

# Solving Linear Systems of Equations

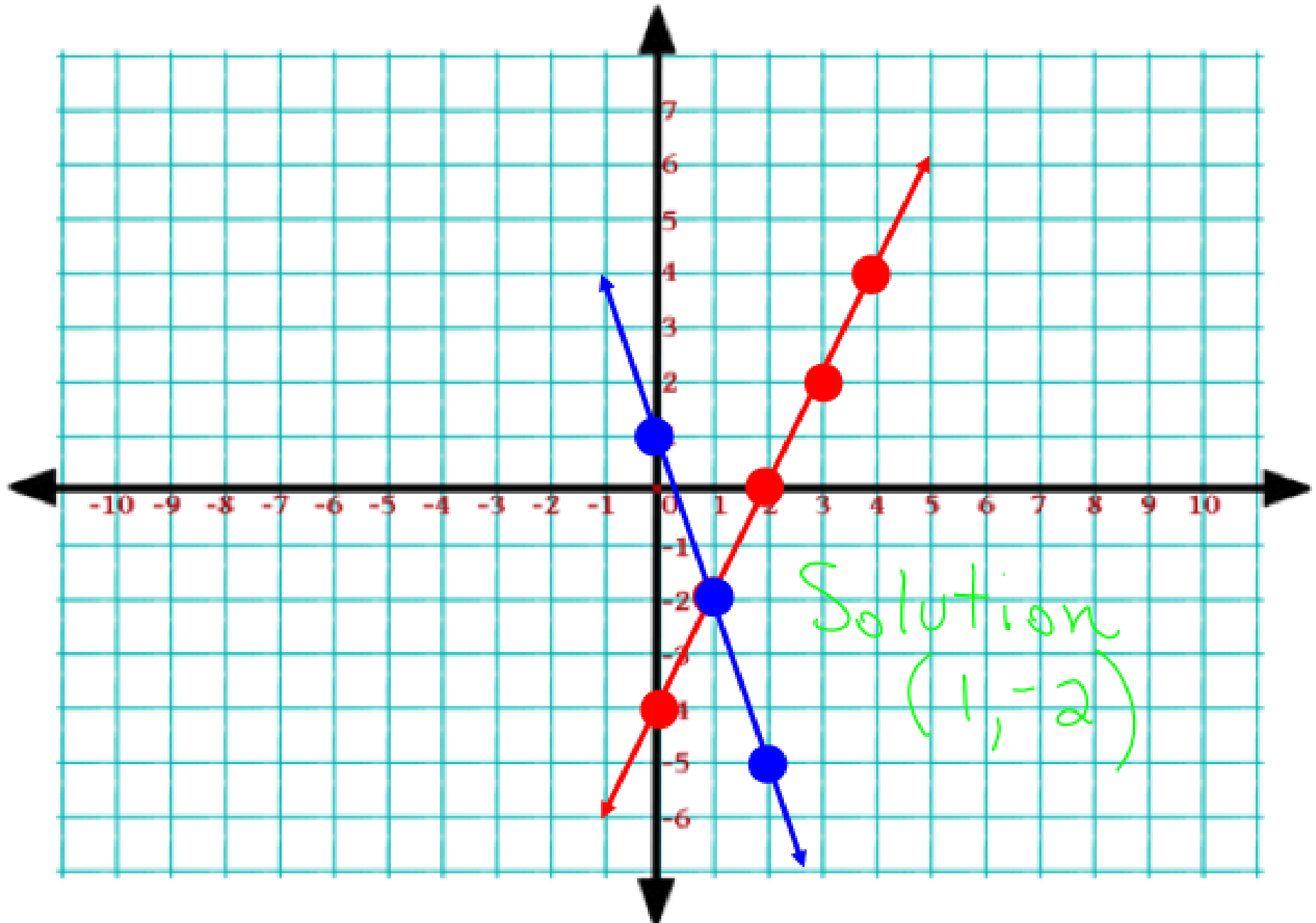
**Linear System:** a set of two or more linear equations.

A **solution** to a linear system is the ordered pair  $(x, y)$  that satisfies each equation in the system.

## Methods to solve linear systems

- 1) Graphing; where the lines cross is the solution.
- 2) Substitution; isolate one of the variables in one of the equations and substitute into the other equation. Solve, and then substitute again.
- 3) Combination / elimination; more to follow in a later lesson.

Solve the system by graphing.  $y = 2x - 4$  and  $y = -3x + 1$



Solve the system by using substitution.

$$y = 2x - 4 \text{ and } y = -3x + 1$$

$$2x - 4 = -3x + 1$$

$+3x$

$$5x - 4 = 1$$

$+4$

$$5x = 5$$

$$x = 1$$

$$(1, -2)$$

Solve the system by using substitution.

$$y = -x + 1 \text{ and } 2x - y = 2$$

$$2x - 1(-x + 1) = 2$$

$$2x + 1x - 1 = 2$$

$$3x = 3$$

$$x = 1$$

$$y = 0$$

$$(1, 0)$$

another way to solve

$$2x - 2 = y$$

$$2x - 2 = -x + 1$$

$$3x = 3$$

$$x = 1$$

Solve the system by using substitution.

$$7x + 2y = 1 \text{ and } 3x + y = 3$$

$$y = -3x + 3$$

$$7x + 2(-3x + 3) = 1$$

$$7x - 6x + 6 = 1$$

$$x + 6 = 1$$

$$x = -5$$

$$y = -3(-5) + 3$$

$$y = 18$$

Solution  
 $(-5, 18)$