Make sure the homework for today gets done by 8:00 pm later today. If you have to, once you have your system, just use a website to solve the system for m and b. Wolfram Alpha
Saying like "I tried one or twice..." nothing! Try 10 times.

System of linear Inequalities: (Page 176...)

(1) Is $(-\mathbf{3}, -10)$ a solution of the system

$$\begin{cases} -4x+2y<4 \\ 2x+y>-10 \end{cases} \xrightarrow{\text{replace x and y}} \begin{cases} -4(-\mathbf{3})+2(-10)<4 \\ 2(-\mathbf{3})+\ -10>-10 \end{cases} \xrightarrow{\text{simplify each LHS}} \begin{cases} 12-20<4 \\ -6-10>-10 \end{cases}$$

$$\xrightarrow{\text{finalize each LHS}} \begin{cases} -8<4 \leftarrow \text{true} \\ -16>-10 \leftarrow false \end{cases} \xrightarrow{\text{since one false...the point (-3,-10) does not solve the system!}}$$

For a point to be a solution it 's got to make both inequalities true.

Graphing $2x+3y\geq 6$

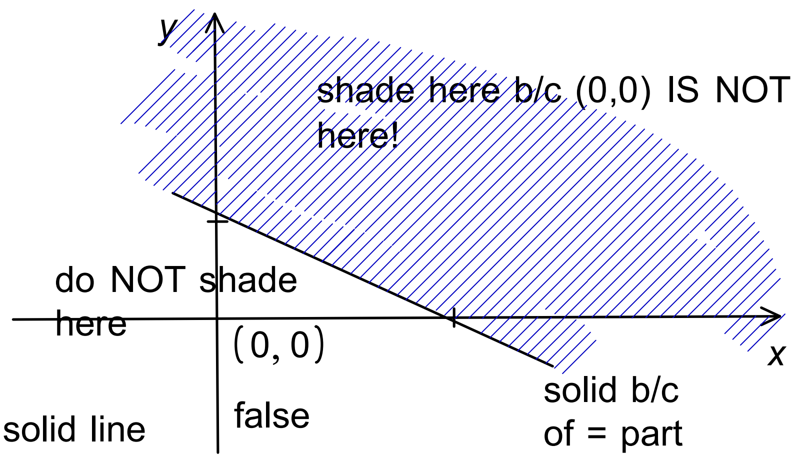
1 graph boundary line: $2x+3y=6$

$x=0: 2\cdot 0+3y=6 \rightarrow 3y=6 \rightarrow y=2$

$(0,2)$

$y=0:\ 2x+3\cdot 0=6 \rightarrow 2x=6 \rightarrow x=3$

$(3,0)$



Observe we have > = ..b/c = is present, use solid line
B/c of > ..do we shade above or below the line?
plug in (0,0): $2\cdot 0+3\cdot 0\geq 6$

$0+0\geq 6$

$0\geq 6$ false!

DO NOT SHADE WHERE (0,0) is located!

Example of one inequality in two variables: $x and y$

Process: Pretend it's an equation so you can mark the boundary.
set x=0 and get y intecept.
set y=0 and get x intercept.
if inequality has ≥ or ≤, use a solid line b/c of the = part
mark the intercepts and connect them with a line
if inequality has only < or >, use a dashed line
where to shade? plug in (0,0)..if (0,0) makes it true, shade in that region where (0,0) is located..
if (0,0) makes it false, shade on the other side of the line!

Let's practice graphing: $\begin{cases} 2x+y\leq 6 \\ x-y\geq 3 \end{cases}$

Solution set will be the intersection of the two individually shaded parts.
Repeat steps above for each inequality on its own.

$2x+y\leq 6$ pretend it's $2x+y=6$

$x=0:\ y=6 \rightarrow (0,6)$

$y=0:\ 2x=6 \rightarrow x=3 \rightarrow (3,0)$

we have ≤..< =.. *use* solid line

plug in(0,0): $2\cdot 0+0\leq 6$?

$0\leq 6$ true!

shade where (0,0) is located!

$x-y\geq 3$ becomes x -y = 3

$x=0:\ 0-y=3 \rightarrow y=-3 \xrightarrow{\text{point}} (0,-3)$ •

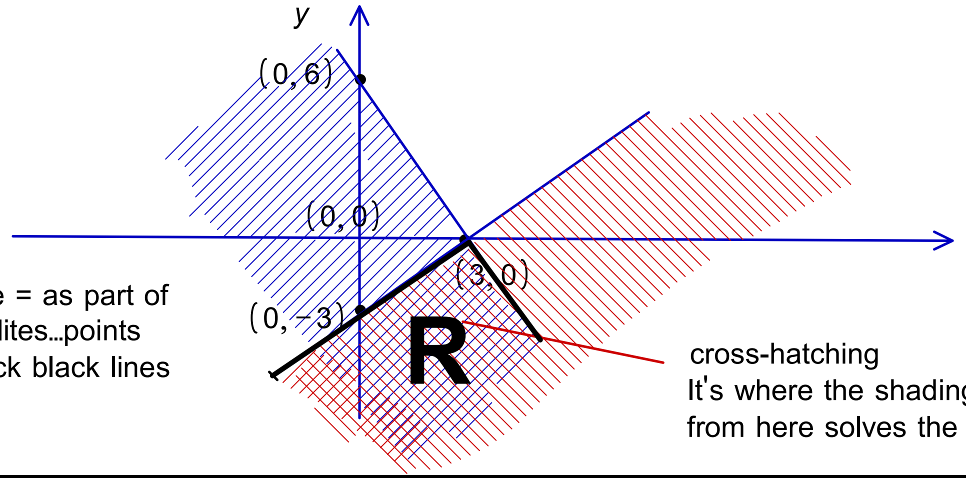
$y=0:$ x-0=3 $\rightarrow x=3 \rightarrow point=(3,0)$

