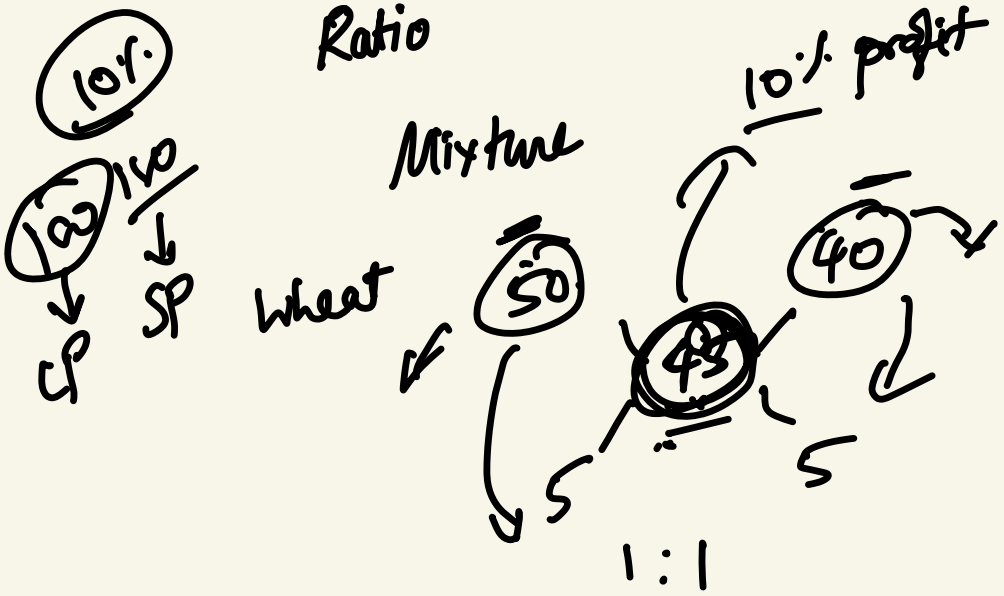
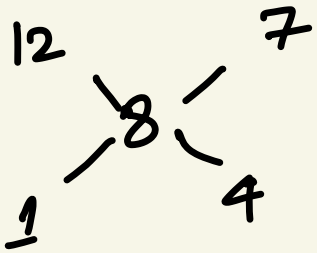

10%
100
110
CP
SP
Ratio
Mixture
Wheat
50
40
45
10% profit
5
5
1 : 1

. In what proportion must a grocer mix sugar at Rs.12 a kg and Rs.7 a kg so as to make a mixture worth Rs. 8 a kg.?

(1) 7 : 12 (2) 1 : 4

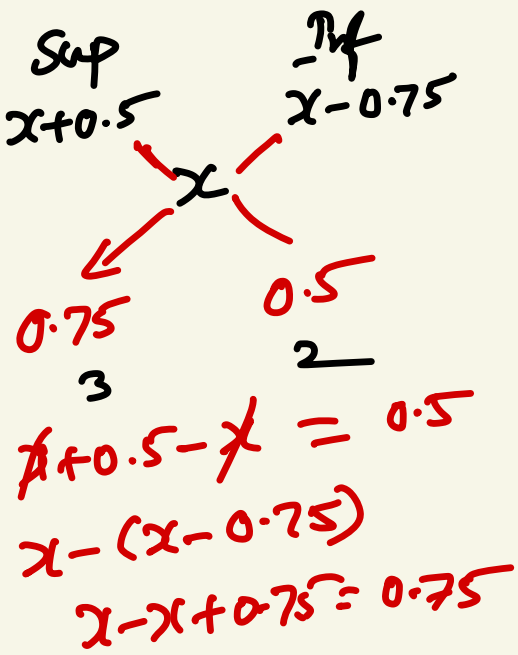
(3) 2 : 3 (4) 12 : 7



Two varieties of sugar are mixed together in a certain ratio. The cost of the mixture per kg is Rs. 0.50 less than that of the superior and Rs. 0.75 more than the inferior variety. The ratio in which the superior and inferior varieties of sugar have been mixed is :

(1) 5 : 2 (2) 2 : 3

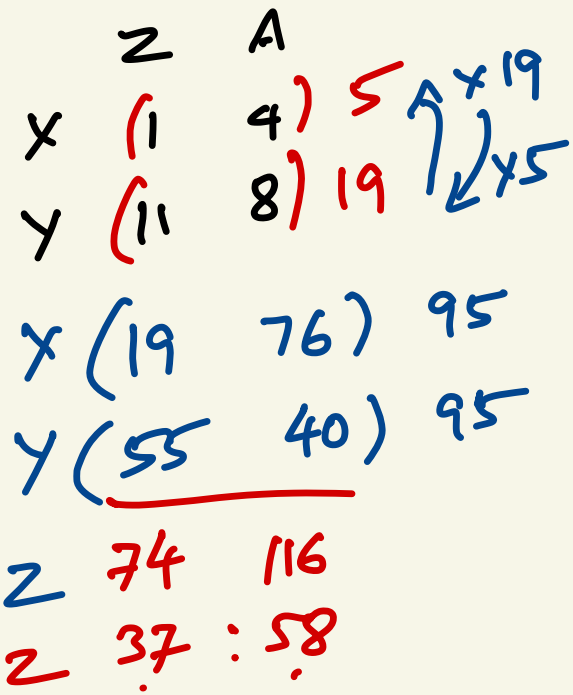
(3) 3 : 2 (4) 5 : 1



X and Y are two alloys which are prepared by mixing zinc and aluminium in the ratio of 1 : 4 and 11 : 8 respectively. If equal quantities of alloys are melted to form a third alloy Z what is the ratio of zinc and aluminium in alloy Z?

(1) 32 : 47 (2) 37 : 58

(3) 37 : 95 (4) 74 : 95



A mixture contains liquid A liquid B in the ratio of 5 : 4 respectively. If 2 litres of liquid B is added to it, the ratio of liquid A and liquid B becomes 7 : 6. What is the quantity (in litres) of liquid A in the mixture?

(1) 32 (2) 35

(3) 40 (4) 42

$5 : 4$

A $\frac{5x}{4x+2} = \frac{7}{6}$

B

$30x = 28x + 14$

$2x = 14$

$x = 7$

$5x = 5 \times 7 = 35$

In a bucket, paint and oil are in the ratio 7 : 5. 24 litres of mixture is drawn off and 24 litres of oil is added. If the ratio of paint and oil becomes 1 : 1, then how many litres of paint was contained in the bucket initially?

(1) 49 (2) 63

(3) 84 (4) 98

P O

7 5

24

7 : 5

7x → 24

7 → ?

14 10

7x

7x − 14 = 98.

$$\frac{7x-14}{5x-10+24} = \frac{1}{1}$$

7x − 14 = 5x + 14 → 2x = 28

x = 14

Rahul adds 2 litres of alcohol in 6 litres of water and Dinesh adds 1 litre of alcohol in 9 litres of water. What is the ratio of the percentage of alcohol in the two mixtures?

