Solving a System of Equations by Graphing

System of Equations

A system of equations is a group of equations
with the same variables.

$3 + 2 = 5$ $x + y = 5$ $2a + b = 3$ $2(2) + \text{-}1 = 3$

$3 - 5(2) = \text{-}7$ $x - 5y = \text{-}7$ $3a - 2b = 8$ $3(2) - 2(\text{-}1) = 8$

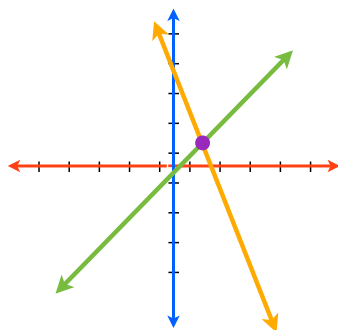✓ $(3,2)$ $a = 2; b = \text{-}1$ ✓

The solution to a system of equations is the
ordered pair (x,y) that satisfies both equations
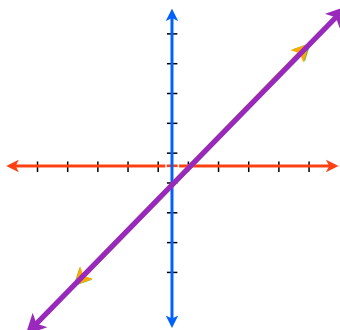We can solve a system of equations by using the method of graphing.

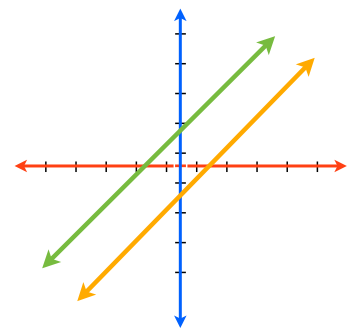Three outcomes when solving a system by graphing

Different Lines

Same Line

Parallel Lines
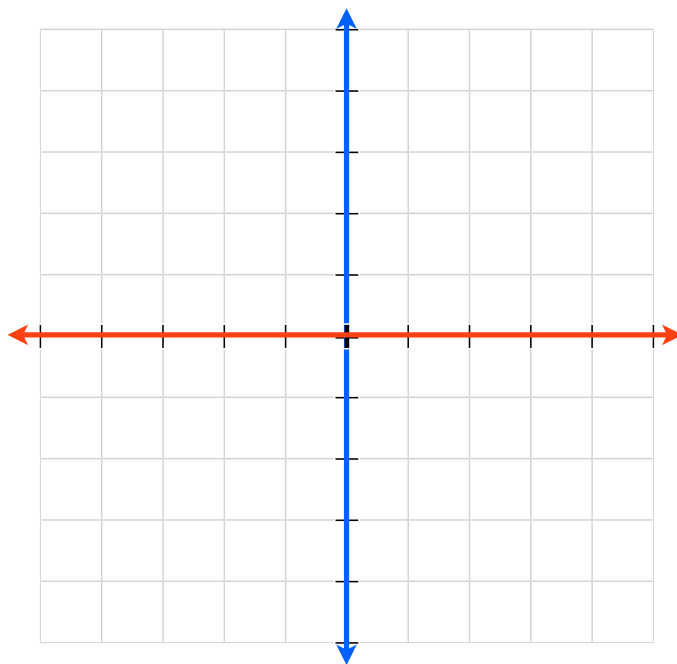

One Solution (x,y)

Infinitely Many Solutions

No Solution

Solve the system of linear equations:
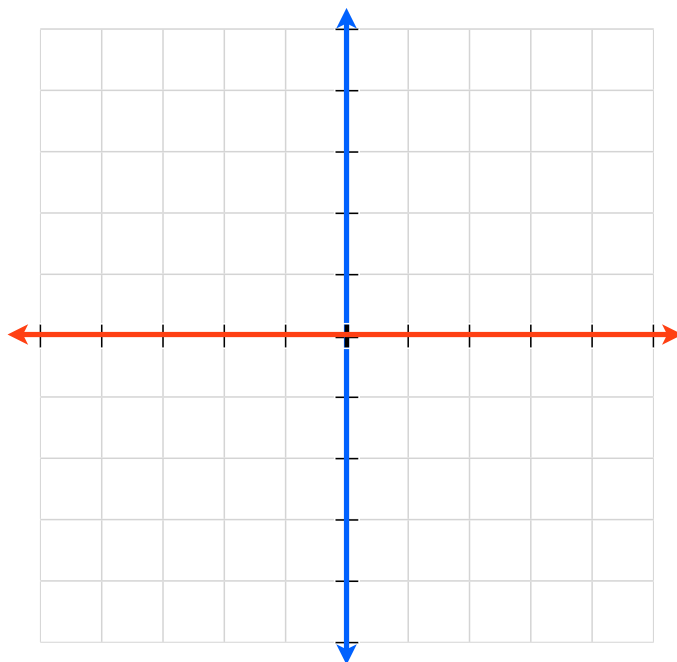
$$y = -x + 5 \qquad y = 2x - 1$$

