

## Boats and Streams

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

- A. 2.4km
- B. 2.5 km
- C. 3 km
- D. 3.6 km

### Answer & Explanation

Answer :

2.4km

Explanation :

Speed downstream =  $(5+1)$  km/hr = 6 km/hr ; speed upstream =  $(5-1)$  km/hr = 4 km/hr.  
Let the required distance be  $x$  km. Then,  $x/6 + x/4 = 1 \Leftrightarrow 2x+3x = 12 \Leftrightarrow 5x = 12 \Leftrightarrow x = 2.4$  km.

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2. 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 km/hr, the speed of the stream is?

- A. 2 mph
- B. 2.5 mph
- C. 3 mph
- D. 4 mph

### Answer & Explanation

Answer :

2 mph

Explanation :

Let the speed of the stream be  $x$  mph. then, speed downstream =  $(10+x)$  mph, speed upstream =  $(10-x)$  mph. therefore  $36/(10-x) - 36/(10+x) = 90/60 \Leftrightarrow 72*60 = 90(100-x^2) \Leftrightarrow x^2 + 48x + 100 = 0 \Leftrightarrow (x+50)(x-2) = 0 \Leftrightarrow x = 2$  mph.

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4. The speed of a boat in still water is 10 km/hr. If it can travel 26 km downstream and 14 km upstream in the same time, the speed of the stream is?

- A. 2 km/hr
- B. 2.5 km/hr
- C. 3 km/hr
- D. 4 km/hr

Answer & Explanation

Answer :

2 km/hr

Explanation :

Let the speed of the stream be  $x$  km/hr. then, speed downstream =  $(10+x)$  km/hr, speed upstream =  $(10-x)$  km/hr. therefore  $26/(10+x) = 14/(10-x) \Leftrightarrow 260 - 26x = 140 + 14x \Leftrightarrow 40x = 120 \Leftrightarrow x = 3$  km/hr.

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5. A boat can travel with a speed of 13 km/hr in still water. If the speed of the stream is 4 km/hr find the time taken by the boat to go 68 km downstream.

- A. 2 hrs
- B. 3 hrs
- C. 5 hrs
- D. 4 hrs

Answer & Explanation

Answer :

4 hrs

Explanation :

Speed downstream =  $(13+4)$  km/hr = 17 km/hr Time taken to travel 68 km downstream =  $(68/17)$  hrs = 4 hrs

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6. A man can row three quarters of kilo meter against the stream in  $11 \frac{1}{4}$  minutes. The speed (in km/hr) of the man still in water is?

- A. 2
- B. 3
- C. 4
- D. 5

**Answer & Explanation**

**Answer :**

5

**Explanation :**

Rate upstream =  $(750/675)$  m/sec =  $10/9$  m/sec Rate downstream =  $(750/450)$  m/sec =  $5/3$  m/sec Rate in still water =  $1/2 (10/9+5/3)$ m/sec =  $25/18$  m/sec =  $(25/18*18/5)$  km /hr = 5 km/hr

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7. A boat takes 19 hours for traveling downstream from point A to point B and coming back to a point C midway between A and B. If the velocity of the stream is 4 km/hr and he speed of the boat in still water is 14 km/hr, what is the distance between A and B?

- A. 160 km
- B. 180 km
- C. 200 km
- D. 220 km

**Answer & Explanation**

**Answer :**

180 km

**Explanation :**

Speed downstream =  $(14+4)$  km/hr = 18 km/hr; Speed upstream =  $(14-4)$  km/hr = 10 km/hr. Let the distance between A and B be x km. then,  $x/18+(x-2)/10=19 \Leftrightarrow x/18+x/20 =19 \Leftrightarrow 19x/180 =19 \Leftrightarrow x =180$  km.

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8. Speed of a boat in standing water is 9 km/ph and the speed of the stream is 1.5 km/ph.A man rows to a place at a distance of 105 km and comes back to the straight point. The total time taken by him is?

- A. 16 hrs
- B. 18 hrs
- C. 24 hrs
- D. 20 hrs

### Answer & Explanation

Answer :

24 hrs

Explanation :

Speed upstream = 7.5 km/ph; speed downstream = 10.5 km/ph Total time taken =  $(105/7.5 + 105/10.5)$  hours = 24 hours

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9. A car travels from a place A to B in 7 hour. It covers half the distance at 30 kmph and the remaining distance at 40 kmph, what is the total distance between A and B?

- A. 120 km
- B. 150 km
- C. 240 km
- D. 250 km

### Answer & Explanation

Answer :

240 km

Explanation :

Total distance =  $x (x/2*30) + (x/20*40) = 7 x = 240$

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10. 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 km/hr, what is the speed of the boat in still water?

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

### Answer & Explanation

Answer :

15 km/hr

Explanation :

Let the speed of the boat in still water be  $x$  km/hr. then, speed downstream =  $(x+3)$  km/hr, speed upstream =  $(x-3)$  km/hr. Therefore  $(x+3)*1 = (x-3)*3/2 \Leftrightarrow 2x+6 = 3x-9 \Leftrightarrow x=15$ km/hr.

