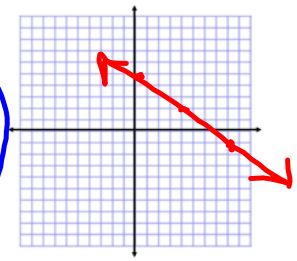
Math 1-A Unit 5 Day 9: Graphing Linear Inequalities

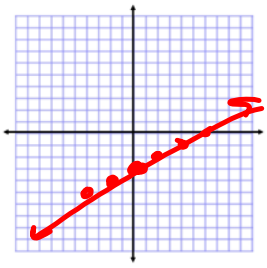
Warm-up

Graph the following lines on the coordinate plane.

1.) $y = -\frac{3}{4}x + 5$



2.) $x - 2y = 6$



Graph the following inequalities on the number line.

3.) $x > 4$

4.) $x \leq -2$

5.) $8 > x$

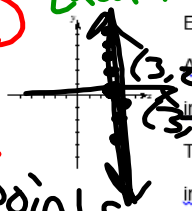
From the warm-up, you can see the graph of a linear equation in two variables is a line. The graph of a linear inequality (one variable) is a points shaded area

On a number line > and < use an open dot. On a coordinate plane > and < use a dotted/dashed line (not equal to)

On a number line ≥ and ≤ use an closed dot. On a coordinate plane ≥ and ≤ use a solid line (equal to)

Ex. #1 Graph x = 3

A solution is any point on the line.



all points with x-value of 3

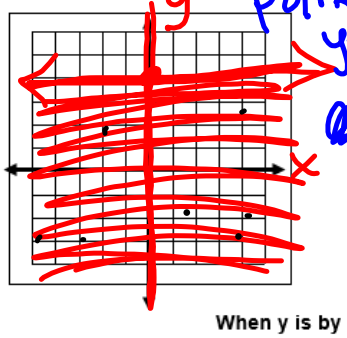
Ex. #2 Graph x < 3

A solution is any point in the shaded region.

The solution does not include points on the line.

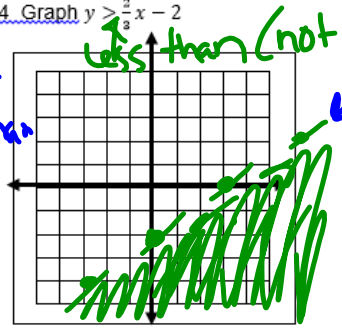
all points have x-values less than 3

Ex. #3 Graph $y \leq 4$



all shaded points have y-values less than 4

Ex. #4 Graph $y > \frac{2}{3}x - 2$



less than (not = to) dashed line

When y is by itself, < shades down and > shades up.

Ask:

① Line dashed or solid? $> <$ $\geq \leq$

② Shade up/down $> <$ $\geq \leq$

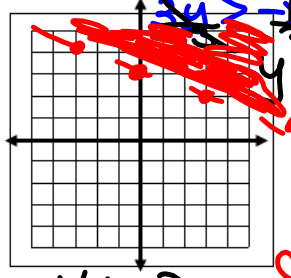
Ex. #5 Graph $x + 3y > 9$

$-x \quad -x$

$3y > -x + 9$

$\frac{3y}{3} > \frac{-1}{3}x + \frac{9}{3}$

$y > -\frac{1}{3}x + 3$



dashed, shade up

Y/N?

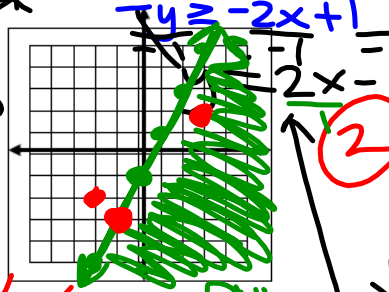
Ex. #6 Graph $2x - y \geq 1$

$-2x \quad -2x$

$-y \geq -2x + 1$

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

$y \leq 2x - 1$



solid, down

* when you mult./divide by negative you flip sign

Are the points (3, 2), (-2,-2), (-1, -3) solutions to example 6?

yes, no, yes

How do you know graphically?

anything on solid line and in shaded area

How do you know algebraically?

$2x - y \geq 1$

(3, 2) → x, y

$2(3) - (2) \geq 1$

$6 - 2 \geq 1$

$4 \geq 1$

TRUE ✓

(is a solution)

(-2, -2) → x, y

$2(-2) - (-2) \geq 1$

$-4 + 2 \geq 1$

$-2 \geq 1$

FALSE

(not a solution)

(-1, -3) → x, y

$2(-1) - (-3) \geq 1$

$-2 + 3 \geq 1$

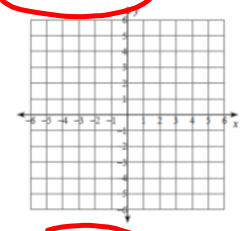
$1 \geq 1$

TRUE

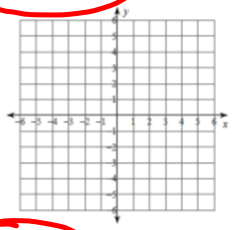
(is a solution)

Sketch the graph of each linear inequality.

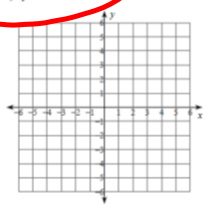
1) $y \geq -3x + 4$



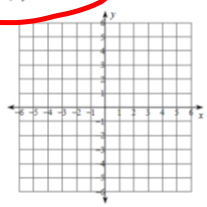
2) $y \leq \frac{3}{5}x - 5$



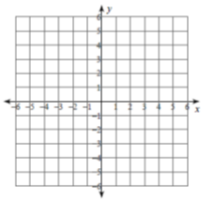
3) $y > -x - 5$



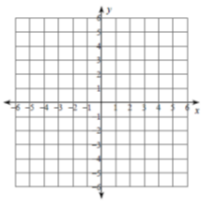
4) $y > -4$



5) $y > 2x - 5$



6) $y \geq \frac{7}{4}x + 2$



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