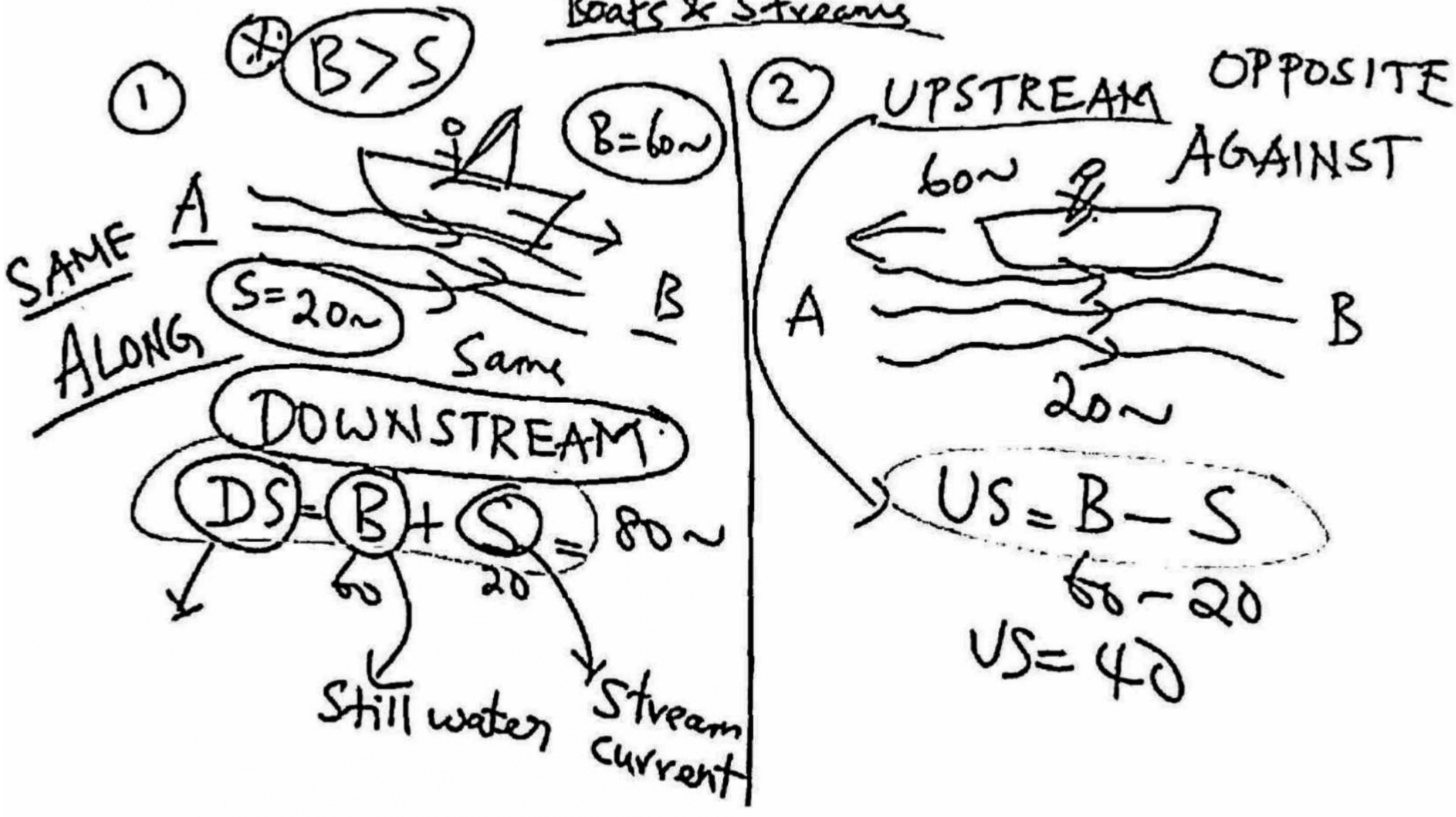
BOATS & STREAMS

TDS

SET-5

1. ~~TDS~~ TDS $\left(S = \frac{D}{T}\right)$ — (1), (2)
2. Trains (Basic)
3. Trains (Relative Speed)
4. Trains (Advanced)
5. Boats

Boats & Streams



$DS = 22$

$b + S = 22$ ... (1)

$b - S = 18$ ... (2)

$2S = 4$

$S = 2$

1 | DS US

The speed of a boat along and against the current is 22 km/hr and 18 km/hr respectively. Then the speed of the current (in km/hr) is: S

1. 4
2. 2
3. 7
4. 3

$b = 10$
$s = 5$

$DS = b + s$

$= 15 \sim km/h$

$\frac{60}{15} = 4$

2

A boy can swim in still water at a speed of 10 km/hr. If the speed of the current would have been 5 kmph, then the boy could swim 60km downstream (along the flow) in how much time ?

