

- ① Two vessels contain milk and water in the ratio 5:9 and 7:1. If both vessels are mixed in the ratio 4:3, Find the ratio of milk and water in the new mixture?

Soln:-

	<u>Milk</u>		<u>Water</u>	
4 3	$5 \times 4 \times 3$	:	$9 \times 3 \times 4 = 14$	$\begin{array}{l} \nearrow \times 9 \\ \searrow \times 7 \end{array}$ 126
	$7 \times 7 \times 3$	:	$11 \times 7 \times 3 = 18$	
	$60 + 49$		$108 + 77$	
	109	:	185	
_____ X _____				

- ② The ratio of milk and water in a mixture is 2:3. If we added x liter of milk, then the ratio becomes 5:6. Again we added 20 liter of the water to the mixture, the ratio becomes 1:2. find the value of x .

Soln:-

	<u>Milk</u>		<u>Water</u>	
1 unit $\left[\begin{array}{l} 2 \times 2 \\ 5 \end{array} \right.$ 5 $\left\{ \begin{array}{l} 5 \\ 1 \times 5 \end{array} \right.$ milk remains Constant			3×2 $\nearrow$ 6 (water remains constant) $\searrow$ 6 $\left\{ \begin{array}{l} 4 \text{ units} = 20 \text{ ltrs.} \\ 1 \text{ unit} = 5 \text{ ltrs.} \end{array} \right.$	
			2×5	
_____ X _____				

- ③ A vessel contains a 32 liter 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 7.5 liters

of water are added to it, then what is the ratio of acid and water in the resulting solution?

Soln:-

<u>Acid</u>	:	<u>Water</u>	
5	:	3	—————> 32 liters
			- 12 liters
5	:	3	—————> 20 liters
12.5	:	7.5	
		+ 7.5	
12.5	:	15	= 5 : 6

————— x —————

- ④ Two jars A and B both contain 20% milk. The quantity of jar A is 4 times than that of quantity of jar B. Both jar mixtures are mixed and form a new mixture C and 15 liter of water is added. The final ratio of water to milk is now 19 : 4. Find the initial quality (in liters) of milk in jar B.

Soln:- Water : Milk remains same in C, Since these ratios are same in both A & B

	<u>Milk</u>	:	<u>Water</u>	
4	4x		4x4	} 3 units = 15 1 unit = 5
	1x4	:	19	
	4	:		

Initial quantity of milk in jar B = $\frac{1}{5} \times 20 = 4$ ltrs.

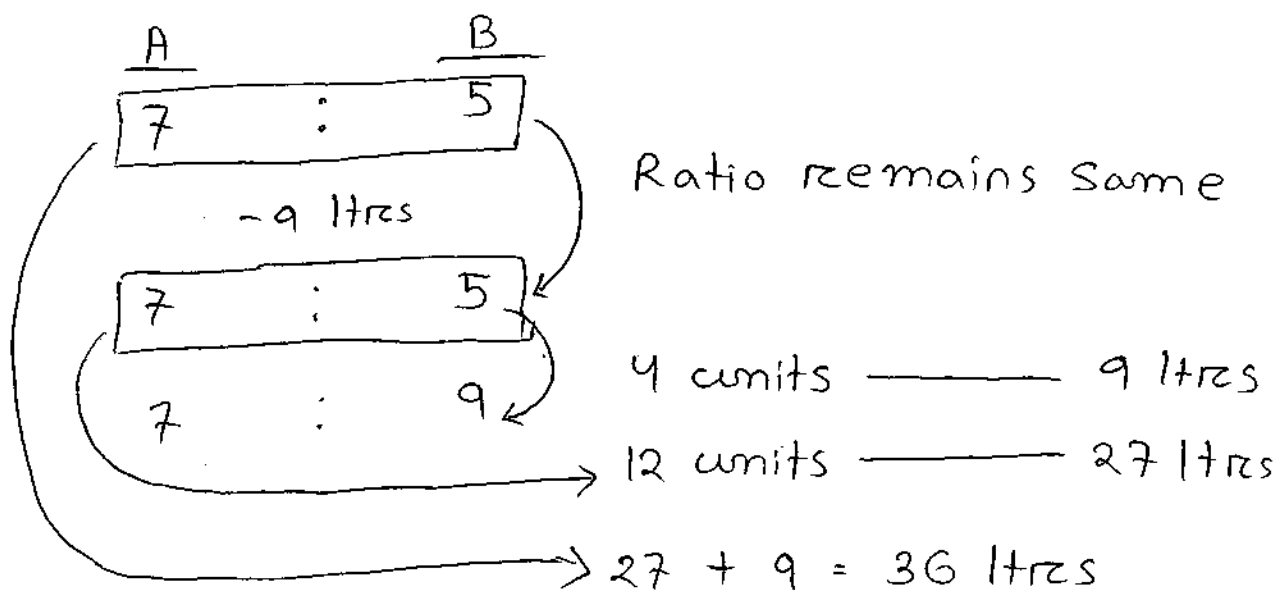
Quantity of mixture in C = $20 \times 5 = 100$ ltrs.

