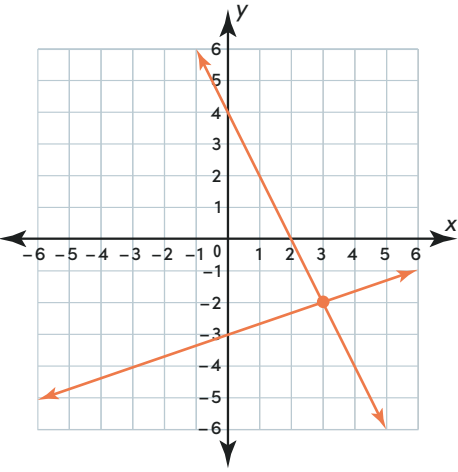


# ●● SOLVING SYSTEMS OF LINEAR EQUATIONS BY ●● Graphing, Substitution, and Elimination

There are different ways to solve a system of linear equations, including graphing, substitution, and elimination. Let's review each method to solve this system of equations.

Equation 1:  $x - 3y = 9$   
Equation 2:  $2x = 4 - y$

●● GRAPHING ●●	●● SUBSTITUTION ●●	●● ELIMINATION ●●
<p>Write each equation in slope-intercept form.</p> $x - 3y = 9$ $y = \frac{1}{3}x - 3$ <p>and</p> $2x = 4 - y$ $y = -2x + 4$	<p>Solve either equation for one of the variables.</p> $x - 3y = 9$ $x + 3y = 9 + 3y$ $x = 9 + 3y$	<p>Rewrite the equations so you can add or subtract them to eliminate a variable term. You'll want the coefficients of one of the variables to be opposites or the same number. Then, solve for the other variable.</p> $2x + y = 4 - y + y$ $2x + y = 4$ $x - 3y = 9$ $3(2x + y = 4)$
<p>Graph both equations on the coordinate plane below. Then, find the point where the lines intersect.</p>	<p>Take your solution from above and substitute it for the variable in the other equation. Then, solve.</p> $2x = 4 - y$ $2(9 + 3y) = 4 - y$ $18 + 6y = 4 - y$ $18 + 6y + y = 4 - y + y$ $18 + 7y = 4$ $18 + 7y - 18 = 4 - 18$ $7y = -14$ $y = -2$	$x - 3y = 9$ $+ 6x + 3y = 12$ <hr/> $7x + 0y = 21$ $7x = 21$ $x = 3$
	<p>Plug the value from above into one of the equations to solve for the other variable.</p> $x - 3y = 9$ $x - 3(-2) = 9$ $x - (-6) = 9$ $x + 6 = 9$ $x + 6 - 6 = 9 - 6$ $x = 3$	<p>Plug the value from above into one of the equations to solve for the other variable.</p> $2x = 4 - y$ $2(3) = 4 - y$ $6 = 4 - y$ $6 - 4 = 4 - y - 4$ $2 = -y$ $y = -2$
<p>The solution is the point of intersection: ( <u>3</u> , <u>-2</u> )</p>	<p>Since <math>x = \underline{3}</math> and <math>y = \underline{-2}</math>, the solution is ( <u>3</u> , <u>-2</u> ).</p>	<p>Since <math>x = \underline{3}</math> and <math>y = \underline{-2}</math>, the solution is ( <u>3</u> , <u>-2</u> ).</p>