1. 10 hours
2. 4 hours
3. 5 hours
4. 6 hours

3

A person can row $22\frac{1}{2}$ km an hour in still water and he finds that it takes him twice as long to row up as to row down the stream. The speed of the stream is:

1. $7\frac{1}{2}$ km/hr
2. $13\frac{1}{2}$ km/hr
3. 12 km/hr
4. 3 km/hr

$b = \frac{45}{2}$ ~

$S = ?$

$\frac{b-s}{b+s} = \frac{1}{2}$

(1S) : (2S)

$T \rightarrow 2 \quad 1$

$S \rightarrow 1 : 2$

$b - 3S$

$15 = 3S$

4

A boat goes 80 km upstream in 16 hours and 72 km downstream in 12 hours. The speed of the boat in still water is:

1. 6.6 km/hour
2. 7.5 km / hour
3. 6.5 km / hour
4. 5.5 km / hour

$S = D/T$

$US = b - s = \frac{80}{16}$ ~

$2b = 11$

$b = 11/2$

$b = 5.5$

$b - s = 5$

$b + s = 6$

$s + s$

$3.5 - 2.5 = 1$

$s + s$

$5.5 - 0.5 = 5$

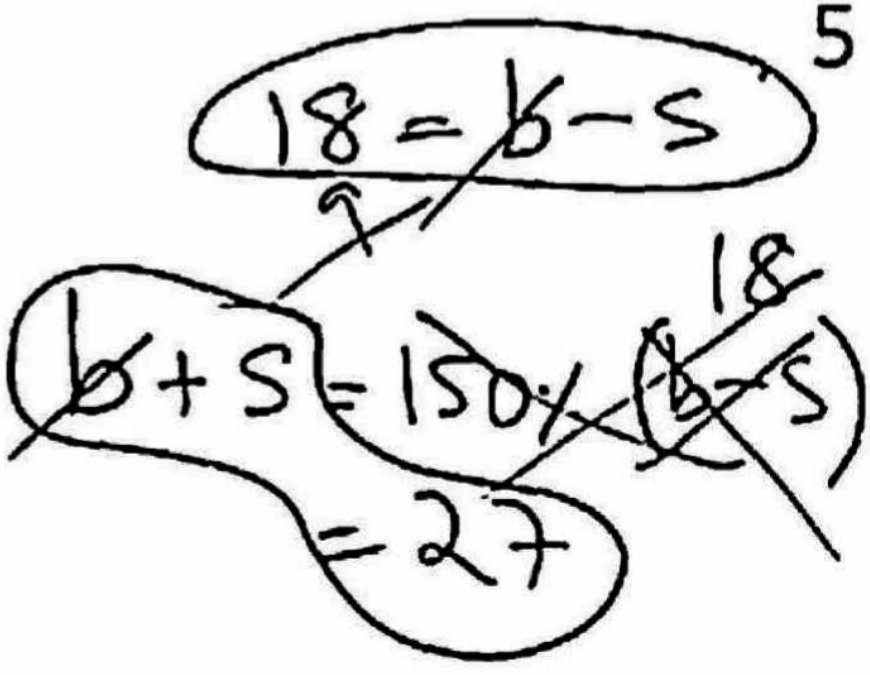
$b \quad s$

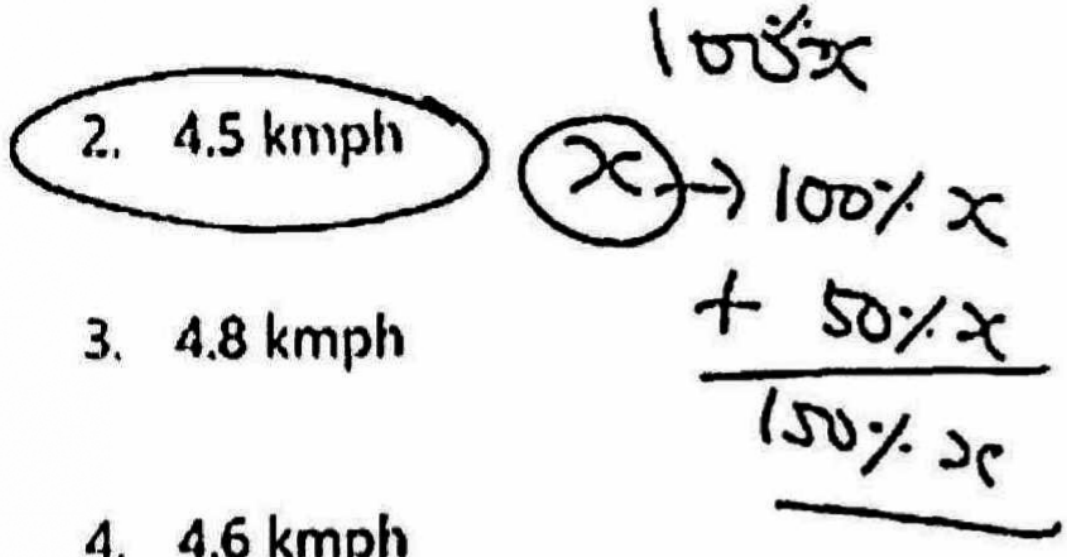
5

If the speed of a boat moving against the current is 18 km/hr, what is the speed of the stream if the boat's speed downstream is 50% greater than its speed upstream ?

$S = ?$

1. 5.2 kmph
2. 4.5 kmph
3. 4.8 kmph
4. 4.6 kmph





$T = D/S$

$4+4 \leftarrow (8) = \frac{20}{b-s} + \frac{44}{b+s}$ (4)

(5)

