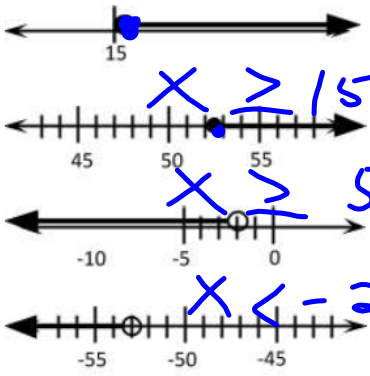
Inequalities

< ... ≤ ... > ... ≥



$x \geq 15$

$x \geq 52.5$

$x < -2$

$x < -53$

$<$ less than

$\leq$ less than or equal

$>$

$\geq$

$2 > 0 + 1$

$y = mx + b$

$(-2, 3)$ $(0, 2)$

Graph:
$y = x$

$m = 1$
$b = 0$

$0 > 0 + 1$

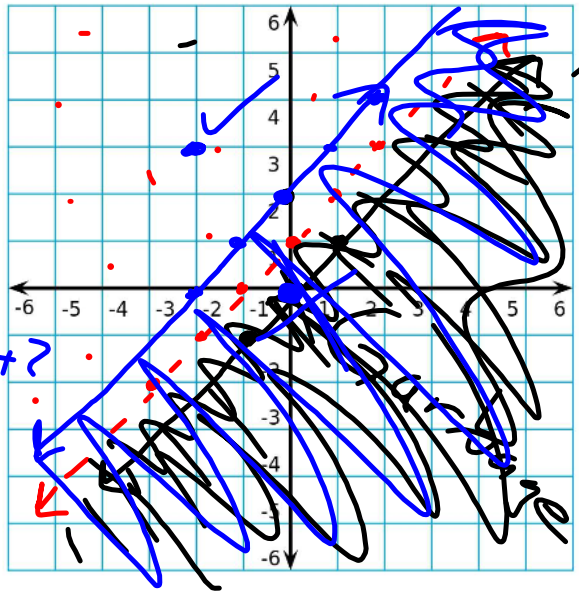
$y > x + 1$

$m = 1$
$b = 0$

$y \geq x + 2$

$3 \geq -2 + 2$

$m = 1$
$b = 2$



$0 < 3(0) + 1$

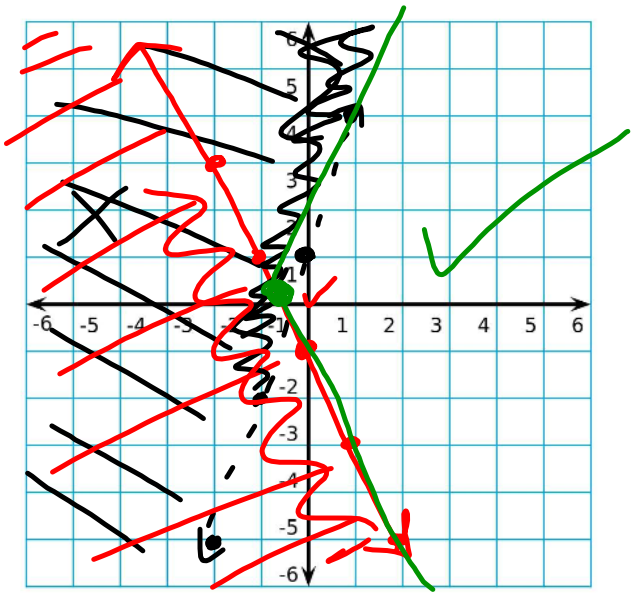
$y \leq 3x + 1$

$m = 3$
$b = 1$

$0 \geq 2(0) - 1$

$y \geq -2x - 1$

$m = -2$
$b = -1$



What we are often interested in is where these two inequalities meet.

There is going to be exactly one point where both inequalities have the same x, and y point.

To find this we set them equal to each other.

Let's look at the previous example:
$y < 3x + 1$ and $y \geq -2x - 1$
If we set them equal to each other we have:
$3x + 1 = -2x - 1$ and we solve for x.

$3x + 1 = -2x - 1$
$3x + 2x = -1 - 1$
$5x = -2$
$x = -\frac{2}{5}$

We can then put the found x value into either of our starting equations and get our value for y.

$(-.4, .2)$

$y < 3x + 1$
$y = 3\left(-\frac{2}{5}\right) + 1$
$y = -\frac{6}{5} + 1$
$y = \frac{-6+5}{5}$
$y = -\frac{1}{5}$

$4x+11>3$	$\frac{1}{4}x+3>8$
Where do the lines meet?	

$5-2x>10x+39$	$4(x-2)\leq 5x-12$
Where do the lines meet?	

Hw:

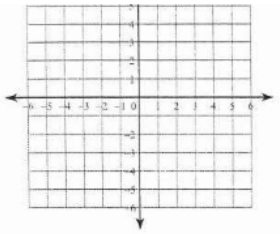
Graph 2 lines on same grid. Shade proper side of the line.

Exact value of point where they meet.

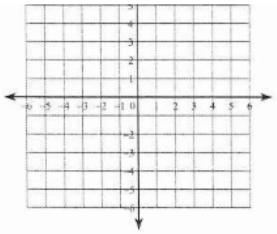
emailed to me today!

Danny has his own computer repair business. He offers his customers two payment options. Option A has a base fee of $40 plus $8 per hour. Option B has no base fee but costs $15 per hour. How many hours does a repair job have to take in order for option B to be less expensive?

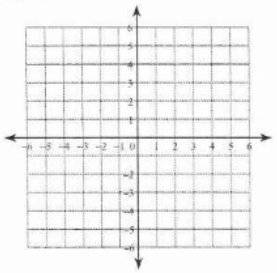
Model this problem using an inequality.
After how many hours will option B be less expensive?



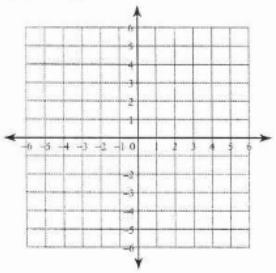
9) $y \geq 5$



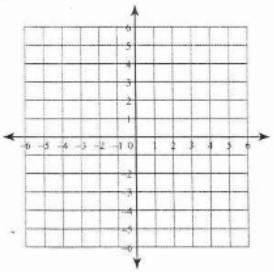
10) $2x - 5y \leq 10$

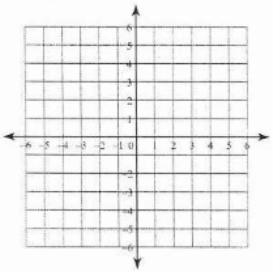


11) $8x - 3y \leq 12$



12) $x - y \geq 0$





Critical thinking questions:

13) Name one particular solution to #11

14) Can you write a linear inequality whose solution contains only points with positive x-values and positive y-values? Why or why not?

Also, where does each row equal each other.
Ie: where does the line in 9 = the line in 10? (for each row)