

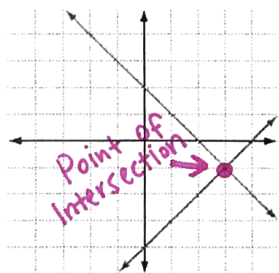
# Solving Systems of Equations by Graphing

- A system of linear equations consists of two or more linear equations.
- A solution of a linear system is an ordered pair that is a solution of each equation in the system.
- If the lines intersect at a single point, the solution is the point of intersection.

**Example One:** Is the ordered pair a solution of the linear system.

$(0, -2)$	$(3, 6)$
$x + y = -2$ $0 + (-2) = -2$ $-2 = -2$ ✓	$2x + 3y = 12$ $2(3) + 3(6) = 12$ $6 + 18 = 12$ $24 \neq 12$ ✗
$7x - 4y = 8$ $7(0) - 4(-2) = 8$ $0 + 8 = 8$ $8 = 8$ ✓	$10x + 3y = -12$ $10(3) + 3(6) = -12$ $30 + 18 = -12$ $48 \neq -12$ ✗

**Example Two:** Use the graph to find solution and solve the linear system.



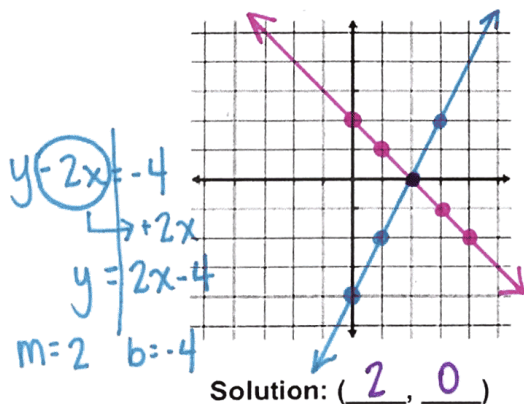
Solution:  $(3, -1)$

$$\begin{aligned} x + y &= 2 \\ 3 + (-1) &= 2 \\ 2 &= 2 \end{aligned}$$

$$\begin{aligned} x - y &= 4 \\ 3 - (-1) &= 4 \\ 4 &= 4 \end{aligned}$$

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

**Example Three:** Solve the linear system by graphing.



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

$$\begin{aligned} y + x &= 2 \\ \downarrow -x \\ y &= -x + 2 \\ m &= -1 \quad b = 2 \end{aligned}$$

$$\begin{aligned} y - 2x &= -4 \\ \downarrow +2x \\ y &= 2x - 4 \\ m &= 2 \quad b = -4 \end{aligned}$$

- Write each equation in slope-intercept form.
- Graph both equations.
- Find the point of intersection.
- Sub. and ✓ solution.