(1) 7 : 4 (2) 2 : 1

(3) 5 : 2 (4) 8 : 3

$\frac{2}{8} \times 100 : \frac{1}{10} \times 100$

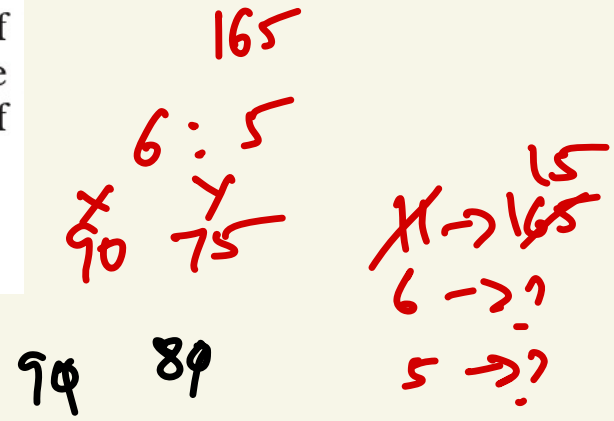
$25 : 10$

$5 : 2$

In a mixture of 165 litres, the ratio of liquids X and Y is 6 : 5. If 5 litres of liquid Y is added in the mixture, then what is the ratio of X and Y in the new mixture?

(1) 10 : 9 (2) 8 : 7

(3) 9 : 8 (4) 5 : 4



The ratio of milk and water in a mixture is 4 : 3. If we add 2 litres of water, the ratio of milk and water becomes 8 : 7. What is the quantity of the final mixture ?

(1) 18 litres

(2) 30 litres

(3) 24 litres

(4) 28 litres

$$\frac{4x}{3x+2} = \frac{8}{7}$$

$$28x = 24x + 16$$

$$4x = 16$$

$$x = 4$$

$7x$

$28 + 2$

50 litres of mixture of alcohol and water is in the ratio of 1 : 4 respectively. If 10 litres of mixture is taken out and replaced with 10 litres of water, What is the new ratio of alcohol and water respectively?

(1) 1 : 4 (2) 2 : 11

(3) 1 : 5 (4) 4 : 21

50

A W

10 40

8 32

8 32+10

8 42

4 : 21

10

2 8

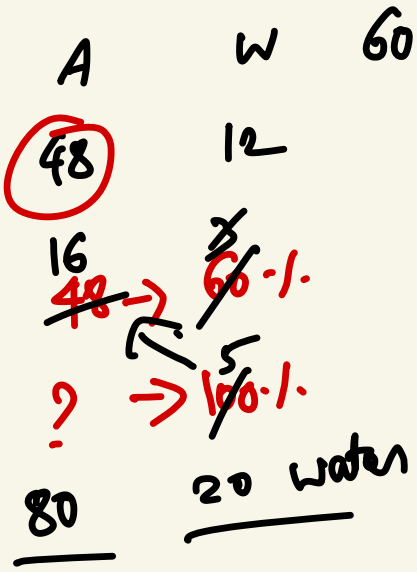
A vessel has 60 litres of solution of acid and water having 80% acid. How much water be added to make it a solution in which acid forms 60% ?

(1) 48 litres

(2) 20 litres

(3) 36 litres

(4) None of these



An ore contains 25% of an alloy that has 90% iron. Other than this, in the remaining 75% of the ore, there is no iron. To obtain 60 kg of pure iron, the quantity of the ore needed (in kgs) is approximately :

(1) 250.57 (2) 266.67

(3) 275.23 (4) 300

Ore → 25% alloy

Ore → $25 \times \frac{90}{100} = 22.5\%$

22.5% → Iron.

Ore → 100%

Iron → 22.5%

22.5 → 60

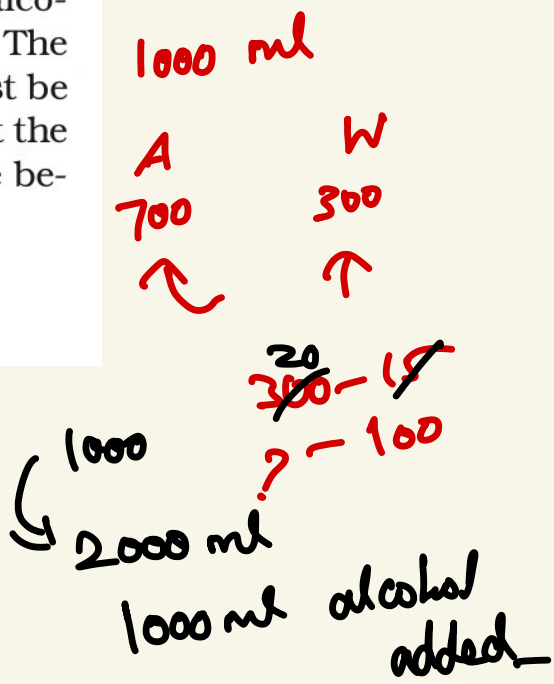
100 → ? x

$x = \frac{100 \times 60}{22.5} = \frac{100 \times 60 \times 2}{45} = \frac{800}{3} = 266.67$

In one litre of a mixture of alcohol and water, water is 30%. The amount of alcohol that must be added to the mixture so that the part of water in the mixture becomes 15% is :

(1) 1000 ml (2) 700 ml

(3) 300 ml (4) 900 ml



One type of liquid contains 20% water and the second type of liquid contains 35% of water. A glass is filled with 10 parts of first liquid and 4 parts of second liquid. The water in the new mixture in the glass is

(1) 37%

(2) 46%

(3) $12\frac{1}{7}\%$

(4) $24\frac{2}{7}\%$

Liquid A

W A

20 80 (100)

Liquid B

W B

35 65 (100)

10 litre

W 2 A 8

4 litre

1.4 2.6

$\frac{2+1.4}{14} \times 100$

$\frac{340}{14} = \frac{170}{7}$

$= 24\frac{2}{7}\%$.

$\frac{3.4}{14} \times 100$.

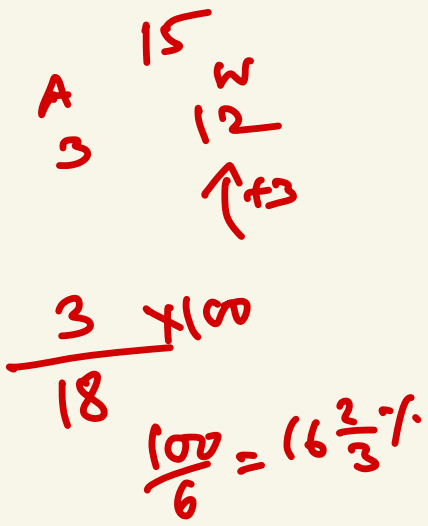
15 litres of a mixture contains alcohol and water in the ratio 1 : 4. If 3 litres of Water is mixed in it, the percentage of alcohol in the new mixture will be

(1) 15%

(2) $16\frac{2}{3}\%$

(3) 17%

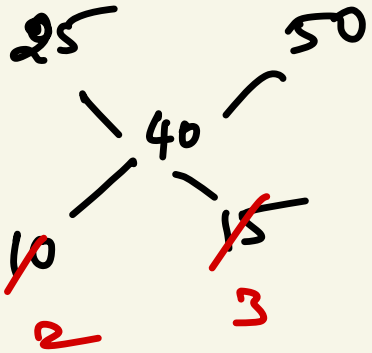
(4) $18\frac{1}{2}\%$



In what ratio must 25% of alcohol be mixed with 50% of alcohol to get a mixture of 40% strength alcohol?