$5 = \frac{15}{b-s} + \frac{22}{b+s}$

(5) (11)

$b - s = 5$

$b + s = 11$

$2b = 16$

$b = 8$

3 + 2

6 A boat goes 20 km upstream and 44 km downstream in 8 hours. In 5 hours, it goes 15 km upstream and 22 km downstream. Determine the speed of the boat in still water.

(b) S

1 6 km/h

2 10 km/h

3 8 km/h

4 7 km/h

A motorboat whose speed is 20 km/h in still water takes 30 minutes more to go 24 km upstream than to cover the same distance downstream. If the speed of the boat in still water is increased by 2 km/h, then how much time will it take to go 30 km downstream and 30 km upstream?

$b + s$ $\quad$ $b - s$

$T_u - T_d = 1/2$

$\frac{24}{20-s} - \frac{24}{20+s} = \frac{1}{2}$

$b = 22$

$s = 4$

$T = \frac{D}{S}$

DS-26

VS-18

$= \frac{39}{26} + \frac{30}{18}$

$= 3/2 + 5/3$

$= \frac{19}{6}$ hr

$= 3$ hr $1/6$

2 h 50 m

$1 - 1/2 = 1/2$

3 h 10 m

$3/4 - 1/4 = 1/2$

3 h 40 m

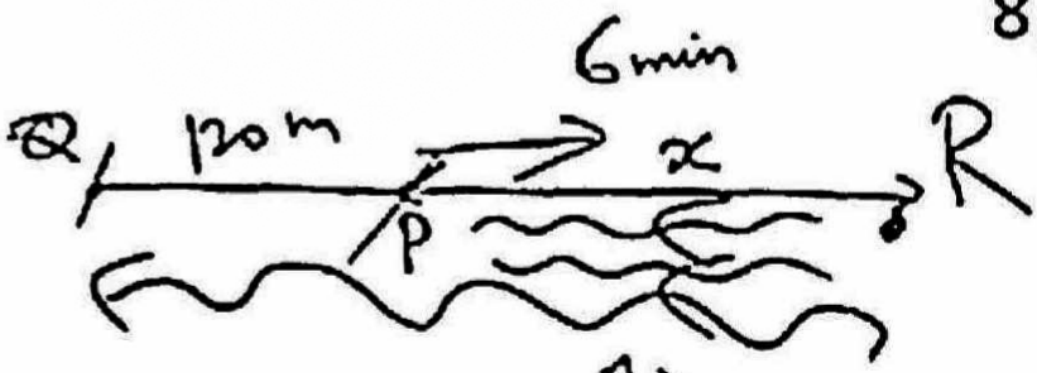
$3/2 - 1 = 1/2$

2 h 40 m

$1/6 \times 60 = 10$

8 A swimmer swims from a point P against the current for 6 min and then swims back along the current for next 6 min and reaches at a point Q. If the distance between P and Q is 120 m then the speed of the current (in km/h) is:

