

4.2 - Day 1 - Systems of Inequalities

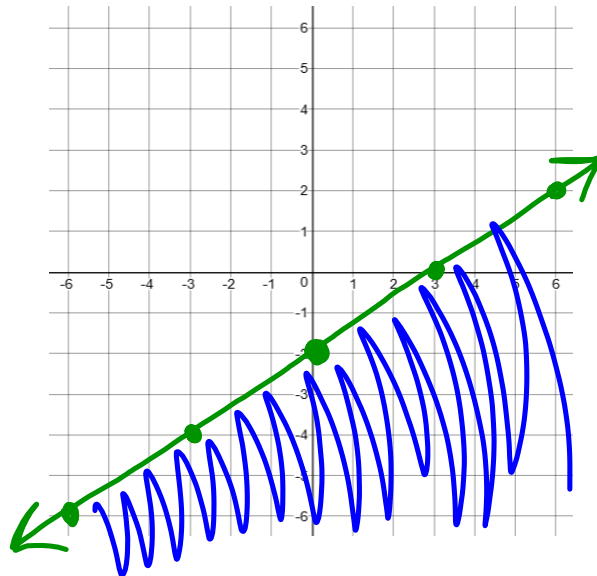
EXAMPLE 1 Graphing a Linear Inequality in Two Variables

Graph: $2x - 3y \geq 6$.

$$\frac{-3y}{-3} \geq \frac{-2x + 6}{-3}$$

$$y \leq \frac{2}{3}x - 2$$

less



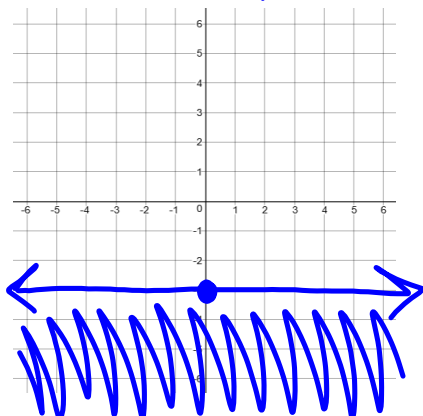
HW Day 1:
#s: 27, 29, 35, 40, 45, 57
60, 62

Graphing other Inequalities

Graph each inequality in a rectangular coordinate system:

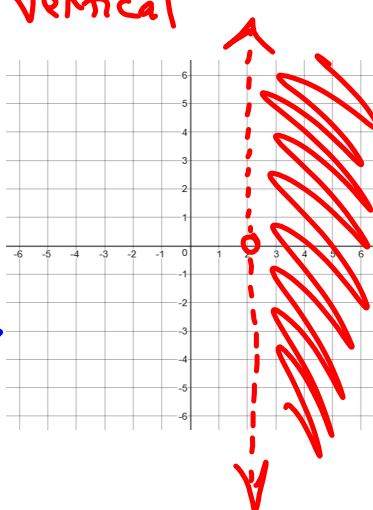
a. $y \leq -3$

horizontal

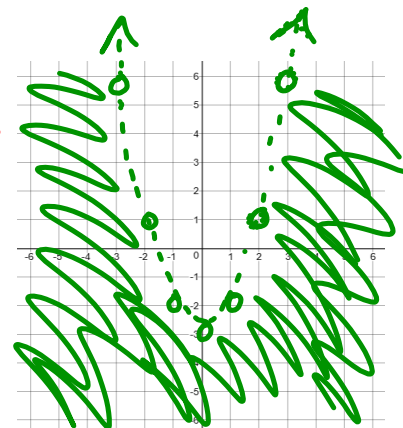


b. $x > 2$

vertical



c. $y < x^2 - 3$



Graphing Systems of Linear Inequalities

The **solution set of a system of linear inequalities in two variables** is the set of all ordered pairs that satisfy each inequality in the system. Thus, to graph a system of inequalities in two variables, begin by graphing each individual inequality in the same rectangular coordinate system. Then find the region, if there is one, that is common to every graph in the system. This region of intersection gives a picture of the system's solution set.

EXAMPLE 6 Graphing a System of Linear Inequalities

Graph the solution set of the system:

$$\begin{cases} x - y < 1 \\ 2x + 3y \geq 12 \end{cases}$$

$$\frac{-y}{-1} < \frac{-x+1}{-1} \frac{1}{-1}$$

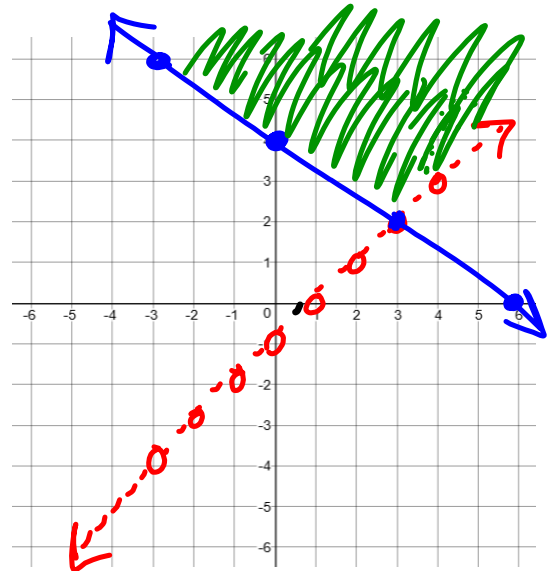
$$y > x - 1$$

↑ above

$$\frac{3y}{3} \geq \frac{-2x+12}{3} \frac{12}{3}$$

$$y \geq -\frac{2}{3}x + 4$$

↑ above



EXAMPLE 7 Graphing a System of Inequalities

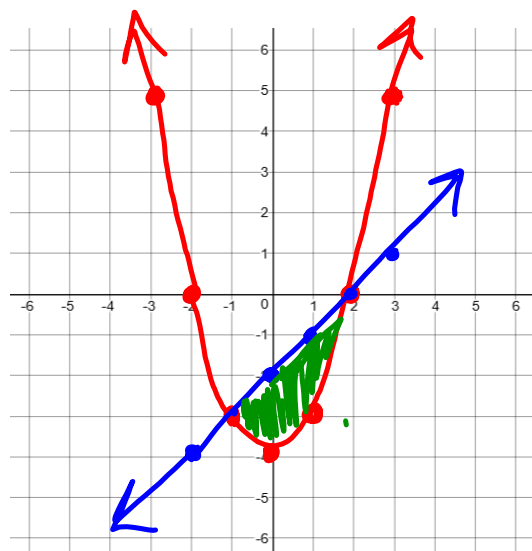
Graph the solution set of the system: ↑ above

$$\begin{cases} y \geq x^2 - 4 \\ x - y \geq 2 \end{cases}$$

$$\frac{-y}{-1} \geq \frac{-x+2}{-1} \frac{2}{-1}$$

$$y \leq x - 2$$

↑ below



EXAMPLE 8 Graphing a System of Inequalities

Graph the solution set of the system:

$$\frac{-y}{-1} < \frac{-x+2}{-1} \frac{2}{-1}$$

$$y > x - 2$$

↑
above

$$\begin{cases} x - y < 2 \\ -2 \leq x < 4 \\ y < 3. \end{cases}$$

Two
Vertical
lines
Inbetween

Horiz.
below

