

Review: Solving Systems

Tuesday, October 27, 2015
10:59 AM

system:
$$\begin{cases} y = -3x \\ x + y = 2 \end{cases}$$

substitution: $y = -3x$ ← note: solved for one variable

$$x + y = 2$$

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

$$-2x = 2$$

$$x = -1$$

so
$$\begin{aligned} y &= -3x \\ &= -3(-1) \\ &= 3 \end{aligned}$$

solution: $x = -1, y = 3$

$$\{(-1, 3)\}$$

example:

$$\begin{cases} y = x + 4 \\ 3y - 5x = 6 \end{cases}$$

$$\begin{aligned} 3y - 5x &= 6 \\ 3(x + 4) - 5x &= 6 \end{aligned}$$

$$3x + 12 - 5x = 6$$

$$-2x = -6$$

$$x = 3$$

$$y = x + 4 = 7$$

$$\underline{x = 3, y = 7}$$

the addition method:

$$\left\{ \begin{array}{l} 3x - 4y = 11 \\ -3x + 2y = -7 \end{array} \right. \quad \begin{array}{l} \text{adding LHS} \\ \text{adding RHS} \end{array}$$

$$\begin{array}{l} a = b \\ c = d \\ \hline a + c = b + d \end{array}$$

$$-2y = 4$$

$$y = -2$$

$$\begin{array}{l} 3x - 4y = 11 \\ 3x - 4(-2) = 11 \\ 3x + 8 = 11 \\ 3x = 3 \\ x = 1 \end{array}$$

$$\boxed{x = 1, y = -2}$$

$$\left\{ \begin{array}{l} 3x + 4y = -5 \\ 5x + 6y = -7 \end{array} \right. \quad \begin{array}{l} \text{mult by 5} \\ \text{mult by -3} \end{array}$$

$$\begin{array}{r} 15x + 20y = -25 \\ -15x - 18y = 21 \\ \hline 2y = -4 \\ y = -2 \end{array}$$

$$3x + 4y = -5$$

$$3x - 8 = -5$$

$$3x = 3$$

$$x = 1$$

$$x = 1, y = -2$$