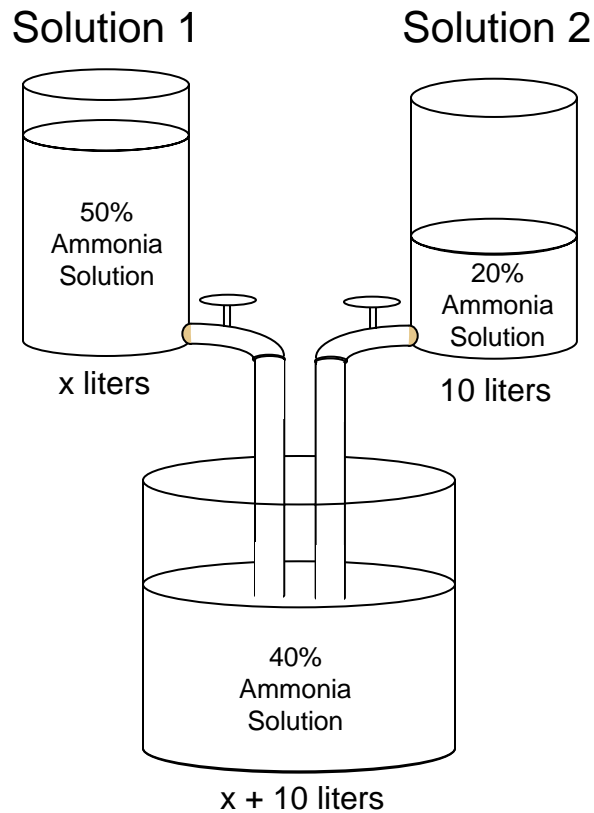


How many liters of a **50%** Ammonia Solution do we need to mix with 10 liters of a **20%** Ammonia Solution to make a final solution that is **40%** Ammonia?



	<i>Amount of Solution</i>	<i>% Ammonia</i>	<i>Amount of Ammonia</i>
Solution 1	x		
Solution 2	10		
Final Solution			

$$\begin{array}{l}
 \textit{Amount} \\
 \textit{of Ammonia} \\
 \textit{from Solution 1}
 \end{array}
 +
 \begin{array}{l}
 \textit{Amount} \\
 \textit{of Ammonia} \\
 \textit{from Solution 2}
 \end{array}
 =
 \begin{array}{l}
 \textit{Amount} \\
 \textit{of Ammonia in} \\
 \textit{the Final Solution}
 \end{array}$$

$$+ \quad =$$

$$0.50x + 0.20(10) = 0.40(x+10)$$

$$\begin{array}{c} \overbrace{10[0.50x + 0.20(10)]} \\ \swarrow \quad \searrow \\ 5x \quad + \quad 2(10) \end{array} = \begin{array}{c} \overbrace{10[0.40(x+10)]} \\ \downarrow \\ 4(x+10) \end{array}$$

