

11-4 Solving Systems by Elimination (Addition)

Solve the system of equations.

$$\begin{cases} a = 3b - 3 \\ 7a - 2b = 17 \end{cases}$$

$$7(3b - 3) - 2b = 17$$

$$\underline{21b} - 21 - \underline{2b} = 17$$

$$\begin{array}{r} \cancel{19b - 21 = 17} \\ \hline 19b = 38 \\ \underline{19} \quad \underline{19} \end{array}$$

Warm-Up

$$b = 2$$

$$a = 3b - 3$$

$$a = 3(2) - 3$$

$$a = 3$$

$$\begin{matrix} a & b \\ \hline (3, 2) \end{matrix}$$

Algebra 11-4 Solving Systems by Elimination (Addition)

$2, -2 \quad -5, 5$

Goal: To have opposite coefficients in front of the same variable. Then, add the equations together to eliminate a variable.

Solve the system by eliminating a variable.

1. $\begin{cases} c+d=1 \\ c-d=-11 \end{cases}$

$\begin{matrix} (-5, 6) \\ c \quad d \end{matrix}$

$\frac{2c}{2} = \frac{-10}{2}$

$c = -5$

$c+d=1$

$-5+d=1$

$\begin{matrix} +5 & +5 \\ \hline d=6 \end{matrix}$

Check
 $c-d=-11$
 $-5-6=-11$
 $-11=-11 \checkmark$

2. $\begin{cases} 2x-5y=18 \\ 4x-5y=-4 \end{cases}$

$\begin{matrix} 2x-5y=18 \\ -4x+5y=4 \end{matrix}$

$\frac{-2x}{-2} = \frac{22}{-2}$

$x = -11$

$\begin{matrix} x & y \\ (-11, -8) \end{matrix}$

$2x-5y=18$
 $2(-11)-5y=18$

$\begin{matrix} -22-5y=18 \\ +22 \end{matrix}$

$\begin{matrix} y = -8 \\ -5y = 40 \\ -5 \end{matrix}$

3. Mark has one less than twice the number of cds as Felipe has. Together they have 65 cds.
How many cds do each of them have?

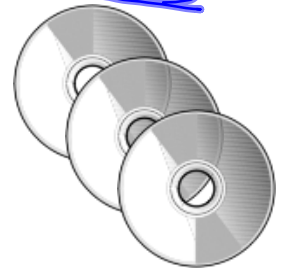
$$x = \text{Mark's CDs}$$

$$y = \text{Felipe's CDs}$$

$$x + y = 65$$

$$x = 2y - 1$$

$$\begin{array}{r} x + y = 65 \\ -x + 2y = 1 \\ \hline 3y = 66 \\ \frac{3y}{3} = \frac{66}{3} \end{array}$$



$$\begin{array}{r} x + y = 65 \\ x + 22 = 65 \\ \hline -22 \quad -22 \end{array}$$

$$y = 22 \text{ Felipe's CD}$$

Assignment: 11-4 #'s 3-6, 9-15, 17, 22, 23

$$x = 43 \text{ Mark's CDs}$$