

Lesson 1.4.3: Solution Sets to Simultaneous Equations

Targets:

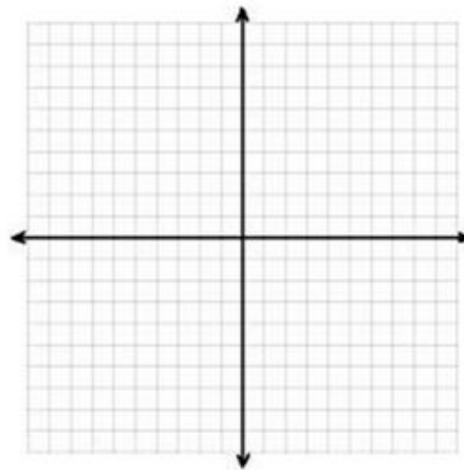
1. I can identify solutions to simultaneous equations or inequalities.

Warm Up

Consider the following compound sentence: $x + y > 10$ and $y = 2x + 1$.

- a. Circle all the ordered pairs (x, y) that are solutions to the inequality $x + y > 10$ (to the right).
 $(3,7)$ $(7,3)$ $(-1,14)$ $(0,1)$ $(12,25)$
- b. Underline all the ordered pairs (x, y) that are solutions to the equation $y = 2x + 1$ (to the right).
 $(5,11)$ $(0,12)$ $(1,8)$ $(12,0)$ $(-1,-1)$
- c. List the ordered pair(s) (x, y) from above that are solutions to the compound sentence $x + y > 10$ and $y = 2x + 1$.
- d. List three additional ordered pairs that are solutions to the compound sentence $x + y > 10$ and $y = 2x + 1$.

- e. Sketch the solution set to the inequality $x + y > 10$ and the solution set to $y = 2x + 1$ on the same set of coordinate axes. Highlight the points that lie in BOTH solution sets.
- f. Describe the solution set to $x + y > 10$ and $y = 2x + 1$.



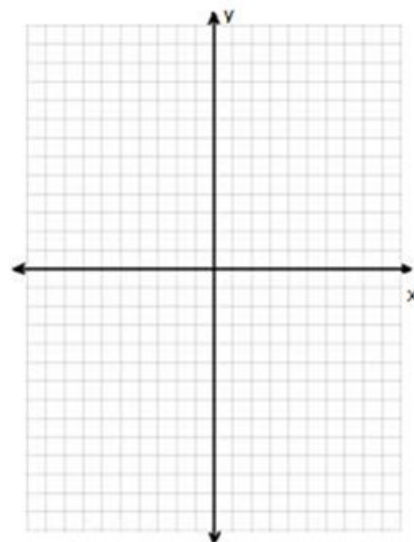
Practice 1

Solve the following system of equations.

$$\begin{cases} y = 2x + 1 \\ x - y = 7 \end{cases}$$

Algebraically:

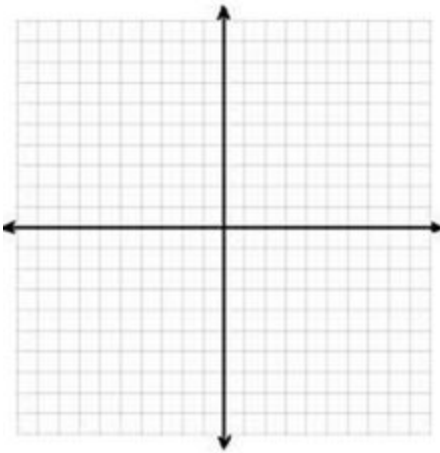
Graphically:



Practice 2

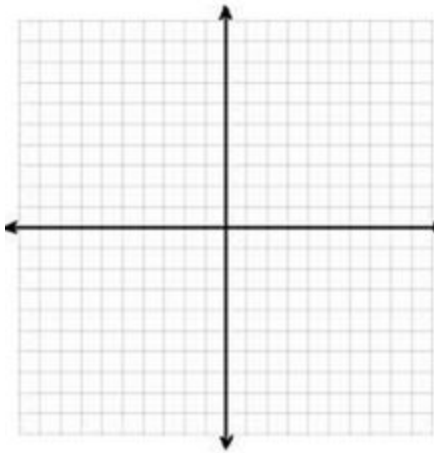
First solve each system of equations by graphing, then solve it algebraically.