Quantity of mixture in B = $\frac{1}{5} \times 100 = 20$ ltrs.

Milk = 20% of 20 = 4 liters.

- ⑤ A can contain a mixture of two liquids A and B in the ratio 7:5 when 9 liters of mixture are drained off and the can is filled with B, the ratio of A and B becomes 7:9. How many liters of liquid A was contained by the can initially?

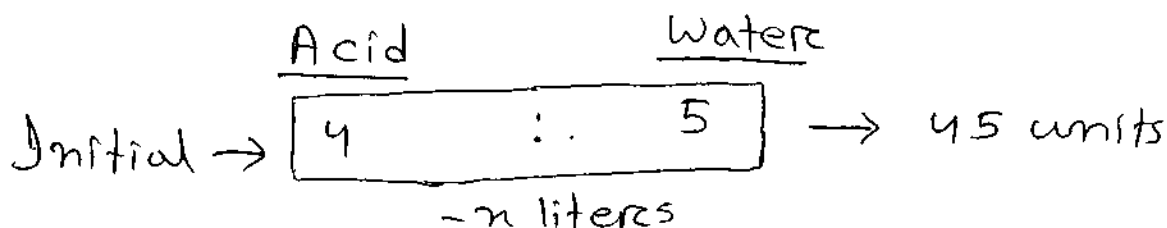
Soln:-



Quantity of liquid A initially = $\frac{7}{12} \times 36 = 21$ liters.

_____ x _____

- ⑥ The ratio of acid and water in a mixture is 4:5. How much part of the mixture should be replaced by water so that ratio of milk and water is 16:29?



Acid qty Same $\left\{ \begin{array}{l} 4 \times 4 : 5 \times 4 \\ 16 : 29 \end{array} \right.$ $\left. \begin{array}{l} 936 \text{ units} \\ 45 \text{ units} \end{array} \right\}$ $+ n \text{ liter}$

Required part = $\frac{9}{45} = \frac{1}{5}$

_____ x _____

- ⑦ Three containers whose volumes are in the ratio 2:3:4 are full of mixture of spirit and water. In the 1st container the ratio of spirit and water is 4:1. In 2nd container the ratio is 11:4 and the third container ratio is 7:3. All the three mixtures are mixed in a big container, the ratio of spirit and water in the resultant mixture is:

