1. A man's speed with the current is 15 km/hr and the speed of the current is 2.5 km/hr. The man's speed against the current is:

A. 8.5 km/hr

B. 10 km/hr.

C. 12.5 km/hr

D. 9 km/hr

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Here is the answer and explanation

Answer : Option B

Explanation :

Man's speed with the current = 15 km/hr

=>speed of the man + speed of the current = 15 km/hr

speed of the current is 2.5 km/hr

Hence, speed of the man = 15 - 2.5 = 12.5 km/hr

man's speed against the current = speed of the man - speed of the current

= 12.5 - 2.5 = 10 km/hr

2. A motorboat, whose speed in 15 km/hr in still water goes 30 km downstream and comes back in a total of 4 hours 30 minutes. The speed of the stream (in km/hr) is:

A. 10

B. 6

C. 5

D. 4

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :

Speed of the motor boat = 15 km/hr

Let speed of the stream = v

Speed downstream = (15+v) km/hr

Speed upstream = (15-v) km/hr

Time taken downstream = $\frac{30}{(15+v)}$

Time taken upstream = $\frac{30}{(15-v)}$

total time = $\frac{30}{(15+v)} + \frac{30}{(15-v)}$

It is given that total time is 4 hours 30 minutes = $4\frac{1}{2}$ hour = $\frac{9}{2}$ hour

i.e., $\frac{30}{(15+v)} + \frac{30}{(15-v)} = \frac{9}{2}$

$\Rightarrow \frac{1}{(15+v)} + \frac{1}{(15-v)} = \frac{9}{2 \times 30} = \frac{3}{20}$

$\Rightarrow \frac{15-v+15+v}{(15+v)(15-v)} = \frac{3}{20}$

$\Rightarrow \frac{30}{15^2 - v^2} = \frac{3}{20}$

$\Rightarrow \frac{30}{225 - v^2} = \frac{3}{20}$

$\Rightarrow \frac{10}{225 - v^2} = \frac{1}{20}$

$\Rightarrow 225 - v^2 = 200$

$\Rightarrow v^2 = 225 - 200 = 25$

$\Rightarrow v = 5$ km/hr

3. In one hour, a boat goes 14 km/hr along the stream and 8 km/hr against the stream. The speed of the boat in still water (in km/hr) is:

A. 12 km/hr

B. 11 km/hr

C. 10 km/hr

D. 8 km/hr

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Solution 1 : Using Formula

Let the speed downstream be a km/hr and the speed upstream be b km/hr, then

Speed in still water $= \frac{1}{2}(a + b)$ km/hr

Rate of stream $= \frac{1}{2}(a - b)$ km/hr

[Read more ...]

Speed in still water $= \frac{1}{2}(14 + 8)$ kmph $= 11$ kmph.

Solution 2 : Using Principles

Let speed of the boat in still water = a and speed of the stream = b

Then
a + b = 14
a - b = 8

Adding these two equations, we get 2a = 22
=> a = 11

ie, speed of boat in still water = 11 km/hr

4. A man rows to a place 48 km distant and come back in 14 hours. He finds that he can row 4 km with the stream in the same time as 3 km against the stream. The rate of the stream is:

A. 1 km/hr.
B. 2 km/hr.
C. 1.5 km/hr.
D. 2.5 km/hr.

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :

Assume that he moves 4 km downstream in x hours

Then, speed downstream $= \frac{\text{distance}}{\text{time}} = \frac{4}{x}$ km/hr

Given that he can row 4 km with the stream in the same time as 3 km against the stream

i.e., speed upstream $= \frac{3}{4}$ of speed downstream

=> speed upstream $= \frac{3}{x}$ km/hr

He rows to a place 48 km distant and come back in 14 hours

$$\Rightarrow \frac{48}{(\frac{4}{x})} + \frac{48}{(\frac{3}{x})} = 14$$

$\Rightarrow 12x + 16x = 14$

$\Rightarrow 6x + 8x = 7$

$\Rightarrow 14x = 7$

$\Rightarrow x = \frac{1}{2}$

Hence, speed downstream $= \frac{4}{x} = \frac{4}{(\frac{1}{2})} = 8$ km/hr

speed upstream $= \frac{3}{x} = \frac{3}{(\frac{1}{2})} = 6$ km/hr

Now we can use the below formula to find the rate of the stream

Let the speed downstream be a km/hr and the speed upstream be b km/hr, then

Speed in still water $= \frac{1}{2}(a + b)$ km/hr

Rate of stream $= \frac{1}{2}(a - b)$ km/hr

[Read more ...]

