

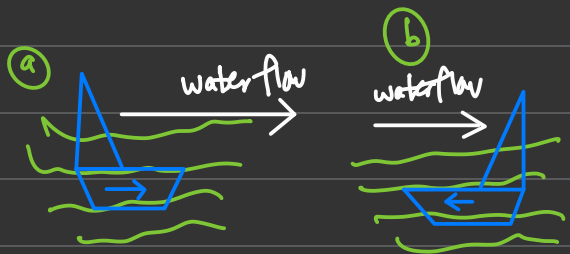
31 Jan 2023

Concept of Circular Motion :

- Circular motion is described as a movement of an object while rotating along a circular path.
- It can be Uniform or Non-Uniform.
- During non-uniform, rate of rotation keeps changing.

$$v = \frac{ds}{dt}$$

Boats & streams:



Let the speed of boat in still water = x
Speed of stream = y

(a) \therefore Along the stream (Downstream): Speed of boat = $x + y$

(b) Against the stream (Upstream): Speed of boat = $x - y$

(c) If Downstream Speed, a , and upstream speed, b are given,
then Speed of Boat ' x ' = $\frac{a+b}{2}$ Speed of 'y' = $\frac{a-b}{2}$
Stream

eg: A train 125m long passed a man, running at 5 km/hr in the same direction in which the train is going, in 10 secs. The speed of train is:

$$D = ST$$

Soln:

Speed of train relative to man - $\left(\frac{125}{10} \right) \text{ m/s}$

$$= \frac{25}{2} \text{ m/s}$$

$$= \left(\frac{25}{2} \times \frac{18}{5} \right) \text{ km/hr}$$

$$= 45 \text{ km/hr.}$$

Let the speed of train be x km/hr. Then, relative speed = $(x - 5)$ km/hr

$$x - 5 = 45$$

$$\therefore \boxed{x = 50 \text{ km/hr}}$$

eg: A man rows a certain distance downstream in 5 hrs & back to same point in 8 hrs. If the speed of stream is 9 km/hr then what is the speed of man in still water?

Soln: Time in DS = 5 hrs
Time in US = 8 hrs
Speed of Stream = 9 km/hr



Let the speed of man in still water be x km/hr

Downstream speed = $(x+9)$ km/hr

Upstream speed = $(x-9)$ km/hr

Dist = Speed \times Time

$$(x+9) \times 5 = (x-9) \times 8$$

$$\therefore \boxed{x = 39 \text{ km/hr}}$$

Data Interpretation:

<https://www.toppr.com/guides/quantitative-aptitude/data-interpretation/>

Continuous = Numerical eg: Price, Age, Salary, etc.

Discrete = Categorical eg: Gender, Car Brand, Hair color, etc.

