

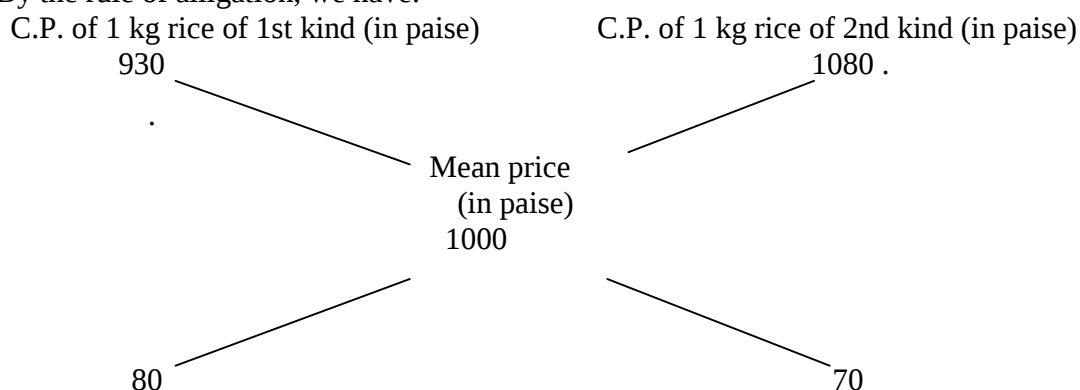
ALLIGATION OR MIXTURE

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SOLVED EXAMPLES

Ex. 1. In what ratio must rice at Rs. 9.30 per kg be mixed with rice at Rs. 10.80 per kg so that the mixture be worth Rs. 10 per kg ?

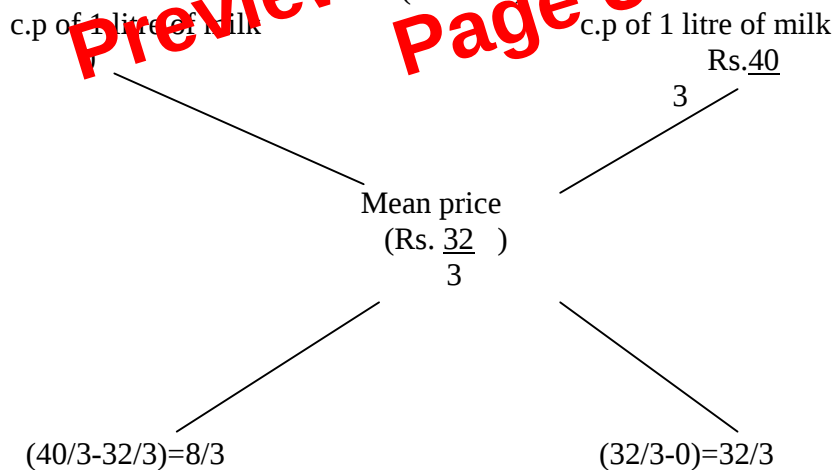
Sol. By the rule of alligation, we have:



$\therefore$ Required ratio = $80 : 70 = 8 : 7$.

Ex. 2. How much water must be added to 60 litres of milk at $\frac{1}{2}$ litres for Rs. 20 So as to have a mixture worth Rs. $10\frac{2}{3}$ a litre?

Sol. C.P. of 1 litre of milk = Rs. $(20 \times \frac{2}{3})$ = Rs. $\frac{40}{3}$


$$\therefore \text{Ratio of water and milk} = \frac{8}{3} : \frac{32}{3} = 8 : 32 = 1 : 4$$

$\therefore$ Quantity of water to be added to 60 litres of milk = $[1/4 \times 60]$ litres = 15 litre

Answer: Option A

Explanation:

Let the amount of Basmati rice being mixed be x kgs. As the trader makes 25% profit by selling the mixture at Rs.40/kg, his cost per kg of the mixture = Rs.32/kg.

$$\text{i.e. } (x * 42) + (25 * 24) = 32 (x + 25)$$

$$\Rightarrow 42x + 600 = 32x + 800$$

$$\Rightarrow 10x = 200 \text{ or } x = 20 \text{ kgs.}$$

19. How many litres of a 12 litre mixture containing milk and water in the ratio of 2 : 3 be replaced with pure milk so that the resultant mixture contains milk and water in equal proportion?

A.4 liters

B.2 liters

C.1 liter

D.1.5 liters

Answer: Option B

Explanation:

The mixture contains 40% milk and 60% water in it. That is 4.8 litres of milk and 7.2 litres of water.