Soln:-

<u>1st</u> 5 $\times 12 \left(\begin{array}{ c } \hline 4:1 \\ \hline \end{array} \right)$ → 60l <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Spirit</td> <td style="text-align: center;">Water</td> </tr> <tr> <td style="text-align: center;">48</td> <td style="text-align: center;">12</td> </tr> </table>	Spirit	Water	48	12	<u>2nd</u> 15 $\times 6 \left(\begin{array}{ c } \hline 11:4 \\ \hline \end{array} \right)$ → 90l <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Spirit</td> <td style="text-align: center;">Water</td> </tr> <tr> <td style="text-align: center;">66</td> <td style="text-align: center;">24</td> </tr> </table>	Spirit	Water	66	24	<u>3rd</u> 10 $\times 12 \left(\begin{array}{ c } \hline 7:3 \\ \hline \end{array} \right)$ → 720l <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Spirit</td> <td style="text-align: center;">Water</td> </tr> <tr> <td style="text-align: center;">84</td> <td style="text-align: center;">36</td> </tr> </table>	Spirit	Water	84	36	30 <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">15</td> <td style="text-align: center;">10</td> </tr> <tr> <td style="text-align: center;">1st</td> <td style="text-align: center;">2nd</td> <td style="text-align: center;">3rd</td> </tr> </table> 30 (2 : 3 : 4) 60 : 90 : 40	5	15	10	1st	2nd	3rd
Spirit	Water																				
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Spirit : Water = $(48 + 66 + 84) : (12 + 24 + 36)$

$= 198 : 72 = 11 : 4$

- ⑧ A beaker contains acid and water in the ratio of $5 : x$ when 4 liters of water is added to 16 liters of mixture, then the ratio of acid to water becomes $1 : 1$. What is the value of x ?

Soln:-

	<u>Acid</u>	:	<u>Water</u>	
	5	:	x	$(5-x)$ units = 4
5	$\swarrow$		$\searrow$	
$\times 5$	1×5	:	$1 \times x$	$(5+x)$ units = 16

$$\Rightarrow \frac{5+x}{5-x} = 4 \Rightarrow \frac{5}{x} = \frac{5}{3} \Rightarrow x = 3$$

- ⑨ A beaker contains acid and water in the ratio $1 : x$. When 300ml of the mixture and 50ml of water are mixed, the ratio of acid and water becomes $2 : 5$. What is the value of x ?

Soln:-

	<u>Acid</u>	:	<u>Water</u>	
	1×2	:	$x \times 2$	$(5-2x)$ units = 50ml
2	$\swarrow$		$\searrow$	
	2	:	5	$(2x+2)$ units = 300ml

$$\Rightarrow 2x+2 = 6(5-2x)$$

$$\Rightarrow 2x+2 = 30-12x$$

$$\Rightarrow 14x = 28 \Rightarrow x = 2$$

- # If a container contains x units of liquid A and y units are taken out and replaced by liquid B and

This process is repeated 'n' times.

then
$$\frac{\text{liquid A left after } n^{\text{th}} \text{ operation}}{\text{initial quantity of liquid A}} = \left(\frac{n-y}{n}\right)^n$$

- (10) A container contains 25 liter of milk. From this container 5 liter of milk is taken out and replaced by water. This process is further repeated two times. How much milk is there in the container now?

Soln:- $25 \times \left(\frac{25-5}{25}\right)^3 = 25 \times \left(\frac{4}{5}\right)^3 = 25 \times \frac{64}{125} = 12.8 \text{ ltrs.}$

_____ x _____

- (11) There are 81 liters pure milk in a container. One-third of milk is replaced by water in the container. Again one third of mixture is extracted and equal amount of water is added. What is the ratio of milk to water in the new mixture?

Soln:- Milk left = $81 \times \left(1 - \frac{1}{3}\right)^2 = 81 \times \frac{4}{9} = 36$

milk : water = $36 : (81 - 36) = 36 : 45 = 4 : 5$

_____ x _____

- (12) A jar contains a mixture of milk and water in the ratio 7:1 then 24 ltrs of mixture is taken out and 5L of milk and 15L of water are added to the remaining mixture. If the resultant mixture contains 33% water, then what was the initial quantity of the mixture in the jar?

Soln:-

Initial <u>7:1</u> 40+24 = 64 ltrs.	$\xrightarrow{-24\text{L}}$ <u>7:1</u> 8x5 = 40	Milk: 7 2 5 Water: 1 1 15 5 units = 25 1 unit = 5
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