

Examples:

3. The sum of two numbers is 18. The sum of the greater number and twice the smaller number is 25. Find the numbers.

let: $\begin{cases} x = 1^{\text{st}} \# = 11 \\ y = 2^{\text{nd}} \# = 7 \end{cases}$

$$\begin{cases} x+y=18 \\ x+2y=25 \end{cases} \rightarrow \begin{array}{r} x+y=18 \\ -x-2y=-25 \\ \hline -y=-7 \\ \frac{-1}{-1} \quad \frac{-7}{-7} \\ \hline \boxed{y=7} \end{array}$$

ck
 $(11) + 2(7) \stackrel{?}{=} 25$
 $11 + 14 \stackrel{?}{=} 25$
 $25 = 25 \checkmark$

$$\begin{array}{r} x+(7)=18 \\ -7 \quad -7 \\ \hline \boxed{x=11} \end{array}$$

4. Suppose a band at another school sells erasers for \$2 per package and pencils for \$5 per package. The band sells 220 packages in all and earns a total of \$695. Write a system of equations to find the number of each type of package sold.

let: $\begin{cases} x = \# \text{ of eraser packages} = 135 \\ y = \# \text{ of pencil packages} = 85 \end{cases}$

Cost \rightarrow $\begin{cases} 2x+5y=695 \\ x+y=220 \end{cases} \rightarrow \begin{array}{r} 2x+5y=695 \\ -2x-2y=-440 \\ \hline 3y=255 \\ \frac{3}{3} \quad \frac{255}{3} \\ \hline \boxed{y=85} \end{array}$

$$\begin{array}{r} x+(85)=220 \\ -85 \quad -85 \\ \hline \boxed{x=135} \end{array}$$

ck
 $2(135)+5(85) \stackrel{?}{=} 695$
 $270 + 425 \stackrel{?}{=} 695$
 $695 = 695 \checkmark$

Try It!

- a. Grandma's Bakery sells single crust apple pies for \$6.99 and double crust cherry pies for \$10.99. The total number of pies sold on a busy Friday was thirty-six. If the amount collected for all the pies that day was \$331.64, how many of each type of pies was sold?

let:
$$\begin{cases} x = \# \text{ of apple pies} = 16 \\ y = \# \text{ of cherry pies} = 20 \end{cases}$$

$$\begin{cases} 6.99x + 10.99y = 331.64 \\ x + y = 36 \end{cases} \rightarrow \begin{cases} 6.99x + 10.99y = 331.64 \\ -6.99x - 6.99y = -251.64 \end{cases}$$

$$\begin{array}{r} x + (20) = 36 \\ -20 \quad -20 \\ \hline x = 16 \end{array}$$

$$\begin{array}{r} 4y = 80 \\ \hline y = 20 \end{array}$$

ck
$$\begin{aligned} & 6.99(16) + 10.99(20) \stackrel{?}{=} 331.64 \\ & 111.84 + 219.80 \stackrel{?}{=} 331.64 \\ & 331.64 = 331.64 \checkmark \end{aligned}$$

- b. A promoter priced tickets to a concert as follows: \$17 when purchased in advance and \$20 when purchased at the door. The total number of tickets purchased was 514, and ticket sales totaled \$9,158. How many tickets were sold at the door?

let:
$$\begin{cases} x = \# \text{ of advance tik} = 374 \\ y = \# \text{ of door tik} = 140 \end{cases}$$

$$\begin{cases} 17x + 20y = 9158 \\ x + y = 514 \end{cases} \rightarrow \begin{cases} 17x + 20y = 9158 \\ -17x - 17y = 8738 \end{cases}$$

$$\begin{array}{r} x + (140) = 514 \\ -140 \quad -140 \\ \hline x = 374 \end{array}$$

$$\begin{array}{r} 3y = 420 \\ \hline y = 140 \end{array}$$

ck
$$\begin{aligned} & 17(374) + 20(140) \stackrel{?}{=} 9158 \\ & 6358 + 2800 \stackrel{?}{=} 9158 \\ & 9158 = 9158 \checkmark \end{aligned}$$

