



Solving Systems of Linear Equations by Graphing (page 1)

Two or more equations with the same set of variables are called a **system of equations**. You can estimate the solution of a system of equation by graphing: the ordered pair for the point of intersection of the two graphs is the **solution** of the system (because it simultaneously satisfies both equations). To solve by graphing:

- 1) Rewrite the equations in the slope-intercept form (if necessary).
- 2) Graph the lines on the same coordinate plane.
- 3) Estimate the point of intersection.
- 4) Check your answer by substituting for x and y in each equation of the system.

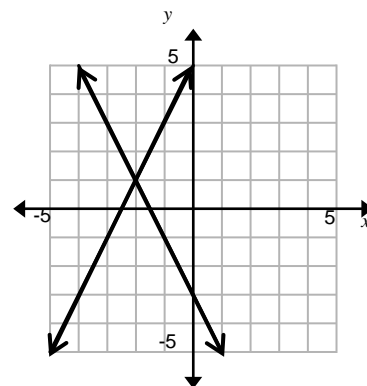
Example: Solve the system $\begin{cases} 2x + y = -3 \\ y = 2x + 5 \end{cases}$

Solution: 1) Rewrite $2x + y = -3$ in slope-intercept form.
 $y = 2x + 5$ is already in that form.

$$\begin{aligned} 2x + y &= -3 \\ -2x &= -2x \\ y &= -2x - 3 \end{aligned}$$

- 2) Graph the lines.
- 3) Estimate the point of intersection. $(-2, 1)$
- 4) Check.

$$\begin{array}{ll} 2x + y = -3 & y = 2x + 5 \\ 2(-2) + (1) = -3 & 1 = 2(-2) + 5 \\ -4 + 1 = -3 & 1 = -4 + 5 \\ -3 = -3 \checkmark & 1 = 1 \checkmark \end{array}$$



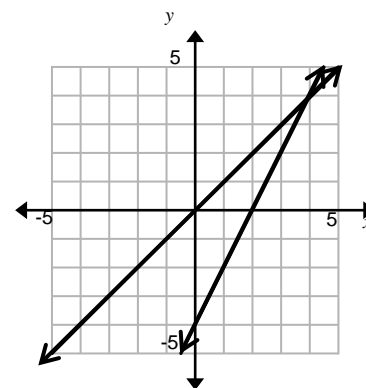
Example: Solve the system $\begin{cases} 2x - y = 4 \\ y = x \end{cases}$

Solution: 1) Rewrite $2x - y = 4$ in slope-intercept form.

$$\begin{aligned} 2x - y &= 4 \\ -2x &= -2x \\ -y &= -2x + 4 \\ y &= 2x - 4 \end{aligned}$$

- 2) Graph the lines.
- 3) Estimate the point of intersection. $(4, 4)$
- 4) Check.

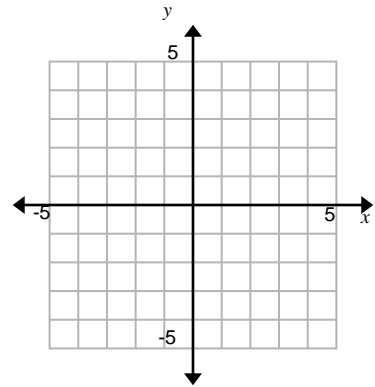
$$\begin{array}{ll} 2x - y = 4 & y = x \\ 2(4) - (4) = 4 & 4 = 4 \checkmark \\ 4 = 4 \checkmark & \end{array}$$



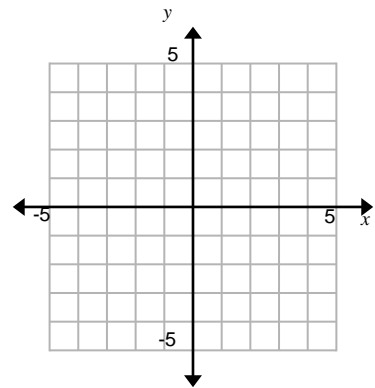
Solving Systems of Linear Equations by Graphing (page 2)

Solve each system by graphing. Show the check.

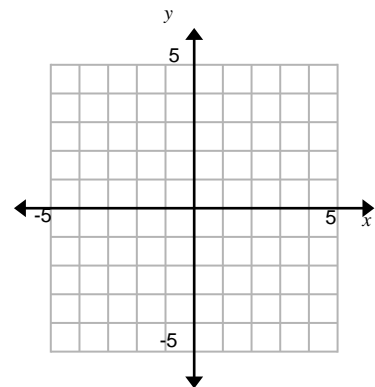
1.
$$\begin{cases} y = 2x \\ y = x + 1 \end{cases}$$



2.
$$\begin{cases} x + y = -2 \\ y = x + 2 \end{cases}$$



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



4.
$$\begin{cases} y = 2 \\ 3x - y = 4 \end{cases}$$

