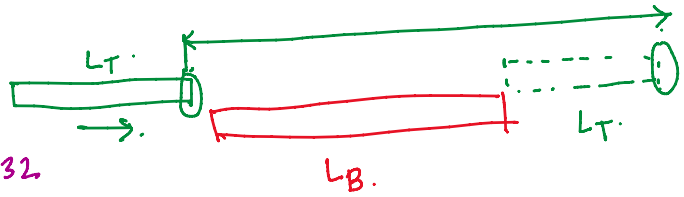


Q.10. How long does a train 110 metres long running at the speed of 72 km/hr take to cross a bridge 132 metres in length?

- (a) 9.8 sec
- ✓ (b) 12.1 sec
- (c) 12.42 sec
- (d) 14.3 sec



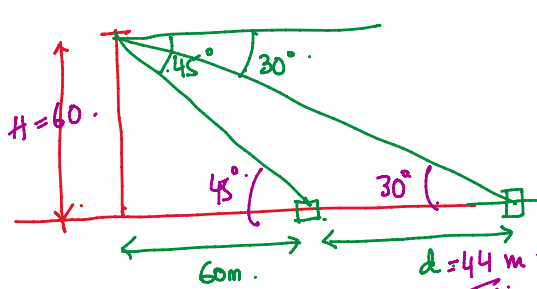
$$D = L_B + L_T = 110 + 132 = 242 \text{ m.}$$

$$T = \frac{D}{S} = \frac{242}{S} = \frac{242}{20}$$

$$S = 72 \times \frac{5}{18} \text{ m/s.}$$

Q.11. A man is watching from the top of a tower a boat speeding away from the tower. The boat makes an angle of depression of 45° with the man's eye when at a distance of 60 metres from the tower. After 5 seconds, the angle of depression becomes 30°. What is the approximate speed of the boat, assuming that it is running in still water?

- ✓ (a) 32 kmph
- (b) 36 kmph
- (c) 38 kmph
- (d) 40 kmph



$$\sqrt{3} = 1.732$$

$$\begin{array}{r} 7.32 \\ \times 6 \\ \hline 43.92 \end{array}$$

$$60\sqrt{3} = 60 + d$$

$$d = 60\sqrt{3} - 60$$

$$= 60(\sqrt{3} - 1)$$

$$= 60 \times 0.732$$

$$\frac{H}{60} = \tan 45^\circ = 1 \Rightarrow H = 60$$

$$\frac{H}{60+d} = \tan 30^\circ = \frac{1}{\sqrt{3}} \Rightarrow \frac{60}{60+d} = \frac{1}{\sqrt{3}}$$

$$S = \frac{44}{5} \text{ m/s.}$$

$$= \frac{44}{5} \times \frac{18}{5}$$

$$= \frac{792 \times 4}{25 \times 4}$$

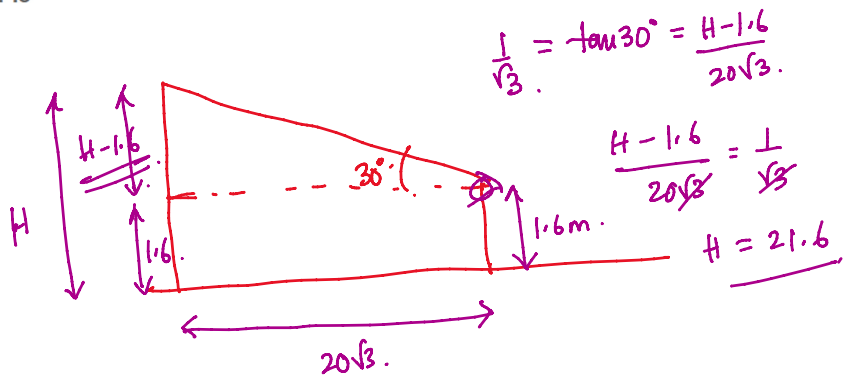
$$= \frac{3168}{100}$$

$$= 32$$

Q.13. An observer 1.6 m tall is $20\sqrt{3}$ m away from a tower. The angle of elevation from his eye to the top of the tower is 30° . The height of the tower is

