

BOATS AND STREAMS

1. A boatman can row a certain distance down the stream in 2 hours and can row the same distance up the stream in 3 hours. If the velocity of the stream is 4km/hr, what is the speed of the boat in still water?
A. 12km/hr
B. 40km/hr
☒ C. 20km/hr
D. 8km/hr
2. A man can row $9\frac{1}{3}$ km/hr in still water. He finds that it takes thrice as much time to row upstream as to row downstream (same distance). Find the speed of the current.
A. $3\frac{1}{3}$ km/hr
B. $1\frac{1}{4}$ km/hr
☒ C. $4\frac{2}{3}$ km/hr
D. $3\frac{1}{9}$ km/hr
3. A boat travels from A to B along the stream and from B to A against the stream in 3 hours. If the velocity of the boat in still water is 4 km/hr, what is the distance between A and B?
A. 8 km
B. 10 km
C. 12 km
☒ D. Data insufficient
4. A motorboat travels 16 km in 2 hours against the flow of river and travels next 8 km along the flow of the river in 20 minutes. How long will it take motorboat to travel 48 km in still water?
A. 2.5 hours
☒ B. 3 hours
C. 3.5 hours
D. 4 hours
5. A boat running upstream takes 9 hours 48 minutes to cover a certain distance, while it takes 7 hours to cover the same distance running downstream. What is the ratio between the speed of the boat and speed of the water current respectively?
A. 5:2
B. 7:4

☒ C. 6:1

D. 8:3

6. Speed of a boat in standing water is 9 kmph and the speed of the stream is 1.5 kmph. A man rows to a place at a distance of 105 km and comes back to the starting point. The total time taken by him is:

A. 16 hours

B. 18 hours

C. 20 hours

☒ D. 24 hours

7. In one hour, a boat goes 11 km/hr along the stream and 5 km/hr against the stream. The speed of the boat in still water (in km/hr) is:

A. 3km/hr

B. 5km/hr

☒ C. 8km/hr

D. 9km/hr

8. A man takes twice as long to row a distance against the stream as to row the same distance in favour of the stream. The ratio of the speed of the boat (in still water) and the stream is:

A. 2 : 1

☒ B. 3 : 1

C. 3 : 2

D. 4 : 3

8. If a man rows at the rate of 5 kmph in still water and his rate against the current is 3.5 kmph. then the man's rate along the current is

A. 4.25 kmph

B. 6 kmph

☒ C. 6.5 kmph

D. 8.5 kmph

9. The time taken by a man to row his boat upstream is twice the time taken by him to row the same distance downstream. If the speed of the boat in still water is 42 kmph, find the speed of the stream?

A. 12 kmph

B. 13 kmph

☒ C. 14 kmph

D. 15 kmph

10. A man can row 30 km downstream and 20 km upstream in 4 hours. He can row 45 km downstream and 40 km upstream in 7 hours. Find the speed of man in still water?

A. 15 kmph

B. 10 kmph

C. 12 kmph

☒ D. 12.5 kmph

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$$1) \quad T_d = 2 \text{ hr}$$

$$T_u = 3 \text{ hr}$$

$$y = 4 \text{ km/h}$$

$$x = ?$$

$$\text{Distance} = \text{Speed} \times \text{Time}$$

$$2x(x+y) = 3x(x-y)$$

$$2x(x+4) = 3(x-4)$$

$$2x+8 = 3x-12$$

$$x = 20 \text{ km/h}$$

$$2) \quad x = 9 \frac{1}{3} = \frac{28}{3} \text{ km/h} ; y = ?$$

$$T_{up} = 3 T_{down}$$

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\frac{x}{x-y} = 3 \left[\frac{x}{x+y} \right]$$

$$x+y = 3(x-y)$$

$$\frac{28}{3} + y = \cancel{3} \times \frac{28}{\cancel{3}} - 3y$$

$$4y = 28 - \frac{28}{3} = \frac{84-28}{3} = \frac{56}{3}$$

$$y = \frac{14}{3} = \frac{14}{3} = 4 \frac{2}{3}$$

$$3) \quad \frac{D}{x+y} + \frac{D}{x-y} = 3 \text{ hr}$$

$$\frac{D}{4+y} + \frac{D}{4-y} = 3$$

Data insufficient.

