

Graphing and Solving Systems of Linear Inequalities

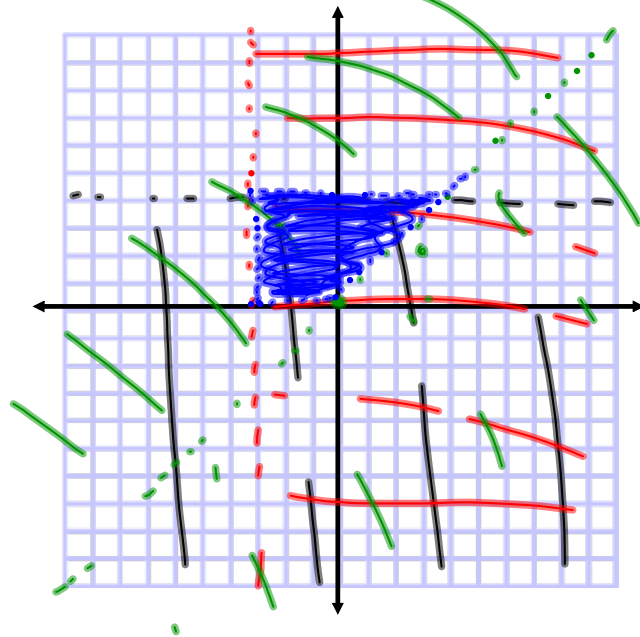
To graph a system of linear inequalities, do the following for each inequality in the system:

Graph the line that corresponds to the inequality. Use a dashed line for an inequality with $<$ or $>$ and a solid line for \leq or \geq .

Lightly shade the half-plane that is the graph of the inequality. (Colored pencils or different colored pens can be useful.)

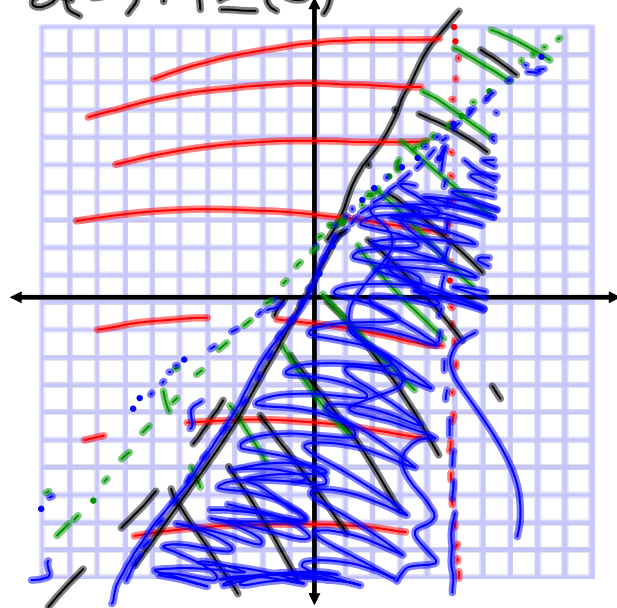
The graph of the system (solution) is the region common to all half-planes (the region shaded with every color).

Graph the system $y < 4$, $x > -3$, and $y > x$.



Graph the system $2x + 1 \geq y$, $x < 5$, and $y < x + 2$.

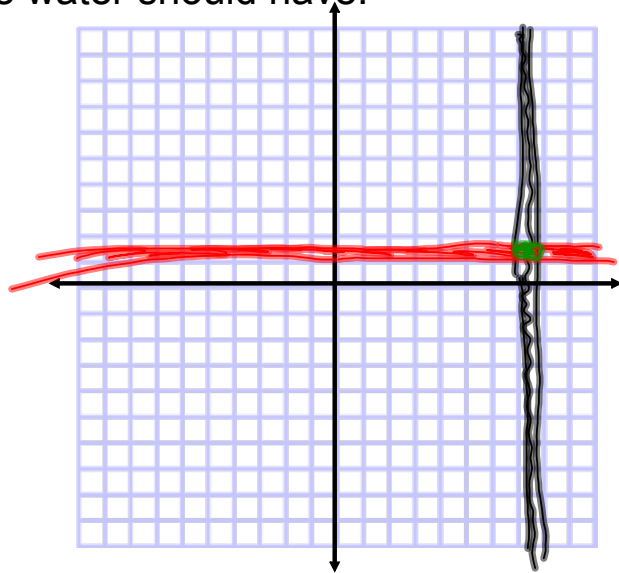
$0 < 0 + 2$
 $0 < 2$



You are a lifeguard at a community pool and you are in charge of maintaining the proper pH and chlorine levels. The water test kit says the pH should be between 7.4 and 7.6 units and the chlorine should be between 1.0 and 1.5 parts per million (ppm). Write and graph a system of inequalities for the pH and chlorine levels the water should have.

$$7.4 \leq x \leq 7.6$$

$$1.0 \leq y \leq 1.5$$



Optimization

Similar words?

Finds preferred result (maximum or minimum)

Vocab to understand:

constraints- system of linear inequalities that limit the solution set

bounded- region has a definite maximum and minimum

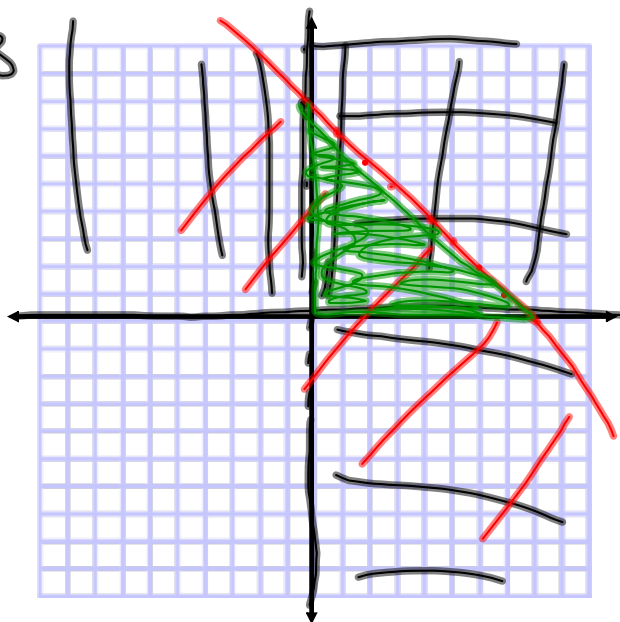
unbounded- region has a definite maximum or minimum



Find the ~~minimum~~ and maximum values of $C = 5x + 6y$ subject to the following constraints:

$$x \geq 0, y \geq 0, x + y \leq 8$$

$$y \leq -x + 8$$



Assignment:

p.159 #28-32 even, 40-44 even, 48, 52, 54, 59

~~p.166 #10-14 even~~