Hence, rate of the stream $= \frac{1}{2}(8 - 6) = 1$ km/hr

5. A boatman goes 2 km against the current of the stream in 2 hour and goes 1 km along the current in 20 minutes. How long will it take to go 5 km in stationary water?

A. 2 hr 30 min

B. 2 hr

C. 4 hr

D. 1 hr 15 min

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :

Speed upstream $= \frac{2}{2} = 1$ km/hr

Speed downstream $= \frac{1}{(\frac{20}{60})} = 3$ km/hr

Speed in still water $= \frac{1}{2}(3 + 1) = 2$ km/hr

Time taken to travel 5 km in still water $= \frac{5}{2} = 2\frac{1}{2}$ hours $= 2$ hour 30 minutes

6. Speed of a boat in standing water is 14 kmph and the speed of the stream is 1.2 kmph. A man rows to a place at a distance of 4864 km and comes back to the starting point. The total time taken by him is:

A. 700 hours

B. 350 hours

C. 1400 hours

D. 1010 hours

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Here is the answer and explanation

Answer : Option A

Explanation :

Speed downstream = (14 + 1.2) = 15.2 kmph

Speed upstream = (14 - 1.2) = 12.8 kmph

Total time taken $= \frac{4864}{15.2} + \frac{4864}{12.8} = 320 + 380 = 700$ hours

7. The speed of a boat in still water in 22 km/hr and the rate of current is 4 km/hr. The distance travelled downstream in 24 minutes is:

A. 9.4 km

B. 10.2 km

C. 10.4 km

D. 9.2 km

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :

Speed downstream = (22 + 4) = 26 kmph

Time $= 24$ minutes $= \frac{24}{60}$ hour $= \frac{2}{5}$ hour

distance travelled = Time $\times$ speed $= \frac{2}{5} \times 26 = 10.4$ km

8. A boat covers a certain distance downstream in 1 hour, while it comes back in $1^1/_2$hours. If the speed of the stream be 3 kmph, what is the speed of the boat in still water?

A. 14 kmph
B. 15 kmph
C. 13 kmph
D. 12 kmph

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Let the speed of the water in still water = x

Given that speed of the stream = 3 kmph

Speed downstream = (x+3) kmph

Speed upstream = (x-3) kmph

He travels a certain distance downstream in 1 hour and come back in $1^1/_2$ hour.

ie, distance travelled downstream in 1 hour = distance travelled upstream in $1^1/_2$hour

since distance = speed × time, we have

$$(x+3) \times 1 = (x-3)\frac{3}{2}$$

=> 2(x + 3) = 3(x-3)

=> 2x + 6 = 3x - 9

=> x = 6+9 = 15 kmph

9. A boat running upstream takes 8 hours 48 minutes to cover a certain distance, while it takes 4 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 : 6
B. 6 : 5
C. 8 : 3
D. 3 : 8

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :

Let the rate upstream of the boat = x kmph

and the rate downstream of the boat = y kmph

Distance travelled upstream in 8 hrs 48 min = Distance travelled downstream in 4 hrs.