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11. A boat takes 28 hours for traveling downstream from point A to point B and coming to point C midway between A and B. If the velocity of the stream is 6 km/hr and the speed of the boat in still water is 9 km/hr, what is the distance between A and B?

- A. 115 km
- B. 120 km
- C. 140 km
- D. 165 km

Answer & Explanation

Answer :

140 km

Explanation :

Downstream speed =  $9+6 = 15$  Upstream speed =  $9-6 = 3$  Now total time is 28 hours If distance between A and B is  $d$ , that distance  $BC = d/2$  Now distance/speed = time, So  $d/15 + (d/2)/3 = 28$  Solve,  $d = 120$  km

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12. A man's speed with the current is 20 km/ph and speed of the current is 3 km/ph. The Man's speed against the current will be

- A. 11 km/ph
- B. 12 km/ph
- C. 14 km/ph
- D. 17 km/ph

Answer & Explanation

Answer :

14 km/ph

Explanation :

Speed with current is 20, speed of the man + It is speed of the current Speed in still water =  $20 - 3 = 17$  Now speed against the current will be speed of the man - speed of the current =  $17 - 3 = 14$  km/ph

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13. Two vans start from a place with a speed of 50 kmph at an interval of 12 minutes. What is the speed of a car coming from the opposite direction towards the place if the car meets the vans at an interval of 10 minutes.

- A. 10kmph
- B. 14kmph
- C. 15kmph
- D. 16kmph

Answer & Explanation

Answer :

10kmph

Explanation :

$50 \cdot 12/60 = 10/60 \cdot (50+x)$   $600 = 500 + 10x$   $x = 10$  kmph

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14. Sahil can row 3 km against the stream in 20 minutes and he can return in 18 minutes. What is rate of current ?

- A.  $1/2$  km/hr
- B.  $1/3$  km/hr
- C. 2 km/hr
- D. 4 km/hr

Answer & Explanation

Answer :

$1/2$  km/hr

Explanation :

Speed Upstream =  $3/20/60 = 9$  km/hr Speed Downstream =  $3/18/60 = 10$  km/hr Rate of current will be  $10 - 9 = 1/2$  km/hr

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15. A man rows downstream 32 km and 14 km upstream. If he takes 6 hours to cover each distance then the velocity (in km/ph) of the current is?

- A.  $1/2$
- B. 1
- C.  $1 \frac{1}{2}$
- D. 2

Answer & Explanation

Answer :

$1 \frac{1}{2}$

Explanation :

Rate downstream =  $(32/6)$  km/ph; Rate upstream =  $(14/6)$  km/ph Velocity of current =  $1/2$   
 $(32/6 - 14/6)$  km/ph =  $3/2$  km/ph = 1.5 km/ph

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16. The speed of a boat in still water is 15 km/hr and the rate of current is 3 km/hr. The distance traveled downstream in 12 minutes is

- A. 1.6 km
- B. 2 km
- C. 3.6 km
- D. 4 km

Answer & Explanation

Answer :

3.6 km

**Explanation :**

Speed down streams  $= (15 + 3) \text{ km/ph} = 18 \text{ km/ph}$ . Distance traveled  $= (18 \times 12/60) \text{ km} = 3.6 \text{ km}$

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17. A man can row upstream at 7 km/ph and downstream at 10 km/ph. Find man's rate in still water and the rate of current?

- A. 1.5 km/hr
- B. 2.5 km/hr
- C. 3 km/hr
- D. 2 km/hr

**Answer & Explanation**

**Answer :**

1.5 km/hr

**Explanation :**

Rate in still water  $= \frac{1}{2} (10+7) \text{ km/hr} = 8.5 \text{ km/hr}$  Rate of current  $= \frac{1}{2} (10-7) \text{ km/hr} = 1.5 \text{ km/hr}$

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18. The speed of a boat in still water is 15 km/hr and the rate of current is 3 km/hr. The distance traveled downstream in 12 minutes is?

- A. 1.2 km
- B. 1.8 km
- C. 2.4 km
- D. 3.6 km

**Answer & Explanation**

**Answer :**

3.6 km

**Explanation :**

Speed downstream  $= (15+3) \text{ km/hr} = 18 \text{ km/hr}$ . distance traveled  $= (18 \times 12/60) \text{ km} = 3.6 \text{ km}$ .

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19. A man rows to a place 48 km distant and 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. 1.5 km/hr
- C. 1.8 km/hr
- D. 3.5 km/hr

Answer & Explanation

Answer :

1 km/hr

Explanation :

Suppose he moves 4 km downstream in x hours. then, speed downstream = (4/x) km/hr, speed upstream =(3/x) km/hr. Therefore  $48/(4/x) + 48/(3/x) = 14$  so speed downstream = 8 km/hr, speed upstream = 6 km/hr. Rate of the stream =  $1/2 (8-6)$  km/hr = 1 km/hr.

