

LEARNING OBJECTIVE: We will solve linear inequalities in two variables.
(Alg1M1L10)

CONCEPT DEVELOPMENT:

Recall a **linear equation** is an equation in two variables. The solution is typically a straight line on a coordinate plane.

Examples:

$y = 2x - 1$

↖ SLOPE IS INTERCEPT

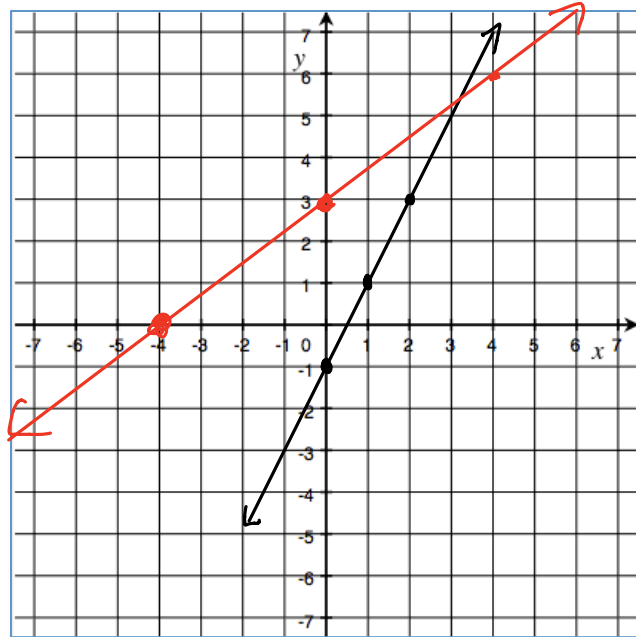
$3x - 4y = -12$

STANDARD FORM

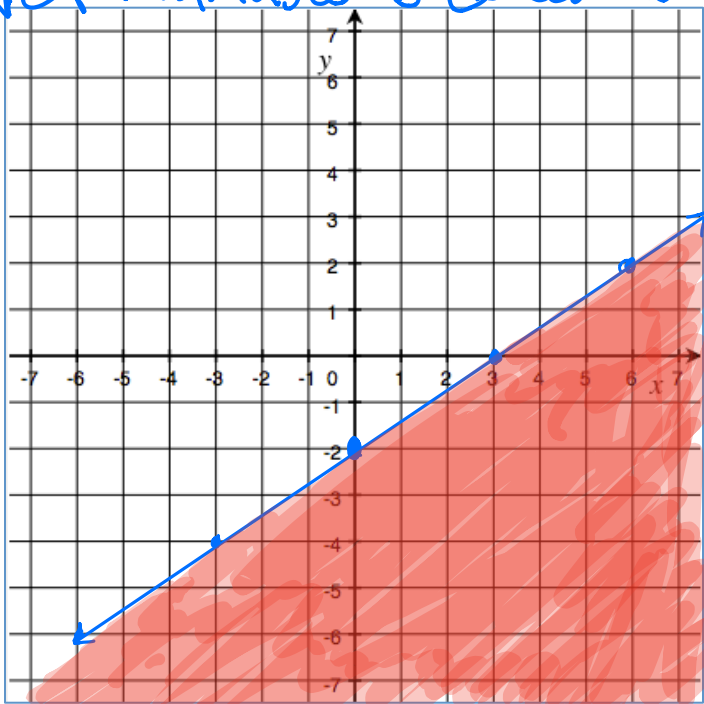
$-3x$ $-3x$

$$\frac{-4y}{-4} = \frac{-3x - 12}{-4}$$

$$y = \frac{3}{4}x + 3$$



Solution Set for an inequality in 2 real # variables is called a **HALF PLANE**



Linear Inequalities result when you replace the equal sign an inequality symbol. **The solution** is a region on a coordinate plane that is determined by the **boundary line**.

Example:

$2x - 3y \geq 6$

$-2x$ $-2x$

$$\frac{-3y}{-3} \geq \frac{-2x + 6}{-3}$$

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

x	y	$2x - 3y \geq 6$?
3	0	$6 \geq 6$ ✓
2	0	$4 \geq 6$ ✗
4	0	$8 \geq 6$ ✓

GUIDED PRACTICE:**Steps for Graphing Inequalities in Two Variables**

1. Change the inequality (as needed) so that the inequality resembles slope-intercept form.
2. Temporarily replace the inequality sign with an equal sign.
3. Graph the linear equation.
4. Reinsert the inequality sign.
5. If the line is a PART of the solution (\leq or \geq), the graph is a solid line. If the line is NOT a part of the solution ($<$ or $>$), the graph is a dashed line.
6. If the inequality is greater than ($>$ or \geq) shade the area ABOVE the line. If the inequality is less than ($<$ or \leq), shade the area BELOW the line.

