

### Mixture Problems Made Easy.

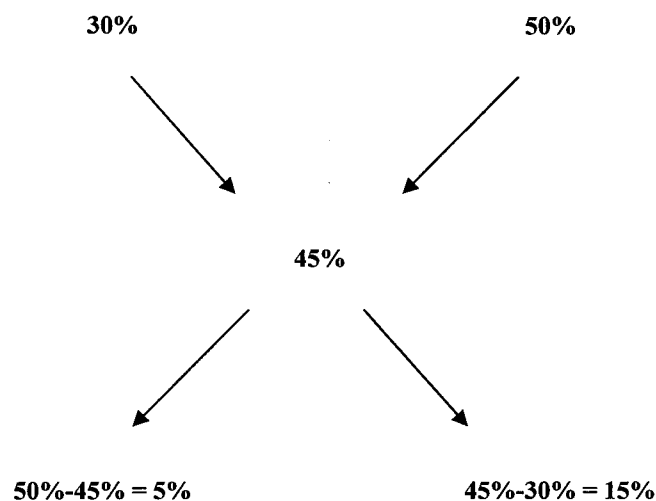
The following method is an easy way to solve basic mixture problems. This method was posted in this forum a long time ago and I thought to refresh it and bring it to you once more.

The method is simple:

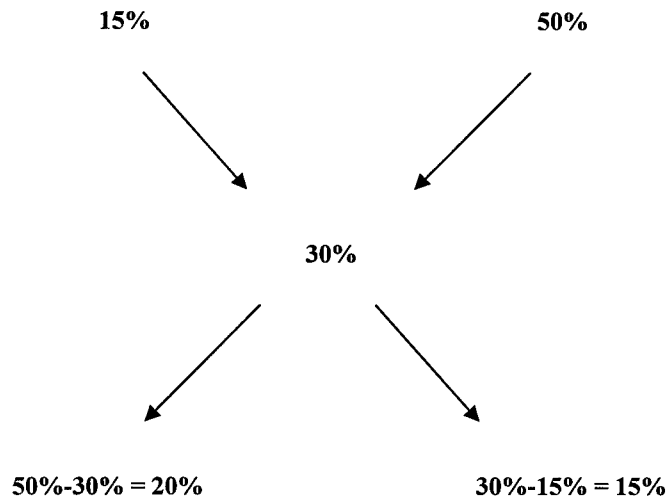
**A 30% solution of alcohol is mixed with a 50% solution of alcohol to form a 10 liter solution of 45% alcohol. How much of the 30% solution was used.**

- (A) 2.0 liters
- (B) 2.5 liters
- (C) 2.7 liters
- (D) 3.0 liters
- (E) 3.2 liters

First let's write down the variables that we know. Next we will subtract the variables in the first line from the variable in the second line to get the third line (in absolute values). This in turn will give us the ratio of solutions in the new 45% solution that is  $5:15 = 1:3$ . Since the solution volume is 10 liters then we used 2.5 liter from the 30% solution. The answer is (B).



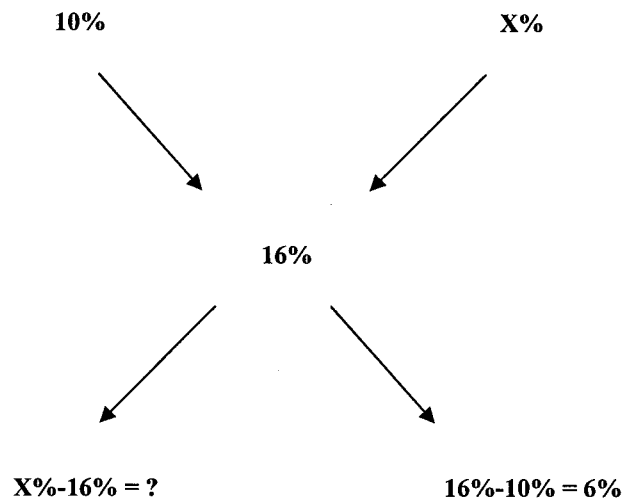
**Mixture A is 15% alcohol and B is 50 % alcohol. They are mixed together to create 4 gallons with 30% alcohol in it. How many gallons of mixture A is in the final mixture?**



This time the ratio is  $20:15 = 4:3$  this means that in 4 gallons of mixture we have  $\frac{4}{7} \times 4 = \frac{16}{7}$  from mixture A and  $\frac{12}{7} =$  from mixture B

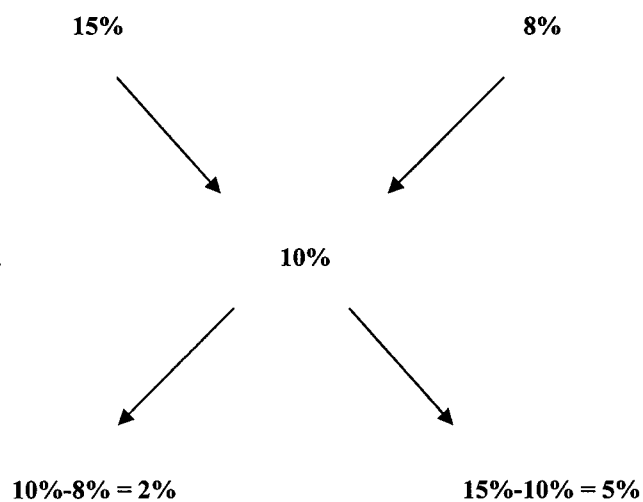
**One fourth of a solution that was 10 percent sugar by weight was replaced by a second solution resulting in a solution that was 16 percent sugar by weight. The second solution was what percent sugar by weight?**

- (A) 34%
- (B) 24%
- (C) 22%
- (D) 18%
- (E) 8.5%



Look at the above drawing, this time we have X as one variable and we get the ratio of  $(x-16):6 = 3:1$  (since a quarter was replaced) solving for x will give  $x = 34$  and the answer is (A).

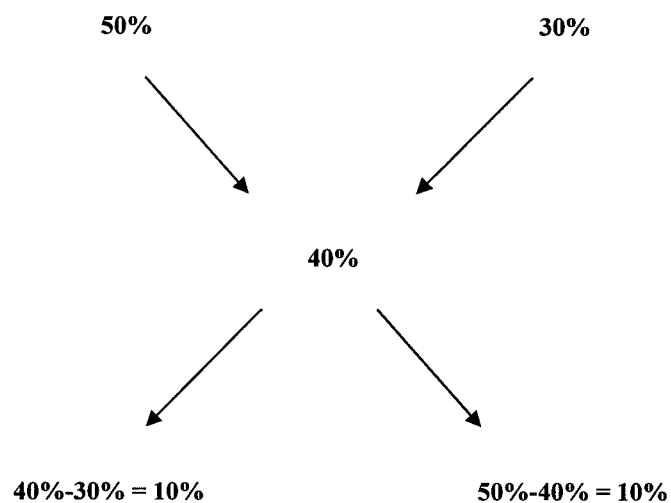
**How many liters of a solution that 15% salt must be added to 5 liters of a solution that 8% salt so that the resulting mixture is 10% salt?**



Look at the above drawing, the ratio of 2% to 5% is 2:5 so we need to add to five liters of 8% two liter of 15% to get the desire solution.

**Some part of the 50% solution of acid was replaced with the equal amount of 30% solution of acid. As a result, 40% solution of acid was obtained. What part of the original solution was replaced?**

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



If the old solution had a volume of  $x$  then the new volume is  $x/2$ . So the replaced part was  $x - x/2 = x/2$ . The answer is (C).