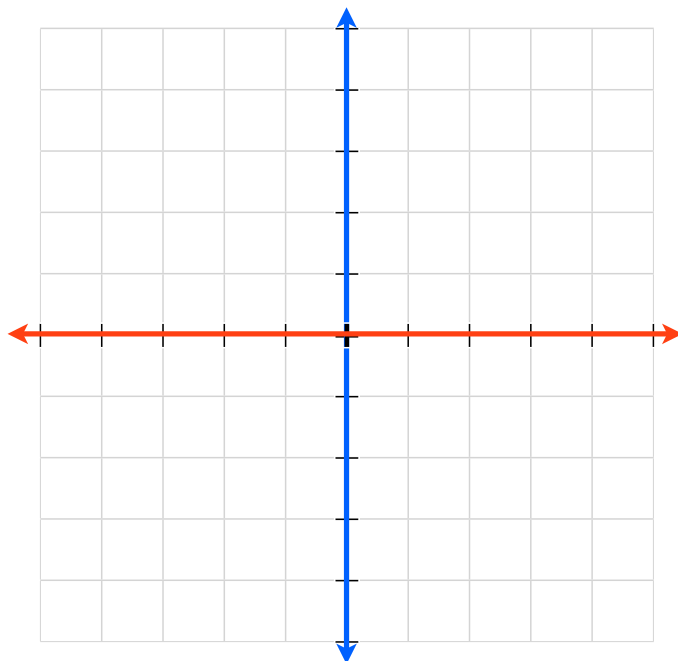Solve the system of linear equations:

$$y = -2 \qquad y = -3x + 4$$

Solve the system of linear equations:
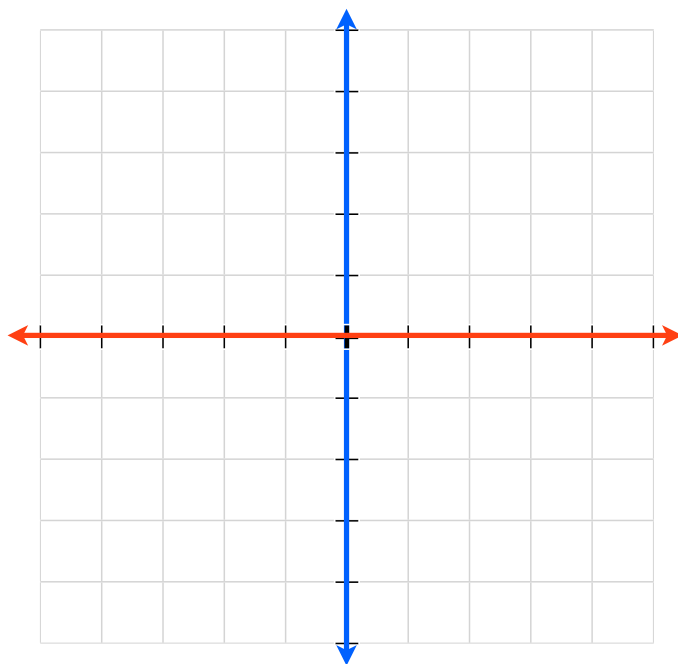
$$y = 2x - 3 \qquad y = 2x + 1$$