(1) 1 : 2 (2) 2 : 1

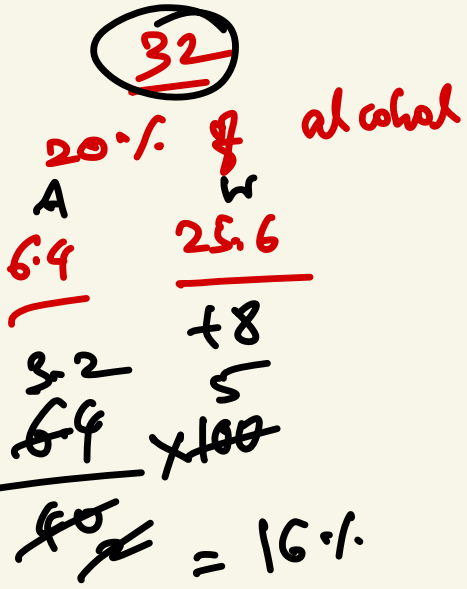
(3) 2 : 3 (4) 4 : 3



8 litres of water is added to 32 litres of a solution containing 20% of alcohol in water. What is the approximate concentration of alcohol in the solution now ?

(1) 24% (2) 16%

(3) 8% (4) 12%



$\frac{6.4}{40} \times 100$

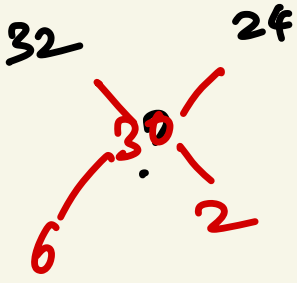
In what ratio wheat at Rs. 32 per kg should be mixed with wheat at Rs. 24 per kg so that on selling the mixture at Rs 39 per kg, there is a profit of 30%?

a) 3:1

b) 2:3

c) 1:4

d) 4:5



3 : 1

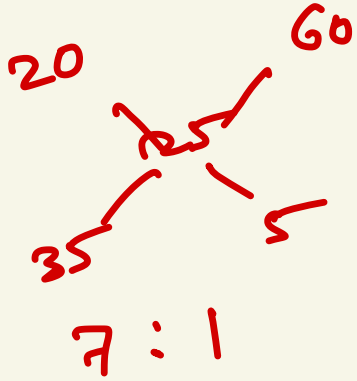
~~3~~ → 150

? → 100

In what ratio must a mixture of 20% milk strength be mixed with that of 60% milk strength so as to get a new mixture of 25% milk strength?

(1) 7 : 1 (2) 4 : 1

(3) 5 : 2 (4) 9 : 2



7 litres mixture of milk and water contains 30% water. 3.5 litres of milk is added to this mixture. What is the percentage of water in the new mixture?

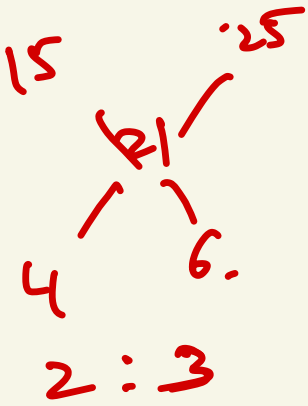
(1) 10 (2) 15

(3) 20 (4) 25

In what ratio must a mixture of 15% spirit strength be mixed with that of 25% spirit strength to get a mixture of 21% spirit strength?

(1) 1 : 3 (2) 2 : 3

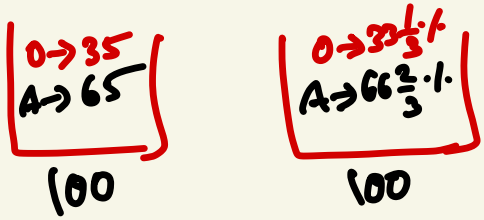
(3) 3 : 4 (4) 4 : 5



Two bottles of the same capacity are 35% and $33\frac{1}{3}\%$ full of orangne juice, respectively. They are filled up completely with apple juice and then the contents of both bottles are emptied into another vessel. The percentage of apple juice in the mixture is :