- (a) 21.6 m
- (b) 23.2 m
- (c) 24.72 m
- (d) None of these

$\sqrt{2} = 1.414$
 $\sqrt{3} = 1.732$



Q.22. The difference between simple and compound interests compounded annually on a certain sum of money for 2 years at 4 % per annum is Rs. 1. The sum (in Rs.) is:

- (A) 625
- (B) 630
- (C) 640
- (D) 650

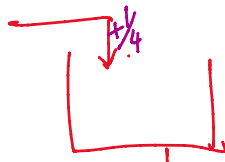
$SI = \frac{P \times R \times T}{100}$
 $CI = P(1 + \frac{R}{100})^T - P$
 $CI - SI = 1$
 $1 = 4\% \times I_1$
 $I_1 = \frac{1}{4} \times 100 = 25$
 $P = 25 \times 25 = 625$

Q.26. A Cistern can be filled by a tap in 4 hours while it can be emptied by another tap in 9 hours. If both the taps are opened simultaneously then after how much time will the cistern get filled?

- (A) 2.5 hrs
- (B) 3 hrs
- (C) 6.5 hrs
- (D) 7.2 hrs

In 1 hr

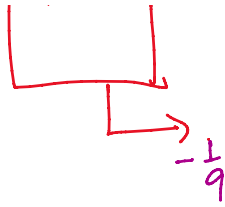
What fraction of the cistern is filled in 1 hr.



Net fraction filled in 1 hr

$= \frac{1}{4} - \frac{1}{9} = \frac{9-4}{36} = \frac{5}{36}$

✓ (D) 7.2 hrs



Net fraction filled in 1 min

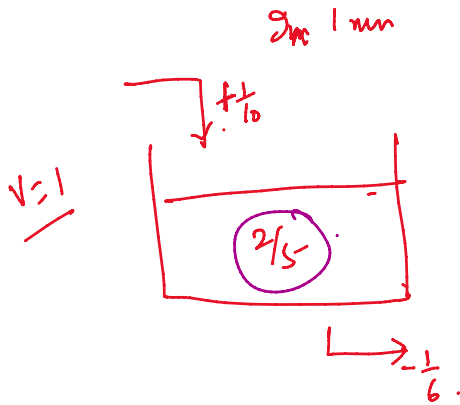
$$= \frac{1}{4} - \frac{1}{9} = \frac{9-4}{36} = \frac{5}{36}$$

∴ No of hrs reqd to fill the tank

$$= \frac{1}{\frac{5}{36}} = \frac{36}{5} = 7.2 \text{ hrs}$$

Q.28. A water tank is two-fifth full. Pipe A can fill a tank in 10 minutes and pipe B can empty it in 6 minutes. If both the pipes are open, how long will it take to empty or fill the tank completely?

- (A) 6 min to empty
- (B) 6 min to fill
- (C) 8 min to empty
- (D) 8 min to fill
- (E) None of these



Net fraction emptied in 1 min

$$= \frac{1}{6} - \frac{1}{10} = \frac{4}{60} = \frac{1}{15}$$

∴ The entire tank can be emptied in $\frac{1}{\frac{1}{15}} = 15 \text{ min}$

$\frac{2}{5}$ of the tank can be emptied in $\frac{2}{5} \times 15 = 6 \text{ min}$

Q: Gopal and Ravi contracted a work for Rs 480. If Gopal can do that work in 15 days and Ravi can complete that same work in 10 days. He completed this work with Mahesh in 5 days, then tell me how much money Mahesh got.

- (A) Rs.80
- (B) Rs.120
- ✓ (C) Rs.160
- (D) Rs. 40

In 1 day Gopal $\rightarrow \frac{1}{15}$, Ravi $\rightarrow \frac{1}{10}$

$$G+R \rightarrow \frac{1}{15} + \frac{1}{10} = \frac{25}{150} = \frac{1}{6}$$

for 6 days the payment is Rs. 480.

∴ for 1 " " " " " Rs $\frac{480}{6} = \underline{\underline{Rs 80}}$

In 1 day Mahesh $\rightarrow \frac{1}{d}$ $G+M = \frac{1}{15} + \frac{1}{d} = \frac{d+15}{15d}$

H: G = 2:1

In 5 days $\frac{d+15}{15d} \times 5 = 1$

$$480 \times \frac{1}{3} = \underline{\underline{160}}$$

$d+15 = 3d$
 $d = \underline{\underline{7.5}}$

Q : The ratio of the sides of a triangle is $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$ and its perimeter is 104 cm. is. What is the length of the longest arm?

