



# Systems of Equations

Class

Algebra 2

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**Two Possible Ways to Solve:** Elimination & Substitution

## Substitution

$$2x + y = 11 \text{ and } y = 3x - 9$$

$$2x + 3x - 9 = 11$$

Take out the y and substitute it with  $3x - 9$ .

$$\begin{array}{r} 5x - 9 = 11 \\ + 9 \quad + 9 \\ \hline 5x = 20 \\ \hline 5 \quad 5 \\ x = 4 \end{array}$$

Combine like terms:  $2x + 3x = 5x$

Solve for x by adding 9 to both sides and dividing both sides by 5.

$$x = 4$$

Plug 4 in for x into one of the original equations.

$$2x + y = 11 \text{ and } y = 3(4) - 9$$

$$y = 12 - 9 = 3 \quad \text{Simplify to find } y.$$

Solution:  $(4, 3)$

Write answer as an ordered pair.

## Elimination

$$y = 2x - 7 \text{ and } y = -4x + 11$$

$$\begin{array}{r}
 2x - 7 = -4x + 11 \\
 +4x \quad \quad +4x \\
 \hline
 6x - 7 = 11 \\
 +7 \quad \quad +7 \\
 \hline
 6x = 18 \\
 \frac{6x}{6} = \frac{18}{6} \\
 x = 3
 \end{array}$$

Take out the y and substitute in  $2x - 7$ .

Get all the variables on one side by adding  $4x$  to both sides.

Solve for x by adding 7 to both sides and dividing both sides by 6.

$$x = 3$$

$$y = 2(3) - 7 \text{ and } y = -4x + 11$$

Go back to an original equation and plug in 3 for x.

$$y = 6 - 7 = -1$$

Simplify to find y.

Solution:  $(3, -1)$

Write answer as an ordered pair.