Graph $4x - y \leq 10$

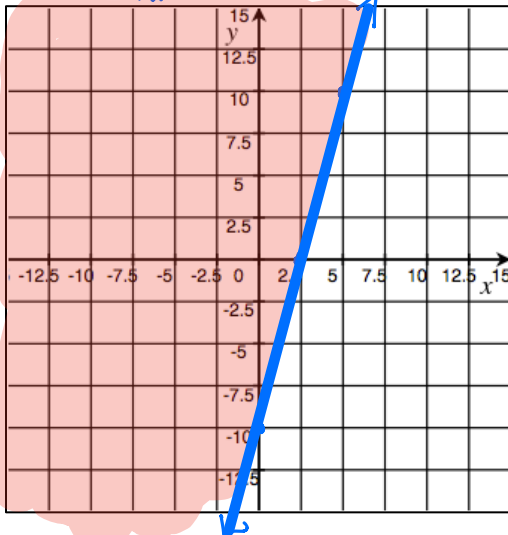
$$-4x \quad -4x$$

$$\frac{-y}{-1} \leq \frac{-4x + 10}{-1}$$

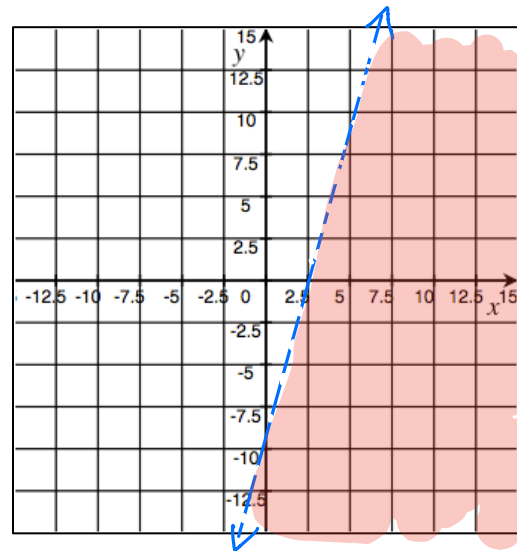
$$y \geq 4x - 10$$

SOLID LINE \geq or \leq

ABOVE THE LINE \geq or \leq

Graph $4x - y > 10$

$$y < 4x - 10$$



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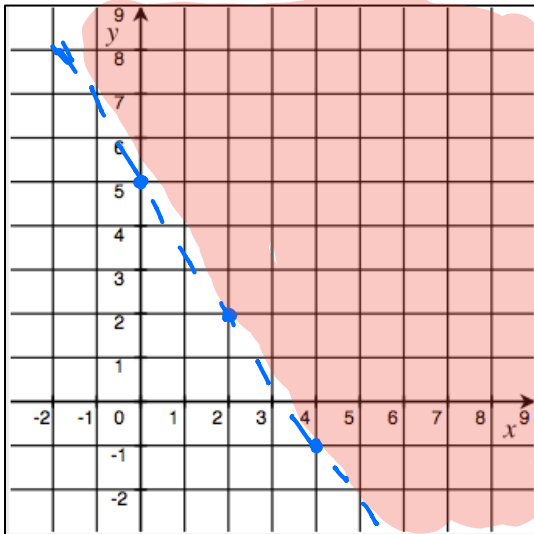
Math 7.2, Period _____

Mr. Rogove

Date: _____

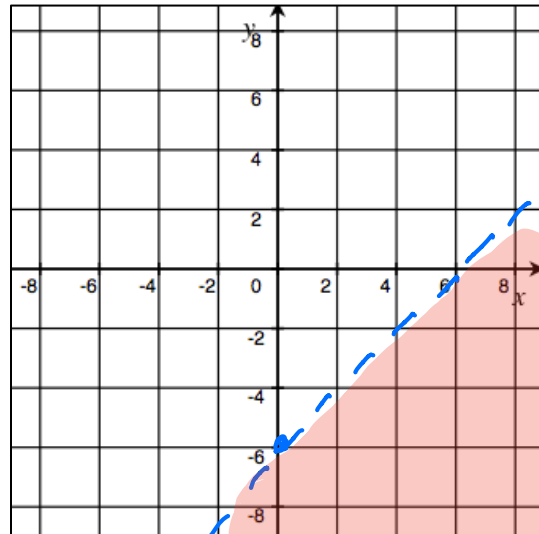
Graph $3x + 2y > 10$

$$\begin{aligned} & -3x \quad -3x \\ & \frac{2y}{2} > \frac{-3x+10}{2} \\ & y > -\frac{3}{2}x + 5 \end{aligned}$$