$$4) \quad \phi_u = \frac{16}{2} = 8 \text{ km/h} = x-y \quad \text{--- (1)}$$

$$S_d = \frac{8}{24} \times 60 = 24 \text{ km/h} = x+y \quad \text{--- (2)}$$

$$(1) + (2) \Rightarrow x-y + x+y = 8+24$$

$$x = 16 \text{ km/h}$$

$$\frac{48}{16} = 3 \text{ hr}$$

$$5) \quad 9 \text{ hr } 48 = (9 \times 60) + 48 = 540 + 48$$

$$T_{up} = 588 \text{ min}$$

$$T_{down} \text{ in hr} = T \times 60 = 420 \text{ min}$$

$$S_{up} \times T_{up} = S_{down} \times T_{down}$$

$$(x-y) \times 588 = (x+y) \times 420$$

$$588x - 588y = 420x + 420y$$

588	588
420	420
168	1008

$$168x = 1008y$$

$$x/y = \frac{1008}{168} = \frac{6}{1}$$

$$6. > x = 9 \text{ kmph.}$$

$$y = 1.5 \text{ kmph.}$$

total time ?

$$T = t_{\text{up}} + t_{\text{down}}$$

$$= \frac{D_{\text{up}}}{S_{\text{up}}} + \frac{D_{\text{down}}}{S_{\text{down}}}$$

$$= \frac{105}{(9-1.5)} + \frac{105}{9+1.5}$$

$$= \frac{105}{7.5} + \frac{105}{10.5}$$

$$= \frac{42 \cdot 14}{75} + \frac{10}{105}$$

$$= \frac{1050}{75} + \frac{1050}{105}$$

$$= 14 + 10 = 24$$

$$T = 24 \text{ hours.}$$

$$7. > S_{\text{up}} = 5 \text{ km/h.} = x - y \quad - (1)$$

$$S_{\text{down}} = 11 \text{ kmph.} = x + y \quad - (2)$$

$$(1) + (2) \Rightarrow 2x = 16$$

$$x = 8 \text{ kmph.}$$

$$8. > T_{\text{up}} = 2 T_{\text{down}}$$

$$\frac{D}{S_{\text{up}}} = 2 \frac{D}{S_{\text{down}}}$$

$$S_{\text{down}} = 2 S_{\text{up}}$$

$$x + y = 2x - 2y \Rightarrow x/y = 3:1$$

$$8. > x = 5 \text{ kmph}$$

$$x - y = 3.5 \text{ kmph.}$$

$$y = x - 3.5 = 5 - 3.5 = 1.5 \text{ kmph.}$$

$$x + y = 5 + 1.5 = 6.5 \text{ kmph.}$$

$$9. > x/y = \frac{3}{1}$$

$$\frac{42}{y} = \frac{3}{1}$$

$$y = 42/3 = 14 \text{ kmph}$$

$$10. >$$

$$\frac{30}{S_{\text{down}}} + \frac{20}{S_{\text{up}}} = 4 \Rightarrow \frac{30}{x+y} + \frac{20}{x-y} = 4 \quad - (1)$$

$$\frac{45}{S_{\text{down}}} + \frac{40}{S_{\text{up}}} = 7 \Rightarrow \frac{45}{x+y} + \frac{40}{x-y} = 7 \quad - (2)$$

$$(1) \times 2 \Rightarrow \frac{60}{x+y} + \frac{40}{x-y} = 8 \quad - (3)$$

$$(3) - (2) \Rightarrow \frac{15}{x+y} = 1 \Rightarrow \boxed{x+y=15} \quad - (4)$$

$$\text{put (4) in (3)} \Rightarrow \frac{60}{15} + \frac{40}{x-y} = 8$$

$$\frac{40}{x-y} = 4$$

$$\boxed{x-y=10} \quad - (5)$$

$$(4) + (5) \Rightarrow 2x = 25$$

$$x = 12.5 \text{ kmph.}$$