we have > = .. use solid line

plug in (0,0): $0-0\geq 3$

$0\geq 3$ false

so shade where (0,0) IS NOT located!



B/c we have = as part of both inequalites...points from the thick black lines also work!

cross-hatching
It's where the shadings overlap. Any point from here solves the system.

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graph: $\begin{cases} 2x - y \le -4 \\ x + y \ge -1 \end{cases}$

$2x - y \le -4$ becomes $2x - y = -4$

$x = 0:\ -y = -4 \to y = 4 \xrightarrow{\text{point}} (0, 4)$

$y = 0:\ 2x = -4 \to x = -2 \xrightarrow{\text{point}} (-2, 0)$

b/c of = in ≤ , use solid line

plug in (0,0): $2\cdot 0 - 0 \le -4$?

$0 \le -4$ false

so DO NOT shade where (0,0) is located

$x + y \ge -1$ becomes $x + y = -1$

$x = 0:\ y = -1 \xrightarrow{point} (0, -1)$ •

$y = 0:\ x + 0 = -1 \to x = -1 \xrightarrow{\text{point}} (-1, 0) \Leftarrow$ fix this!!

b/c of the = part of ≥, use a solid line

plug in (0,0): $0 + 0 \ge -1$?

$0 \ge -1$? true

shade where (0,0) is located!

Any point from R solves the system
Any point from the thick black lines also solves the system.

point in R: $(-1.5, 6)$

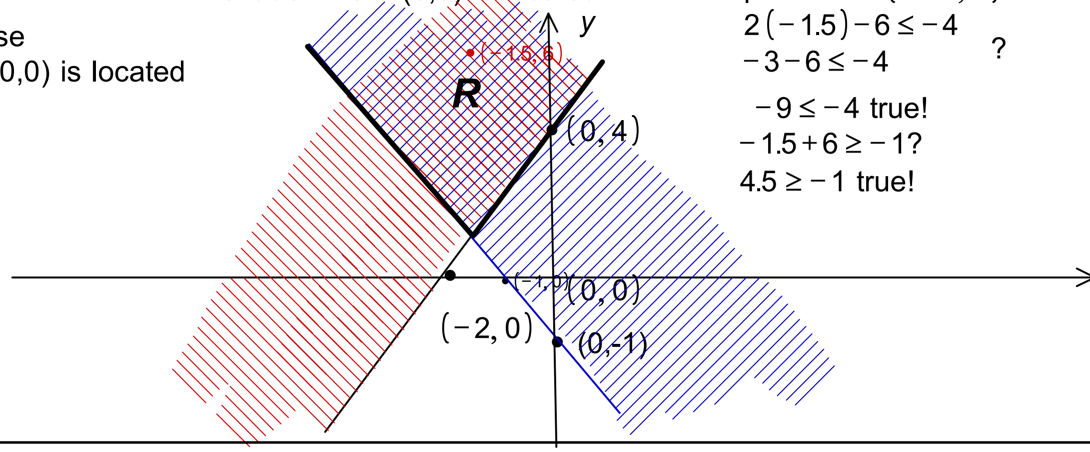
$2(-1.5) - 6 \le -4$?

$-3 - 6 \le -4$

$-9 \le -4$ true!

$-1.5 + 6 \ge -1$?

$4.5 \ge -1$ true!



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graph : $\begin{cases} -2x + y \le -6 \\ 4x + 5y \ge 20 \end{cases}$

$-2x + y = -6$

$x = 0:\ y = -6 \xrightarrow{point} (0, -6)$

$y = 0:$ -2x=-6 $\xrightarrow{\text{solve for x}} x = 3 \xrightarrow{\text{point}} (3, 0)$

b/c of the = part of <=, use a solid line

plug in (0,0): $-2\cdot 0 + 0 \le -6$?

$0 \le -6$? false

so shade where (0,0) is NOT located!

Since both inequalites have = present, the lines that bound the region R also solve the inequalities, so trace over them in bold black.

$4x + 5y = 20$ (boundary line)

$x = 0:$ 5y=20 $\xrightarrow{\text{divide by 5}} y = 4 \xrightarrow{\text{point}} (0, 4)$

$y = 0:$ 4x=20 $\xrightarrow{\text{divide by 4}} x = 5 \xrightarrow{point} (5, 0)$

b/c of the = part of >=, use a solid line

plug in (0,0): $4\cdot 0 + 5\cdot 0 \ge 20$?

$0 + 0 \ge 20$

$0 \ge 20$ false

so shade where (0,0) is NOT located!

in older books...
≥ *was* written as > =
in older books ≤ was written as < =