- (A) 52 cm
- ✓ (B) 48 cm
- (C) 44 cm
- (D) 40 cm

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

$a : b : c = \frac{1}{2} : \frac{1}{3} : \frac{1}{4}$ LCM = 12

$= 12 \times \frac{1}{2} : 12 \times \frac{1}{3} : 12 \times \frac{1}{4}$

$= \underline{6 : 4 : 3}$

$6x + 4x + 3x = 104$
 $13x = 104$
 $x = \underline{\underline{8}}$

Q : The ratio of the age of a son and father is 1: 4. After 9 years, the ratio will be 2: 5. What is the present age (in years) of the son?

- (A) 10
- (B) 8
- ✓ (C) 9
- (D) 12

1: 4 2: 5

Son Father
 x $4x$

Present age

After 9 yrs.

$x + 9 : 4x + 9 = 2 : 5$

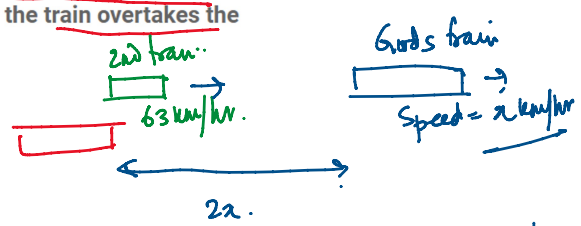
$\frac{x + 9}{4x + 9} = \frac{2}{5}$

$3x = 27$
 $x = \underline{\underline{9}}$

$5x + 45 = 8x + 18$

Q : Two hours after a goods train passed a station, another train travelling at a speed of 63 km / hr following goods train passed through that station, if after passing the station the train overtakes the goods train in 7 hours What is the speed of the goods train ?

- ✓ (A) 49 km / hr
- (B) 32.2 km / hr
- (C) 58.8 km / hr
- (D) 73.5 km / hr



Relative speed of the 2nd train w.r.t the goods train

(C) 58.8 km / hr

(D) 73.5 km / hr

2x.

Relative speed of the 2nd train w.r.t the goods train
 $= (63 - x)$ km/hr.

$$\frac{2x}{63-x} = 7$$

$$2x = 7 \times 63 - 7x$$

$$9x = 7 \times 63$$

$$x = 7 \times 7 = 49$$

Q : Out of 5 men and 3 women, committee of 3 members is to be formed so that it has 1 woman and 2 men. In how many different ways can it be done?

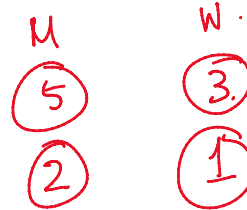
(A) 20

(B) 10

(C) 23

(D) 30

(E) None of these



W → 3 ways

M → 5C_2 ways

$$= \frac{5 \times 4}{2} = 10 \text{ ways}$$

$$3 \times 10 = 30$$

Q : In how many different ways can the letters of the word 'CREAM' be arranged?

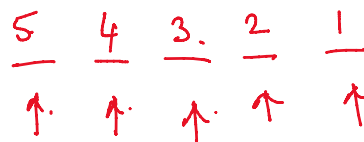
(A) 720

(B) 240

(C) 360

(D) 504

(E) None of these



$$5 \times 4 \times 3 \times 2 \times 1 = 120$$

Q: If $x^{\sqrt{x}} = (x\sqrt{x})^x$, then find the value of x

(A) $\frac{3}{4}$

(B) $\frac{3}{5}$

(C) $\frac{9}{4}$

(D) $\frac{7}{4}$

$\sqrt{x} = x^{\frac{1}{2}}$

$x^1 \cdot x^{\frac{1}{2}} = x^{1+\frac{1}{2}} = x^{\frac{3}{2}}$

$x^{x^{\frac{1}{2}}} = (x \cdot x^{\frac{1}{2}})^x = (x^{\frac{3}{2}})^x = x^{\frac{3}{2}x}$ $(x^a)^b = x^{ab}$

$x = \frac{4}{9}$

$x^{\frac{1}{2}} = x^{\frac{3}{2}}$

$x^{\frac{1}{2}} = \frac{3}{2}x$

$\frac{x^2}{x} = \frac{4}{9}$

$x = \frac{9}{4}x^2$

$(x^{\frac{1}{2}})^2 = (\frac{3}{2}x)^2$

Q: Chandu bought a watch at 20 percent discount on mark price but sold it at mark price. Find the percentage of profit.