Since distance = speed × time, we have

$$x \times 8\frac{4}{5} = y \times 4$$

$$x \times \frac{44}{5} = y \times 4$$

$$x \times \frac{11}{5} = y \quad \text{--- (equation 1)}$$

Now consider the formula given below

Let the speed downstream be a km/hr and the speed upstream be b km/hr, then

$$\text{Speed in still water} = \frac{1}{2}(a+b) \text{ km/hr}$$

$$\text{Rate of stream} = \frac{1}{2}(a-b) \text{ km/hr}$$

[Read more ...]

$$\text{Hence, speed of the boat} = \frac{y+x}{2}$$

$$\text{speed of the water} = \frac{y-x}{2}$$

$$\text{Required Ratio} = \left(\frac{y+x}{2}\right) : \left(\frac{y-x}{2}\right)$$

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

$$= \left(\frac{11x}{5}+x\right) : \left(\frac{11x}{5}-x\right) \quad \because \text{(Substituted the value of y from equation 1)}$$

$$= (11x+5x) : (11x-5x)$$

$$= 16x : 6x$$

$$= 8 : 3$$

10. A boat can travel with a speed of 22 km/hr in still water. If the speed of the stream is 5 km/hr, find the time taken by the boat to go 54 km downstream

A. 5 hours

B. 4 hours

C. 3 hours

D. 2 hours

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :

Speed of the boat in still water = 22 km/hr

speed of the stream = 5 km/hr

Speed downstream = (22+5) = 27 km/hr

Distance travelled downstream = 54 km

$$\text{Time taken} = \frac{\text{distance}}{\text{speed}} = \frac{54}{27} = 2 \text{ hours}$$

11. A boat running downstream covers a distance of 22 km in 4 hours while for covering the same distance upstream, it takes 5 hours. What is the speed of the boat in still water?

A. 5 kmph

B. 4.95 kmph

C. 4.75 kmph

D. 4.65

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

$$\text{Speed downstream} = \frac{22}{4} = 5.5 \text{ kmph}$$

$$\text{Speed upstream} = \frac{22}{5} = 4.4 \text{ kmph}$$

$$\text{Speed of the boat in still water} = \frac{5.5 + 4.4}{2} = 4.95 \text{ kmph}$$

12. 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. 3 : 1

B. 1 : 3

C. 1 : 2

D. 2 : 1

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Here is the answer and explanation

Answer : Option A

Explanation :

Let speed upstream = x

Then, speed downstream = 2x

$$\text{Speed in still water} = \frac{2x + x}{2} = \frac{3x}{2}$$

$$\text{Speed of the stream} = \frac{2x - x}{2} = \frac{x}{2}$$

$$\text{Speed in still water} : \text{Speed of the stream} = \frac{3x}{2} : \frac{x}{2} = 3 : 1$$

13. A man can row at 5 kmph in still water. If the velocity of current is 1 kmph and it takes him 1 hour to row to a place and come back, how far is the place?

A. 3.2 km
B. 3 km
C. 2.4 km
D. 3.6 km

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :

Speed in still water = 5 kmph
Speed of the current = 1 kmph

Speed downstream = (5+1) = 6 kmph
Speed upstream = (5-1) = 4 kmph

Let the requited distance be x km

Total time taken = 1 hour

$$\Rightarrow \frac{x}{6} + \frac{x}{4} = 1$$

=> 2x + 3x = 12

=> 5x = 12

=> x = 2.4 km

14. A man can row three-quarters of a kilometre against the stream in $11^{1}/_{4}$ minutes and down the stream in $7^{1}/_{2}$minutes. The speed (in km/hr) of the man in still water is:

A. 4 kmph
B. 5 kmph
C. 6 kmph
D. 8 kmph

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Distance = $\frac{3}{4}$ km

Time taken to travel upstream = $11\frac{1}{4}$ minutes = $\frac{45}{4}$ minutes = $\frac{45}{4 \times 60}$ hours = $\frac{3}{16}$ hours

Speed upstream = $\frac{\text{Distance}}{\text{Time}} = \frac{(\frac{3}{4})}{(\frac{3}{16})} = 4$ km/hr

Time taken to travel downstream = $7\frac{1}{2}$ minutes = $\frac{15}{2}$ minutes = $\frac{15}{2 \times 60}$ hours = $\frac{1}{8}$ hours

Speed downstream = $\frac{\text{Distance}}{\text{Time}} = \frac{(\frac{3}{4})}{(\frac{1}{8})} = 6$ km/hr

