

# Lesson 1.4.2: Solutions to Inequalities with 2 Variables

## Targets:

1. I can recognize and identify solutions to two-variable inequalities, and I can represent them graphically.

## Practice 1

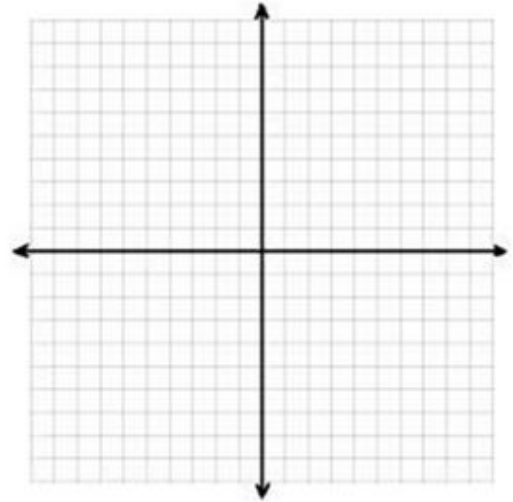
- a. Circle each ordered pair  $(x, y)$  that is a solution to the equation  $4x - y \leq 10$ .

i.  $(3, 2)$     $(2, 3)$     $(-1, -14)$     $(0, 0)$     $(1, -6)$

ii.  $(5, 10)$     $(0, -10)$     $(3, 4)$     $(6, 0)$     $(4, -1)$

- b. Plot each solution as a point  $(x, y)$  in the coordinate plane.

- c. How would you describe the location of the solutions in the coordinate plane?

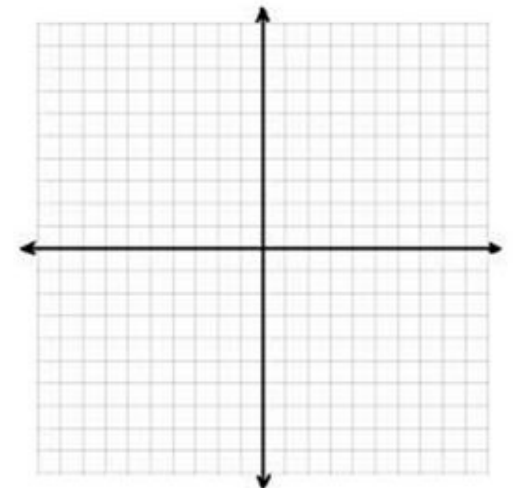


## Practice 2

- a. Discover as many additional solutions to the equation  $4x - y \leq 10$  as possible. Organize your solutions by plotting each solution as a point  $(x, y)$  in the coordinate plane.

- b. Graph the line  $y = 4x - 10$ . What do you notice about the solutions to the inequality  $4x - y \leq 10$  and the graph of the line  $y = 4x - 10$ ?

- c. Solve the inequality for  $y$ .

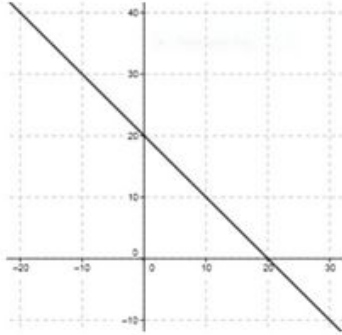


- d. Complete the following sentence: If an ordered pair is a solution to  $4x - y \leq 10$ , then it will be located \_\_\_\_\_ the line  $y = 4x - 10$ . Explain how you arrived at your conclusion.

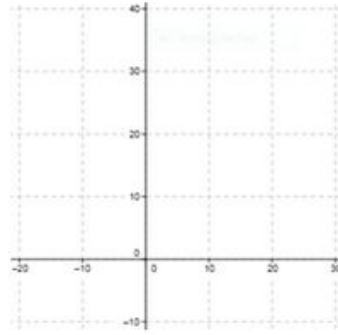
### Practice 3

The solution to  $x + y = 20$  is shown on the graph below.

