Solving Systems of Linear Equations
(Graphing)

Level 1 - Graph the equations using the given slope intercept form
Level 2 - Rearrange into slope-intercept form or use axes intercepts to graph

When two lines are drawn on the same coordinate plane, their intersection point represents the solution to the system of equations.

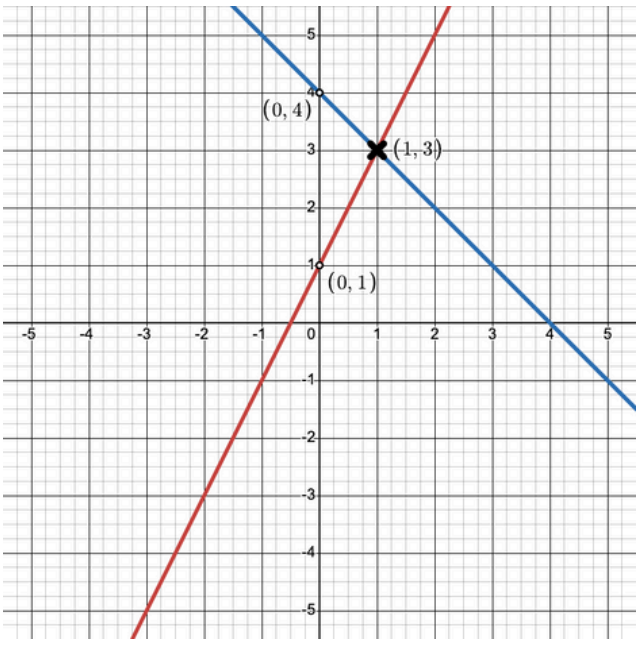
Each equation represents a line, and the point where they meet shows the values of *x* and *y* that make both equations true at the same time.

Example #1

$$\begin{cases} y_1 = 2x_1 + 1 \\ y_2 = -x_2 + 4 \end{cases}$$

y – intercepts:
$b_1 = +1$
$b_2 = +4$

slopes:
$m_1 = \frac{2}{1}$
$m_2 = \frac{-1}{1}$

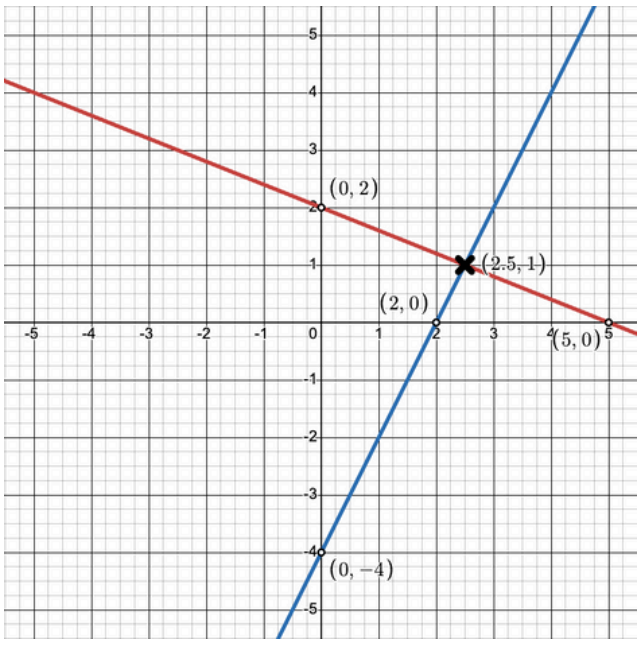


Solution: (1, 3)

Example #2

$$\begin{cases} 2x_1 - y_1 = 4 \\ 2x_2 = 10 - 5y_2 \end{cases}$$

set variables to 0 to solve for intercepts:
$x_1 = 0,\ y_1 = -4$
$y_1 = 0,\ x_1 = 2$
$x_2 = 0,\ y_2 = 2$
$y_2 = 0,\ x_2 = 5$



Solution: $\left(\frac{5}{2}, 1\right)$

Remember:

- Always label your axes and intercepts clearly to easily see the intersection point.
- Check your slopes: positive slopes rise to the right, negative slopes fall to the right.
- Verify plugging the intersection point into both equations, showing the points satisfy both equations.