Rate in still water = $\frac{6+4}{2} = \frac{10}{2} = 5$ kmph

15. A boat takes 90 minutes less to travel 36 miles downstream than to travel the same distance upstream. If the speed of the boat in still water is 10 mph, the speed of the stream is:

A. 4 mph

B. 2.5 mph

C. 3 mph

D. 2 mph

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :

Speed of the boat in still water = 10 mph

Let speed of the stream be x mph

Then, speed downstream = (10+x) mph

speed upstream = (10-x) mph

Time taken to travel 36 miles upstream - Time taken to travel 36 miles downstream = $\frac{90}{60}$ hours

$\Rightarrow \frac{36}{10-x} - \frac{36}{10+x} = \frac{3}{2}$

$\Rightarrow \frac{12}{10-x} - \frac{12}{10+x} = \frac{1}{2}$

$\Rightarrow 24(10+x) - 24(10-x) = (10+x)(10-x)$

$\Rightarrow 240 + 24x - 240 + 24x = (100 - x^2)$

$\Rightarrow 48x = 100 - x^2$

$\Rightarrow x^2 + 48x - 100 = 0$

$\Rightarrow (x + 50)(x - 2) = 0$

$\Rightarrow x = -50$ or 2

Since x can not be negative, x = 2 mph

16. Tap 'A' can fill the tank completely in 6 hrs while tap 'B' can empty it by 12 hrs. By mistake, the person forgot to close the tap 'B', As a result, both the taps, remained open. After 4 hrs, the person realized the mistake and immediately closed the tap 'B'. In how much time now onwards, would the tank be full?

A. 2 hours
B. 4 hours
C. 5 hours
D. 1 hour

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Tap A can fill the tank completely in 6 hours

=> In 1 hour, Tap A can fill $^1/_6$ of the tank

Tap B can empty the tank completely in 12 hours

=> In 1 hour, Tap B can empty $^1/_{12}$ of the tank

i.e., In one hour, Tank A and B together can effectively fill $^1/_6$ - $^1/_{12}$ = $^1/_{12}$ of the tank

=> In 4 hours, Tank A and B can effectively fill $^1/_{12} \times 4 = {}^1/_3$ of the tank.

$$\text{Time taken to fill the remaining } 1 - \frac{1}{3} = \frac{2}{3} \text{ of the tank } = \frac{(\frac{2}{3})}{(\frac{1}{6})} = 4 \text{ hours}$$

17. A Cistern is filled by pipe A in 8 hrs and the full Cistern can be leaked out by an exhaust pipe B in 12 hrs. If both the pipes are opened in what time the Cistern is full?

A. 12 hrs
B. 24 hrs
C. 16 hrs
D. 32 hrs

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Pipe A can fill $^1/_8$ of the cistern in 1 hour.

Pipe B can empty $^1/_{12}$ of the cistern in 1 hour

Both Pipe A and B together can effectively fill $^1/_8$-$^1/_{12}$= $^1/_{24}$ of the cistern in 1 hour

i.e, the cistern will be full in 24 hrs.

18. In a river flowing at 2 km/hr, a boat travels 32 km upstream and then returns downstream to the starting point. If its speed in still water be 6 km/hr, find the total journey time.

A. 10 hours

B. 12 hours

C. 14 hours

D. 16 hours

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Solution 1

---

speed of the boat = 6 km/hr

Speed downstream = (6+2) = 8 km/hr

Speed upstream = (6-2) = 4 km/hr

Distance travelled downstream = Distance travelled upstream = 32 km

Total time taken = Time taken downstream + Time taken upstream

$$= \frac{32}{8} + \frac{32}{4} = \frac{32}{8} + \frac{64}{8} = \frac{96}{8} = 12 \text{ hr}$$

Solution 2

A man can row a boat in still water at x km/hr. In a stream flowing at y km/hr, if it takes him t hours to row a place and come back, then the distance between the two places

$$= \frac{t(x^2 - y^2)}{2x} \text{ km}$$

[Read more ...]

x = 6 km/hr

y = 2 km/hr

distance = 32 km

As per the formula, we have

$$32 = \frac{t(6^2 - 2^2)}{2 \times 6}$$
$$\Rightarrow 32 = \frac{32t}{12}$$
$$\Rightarrow t = 12 \text{ hr}$$

19. Two pipes A and B can fill a tank in 10 hrs and 40 hrs respectively. If both the pipes are opened simultaneously, how much time will be taken to fill the tank?

