

A pharmacist mixed some 10%-saline solution with some 15%-saline solution to obtain 100 mL of a 12%-saline solution. How much of the 10%-saline solution did the pharmacist use in the mixture?

- A. 60 mL
- B. 45 mL
- C. 40 mL
- D. 25 mL

Given:

A = the amount of the 10% solution

B = the amount of the 15% solution

A + B = 100 = the amount of the 12% solution

$$\begin{array}{rcl} \text{salt} + \text{salt} & = & \text{total salt:} \\ .1A + .15B & = & .12(100) \\ .1A + .15B & = & 12 \end{array}$$

Multiply the equation times 10 to get A:

$$\begin{array}{rcl} 10(.1A + .15B = 12) & & \\ A + 1.5B & = & 120 \end{array}$$

Eliminate a variable by subtracting the terms of the second equation:

$$\begin{array}{rcl} A + 1.5B & = & 120 \\ -(A + B = 100) & & \end{array}$$

$$\begin{array}{rcl} A + 1.5B & = & 120 \\ -A - B & = & -100 \end{array}$$

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$$\begin{array}{rcl} .5B & = & 20 \\ B & = & 40 \end{array}$$

$$\begin{array}{rcl} A + 40 & = & 100 \\ A & = & \mathbf{60} \end{array}$$

Check:

$$\begin{array}{rcl} \mathbf{60} + 40 & = & 100 \\ .1(\mathbf{60}) + .15(40) & = & .12(100) \\ 6 + 6 & = & 12 \end{array}$$