

### 7.3 Solve Linear Systems by Adding or Subtracting

Date: \_\_\_\_\_

#### Steps for Adding/Subtracting

Step 1: Add or Subtract the 2 equations

Step 2: Solve for remaining variable.

Step 3: Plug in your answer. Solve.

Step 4: Write the solution as an (x,y)

\*\*\*Be sure to line up your corresponding variables. Rearranging may be necessary.\*\*\*

Ex. 1: Solve the linear system:

$$\begin{array}{r} 4x - 3y = 5 \\ -2x + 3y = -7 \\ \hline \end{array}$$

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

$$x = -1$$

$$4(-1) - 3y = 5$$

$$\begin{array}{r} -4 - 3y = 5 \\ +4 \quad +4 \\ \hline \end{array}$$

$$\frac{-3y}{-3} = \frac{9}{-3}$$

$$y = -3$$

Solution: (-1, -3)

Ex. 2: Solve the linear system:

$$\begin{array}{r} 2x + 3y = 11 \\ -2x + 5y = 13 \\ \hline \end{array}$$

$$\frac{8y}{8} = \frac{24}{8}$$

$$y = 3$$

$$2x + 3(3) = 11$$

$$\begin{array}{r} 2x + 9 = 11 \\ -9 \quad -9 \\ \hline \end{array}$$

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

$$x = 1$$

Solution: (1, 3)

Ex. 3: Solve the linear system:

$$\begin{array}{r} 4x + 3y = 2 \\ -1(5x + 3y = -2) \\ \hline \end{array}$$

$$\begin{array}{r} +1x = 4 \\ +1 \quad -1 \\ \hline \end{array}$$

$$x = -4$$

$$4(-4) + 3y = 2$$

$$\begin{array}{r} -16 + 3y = 2 \\ +16 \quad +16 \\ \hline \end{array}$$

$$\frac{3y}{3} = \frac{18}{3}$$

$$y = 6$$

Solution: (-4, 6)

Ex. 4: Solve the linear system:

$$\begin{array}{r} 7x - 2y = 5 \\ -1(7x - 3y = 4) \\ \hline -7x + 3y = -4 \\ \hline y = 1 \end{array}$$

$$7x - 2(1) = 5$$

$$\begin{array}{r} 7x - 2 = 5 \\ +2 \quad +2 \\ \hline \end{array}$$

$$\begin{array}{r} 7x = 7 \\ \hline x = 1 \end{array}$$

Solution: (1,1)

Ex. 5: Solve the linear system:

$$\begin{array}{r} 8x - 4y = -4 \\ 4y = 3x + 14 \\ \hline -3x \quad -3x \\ \hline \end{array}$$
$$\begin{array}{r} 8x - 4y = -4 \\ -3x + 4y = 14 \\ \hline 5x = 10 \\ \frac{5x}{5} = \frac{10}{5} \\ x = 2 \end{array}$$

$$8(2) - 4y = -4$$

$$\begin{array}{r} 16 - 4y = -4 \\ -16 \quad -16 \\ \hline \end{array}$$

$$\begin{array}{r} -4y = -20 \\ \hline y = 5 \end{array}$$

Solution: (2,5)

Ex. 6: Solve the linear system:

$$\begin{array}{r} 3x + 4y = -6 \\ 2y = 3x + 6 \\ \hline -3x \quad -3x \\ \hline \end{array}$$
$$\begin{array}{r} 3x + 4y = -6 \\ -3x + 2y = 6 \\ \hline 6y = 0 \\ \frac{6y}{6} = \frac{0}{6} \\ y = 0 \end{array}$$

$$2(0) = 3x + 6$$

$$\begin{array}{r} 0 = 3x + 6 \\ -6 \quad -6 \\ \hline \end{array}$$

$$\begin{array}{r} -6 = 3x \\ \frac{-6}{3} = \frac{3x}{3} \end{array}$$

$$x = -2$$

Solution: (-2,0)

Homework: