

## Answer on Question #43681, Math, Abstract Algebra

Problem. The owner of The Daily Grind coffee shop mixes French roast coffee worth \$9.00 per pound with Kenyan coffee worth \$7.50 per pound in order to get a 10 pound mixture worth \$8.40 per pound. How much of each type of coffee was used?

Solution. Assume that the owner used  $x$  pounds of French coffee and  $y$  pounds of Kenyan coffee. Then  $x + y = 10$  (equation concerning weight). Also  $9x + 7.5y = 8.4 \cdot 10$  (equation concerning price). Now we solve the system of equations:

$$\begin{cases} x + y = 10, \\ 9x + 7.5y = 84; \end{cases} \begin{cases} x + y = 10, \\ 6x + 5y = 52; \end{cases} \begin{cases} x + y = 10, \\ x + 5(x + y) = 52; \end{cases} \begin{cases} x + y = 10, \\ x + 5 \cdot 10 = 52; \end{cases} \begin{cases} x + y = 10, \\ y = 8, \end{cases} \begin{cases} y = 8, \\ x = 2. \end{cases}$$

Thus,  $x = 2$ ,  $y = 8$  and we are done.