

## 7.1 Solving Systems of Two Equations

$$2x - y = 10$$

$$3x + 2y = 1$$

A Solution is an ordered pair  $(x, y)$  that makes both equations true.

The two main methods for solving systems are substitution and elimination.

### Solving by substitution:

Solving by substitution means we solve for one variable in one equation and then substitute that expression into the second equation to solve for the remaining variable.

$$2x - y = 10$$

$$3x + 2y = 1$$

Find the dimensions of a rectangular garden that has perimeter 100ft and area of 300 ft.

### Solving by Elimination

Solving by elimination means using basic operations we eliminate one of the variables when adding the equations together, then solve for the remaining variable.

$$2x + 3y = 5$$

$$-3x + 5y = 21$$

Solve:

$$x - 3y = -2$$

$$2x - 6y = 4$$

Solve:

$$4x - 5y = 2$$

$$-12x + 15y = -6$$

## Possible Solutions:

One/two/three Solution(s): A unique ordered pair  $(x, y)$  that satisfies both equations.  
Number of solutions depends on the degree:  
Linear- one, Quadratic - two, cubic - three

No Solution: There is no ordered pair  $(x, y)$  that will make both equations true.

Infinitely many solutions: There are infinite ordered pairs  $(x, y)$  that make both equations true.