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Solving Linear Systems Algebraically

***Example****:* Solve the following linear system: $\left\{\begin{array}{c}y=6x-11\\-2x-3y=-7\end{array}\right.$

Step 1: Solve each equation for *y*.

$$-2x-3y=-7$$

$$-3y=2x-7$$

$$y=-\frac{2}{3}x+\frac{7}{3}$$

Step 2: Set the equations equal to each other.

$$6x-11=-\frac{2}{3}x+\frac{7}{3}$$

Step 3: Solve for *x*.

$$18x-33=-2x+7$$

$$20x-33=7$$

$$20x=40$$

$$x=2$$

Step 4: Plug the solution that you found for *x* in for *x* in one of the original equations.

$$y=6(2)-11$$

Step 5. Simplify to find *y*.

$$y=12-11$$

$$y=1$$

Step 6: Write the solution as an ordered pair.

SOLUTION: 

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Solve the following systems algebraically. Check by graphing.

|  |  |
| --- | --- |
| 1. $\left\{\begin{array}{c}2x-3y=-1\\y=x-1\end{array}\right.$

http://media1.shmoop.com/images/algebra-ii/alg2_ch2_narr_graphik_2.png | 1. $\left\{\begin{array}{c}y=-3x+5\\5x-4y=-3\end{array}\right.$

http://media1.shmoop.com/images/algebra-ii/alg2_ch2_narr_graphik_2.png |
| 1. $\left\{\begin{array}{c}y=5x-7\\-3x-2y=-12\end{array}\right.$

http://media1.shmoop.com/images/algebra-ii/alg2_ch2_narr_graphik_2.png | 1. $\left\{\begin{array}{c}-5x+y=-3\\3x-8y=24\end{array}\right.$

http://media1.shmoop.com/images/algebra-ii/alg2_ch2_narr_graphik_2.png |