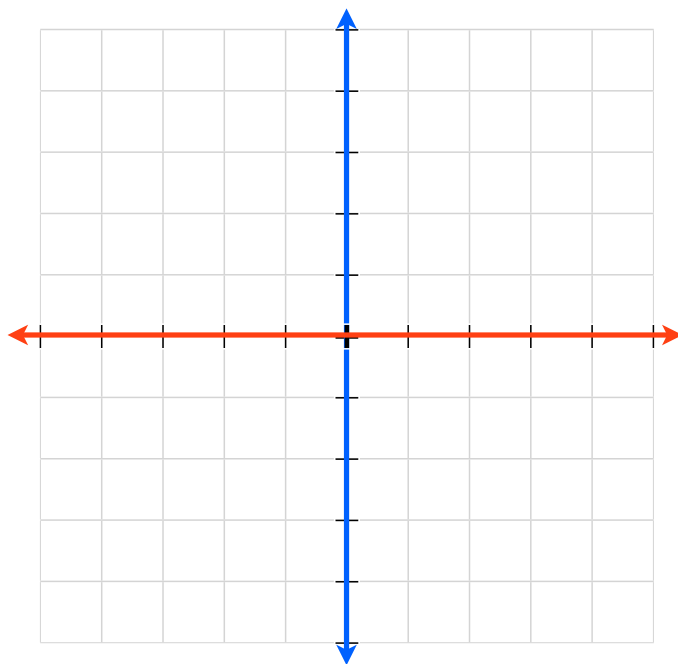Solve the system of linear equations:

$$y = -\frac{1}{4}x + 2 \qquad y = \frac{1}{2}x - 1$$
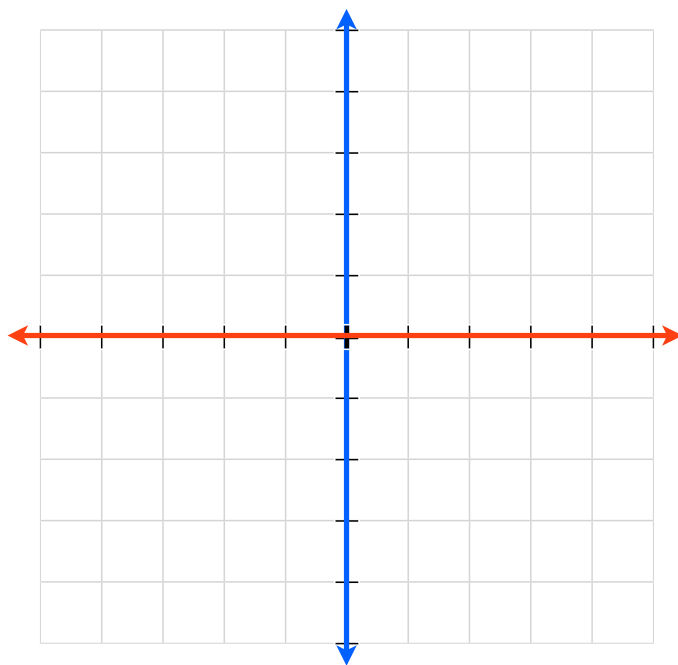
Solve the system of linear equations:
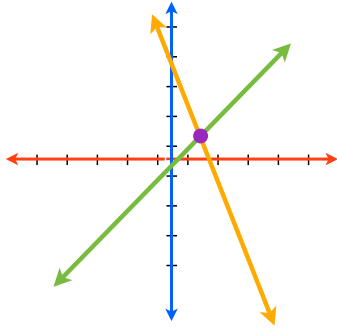
$$3x + y = -1 \qquad x - y = -3$$

Solve the system of linear equations:
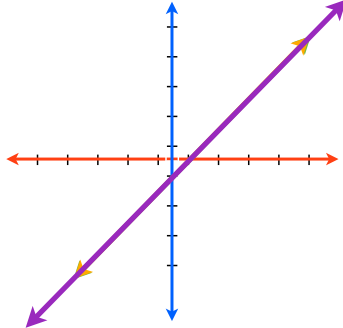
$$x + y = 2 \qquad 2x + 2y = 4$$

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Three outcomes when solving a system by graphing
Solve for y, put equation in slope-intercept form.

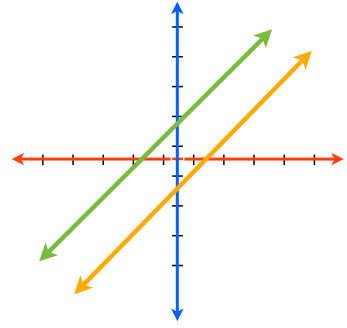| Different Lines	Same Line	Parallel Lines

One Solution (x,y)   Infinitely Many Solutions   No Solution