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20. A boat covers 24 km upstream and 36 km downstream in 6 hours while it covers 36 km upstream and 24 km downstream in 6 1/2 hours. the velocity of the current is?

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

Answer & Explanation

Answer :

2 km/hr

Explanation :

Let rate upstream = x km/hr and rate downstream = y km/hr. Then,  $24/x + 36/y = 36$  .....(1) and  $36/x + 24/y = 13/2$  .....(2) Adding (1) and (2) we get :  $60(1/x + 1/y) = 25/2$  or  $1/x + 1/y = 5/24$  .....(3) subtracting (1) from (2) we get :  $12(1/x - 1/y) = 1/2$  or  $1/x - 1/y = 1/24$  .....(4) Adding (3) and (4) we get :  $2/x = 6/24$  or  $x = 8$ . so,  $1/8 + 1/y = 5/24$   $\Leftrightarrow 1/y = (5/24 - 1/8) = 1/12$   $\Leftrightarrow y = 12$ . therefore speed upstream = 8 km/hr, speed downstream = 12 km/hr. Hence, rate of current =  $1/2(12-8)$  km/hr = 2 km/hr.

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21. A man takes 3 hours 45 minutes to row a boat 15 km downstream of a river and 2 hours 30 minutes to cover a distance of 5 km upstream. Find the speed of the current.

- A. 1 km/hr
- B. 2 km/hr
- C. 3 km/hr
- D. 4 km/hr

Answer & Explanation

Answer :

1 km/hr

Explanation :

First of all, we know that speed of current =  $1/2(\text{speed downstream} - \text{speed upstream})$  [important] So we need to calculate speed downstream and speed upstream first. Speed = Distance / Time [important] Speed upstream =  $(15/3.75)$  km/hr =  $4$  km/hr Speed



Downstream =  $(5212)\text{km/hr} = 5 \times 25 = 2\text{km/hr}$  So speed of current =  $12(4-2) = 1\text{km/hr}$

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22. At his usual rowing rate, A 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.  $1 \frac{1}{3}$
- B.  $1 \frac{2}{3}$
- C.  $2 \frac{1}{3}$
- D.  $2 \frac{2}{3}$

**Answer & Explanation**

**Answer :**  
2 2/3

**Explanation :**

Let the speed still in water be  $x$  mph and the speed of the current be  $y$  mph. Speed upstream =  $(x-y)$ : Speed downstream =  $(x+y)$   $\frac{12}{(x-y)} - \frac{12}{(x+y)} = 6 \Leftrightarrow 6(x^2 - y^2) = 24y, \Leftrightarrow x^2 - y^2 = 4y \Leftrightarrow x^2 = (4y + y^2) \dots \dots (1)$  And  $\frac{12}{(2x-y)} - \frac{12}{(2x+y)} = 1 \Leftrightarrow 4x^2 - y^2 = 24y \Leftrightarrow x^2 = 24y + y^2/4 \dots \dots (2)$

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23. Two persons A and B start from the opposite ends of a 450 km straight track and run to and from between the two ends. The speed of the first person is 25 m/s and the speed of other is 35 m/s. They continue their motion for 10 hours. How many times did they pass each other?

- A. 1
- B. 4
- C. 3
- D. 2

**Answer & Explanation**

**Answer :**  
2

**Explanation :**

First person speed =  $25\text{m/s} \times \frac{18}{5} = 90 \text{ kmph}$ . Second person speed =  $35\text{m/s} \times \frac{18}{5} = 126 \text{ kmph}$ . First person covers  $90 \times 10 = 900 \text{ km}$   $\frac{900}{450} = 2$

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24. A man takes 3 hours 45 minutes to row a boat 15 km downstream of a river and 2 hours 30 minutes to cover a distance of 5 km upstream. Find the speed of the river current in km/hr?

- A. 0.5 km/hr
- B. 1 km/hr
- C. 2 km/hr
- D. 2.5 km/hr

Answer & Explanation

Answer :

1 km/hr

Explanation :

Rate downstream =  $(15\frac{3}{4})$  km/hr =  $(15 \times \frac{4}{15}) = 4$  km/hr Rate upstream =  $(5\frac{1}{2})$  km/hr =  $(5 \times \frac{2}{5})$  km/hr = 2 km/hr Speed of current =  $\frac{1}{2} (4 - 2)$  km/hr = 1 km/hr

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25. A man can row upstream 10 km/ph and downstream 20 km/ph. Find the man rate in still water and rate of the stream.

- A. 0,5
- B. 5,5
- C. 15,5
- D. 10,5

Answer & Explanation

Answer :

15,5

Explanation :

Rate in still water =  $\frac{1}{2}(20+10) = 15$  km/ph Rate of current =  $\frac{1}{2}(20-10) = 5$  km/ph

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