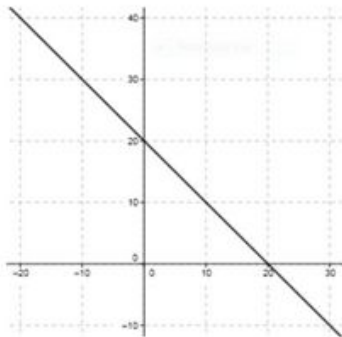
a. Graph the solution to  $x + y \leq 20$



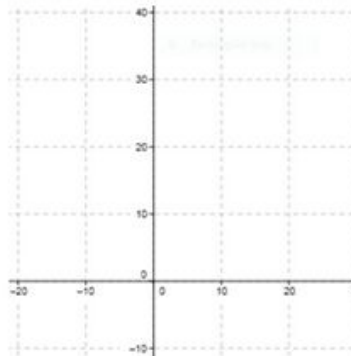
c. Graph the solution to  $x + y < 20$



b. Graph the solution to  $x + y \geq 20$



d. Graph the solution to  $x + y > 20$



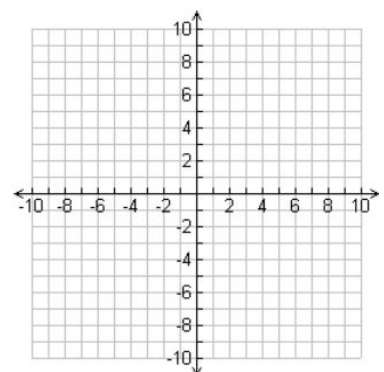
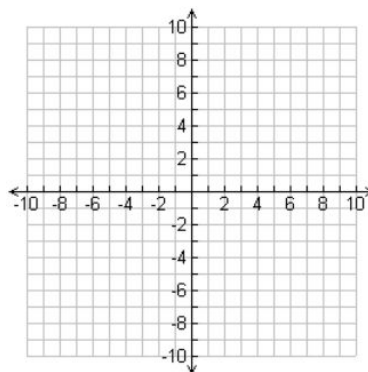
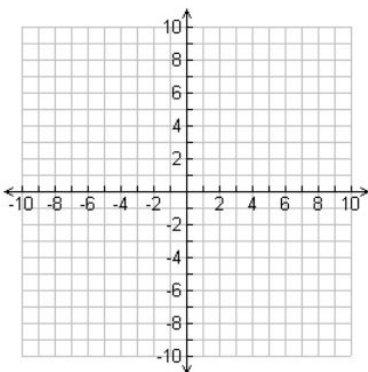
### Practice 4

Plot the solution sets to the following equations and inequalities:

