01 Linear Inequalities

Wednesday, November 28, 2018 8:09 AM

01 Linear Inequalities

$$9x - 7i > 3(3x - 7u)$$

$9x - 7i > 9x - 21u$

$-7i > 9x - 9x - 21u$

$-7i > -21u$

$i < \frac{-21u}{-7}$

$i < 3u$

A linear inequality in two variables may come in two forms:

→ $y \geq 3x + 2$ $m = 3$ y-int $= 2$

$4x + 2y \geq 10$

$y = mx + b$

An inequality in 2 variables defines an infinite area in the cartesian plane.

Any point (x, y) that satisfies the inequality is a solution.

Eg: Which points are solutions?

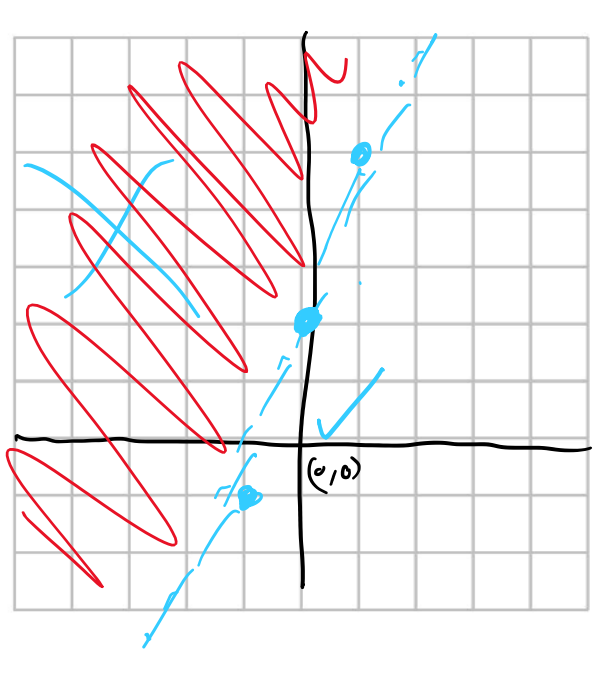
$3x - 2y \geq -16$ $[(-3, 4), (0, 2), (-5, 3)]$

$3(-3) - 2(4) \geq -16$ $-9 - 8 \geq -16$ $-17 \geq -16$ ✗	$3(0) - 2(2) \geq -16$ $-4 \geq -16$ ✓	$3(-5) - 2(3) \geq -16$ $-15 - 6 \geq -16$ $-21 \geq -16$ ✗

$y < 3x + 2$

1) draw line → solid / dashed
$\geq, \leq$ $>, <$

2) $(0, 0)$
$0 < 0 + 2$ ✓

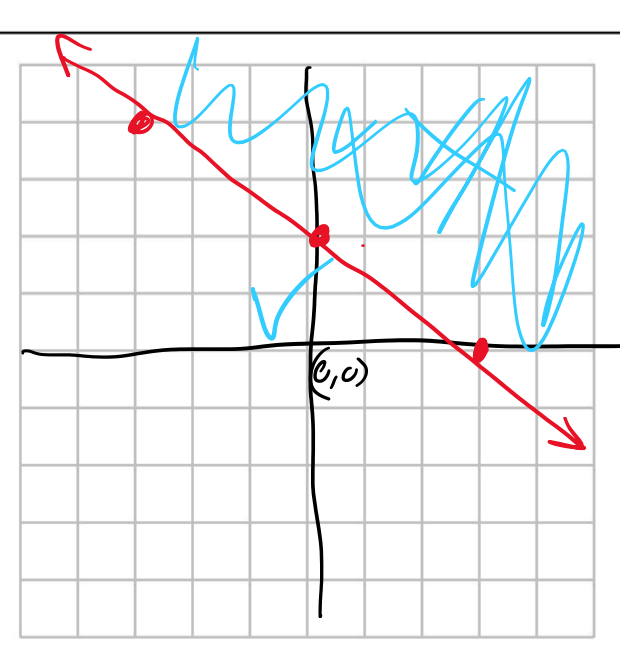


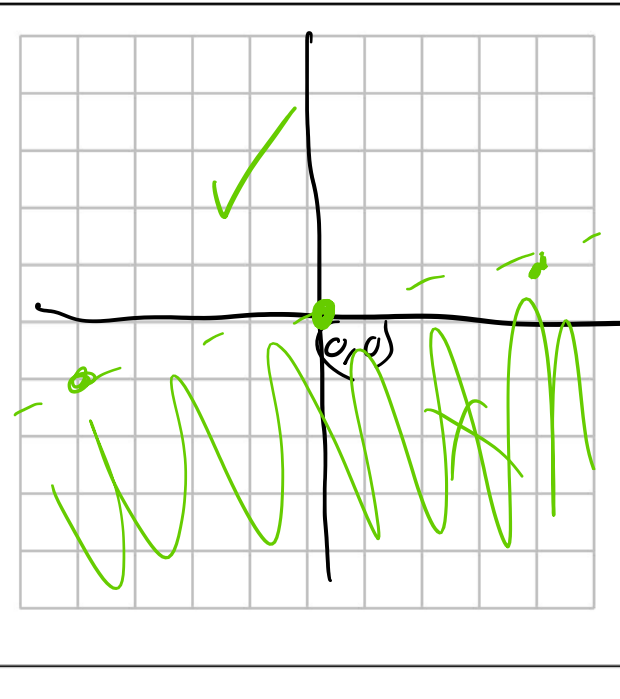
The line that separates valid solution points from invalid points is called the boundary line.

