a distance 30 km upstream in 5 hrs. If he rows the same distance down the stream in 3 hrs. then speed of man ?

a. 8 b. 4 c. 2 d. 6

Sol : [30*(5+3)]/(2*5*3)= 8 km/hr