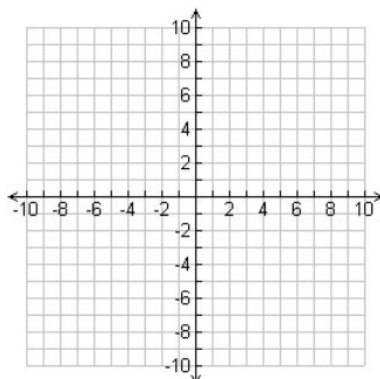
a.  $x - y = 10$

b.  $x - y < 10$

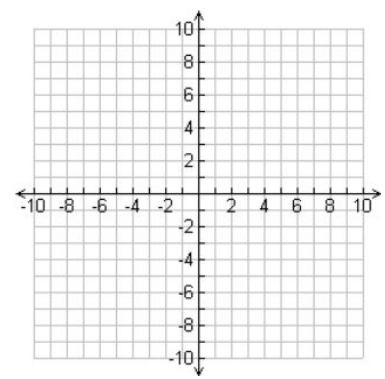
c.  $y > x - 10$



d.  $y \geq x$

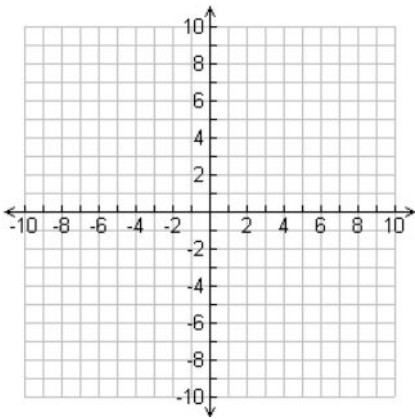


e.  $x \geq y$

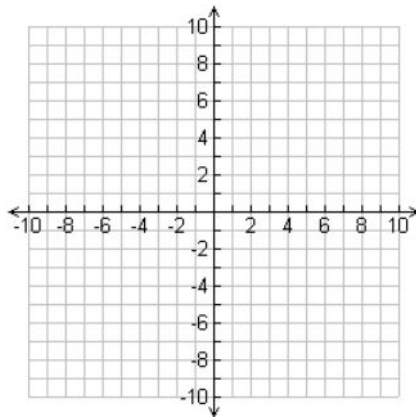


### Practice 4 (continued)

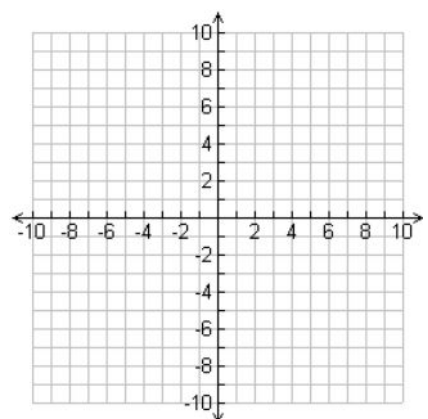
f.  $y = 5$



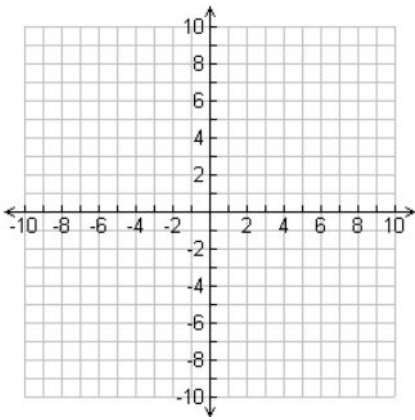
g.  $y < 5$



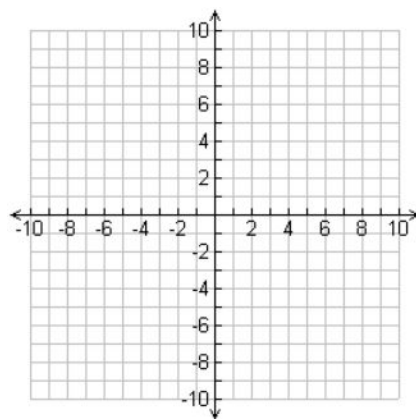
h.  $x \geq 5$



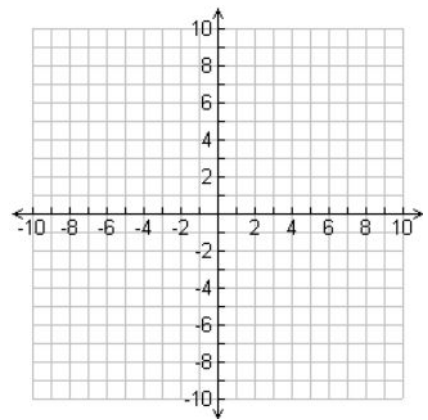
i.  $x = 0$



j.  $x > 0$



k.  $y < 0$



### Exit Ticket

What pairs of numbers satisfy the statement: *The sum of two numbers is less than 10?*

- Create an inequality with two variables to represent this situation and graph the solution set.