If the line itself is a solution, $(\geq, \leq)$ then the boundary line should be solid.

If the line itself is not a solution, $(>, <)$ then the boundary line should be dashed.

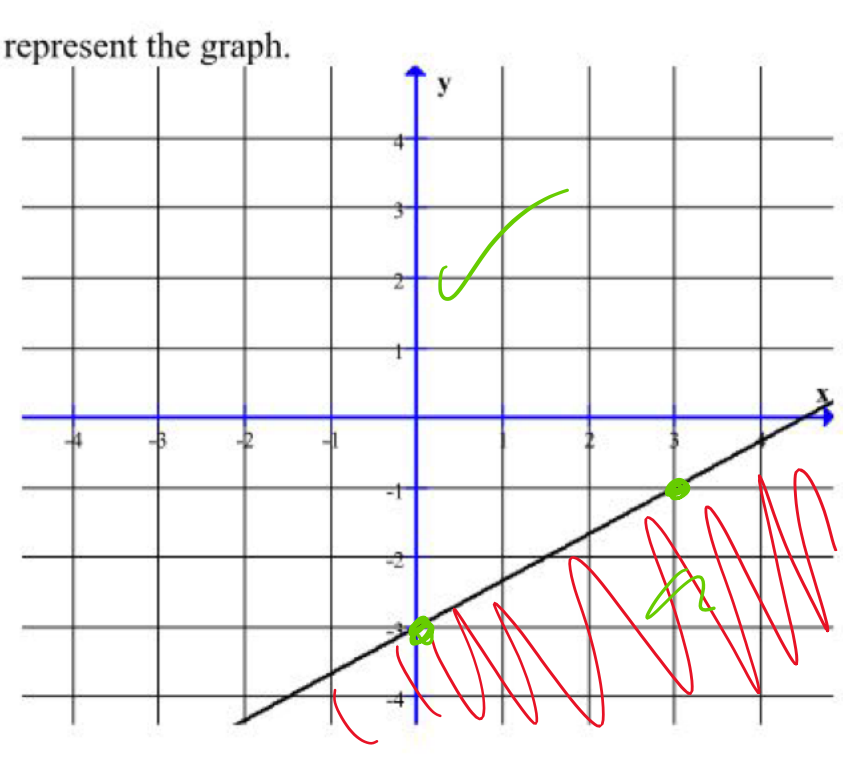
The algorithm:

EG:	$2x + 3y \leq 6$
Solve for y	$3y \leq 6 - 2x$ $y \leq -\frac{2}{3}x + 2$
Decide if you need a solid or dotted line	Solid $0 \leq 0 + 2$
Draw your line	
Decide which part of the graph contains valid solutions	
Scratch out the 'garbage'.	

EG:	$5x - 20y < 0$
Solve for y	$-20y < -5x$ $y > \frac{-5x}{-20}$ $y > \frac{1}{4}x$
Decide if you need a solid or dotted line	dashed $(0, 1)$ $1 > \frac{1}{4}$
Draw your line	
Decide which part of the graph contains valid solutions	
Scratch out the 'garbage'.	

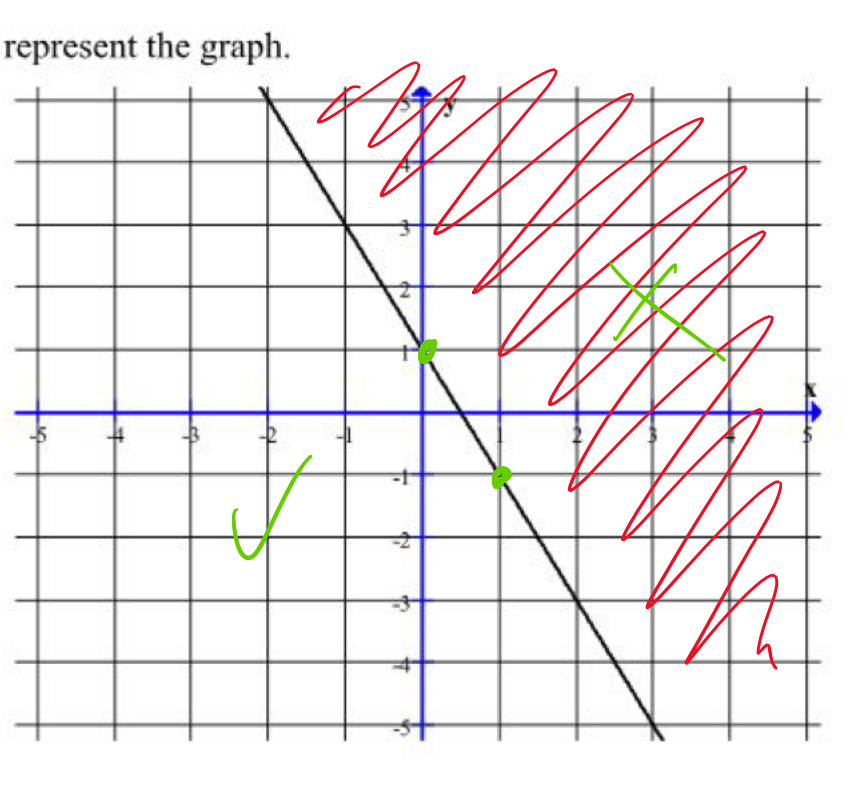
Write an inequality to represent the graph.

$y \geq \frac{2}{3}x - 3$



Write an inequality to represent the graph.

$y \leq -2x + 1$



HW Pg 472
1bd, 3, 4, 9, 11, 12