1. 0.4
2. 0.2
3. 1
4. 0.6



PR

$b - s = \frac{x}{360}$ (m) (s) $\frac{6 \times 60 s}{6 \times 60 s}$

RQ

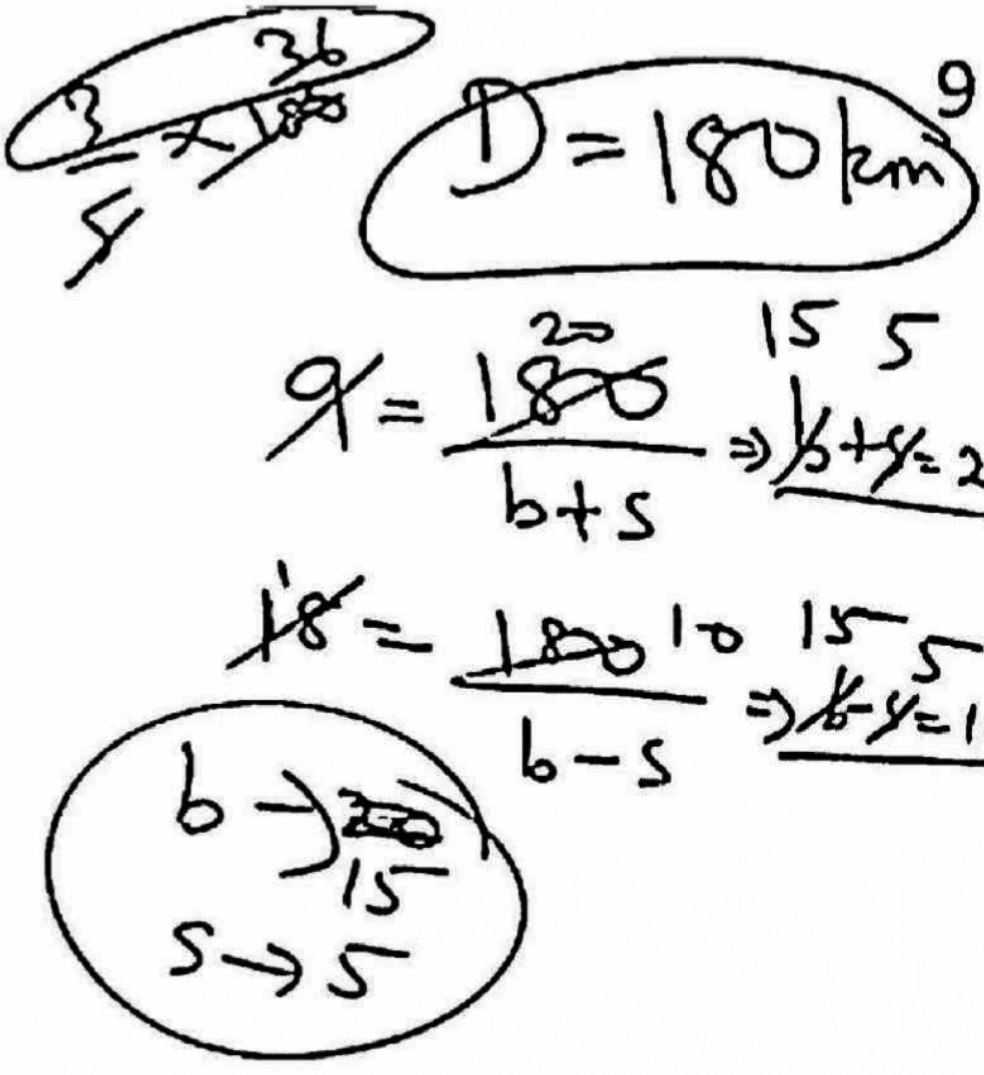
$b + s = \frac{x + 120}{360}$ $\frac{x}{360}$ $\frac{+120}{360}$

$2s = \frac{1}{3}$

$s = \frac{1}{6}$ m/s $\times \frac{18}{5} = 0.6$ kmph

A man rows a boat a certain distance downstream in 9 hours, while it takes 18 hours to row the same distance upstream. How many hours will it take him to row three-fifth of the same distance in still water?