A. 8 hours
B. 6 hours
C. 4 hours
D. 2 hours

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :

Pipe A can fill $^1/_{10}$ of the tank in 1 hr

Pipe B can fill $^1/_{40}$ of the tank in 1 hr

Pipe A and B together can fill $^1/_{10} + {}^1/_{40} = {}^1/_8$ of the tank in 1 hr

i.e., Pipe A and B together can fill the tank in 8 hours

20. A boat covers a certain distance downstream in 4 hours but takes 6 hours to return upstream to the starting point. If the speed of the stream be 3 km/hr, find the speed of the boat in still water

A. 15 km/hr
B. 12 km/hr
C. 13 km/hr
D. 14 km/hr

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :

Solution 1

Let the speed of the water in still water = x
Given that speed of the stream = 3 kmph

Speed downstream = (x+3) kmph
Speed upstream = (x-3) kmph

He travels a certain distance downstream in 4 hour and come back in 6 hour.
ie, distance travelled downstream in 4 hour = distance travelled upstream in 6 hour

since distance = speed × time, we have

$(x + 3)4 = (x - 3)6$

=> (x + 3)2 = (x - 3)3

=> 2x + 6 = 3x - 9

=> x = 6+9 = 15 kmph

Solution 2

A man rows a certain distance downstream in t_1 hours and returns the same distance upstream in t_2 hours. If the speed of the stream is y km/hr, then the speed of the man in still water

$$= y\left(\frac{t_2 + t_1}{t_2 - t_1}\right) \text{ km/hr}$$

[Read more ...]

t_1 = 4 hour

t_2 = 6 hour

y = 3 km/hr

By using the the abov formula, Speed of the boat in still water

$$= y\left(\frac{t_2 + t_1}{t_2 - t_1}\right) = 3\left(\frac{6 + 4}{6 - 4}\right) = 15 \text{ km/hr}$$

21. If a man rows at the rate of 5 kmph in still water and his rate against the current is 3 kmph, then the man's rate along the current is:

A. 5 kmph

B. 7 kmph

C. 12 kmph

D. 8 kmph

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Let the rate along with the current is x km/hr

$$\frac{x + 3}{2} = 5$$

=> x + 3 = 10

=> x = 7 kmph

22. A man can row 8 km/hr in still water. If the river is running at 3 km/hr, it takes 3 hours more in upstream than to go downstream for the same distance. How far is the place?

A. 32.5 km

B. 25 km

C. 27.5 km

D. 22.5 km

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :

Solution 1

Let the speed downstream = x and speed updstream = y

Then

$$\frac{x+y}{2} = 8$$

=> x + y = 16 ---(Equation 1)

$$\frac{x-y}{2} = 3$$

=> x - y = 6 ---(Equation 2)

(Equation 1 + Equation 2) = > 2x = 22

=> x = 11 km/hr

(Equation 1 - Equation 2) = > 2y = 10

=>y = 5 km/hr

Time taken to travel upstream = Time taken to travel downstream + 3

Let distance be x km

Then

$$\frac{x}{5} = \frac{x}{11} + 3$$

=> 11x = 5x + 165

=> 6x = 165

=> 2x = 55

=> x = 27.5

Solution 2

Let the speed of a man in still water be x km/hr and the speed of a stream be y km/hr. If he takes t hours more in upstream than to go downstream for the same distance, the distance

$$= \frac{(x^2 - y^2)t}{2y} \text{ km}$$

[Read more ...]

x = 8 km/hr

y = 3 km/hr

t = 3 hours

As per the formula, we have

$$\text{distance} = \frac{(8^2 - 3^2)\,3}{2 \times 3} = \frac{55 \times 3}{2 \times 3} = \frac{55}{2} = = 27.5 \text{ km}$$

23. A man can row 4 kmph is still water. If the river is running at 2 kmph it takes 90 min to row to a place and back. How far is the place?

