5.4 Special SYSTEMS OF LINEAR EQUATIONS
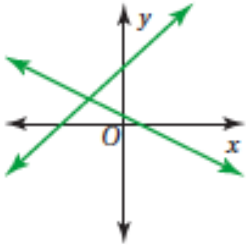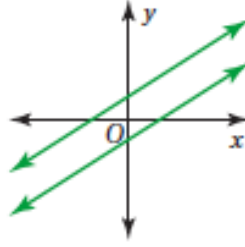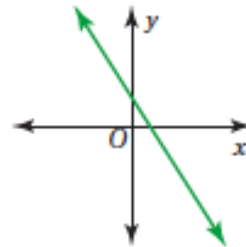
Solutions of Systems of Linear Equations

A system of linear equations can have *one solution, no solution,* or *infinitely many solutions.*

One solution
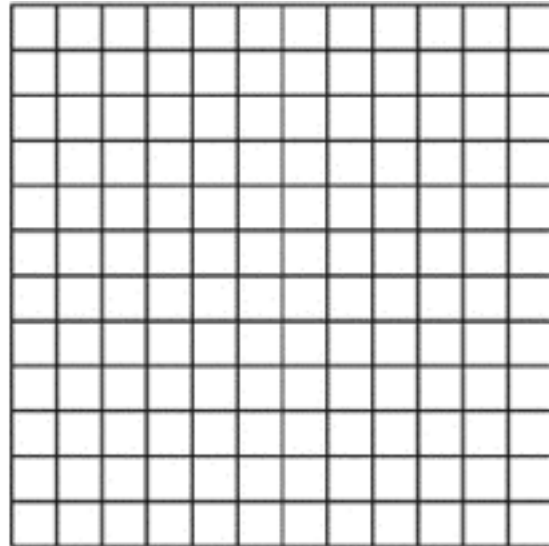The lines intersect.

No solution
The lines are parallel.

Infinitely many solutions
The lines are the same.

EXAMPLE 1: Solving a System: No Solution
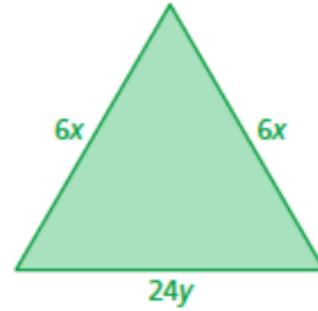
Solve the system.

$$y = 3x + 1$$
$$y = 3x - 5$$

You can also solve it using substitution.

EXAMPLE 2: Solving a System: Infinitely Many Solutions
The perimeter of the rectangle is 36 units. The perimeter of the triangle is 108 units. Write and solve a system of linear equations to find the values of x and y.
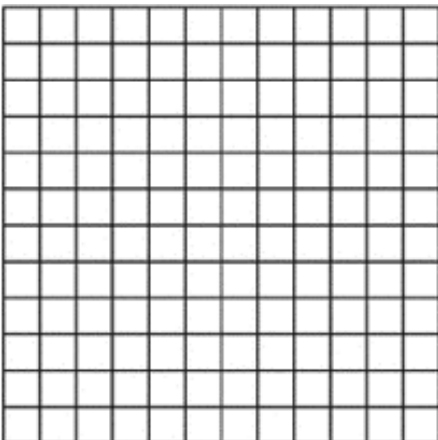
On you own:
Solve the system of linear equations. Check your solution.

1. graph

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

2. Substitution

$$x = 2y + 10$$
$$2x + 3y = -1$$

3. Elimination

$$2x - 4y = 10$$
$$-12x + 24y = -60$$