(1) $64\frac{1}{3}$ (2) $65\frac{5}{6}$

(3) $60\frac{2}{3}$ (4) $34\frac{1}{6}$

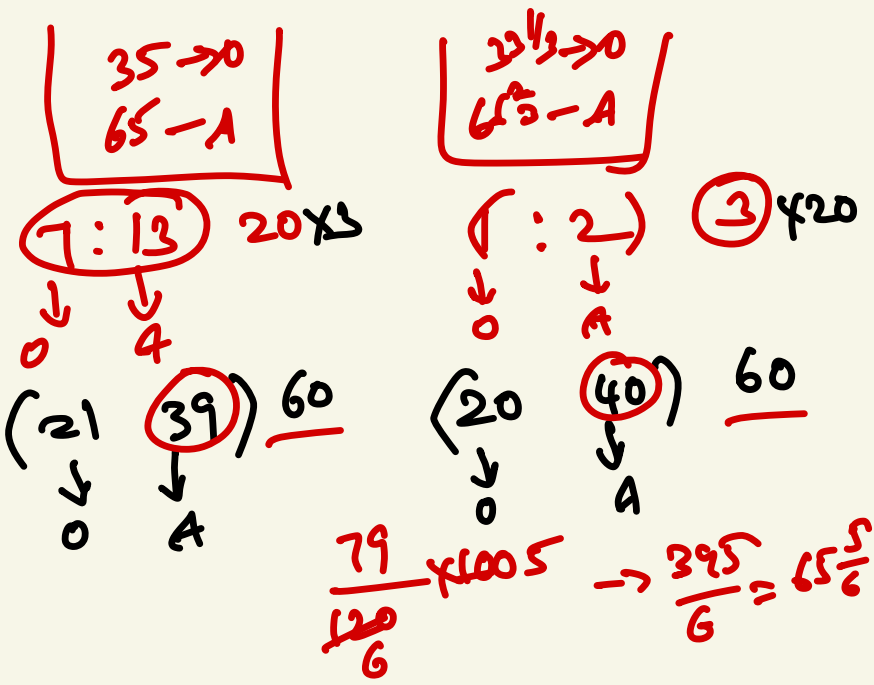


$$\frac{65 + 66\frac{2}{3}}{200} \times 100$$

$$66\frac{2}{3} \Rightarrow \frac{200}{3}$$

$$\frac{65 + \frac{200}{3}}{200} \times 100 = \frac{395}{600} \times 100$$

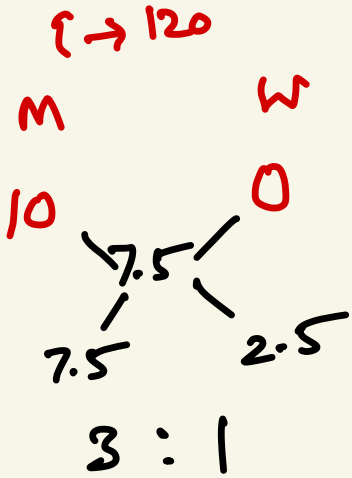
$$= 65\frac{5}{6}\%$$

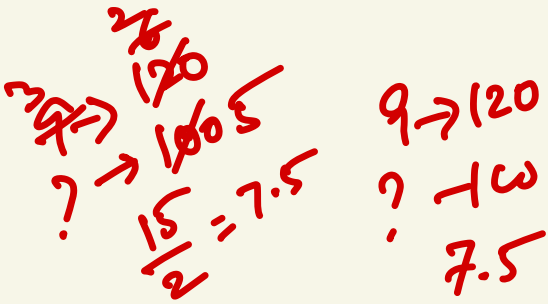

35 → 0
65 − A
7 : 13
20X3
0
4
21
39
60
0
A
33⅓ → 0
66⅔ − A
: 2
3
X20
0
A
20
40
60
0
A
79/120 X1005 → 395/6 = 65 5/6

A milkman makes 20% profit by selling milk mixed with water at ₹ 9 per litre. If the cost price of 1 litre pure milk is ₹ 10, then the ratio of milk and water in the said mixture is

(1) 3 : 1 (2) 4 : 1

(3) 3 : 2 (4) 4 : 3





A shopkeeper bought 15kg of rice at the rate of ₹29 per kg and 25kg of rice at the rate of ₹20 per kg. He sold the mixture of both types of rice at the rate of ₹27 per kg. His profit in this transaction is

(1) ₹125 (2) ₹150

(3) ₹ 140 (4) ₹145

$15 \times 29 = 435$

$25 \times 20 = 500$

CP $= 935$

$40 \times 27 = 1080$

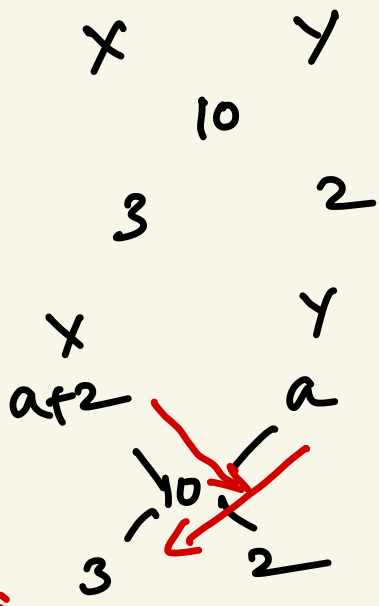
$1080 - 935 = 145$

$27 \times 4 = 108$

The liquids, X and Y are mixed in the ratio of 3 : 2 and the mixture is sold at Rs. 11 per litre at a profit of 10%. If the liquid X costs Rs. 2 more per litre than Y, the cost of X per litre is (in Rs.) :

(1) 10.80 (2) 11.75

(3) 9.50 (4) 11



$$\frac{a+2-10}{10-a} = \frac{2}{3}$$

$$3a-24 = 20-2a$$

$$5a = 44$$

$$a = \frac{44}{5} = 8.8 + 2 = 10.8.$$

In what proportion must water be added with milk to gain 20% by selling the mixture at cost price?

(1) 1 : 5 (2) 4 : 1

(3) 5 : 1 (4) 1 : 1

20 : 100

1 : 5

5 → 50

1 litre → 10

1 water 5 → milk

6 →

6 litre → 60 1

10/50 × 100

20%

Rama mixes 20% of kerosene to his petrol and then he sells the whole mixture at the price of petrol. If the cost price of the kerosense is 40% of the CP of petrol. What is the net profit% ?

(1) 11.11% (2) 11.5%

(3) 12.5% (4) 9.5%

1000 ml P → 100

1000 ml K → 40.

200 ml K → 8.

K P

200 ml 1000 ml

1200 ml → 120

200 1000

K P

8 100

108

$\frac{12}{108} \times 100 = 11.11\%$

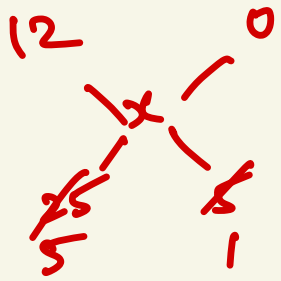
A merchant buys 25 litres of milk daily at the rate of Rs. 12 per litre. He mixes 5 litres of water in it and sells at the rate Rs. 10.40 per litre. His gain is :

(1) 8% profit (2) 2% profit

(3) 4% profit (4) 6% profit

$25 \times 12 \rightarrow 300$

$30 \times 10.4 \rightarrow 312$



$\frac{12-x}{x-0} = \frac{1}{5}$

$60 - 5x = x$

$6x = 60 \quad x = 10$

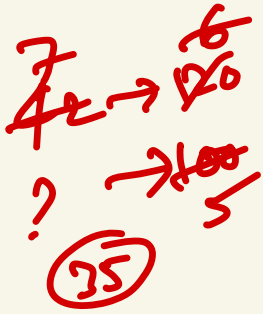
$\frac{12}{300} \times 100$

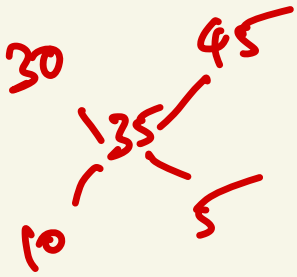
4% profit.

In what ratio sugar at Rs. 30 per kg should be mixed with sugar at Rs. 45 per kg so that on selling the mixture at Rs. 42 per kg there is a profit of 20%?

(1) 2 : 1 (2) 2 : 3

(3) 5 : 2 (4) 3 : 7

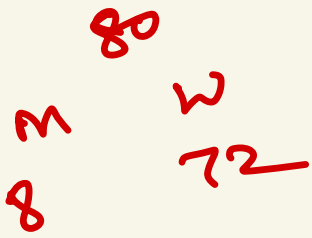




80 litre mixture of milk and water contains 10% milk. How much milk (in litres) must be added to make water percentage in the mixture as 80%?

(1) 8 (2) 9

(3) 10 (4) 12



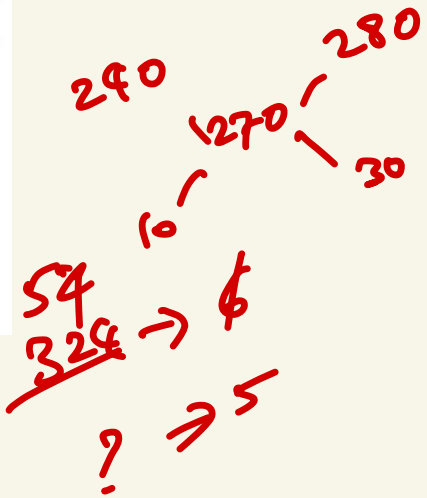
In what ratio tea at Rs. 240 per kg. should be mixed with tea at Rs. 280 per kg. so that on selling the mixture at Rs. 324 per kg. there is a profit of 20%?