Graph $x - y > 6$

$$\begin{aligned} & -x \quad -x \\ & \frac{-y}{-1} > \frac{-x+6}{-1} \\ & y < x - 6 \end{aligned}$$



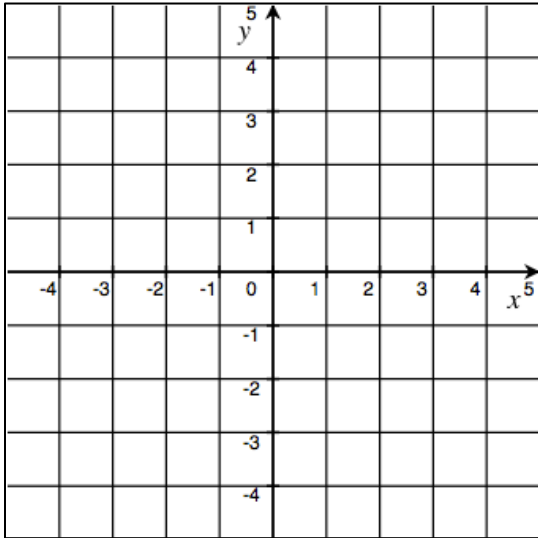
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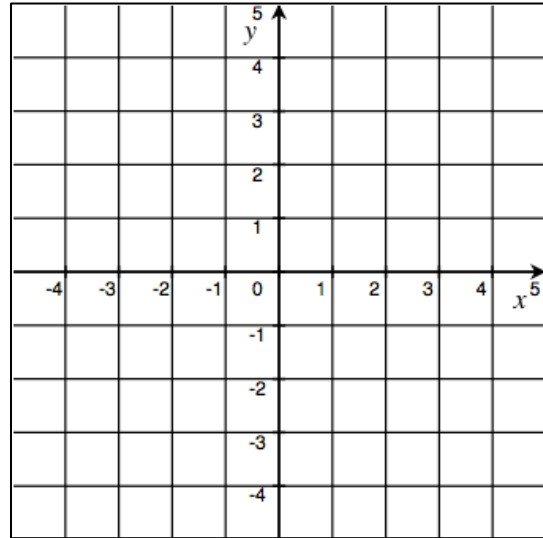
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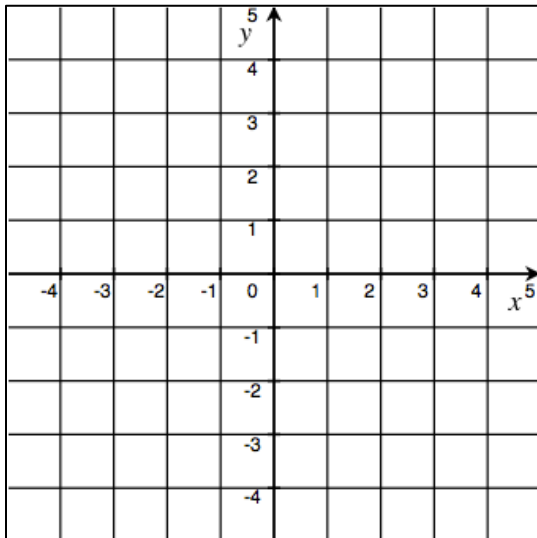
Graph $y > 1$



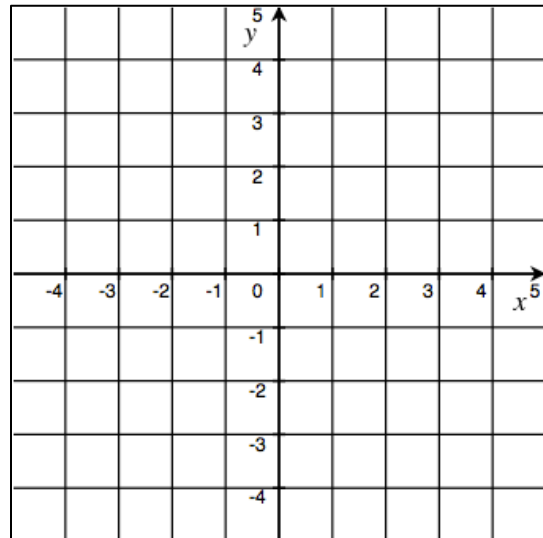
Graph $x \leq -3$



Graph $y > x$



Graph $y < x$



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INDEPENDENT PRACTICE:

Two Khan Exercises:

Graphs of Inequalities in Two Variables

Graphing Linear Inequalities in Two Variables.

ACTIVATING PRIOR KNOWLEDGE:

CLOSURE:

NOTES:

Maps to lesson 7-4 of Algebra 1 (GO MATH) and Lesson 21 of ENY Alg 1.

HW Khan: Graphing and Solving Linear Inequalities