1.
$$\begin{cases} y = 4x - 1 \\ y = -\frac{1}{2}x + 8 \end{cases}$$



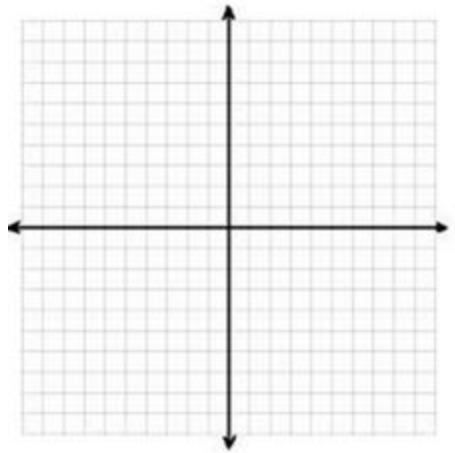
Algebraically:

2.
$$\begin{cases} 2x + y = 4 \\ 2x + 3y = 9 \end{cases}$$



Algebraically:

3.
$$\begin{cases} 3x + y = 5 \\ 3x + y = 8 \end{cases}$$



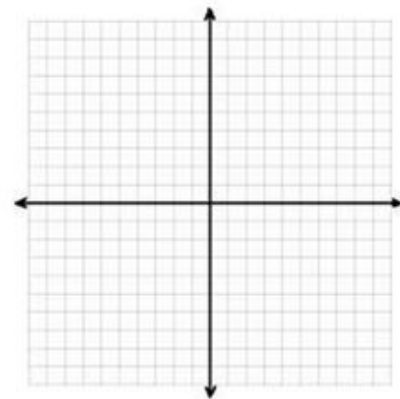
Algebraically:

Practice 3

Now suppose the system of equations from Exercise C was instead a system of inequalities:

$$\begin{cases} 3x + y \geq 5 \\ 3x + y \leq 8 \end{cases}$$

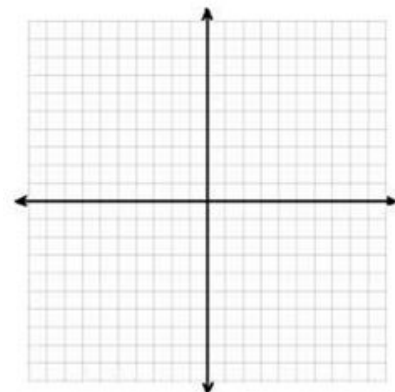
Graph the solution set.



Practice 4

Graph the solution set to the system of inequalities.

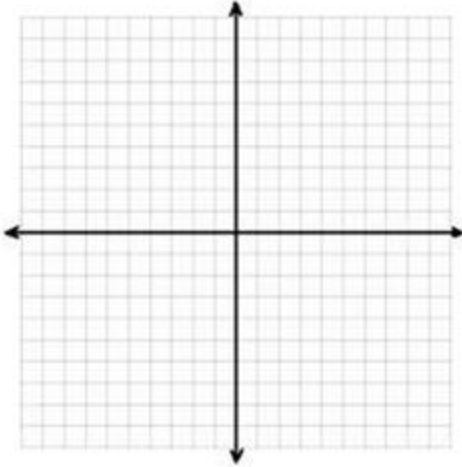
$$2x - y < 3 \text{ and } 4x + 3y \geq 0$$



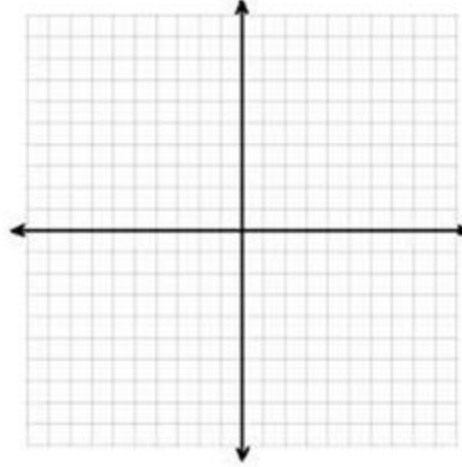
Practice 5

Graph the solution set to each system of inequalities.

1.
$$\begin{cases} x - y > 5 \\ x > -1 \end{cases}$$

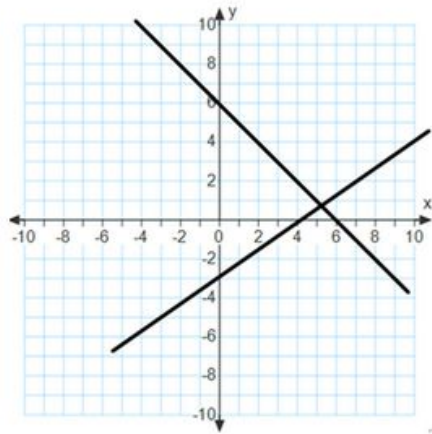


2.
$$\begin{cases} y \leq x + 4 \\ y \leq 4 - x \\ y \geq 0 \end{cases}$$



Exit Ticket

1. Estimate the solution to the system of equations whose graph is shown to the right.



2. Write the two equations for the system of equations and find the exact solution to the system algebraically.

3. Write a system of inequalities that represents the shaded region on the following graph:

