Solving Systems of Linear Equations: Graphing

A **system of linear equations** contains two or more linear equations that use the same variables. The solution is the ordered pair that makes each equation in the system true. So, you can solve a system of linear equations by graphing the lines and finding the point where they intersect.

Let's try an example! Solve this system of equations by graphing.

$y = x - 1$

$x + 2y = 4$

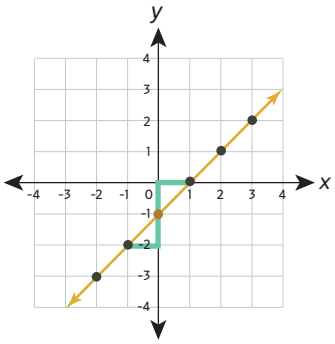
1. To help you graph the equations, make sure each equation is in slope-intercept form. The first equation is already written in slope-intercept form, but the second equation is not. Rewrite the second equation:

$x + 2y = 4$ *Subtract x from both sides.*

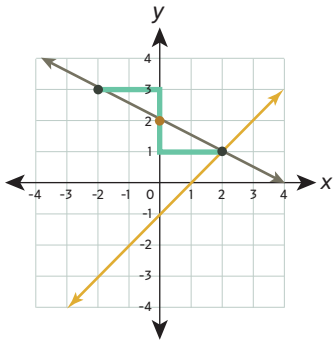
$2y = -x + 4$ *Divide everything on each side of the equation by 2.*

$y = -\frac{1}{2}x + 2$ *Now the second equation is in slope-intercept form.*

2. Next, use the *y*-intercept and the slope to graph the first equation, $y = x - 1$.

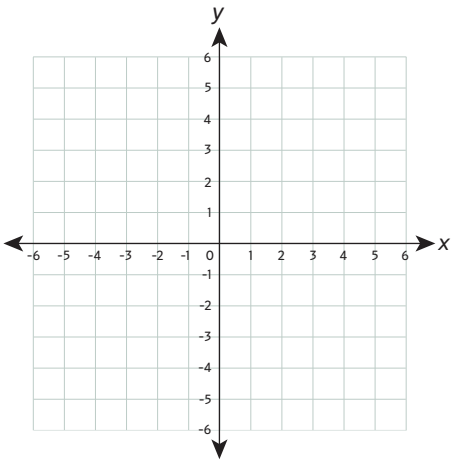


3. Then, graph the second equation, $y = -\frac{1}{2}x + 2$, on the same coordinate plane.



The **solution** to this system of equations is the point of intersection: (2 , 1)

Try it yourself! Graph each system of equations. Then, write the solution.

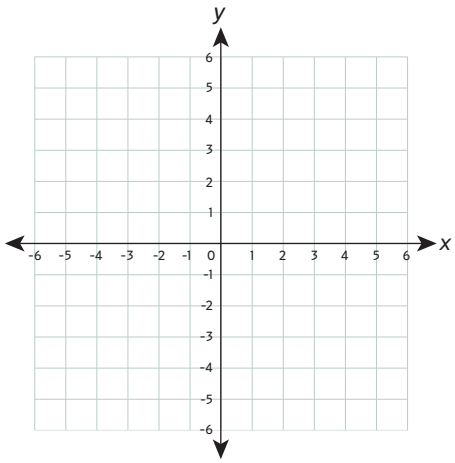


$y = 3x + 1$

$y = -x + 5$

Solution:

(____ , ____)



$y = x - 4$

$y = \frac{1}{2}x - 2$

Solution:

(____ , ____)

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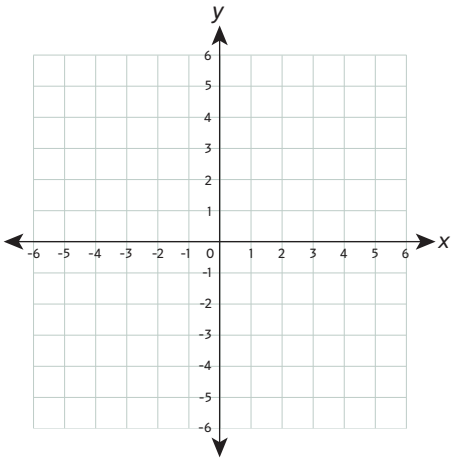
Keep going! Graph each system of equations. Then, write the solution.