A. 2 km

B. 4 km

C. 5 km

D. 2.25 km

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :

Speed in still water = 4 kmph
Speed of the stream = 2 kmph

Speed upstream = (4-2)= 2 kmph
Speed downstream = (4+2)= 6 kmph

Total time = 90 minutes = $^{90}/_{60}$ hour = $^{3}/_{2}$ hour

Let L be the distance. Then

$$\frac{L}{6} + \frac{L}{2} = \frac{3}{2}$$

=> L + 3L = 9

=> 4L = 9

=> L = $^{9}/_{4}$= 2.25 km

24. At his usual rowing rate, Rahul can travel 12 miles downstream in a certain river in 6 hours less than it takes him to travel the same distance upstream. But if he could double his usual rowing rate for his 24-mile round trip, the downstream 12 miles would then take only one hour less than the upstream 12 miles. What is the speed of the current in miles per hour?

A. $2\frac{1}{3}$ mph

B. $1\frac{1}{3}$ mph

C. $1\frac{2}{3}$ mph

D. $2\frac{2}{3}$ mph

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :

Let the speed of Rahul in still water be x mph
and the speed of the current be y mph

Then, Speed upstream = (x - y) mph
Speed downstream = (x + y) mph

Distance = 12 miles

Time taken to travel upstream - Time taken to travel downstream = 6 hours

$$\Rightarrow \frac{12}{x-y} - \frac{12}{x+y} = 6$$

$$\Rightarrow 12(x+y) - 12(x-y) = 6(x^2 - y^2)$$

$$\Rightarrow 24y = 6(x^2 - y^2)$$

$$\Rightarrow 4y = x^2 - y^2$$

$$\Rightarrow x^2 = (y^2 + 4y) \quad \cdots \text{(Equation 1)}$$

Now he doubles his speed. i.e., his new speed = 2x

Now, Speed upstream = (2x - y) mph

Speed downstream = (2x + y) mph

In this case, Time taken to travel upstream - Time taken to travel downstream = 1 hour

$\Rightarrow \frac{12}{2x-y} - \frac{12}{2x+y} = 1$

$\Rightarrow 12(2x+y) - 12(2x-y) = 4x^2 - y^2$

$\Rightarrow 24y = 4x^2 - y^2$

$\Rightarrow 4x^2 = y^2 + 24y$ ··· (Equation 2)

(Equation 1 × 4) $\Rightarrow 4x^2 = 4(y^2 + 4y)$ ··· (Equation 3)

(From Equation 2 and 3, we have) $y^2 + 24y = 4(y^2 + 4y)$

$\Rightarrow y^2 + 24y = 4y^2 + 16y$

$\Rightarrow 3y^2 = 8y$

$\Rightarrow 3y = 8$

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

i.e., speed of the current = $\frac{8}{3}$ mph = $2\frac{2}{3}$ mph

25. A man can row 40 kmph in still water and the river is running at 10 kmph. If the man takes 1 hr to row to a place and back, how far is the place?

A. 16.5 kmph

B. 12.15 kmph

C. 2.25 kmph

D. 18.75 kmph

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :

Let the distance be x

Speed upstream = (40 - 10) = 30 kmph

Speed downstream = (40 + 10) = 50 kmph

Total time taken = 1 hr

$$\frac{x}{50} + \frac{x}{30} = 1$$

$$\Rightarrow \frac{8x}{150} = 1$$

$$\Rightarrow x = \frac{150}{8} = 18.75 \text{ kmph}$$

26. A boatman can row 96 km downstream in 8 hr. If the speed of the current is 4 km/hr, then find in what time will be able to cover 8 km upstream?

