WS 10-7 : Systems of inequalities

Steps for graphing an inequality by hand

step 1.) Replace the inequality symbol with an equal sign and graph the resulting equation. If the inequality is strict, use dashes; if it is nonstrict, use a solid mark. This graph separates the xy-plane into two or more regions.

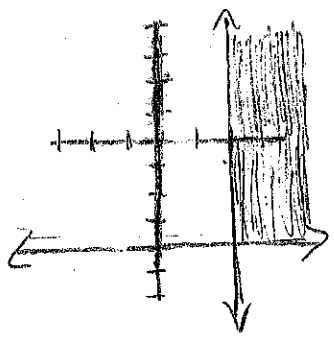
step 2.) In each region, select a test point P.

a.) If the coordinates of P satisfy the inequality, then so do all the points in that region. Indicate this by shading the region.

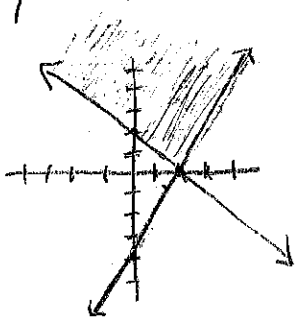
b.) If the coordinates of P do not satisfy the inequality, then none of the points in that region do.

Graph manually.

A. $\begin{cases} x \geq 2 \\ -y \leq 4 \rightarrow y \geq -4 \end{cases}$

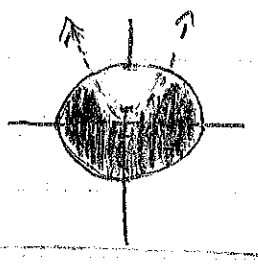


B. $\begin{cases} x+y \geq 2 \rightarrow y \geq -x+2 \\ 2x-y \leq 4 \rightarrow 2x-4 \leq y \end{cases}$



over

C. $\begin{cases} x^2 + y^2 \leq 16 \rightarrow \text{circle w/radius of } \sqrt{16} = 4 \\ x^2 - y > 0 \rightarrow x^2 > y \text{ or } y < x^2 \end{cases}$

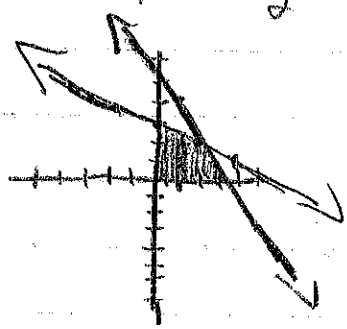


D. $x \geq 0$

$y \geq 0$

$2x + y \leq 6 \rightarrow y \leq -2x + 6$

$x + 2y \leq 6 \rightarrow y \leq -\frac{1}{2}x + 3$



E. $x \geq 0$

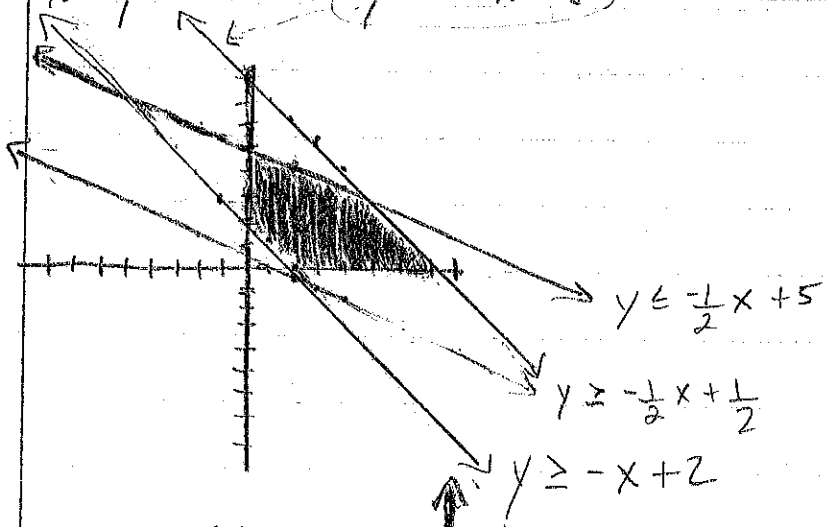
$y \geq 0$

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

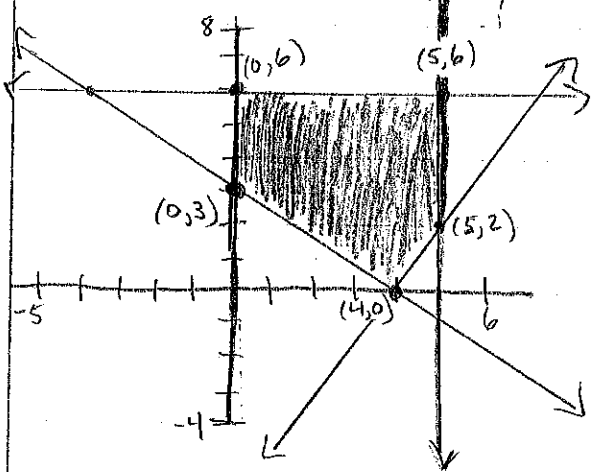
$x + 2y \leq 10 \rightarrow y \leq -\frac{1}{2}x + 5$

$x + y \geq 2 \rightarrow y \geq -x + 2$

$x + y \leq 8 \rightarrow y \leq -x + 8$



F.



- Find the inequalities that represent the graph to the left.

$y \leq 6$

$x \geq 0$

$x \leq 5$

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

$y \geq 2x - 8$