

Example 2: The sum of two numbers is 75. The larger number is 3 more than the smaller number. Find the numbers.

Define Variables

x = smaller #
 y = larger #

$$\begin{aligned} x + y &= 75 \\ y &= x + 3 \\ \hline x + (x + 3) &= 75 \\ 2x + 3 &= 75 \\ -3 & \\ \hline 2x &= 72 \\ \frac{2x}{2} &= \frac{72}{2} \\ x &= 36 \end{aligned}$$

$$\begin{aligned} y &= x + 3 \\ y &= 36 + 3 \\ y &= 39 \end{aligned}$$

Write your solution: the smaller number is 36 and the larger number is 39.

Example 3: At Abby's Supermarket, 3 pounds of squash and 2 pounds of eggplant cost \$2.85. The cost of 4 pounds of squash and 5 pounds of eggplant is \$5.41. What is the cost of 1 pound of squash, and what is the cost of 1 pound of eggplant?

Define Variables

x = \$ per pound of squash
 y = \$ per pound of eggplant

$$\begin{aligned} 3x + 2y &= 2.85 \\ 4x + 5y &= 5.41 \\ \hline -x - 3y &= -2.56 \\ \hline 3x + 2y &= 2.85 \\ -x - 3y &= -2.56 \\ \hline 4x - y &= 0.29 \\ \hline 4x - y &= 0.29 \\ -4x + 12y &= -1.16 \\ \hline 11y &= -0.87 \\ \frac{11y}{11} &= \frac{-0.87}{11} \\ y &= -0.079 \end{aligned}$$

Write your solution:

the cost of squash per pound is \$ 0.69 and the cost of eggplant per pound is \$ 0.49.

Your turn: Ex. 4. A group of 148 people is spending five days at a summer camp. The cook ordered 12 pounds of food for each adult and 9 pounds of food for each child. A total of 1,410 pounds of food was ordered. How many adults and children are in the group?

Let x = # of adults
 y = # of children

$$\begin{aligned} -9(x + y = 148) &\rightarrow -9x - 9y = -1332 \\ 12x + 9y &= 1410 \rightarrow 12x + 9y = 1410 \\ \hline 21y &= 78 \\ \frac{21y}{3} &= \frac{78}{3} \\ y &= 26 \end{aligned}$$

$$\begin{aligned} x + y &= 148 \\ x + 26 &= 148 \\ -26 & \\ \hline x &= 122 \end{aligned}$$

There are 122 adults and 26 children in the group.

Ex. 5: One year, Jack and his wife Wilma together earned \$67,000. If Jack earned \$4,000 more than Wilma earned that year, how much did each earn?

Let x = Jack's salary
 y = Wilma's salary

$$\begin{aligned} x + y &= 67,000 \\ (y + 4,000) + y &= 67,000 \\ \hline 2y + 4,000 &= 67,000 \\ -4,000 & \\ \hline 2y &= 63,000 \\ \frac{2y}{2} &= \frac{63,000}{2} \\ y &= 31,500 \end{aligned}$$

$$\begin{aligned} x + y &= 67,000 \\ x &= y + 4,000 \\ \hline x + y &= 67,000 \\ -y &= -4,000 \\ \hline x &= 63,000 \end{aligned}$$

Jack's salary is 63,000 and Wilma's salary is 31,500.