A. 6 hr

B. 2 hr

C. 4 hr

D. 1 hr

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Speed downstream = $^{96}/_{8}$ = 12 kmph

Speed of current = 4 km/hr

Speed of the boatman in still water = 12-4 = 8 kmph

Speed upstream = 8-4 = 4 kmph

Time taken to cover 8 km upstream = $^{8}/_{4}$ = 2 hours

27. The speed of a boat in still water is 10 km/hr. If it can travel 78 km downstream and 42 km upstream in the same time, the speed of the stream is

A. 3 km/hr

B. 12 km/hr

C. 1.5 km/hr

D. 4.4 km/hr

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :

Let the speed of the stream be x km/hr. Then

Speed upstream = (10-x) km/hr

Speed downstream = (10+x) km/hr

Time taken to travel 78 km downstream = Time taken to travel 42 km upstream

$$\Rightarrow \frac{78}{10+x} = \frac{42}{10-x}$$
$$\Rightarrow \frac{26}{10+x} = \frac{14}{10-x}$$
$$\Rightarrow \frac{13}{10+x} = \frac{7}{10-x}$$
$$\Rightarrow 130 - 13x = 70 + 7x$$
$$\Rightarrow 20x = 60$$
$$\Rightarrow x = 3 \text{ km/hr}$$

28. A man can row at a speed of 12 km/hr in still water to a certain upstream point and back to the starting point in a river which flows at 3 km/hr. Find his average speed for total journey.

A. $12\frac{3}{4}$ km/hr

B. $11\frac{3}{4}$ km/hr

C. $12\frac{1}{4}$ km/hr

D. $11\frac{1}{4}$ km/hr

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :

Assume that a man can row at the speed of x km/hr in still water and he rows the same distance up and down in a stream which flows at a rate of y km/hr. Then his average speed throughout the journey

$$= \frac{\text{Speed downstream} \times \text{Speed downstream}}{\text{Speed in still water}} = \frac{(x+y)(x-y)}{x} \text{ km/hr}$$

[Read more ...]

Speed of the man in still water = 12 km/hr

Speed of the stream = 3 km/hr

Speed downstream = (12+3) = 15 km/hr

Speed upstream = (12-3) = 9 km/hr

$$\text{Average Speed} = \frac{\text{Speed downstream} \times \text{Speed downstream}}{\text{Speed in still water}}$$
$$= \frac{15 \times 9}{12} = \frac{15 \times 3}{4} = \frac{45}{4} = 11\frac{1}{4} \text{ km/hr}$$

29. A boatman can row 3 km against the stream in 20 minutes and return in 18 minutes. Find the rate of current

A. $^1/_2$ km/hr

B. 1 km/hr

C. $^1/_3$ km/hr

D. $^2/_3$ km/hr

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Here is the answer and explanation

Answer : Option A

Explanation :

$$\text{Speed upstream} = \frac{3}{(\frac{20}{60})} = 9 \text{ km/hr}$$

$$\text{Speed downstream} = \frac{3}{(\frac{18}{60})} = 10 \text{ km/hr}$$

$$\text{Rate of current} = \frac{10-9}{2} = \frac{1}{2} \text{ km/hr}$$

30. A boat takes 38 hours for travelling downstream from point A to point B and coming back to point C midway between A and B. If the velocity of the stream is 4 kmph and the speed of the boat in still water is 14 kmph, what is the distance between A and B?

A. 240 km

B. 120 km

C. 360 km

D. 180 km

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Here is the answer and explanation

Answer : Option C

Explanation :

velocity of the stream = 4 kmph

Speed of the boat in still water is 14 kmph

Speed downstream = (14+4) = 18 kmph

Speed upstream = (14-4) = 10 kmph

Let the distance between A and B be x km

Time taken to travel downstream from A to B + Time taken to travel upstream from B to C(mid of A and B) = 38 hours

$$\Rightarrow \frac{x}{18} + \frac{(\frac{x}{2})}{10} = 38$$

$$\Rightarrow \frac{x}{18} + \frac{x}{20} = 38$$

$$\Rightarrow \frac{19x}{180} = 38$$

$$\Rightarrow \frac{x}{180} = 2$$

$$\Rightarrow x = 360$$

i.e., the distance between A and B = 360 km