(1) 1 : 1

(2) 1 : 2

(3) 1 : 3

(4) 1 : 4



In what ratio sugar costing Rs. 38 per kg and Rs. 30 per kg be mixed with each other so that on selling mixture at Rs. 35.2 per kg there will be a profit of 10%?

(1) 1 : 3

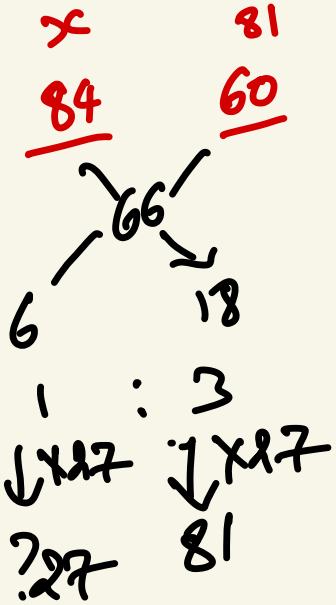
(2) 3 : 7

(3) 13 : 7

(4) 9 : 4

How much quantity (in kg.) of wheat costing Rs. 84 per kg. must be mixed with 81 kg. of wheat costing Rs. 60 per kg. so that on selling the mixture at Rs. 75.9 per kg., there is a gain of 15%?

(1) 27
(2) 20.5
(3) 22.75
(4) 24



A milkman mixes water with milk and sells the mixture at the cost price of pure milk. The volume of water in litres to be mixed with each litre of milk to get a 25% profit is

(1) $\frac{1}{4}$

(2) $\frac{1}{5}$

(3) $1\frac{1}{4}$

(4) cannot be calculated without knowing the cost price of milk

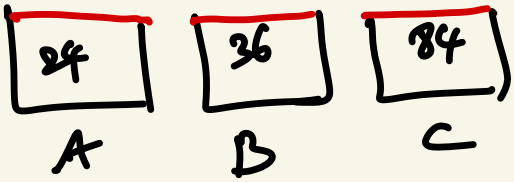
25 : 100

1 : 4.

Three boxes of capacity 24 kg, 36 kg and 84 kg are completely filled with three varieties of wheat A, B and C respectively. All the three boxes were emptied and the three types of wheat were thoroughly mixed and the mixture was put back in the three boxes. How many kg of type A wheat would be there in the third box (in kg)?

(1) 10 (2) 12

(3) 14 (4) 16



A : B : C

2 : 3 : 7

144 kg

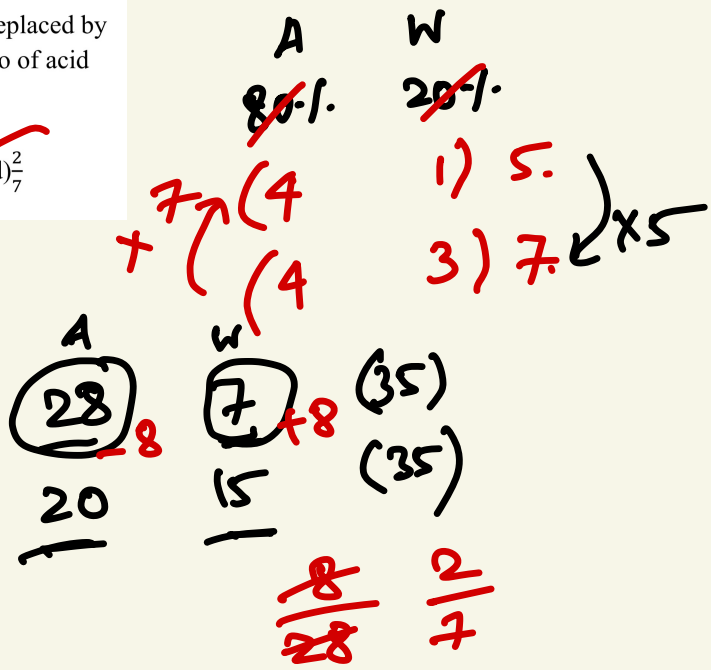
$84 \times \frac{2}{12}$

14 kg.

Mains level questions - Mixtures and Allegations

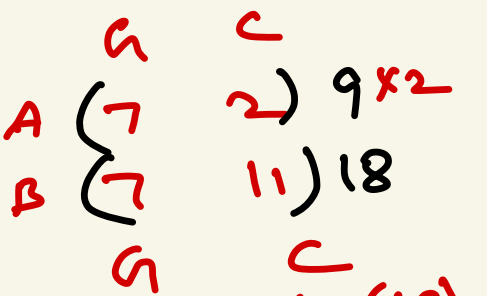
1. A mixture contains 80% acid and rest water. Part of the mixture that should be removed and replaced by the same amount of water to make the ratio of acid and water 4 : 3 is

(a) $\frac{1}{7}$ (b) $\frac{3}{7}$ (c) $\frac{2}{3}$ (d) $\frac{2}{7}$



2. A and B are two alloys of gold and copper prepared by mixing metals in the ratio 7: 2 and 7:11 respectively. If equal quantities of the alloys are melted to form a third alloy C, the ratio of gold and copper in C will be

(a) 5:7 (b) 5:9 (c) 7:5 (d) 9:5

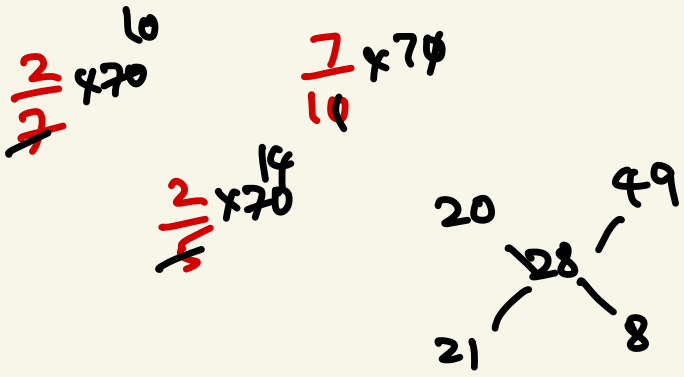


21 : 15

7 : 5

3. In a laboratory, two bottles contain mixture of acid and water in the ratio 2:5 in the first bottle and 7:3 in the second. The ratio in which the contents of these two bottles be mixed such that the new mixture has acid and water in the ratio 2:3 is

(a) 4 : 15 (b) 9 : 8 (c) 21 : 8 (d) 1 : 2



4. A jar contains 10 red marbles and 30 green ones. How many red marbles must be added to the jar so that 60% of the marbles will be red?