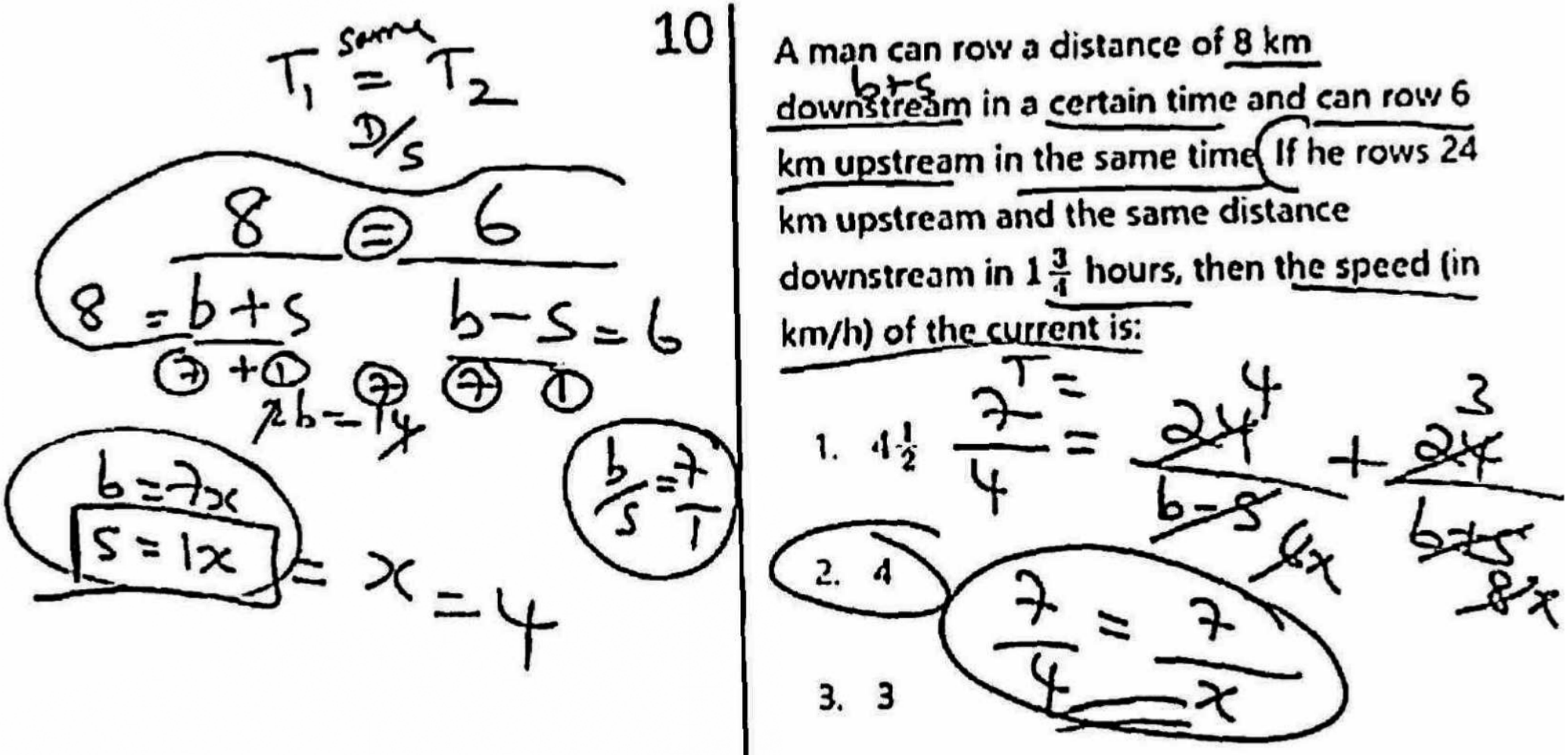
1. 9.5
2. 7.2
3. 10
4. 12



10

A man can row a distance of 8 km downstream in a certain time and can row 6 km upstream in the same time. If he rows 24 km upstream and the same distance downstream in $1\frac{3}{4}$ hours, then the speed (in km/h) of the current is:

1. $4\frac{1}{2}$
2. 4
3. 3
4. $2\frac{1}{2}$



11

A boat can go 16 km downstream and 10 km upstream in 3 hours. It can also go 24 km downstream and 5 km upstream in 2 hours. In how much time (in hours) will it cover a distance of 64 km downstream?