(A) 25%

(B) 20%

(C) 18%

(D) 30%

Let the MP = 100. 20% discount \Rightarrow 20% less.

CP = 80

SP = 100

Profit = 20

Profit % = $\frac{20}{80} \times 100$
 $= 25\%$

Q : A mixture contains wine and water in the ratio 3:2 and another mixture contains them in the ratio 4:5. How many litres of the latter mixture must be mixed with 3 litres of the former mixture so that the resultant mixture may contain equal quantities of wine and water?

- (A) $4\frac{1}{2}$ litres
- (B) $3\frac{3}{4}$ litres
- (C) $1\frac{2}{3}$ litres
- (D) $5\frac{2}{5}$ litres

1:1

$x = \frac{3}{10} \times 18 = \frac{27}{5}$ fraction of wine

$3 \left(\frac{3}{5} - \frac{1}{2} \right) = x \left(\frac{1}{2} - \frac{4}{9} \right)$ fraction of wine in final mixture.

$3 \times \frac{1}{10} = x \frac{1}{18}$

M1: $\frac{3}{5}$

M2: $\frac{4}{9}$

Vol. 3 lit. x lit.

$\frac{1}{2}$

Q : A can contains a mixture of two liquids A and B in the ratio 7:5. When 9 litres of mixture are drained off and the Can is filled with B, the ratio of A and B becomes 7:9. How many litres of liquid A was contained by the Can initially?

- (A) 10
- (B) 21
- (C) 20
- (D) 25

In 9 lit

A $\rightarrow \frac{7}{12} \times 9 = \frac{21}{4}$

B $\rightarrow \frac{5}{12} \times 9 = \frac{15}{4}$

A $\rightarrow 7x - \frac{21}{4}$

B $\rightarrow 5x - \frac{15}{4} + 9$

$\frac{7x - \frac{21}{4}}{5x - \frac{15}{4} + 9} = \frac{7}{9}$

$63x - \frac{189}{4} = 35x + \frac{147}{4}$

$28x = \frac{336}{4} = 84$

x = 3

A $\rightarrow 7x$ B $\rightarrow 5x$ total $\rightarrow 12x$

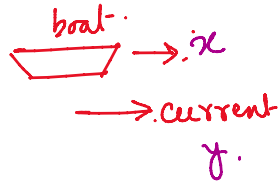
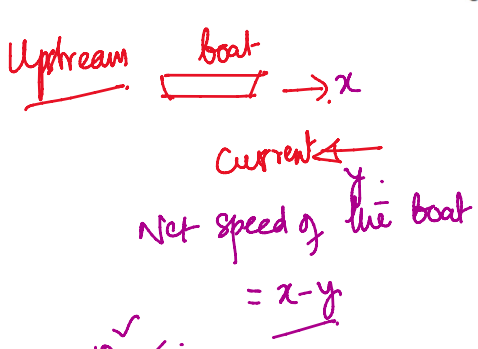
Q: A man goes downstream with a boat to some destination and returns upstream to his original place in 5 hours. If the speed of the boat in still water and the stream are 10 km/hr and 4 km/hr respectively, the distance of the destination from the starting place is :

(A) 21 km

(B) 25 km

(C) 16 km

(D) 18 km

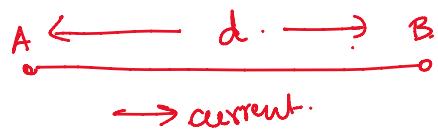


$x = 10$ ✓
 $y = 4$ ✓

time = $\frac{\text{distance}}{\text{speed}}$

total time = $\frac{d}{x+y} + \frac{d}{x-y}$

$\frac{d}{x+y} + \frac{d}{x-y} = 5$



time = $\frac{d}{x+y}$

time = $\frac{d}{x-y}$

$d = \frac{5 \times 42}{10} = 21$ km

$\frac{d}{10+4} + \frac{d}{10-4} = 5$

$\frac{d}{14} + \frac{d}{6} = 5$

$\frac{10d}{42} = 5$

$\frac{3d}{42} + \frac{7d}{42} = 5$