(a) 25 (b) 30 (c) 35 (d) 40

R G
10 30

$\frac{R}{G} = \frac{60}{40} \frac{3}{2}$

$\frac{10+x}{30} = \frac{3}{2} \Rightarrow 20+2x=90$

$2x=70$

$x=35$

5. Nitin bought some oranges at Rs.40 a dozen and an equal number at Rs.30 a dozen. He sold them at Rs.45 a dozen and made a profit of Rs.480. the number of oranges, he bought, was

(a)48 (b) 60 (c) 72 (d) 84

$x \times 40 \rightarrow 40x$

$x \times 30 \rightarrow 30x$

$CP = 40x + 30x = 70x.$

$2x \times 45 \rightarrow 90x \rightarrow SP$

$SP - CP = Profit$

$90x - 70x = 480$

$20x = 480$

$x = 24$

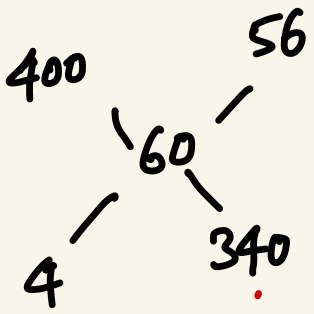
$2x$

2×24

$= 48.$

6. The average salary per head of all workers of an institution is Rs.60. The average salary per head of 12 officers is Rs.400. the average salary per head of the rest is Rs.56. then the total number of workers in the institution is:-

(a) 1062 (b) 1060 (c) 1030 (d) 1032



O : R

1 : 85) ×12

×12

12 : 1020

850
170
1020

1 : 85

1032

7. From a vessel containing 100 *l* of wine, 10 *l* are drawn out and an equal amount of water is added. From the mixture, 10 *l* *is* again drawn out and same quantity of water is added. What is the final ratio of wine and water?

(a) 91:9 (b) 81 : 19 (c) 80: 20 (d) 90 : 10

$$\text{Rem Liquid} = x\left[1 - \frac{y}{x}\right]^n$$

$x \rightarrow$ original

$y \rightarrow$ replaced amount

$n \rightarrow$ No. of times

$$= 100\left[1 - \frac{10}{100}\right]^2$$

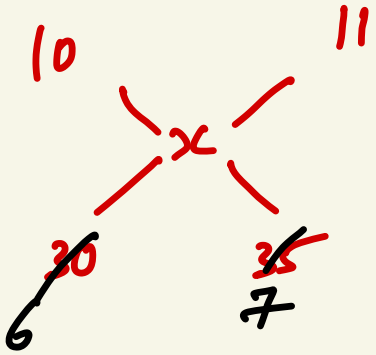
W water

$$\text{Rem Liquid} = 100\left[\frac{81}{100}\right]$$

81 : 19

8. Sourav purchased 30kg of rice at the rate of Rs.10 per kg and 35 kg at the rate of Rs. 11 per kg. He mixed the two. At what price per kg (in Rs.) should he sell the mixture to make a 30 % profit in the transaction?

(a) 12.5 (b) 13 (c) 13.7 (d)14.25



$x = \frac{137}{13} \times \frac{130}{104}$

$x = 13.7$

$\frac{11-x}{x-10} = \frac{6}{7}$

$77 - 7x = 6x - 60$

$13x = 137$

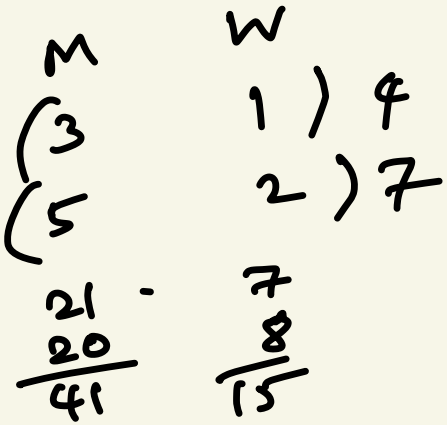
$x = 137/13$

9. 20 liters of a mixture contains 20% alcohol and the rest water. If 4 liters of water be mixed in it, the percentage of alcohol in the new mixture will be

(a) $33\frac{1}{3}\%$ (b) $16\frac{2}{3}\%$ (c) 25% (d) $12\frac{1}{2}\%$

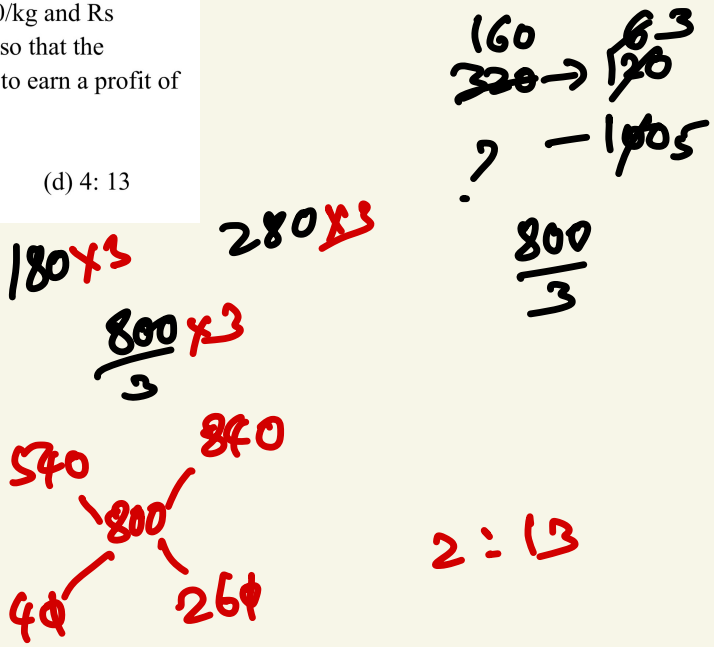
10. There are two contains of equal capacity. The ratio of milk to water in the first container in 3: 1, in the second container 5: 2. If they are mixed up, the ratio of milk to water in the mixture will be-

(a) 28 : 41 (b) 41 : 28 (c) 15 : 41 (d) 41 : 15



11. Two types of tea costing Rs 180/kg and Rs 280/kg should be mixed in the ratio so that the mixture obtained, sold at Rs 320/kg to earn a profit of 20% is

(a) 1: 12 (b) 2: 13 (c) 3:13 (d) 4: 13



12. In two blends of mixed tea, the ratios of Darjeeling and Assam tea are 4: 7 and 2:5. The ratio in which these two blends should be mixed to get the ratio of Darjeeling and Assam tea in the new mixture as 6: 13 is-

(a) 35: 78 (b) 13: 22 (c) 22: 35 (d) 26 : 35

$\frac{4}{11}$ $\frac{2}{7}$

$\frac{6}{19}$

$\frac{6}{19} - \frac{2}{7} : \frac{4}{11} - \frac{6}{19}$

$\frac{42-38}{133} : \frac{76-66}{11\times19}$

$\frac{4}{7} : \frac{10}{11}$

44 : 70

22 : 35

13. The ratio of two liquids in a mixture is 3: 5 and that in another mixture is 6: 1. The ratio in which these two mixture should be mixed so as to make the ratio of the liquids 7:3 is :-