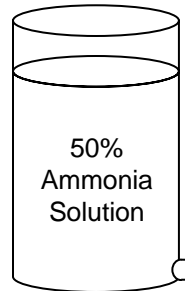
$$5x + 2(10) = 4(x + 10)$$

$$5x + 20 = 4x + 40$$

$$x + 20 = 40$$

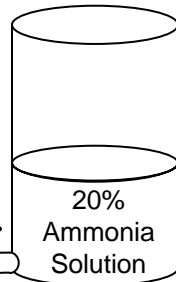
$$x = 20$$

Solution 1

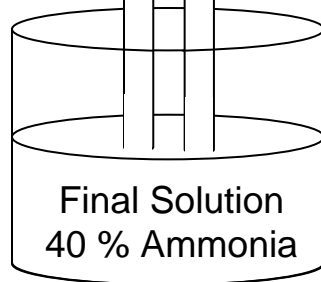


20 liters

Solution 2



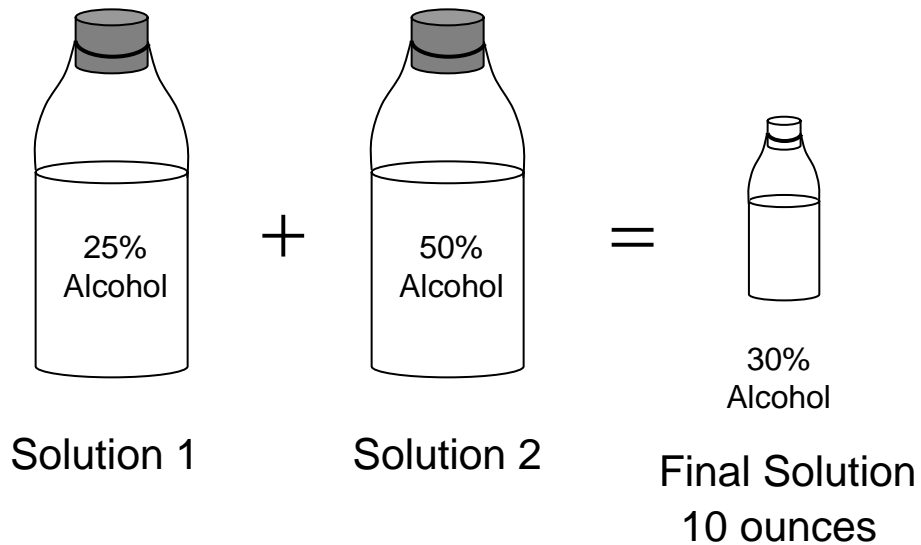
10 liters



30 liters

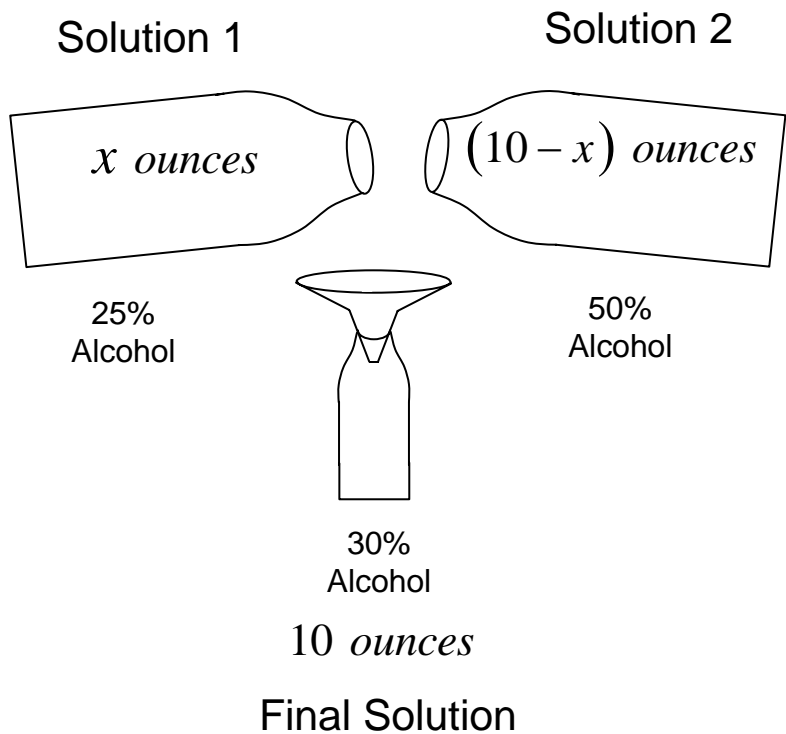
Therefore we need to mix 20 liters of a 50% Ammonia Solution with 10 liters of a 20% Ammonia Solution to make a final Solution that is 40%.

Note: We end up with 30 liters of a Final 40% Ammonia Solution.



In this problem, we are asked to make 10 ounces of a 30% Alcohol Solution. In our stockroom, we only stock 25% and 50% Alcohol Solutions.

How much of Solution 1 and Solution 2 do we need to mix together to make the 10 ounce Final Solution?



	<i>Amount of Solution</i>	<i>% Alcohol</i>	<i>Amount of Alcohol</i>
Solution 1	x		
Solution 2	$10 - x$		
Final Solution			

$$\begin{array}{l}
 \textit{Amount} \\
 \textit{of Alcohol} \\
 \textit{from Solution 1}
 \end{array}
 +
 \begin{array}{l}
 \textit{Amount} \\
 \textit{of Alcohol} \\
 \textit{from Solution 2}
 \end{array}
 =
 \begin{array}{l}
 \textit{Amount} \\
 \textit{of Alcohol in} \\
 \textit{the Final Solution}
 \end{array}$$

$$+ =$$

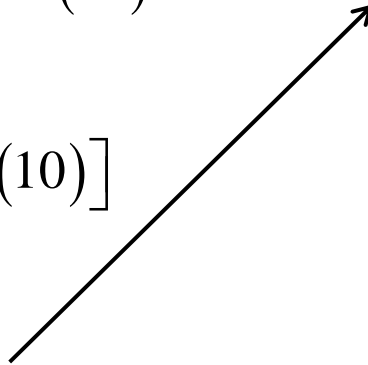
$$0.25x + 0.50(10 - x) = 0.30(10)$$

$$100[0.25x + 0.50(10 - x)] = 100[0.30(10)]$$



+

=



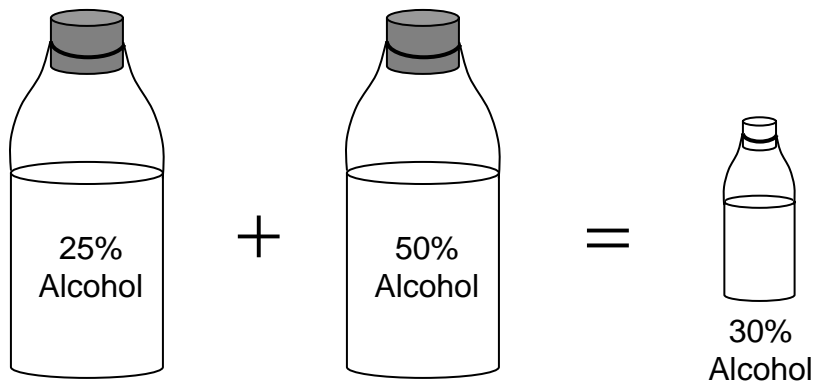
$$25x + 50(10 - x) = 30(10)$$

$$25x + 500 - 50x = 300$$

$$-25x + 500 = 300$$

$$-25x = -200$$

Therefore we need to mix 8 ounces of a 25% Alcohol Solution with 2 ounces of 50% Alcohol Solution to make 10 ounces of a Final Solution that is 30% Alcohol.



Solution 1
8 ounces

+

Solution 2
2 ounces

=

Final Solution
10 ounces