1. 5 hrs
2. 6 hrs
3. 2 hrs
4. 3 hrs

$b+s=32$

$b-s=4$

$3 = \frac{16}{b+s} + \frac{10}{b-s}$ (d, u)

$2 = \frac{24}{b+s} + \frac{5}{b-s}$

$\frac{1}{2} = \frac{16}{32}d + \frac{10}{20}u \times 2$

$\frac{2}{4} = \frac{24}{48}d + \frac{5}{10}u \times 2$

$1 = 32d \Rightarrow d = \frac{1}{32} = \frac{1}{b+s}$

$T = \frac{64}{32}$

$T = 2$

$6 = 1 + 2u$

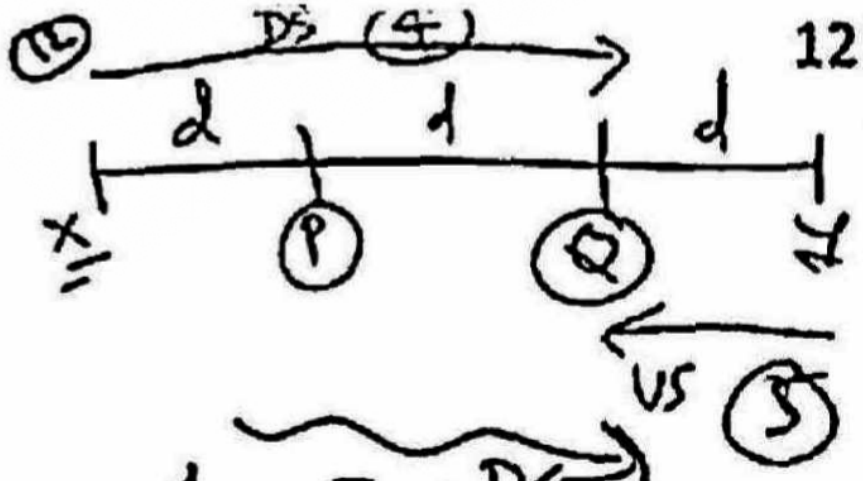
$\Rightarrow 4u = 8$

$u = 1/4 = \frac{1}{b-s}$

12

X, Y are two points in a river. Points P and Q divide the straight line XY into three equal parts. The river flows along XY and the time taken by a boat to row from X to Q and from Y to Q are in the ratio 4 : 5. The ratio of the speed of the boat downstream to that of the river current is equal to:

1. 4 : 3
2. 10 : 3
3. 3 : 10
4. 3 : 4



$\frac{4}{5} = \frac{T_1 \to D/S}{T_2} =$

$\frac{2x}{5} = \frac{x/b+s}{x/b-s}$

$\frac{2}{5} = \frac{b-s}{b+s}$

$3.5x = 1.5x + 2x$

$3 + 2 \Rightarrow 1$

$\frac{b+s}{s} = \frac{5}{1.5}$

$= 5/3/2$

$= 10/3$

$\frac{b+s}{s}$

13

A boat can go 3 km upstream and 5 km downstream in 55 minutes. It can also go 4 km upstream and 9 km downstream in 1 hour 25 minutes. In how much time (in hours) will it go 43.2 km downstream?