(a) 44:91 (b) 44:61 (c) 44:71 (d) 44:81

14. A vessel contains 20 liters of acid. 4 liters of acid is taken out of the vessel and replaced by the same quantity of water. Next 4 liters of the mixture are withdrawn, and again the vessel is filled with the same quantity of water. The ratio of the quantity of acid left in the vessel with the quantity of acid initially in the vessel is:

(a) 16:25 (b) 1:5 (c) 4:5 (d) 4:25

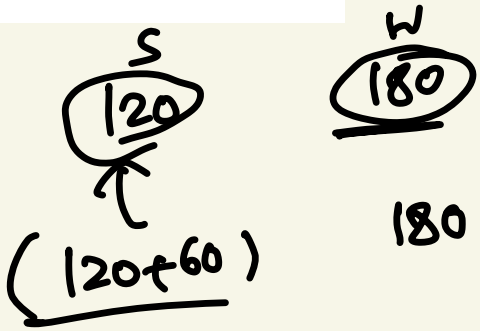
Acid left $= 20\left[1-\frac{4}{20}\right]^2$

$= 20\times\left(\frac{4}{5}\right)^2 = 20\times\frac{16}{25}$

$20\times\frac{16}{25} : 20 \rightarrow 16:25$

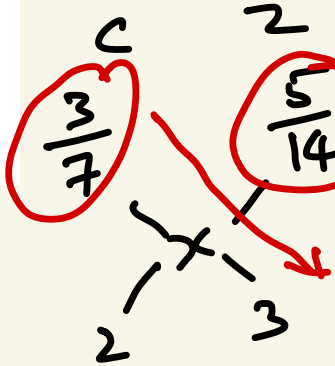
15.300 grams of sugar solution has 40% of sugar in it. How much sugar should be added to make it 50% in the solution?

(a) 10gms (b) 80gms (c) 60gms (d) 40 gms



1. The ratio of copper to zinc in alloy A and B are 3:4 and 5:9, respectively A and B are taken in the ratio 2:3 and melted to form a new alloy C. what is the ratio of copper to zinc in C?

(a) 27:43 (b) 8:13 (c) 9:11 (d)3:5



C

C 2

27:43

$$\frac{\frac{3}{7}-x}{x-\frac{5}{14}}=\frac{3}{2}$$

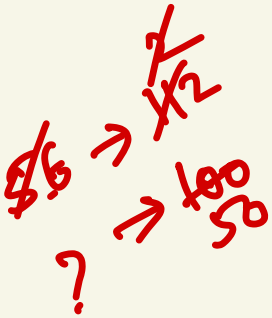
$$\frac{6}{7}-2x=3x-\frac{15}{14} \Rightarrow 5x=\frac{47}{742}\frac{15}{14}$$

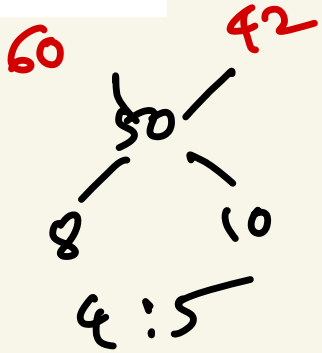
$$5x=\frac{12+15}{14}$$

$$5x=\frac{27}{14} \quad x=\frac{27}{70}$$

2. In what ratio, sugar costing Rs. 60 per kg be mixed with sugar costing Rs. 42 per kg such that by selling the mixture at Rs. 56 per kg there is a gain of 12%?

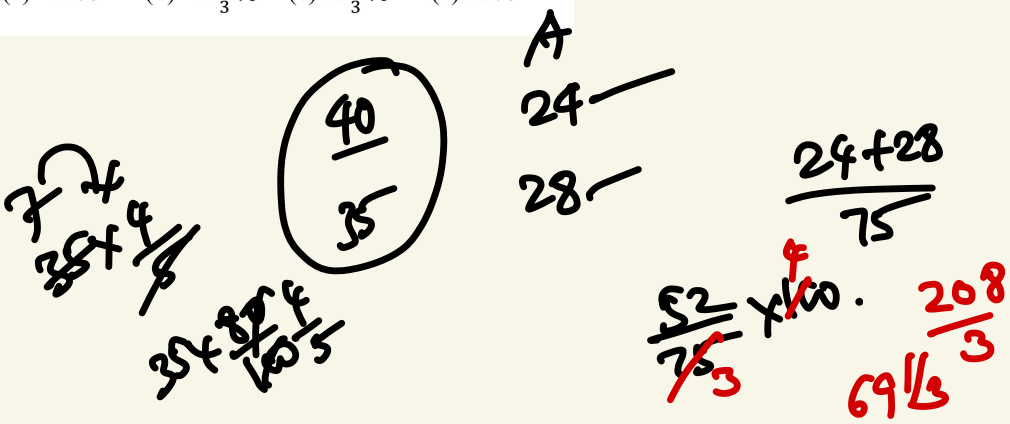
(a) 8:9 (b) 5:6 (c) 5:7 (d) 4:5





3. 40 liters of 60% concentration of acid solution is added to 35 liters of 80% concentration of acid solution. What is the concentration of acid in the new solution?

(a) 66% (b) $66\frac{2}{3}\%$ (c) $69\frac{1}{3}\%$ (c) 69%



4. Alloy A contains copper and zinc in the ratio 4:3 and alloy B contains copper and zinc in the ratio of 5:2. A and B are taken in the ratio of 5:6 and melted to form a new alloy. The percentage of zinc in the new alloy is closed to:

(a) 54 (b) 34.2 (c) 36.8 (d) 35

$\frac{30}{7} - 6x = 5x - \frac{20}{7}$

$11x = \frac{30}{7} + \frac{20}{7}$

$11x = \frac{50}{7}$ → C

$x = \frac{50}{77}$ → T

$\frac{5-x}{x-\frac{4}{7}} = \frac{5}{6}$

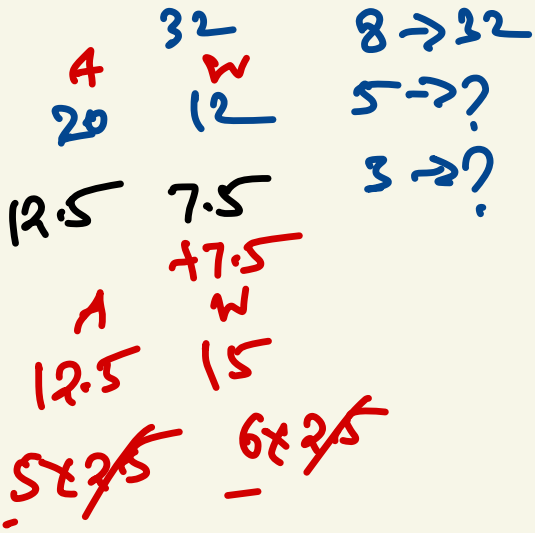
C → 50 Z → 27

$\frac{27}{77} \times 100$

77 | 2700 (35
231
390
385
5

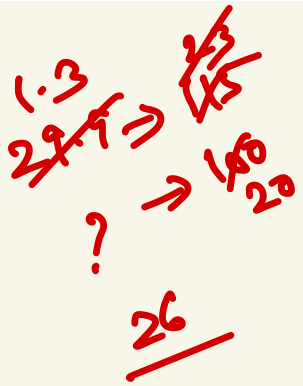
5. A vessel contains a 32 liters solution of acid and water in which the ratio of acid and water is 5:3. If 12 liters of the solution are taken out and $7\frac{1}{2}$ liters of water of water are added to it, then what is the ratio of acid and water in the resulting solution?