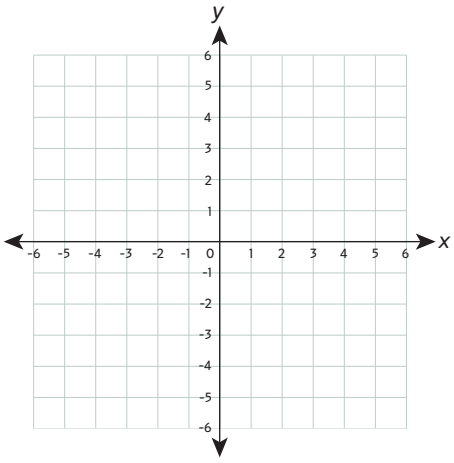


$y = \frac{2}{3}x + 3$

$y = \frac{1}{3}x + 2$

Solution:

(____ , ____)

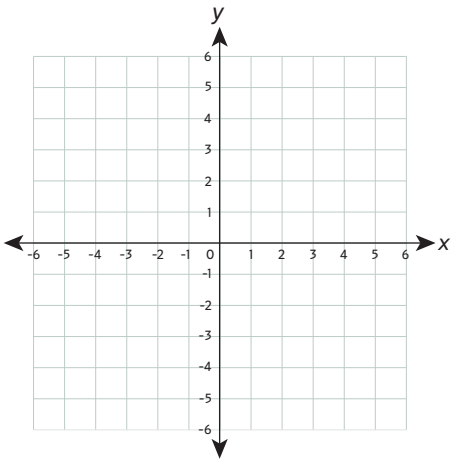


$y = -2x - 5$

$y = 4x + 1$

Solution:

(____ , ____)

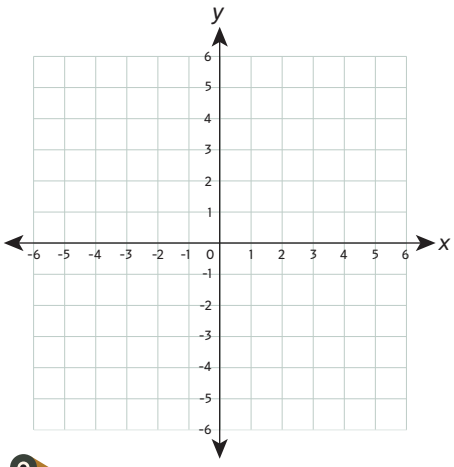


$y = 3x - 6$

$y = \frac{1}{4}x + 5$

Solution:

(____ , ____)

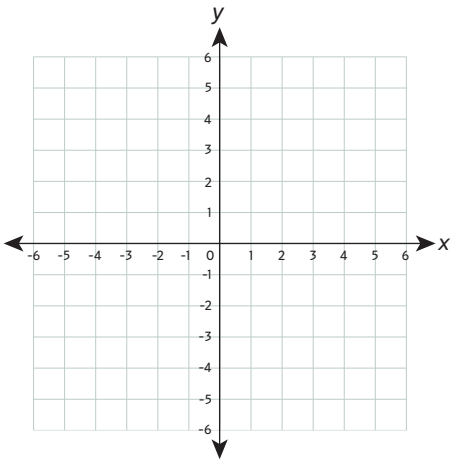


$x + y = 2$

$y = x - 6$

Solution:

(____ , ____)

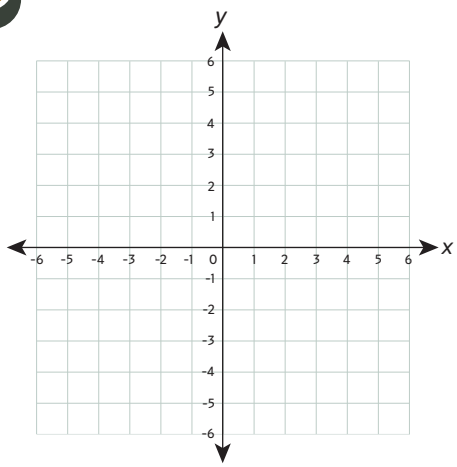


$y = \frac{3}{4}x + 1$

$x + 2y = -8$

Solution:

(____ , ____)



$y = -\frac{2}{3}x + 2$

$-6x + 3y = -18$

Solution:

(____ , ____)