1. 4.4
2. 4.8
3. 3.6
4. 5.4

$$\frac{55}{60} = \frac{3}{b-s} + \frac{5}{b+s}$$

$$\frac{17}{12} = \frac{4}{b-s} + \frac{9}{b+s}$$

$3u + 5v = 11/6$ ×4

$4u + 9v = 17/12$ ×3

$12u + 20v = 11/3$

$12u + 27v = 17/4$

$7v = \frac{17}{4} - \frac{11}{3}$

$7v = \frac{51-44}{12} = \frac{7}{12} = \frac{1}{675}$

$1 + \frac{25}{60} = \frac{5}{12}$ $b+s$

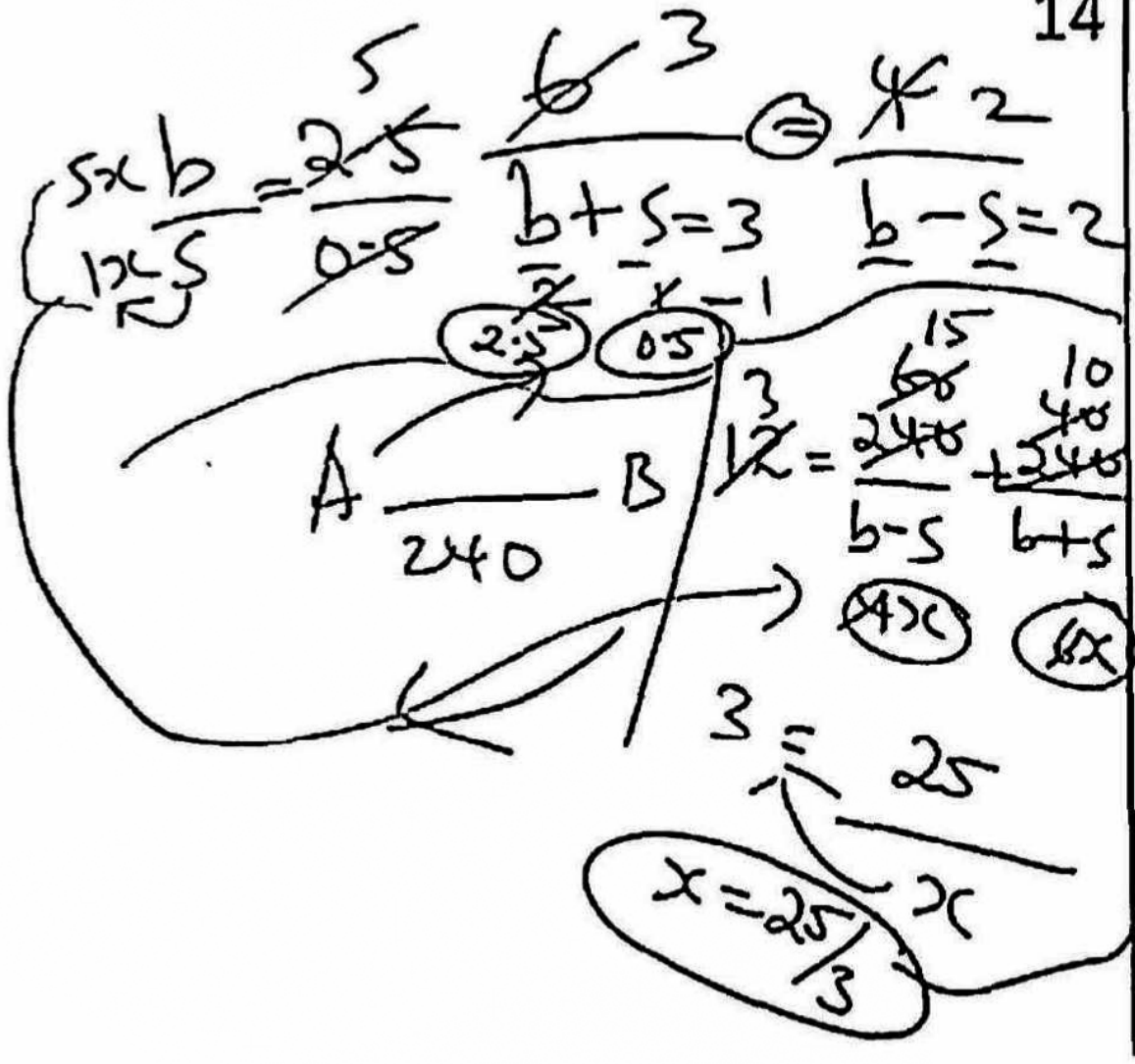
$\frac{17}{12}$ 3.6

$T = \frac{43.2}{12}$

14

A man rows from A to B (upstream) and B A (downstream) in 12 hours. The distance between A and B is 240 km. The time take by the man to row 6 km downstream is identical to the time taken by him to row km upstream. What is the speed of the stream? $s =$

1. $\frac{35}{3}$ km/h
2. $\frac{25}{3}$ km/h
3. $\frac{40}{3}$ km/h
4. $\frac{50}{3}$ km/h



15

$T_u - T_d = 3$

$\frac{D}{5} - \frac{D}{10} = 3$

$\frac{10D - 5D}{50} = 3$

$\frac{5D}{50} = 3$

$D = 30$ km

(b) (s)

A man can row 7.5 km/h in still water. If the speed of the current is 2.5 km/h, it takes 3 hours more upstream than downstream for the same distance. The distance is:

1. 37.5 km
2. 27 km
3. 35 km
4. 30 km