Now we are replacing the mixture with pure milk so that the amount of milk and water in the mixture is 50% and 50%. That is we will end up with 6 litres of milk and 6 litres of water.

Water gets reduced by 1.2 litres.

To remove 1.2 litres of water from the original mixture containing 60% water, we need to remove 1.2 / 0.6 litres of the mixture = 2 litres.

20. A zookeeper counted the heads of the animals in a zoo and found it to be 80. When he counted the legs of the animals he found it to be 260. If the zoo had either pigeons or horses, how many horses were there in the zoo?

A.40

B.30

C.50

D.60

Answer: Option C

Step (ii) By the rule of allegation,

- i. quantity of spirit in A (c) = $5/7$
- ii. Quantity of spirit in B (d) = $7/13$
- iii. Mean price (m) = $8/13$
- iv. $d - m = 5/7 - 8/13 = 9/91$
- v. $m - c = 8/13 - 5/7 = 1/91$
- ∴ Required ratio = $1/91 : 9/91 = 1 : 9$

28. Two vessels A and B contain milk and water mixed in the ratio 8:5 and 5:2 respectively. The ratio in which these 2 mixtures be mixed to get a new mixture containing $69 \frac{3}{13} \%$ milk is :

A.3:4
C.7:9

B.2:7
D.4:3

Answer: Option B

Explanation:

Step (i) : Quantity of milk in 1 lr mixture of A = $8/13$ lr

Quantity of milk in 1 lr mixture of B = $5/7$ lr

Quantity of milk in 1 lr mixture of final mixture = $69 \frac{3}{13} \%$

$$= \left(\frac{900}{13} \times \frac{1}{100} \right) \text{lr}$$

Mean quantity = $9/13$ lr

Step (ii) By the rule of allegation,

- i. quantity of spirit in A (c) = $8/13$
- ii. Quantity of spirit in B (d) = $5/7$
- iii. Mean price (m) = $9/13$ lr
- iv. $d - m = 5/7 - 9/13 = 2/91$
- v. $m - c = 9/13 - 8/13 = 1/13$
- ∴ Required ratio = $2/91 : 1/13 = 2 : 7$

29. The cost of type I rice is Rs.15 p/kg and type II is Rs.20p/kg. Both are mixed in the ratio 2:3, price P/Kg of the mixed variety is :

17. A container contains 40kg of milk, from this container 4kg of milk was taken out and replaced by water. This process was repeated further two times. How much milk is now contained by the container?
- A. 43.12 kg
C. 29.16kg
- B. 43.22kg
D. 12.45kg
18. A can contains a mixture of two liquids A and B in the ratio 7:5 when 9 litres of mixture are drawn off and the can is filled with B, the ratio of A and B becomes 7:9 how many litres of liquids A was contained by the can initially?
- A. 20
C. 22
- B. 21
D. 23
19. A mixture of milk and water measures 60 gallons. It contains 20% water. How many gallons of water should be added to it so that water may be 25%?
- A. 6 gallons
C. 8 gallons
- B. 4 gallons
D. 10 gallons
20. A mixture of spirit and water measure 80 gallons. It contains 20% water. How much water should be added to it so that water may be 25%?
- A. $8\frac{1}{3}$ gallons
C. $7\frac{1}{3}$ gallons
- B. $6\frac{1}{3}$ gallons
D. $5\frac{1}{3}$ gallons
21. A man lent \$2000, part of this at 4% and the rest at 6% per annum simple interest. The whole annual interest amounted to \$92. How much did he lend at 6%?
- A. \$100
C. \$600
- B. \$800
D. \$1000
22. A man invested \$2500 into two parts such that if one part be put out at 5% S.I. and other at 6%, the yearly income may be \$140. How much did he invest at 5%?
- A. \$1250
C. \$1000
- B. \$1500
D. \$750
23. There are two vessels A and B in which the ratio of milk and water are as 5:2 and 8:7 respectively. Two gallons are drawn from vessel A and 3 gallons from vessel B, and are mixed in another empty vessel. What is the ratio of milk and water in it?
- A. 106:69
C. 89:86
- B. 103:72
D. 101:71
24. Two gallons of mixture in which there is $\frac{2}{5}$ of water and the rest spirit is mixed with five gallons of mixture in which there is $\frac{1}{3}$ of water and the rest spirit. What is the ratio of water and spirit in the new mixture?