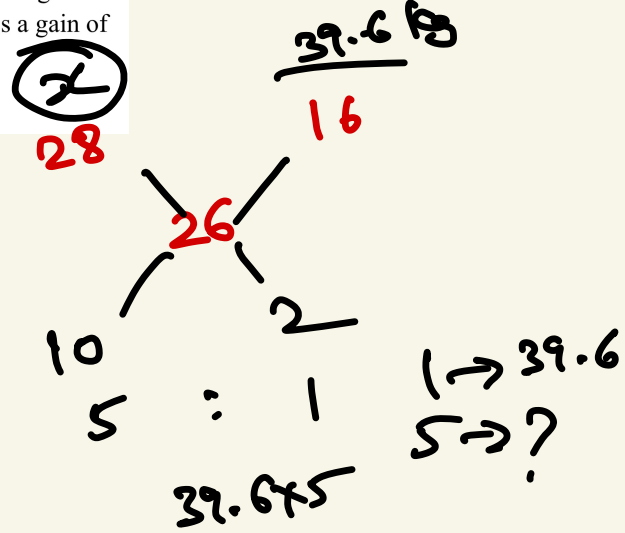
(a) 4:7 (b) 5:6 (c) 4:9 (d) 8:11



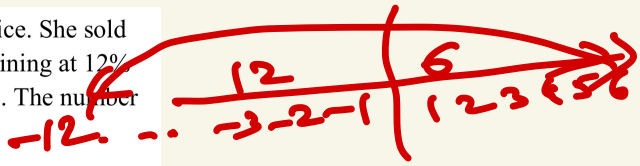
6. How many kg of salt costing Rs. 28 per kg must be mixed with 39.6 kg of salt costing Rs. 16 per kg. So that selling the mixture at Rs. 29.90, there is a gain of 15%?

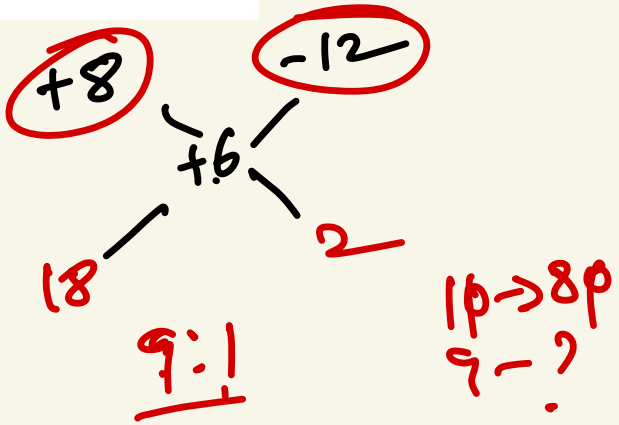
(a) 33 (b) 31 (c) 198 (d) 32





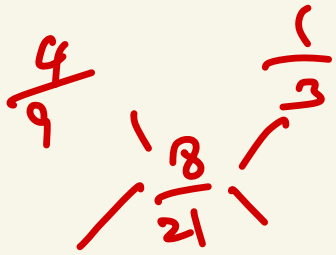
7. Sudha bought 80 articles at the same price. She sold some of them at 8% profit and the remaining at 12% loss resulting in an overall profit of 6% . The number of items sold at 8% profit is:
(a) 64 (b) 60 (c) 72 (d) 70





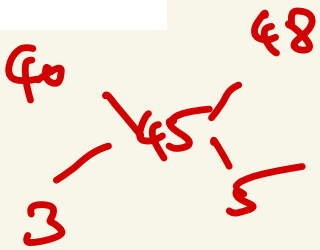
8. A and B solution of acid and water. The ratios of water and acid in A and B are 4:5 and 1:2, respectively. If x liters of A is mixed with y liters of B, then the ratio of water and acid in the mixture become 8:13. What is x:y?

(a) 5:6 (b) 2:5 (c) 3:4 (d) 2:3



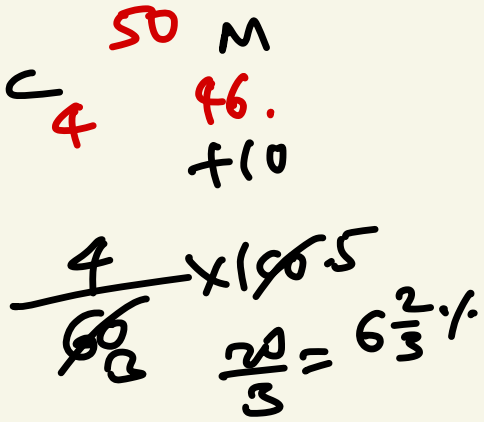
9. In what ratio should sugar costing Rs. 40 per kg be mixed with sugar costing Rs. 48 per kg, so as to earn a profit of 20% by selling the mixture at Rs. 54 per kg?

(a) 2:3 (b) 4:7 (c) 3:5 (d) 5:8



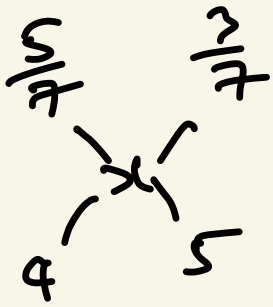
10. A drink of chocolate and milk contains 8% pure chocolate by volume. If 10 liters of pure milk are added to 50 liters of this drinks. The percentage of chocolate in the new drinks is:

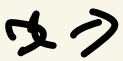
(a) $5\frac{1}{3}$ (b) $6\frac{1}{3}$ (c) $6\frac{2}{3}$ (c) $5\frac{2}{3}$



11. Alloy A contains metals x and y only in the ratio 5:2 and alloy B contains these metals in the ratio 3:4. Alloy C is prepared by mixing A and B in the ratio 4:5. The percentage of x in a lay c is:

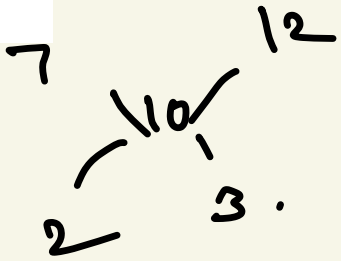
(a) $44\frac{4}{9}$ (b) 56 (c) 45 (d) $55\frac{5}{9}$





12. The price of a variety of a commodity is Rs. 7/kg and that of another is Rs. 12/ kg. find the ratio in which two varieties should be mixed so that price of the mixture is Rs. 10kg.

(a) 3:4 (b) 2:5 (c) 2:3 (d) 4:5



13. A container contains 20 L mixture in which there is 10% sulphuric acid. Find the quantity of sulphuric acid to be added in it to make the solution to contain 25% sulphuric acid.

(a) 3 L (b) 5 L (c) 2L (d) 4L