Name: _____ Math 7.2, Period _____

Mr. Rogove Date: _____

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

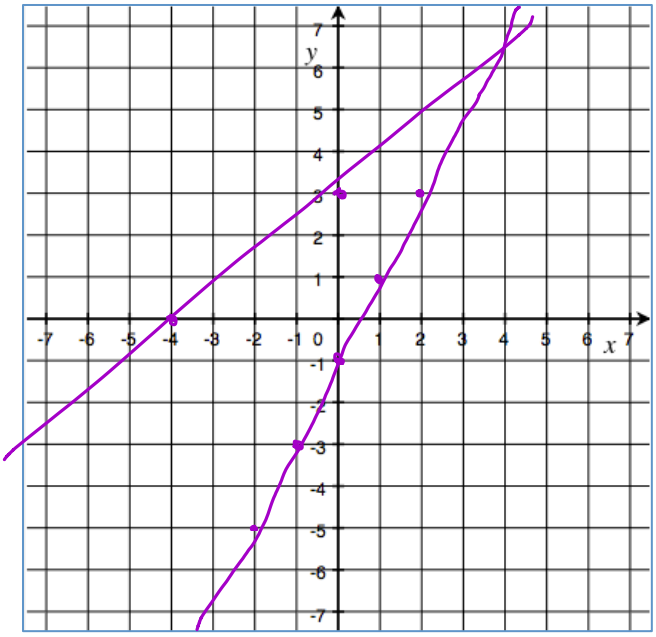
CONCEPT DEVELOPMENT:

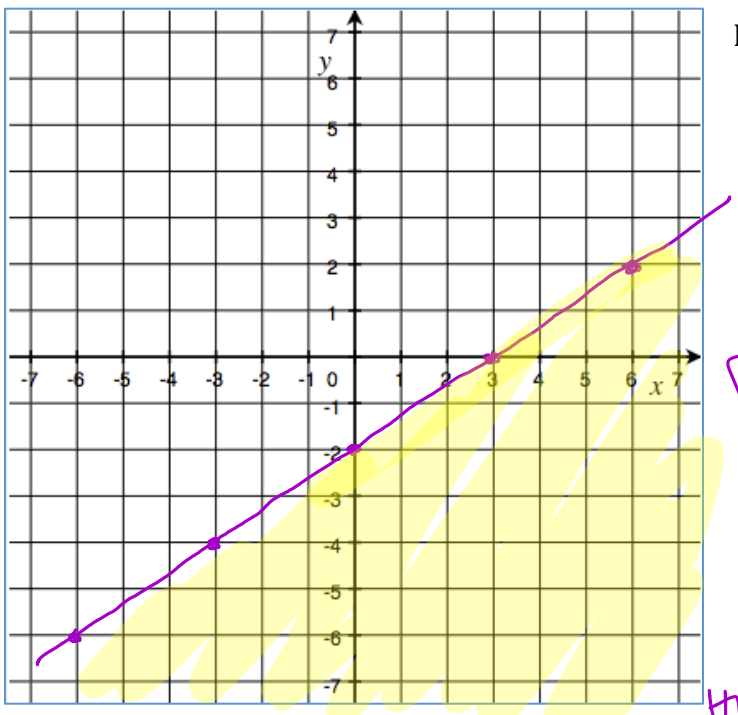
Recall a **linear equation** is an equation in two variables. The solution is a typically a straight line on a coordinate plane.

Examples:

$y = 2x - 1$ SLOPE-INT.

$3x - 4y = -12$ STANDARD





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:

$2x - 3y \geq 6$

$-2x \qquad -2x$

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

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

Half plane

Solution set for linear inequality

SOLID: $\leq$ or $\geq$

DASHED: $<$ or $>$

HALF PLANE

UNDER THE LINE $<$ or $\leq$

ABOVE THE LINE $>$ or $\geq$

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Guided Practice:

Steps for Graphing Inequalities in Two Variables

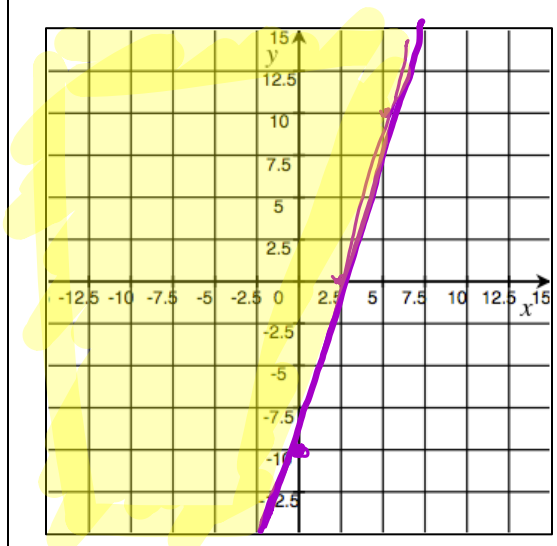
1. Change the inequality (as needed) so that the inequality resembles slope-intercept form.
2. Temporarily replace the inequality sign with an equal sign.
3. Graph the linear equation.
4. Reinsert the inequality sign.
5. If the line is a PART of the solution ($\leq$ *or* $\geq$), the graph is a solid 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 $4x - y \leq 10$

$-4x \quad -4x$

$-y \leq -4x + 10$

$y \geq 4x - 10$

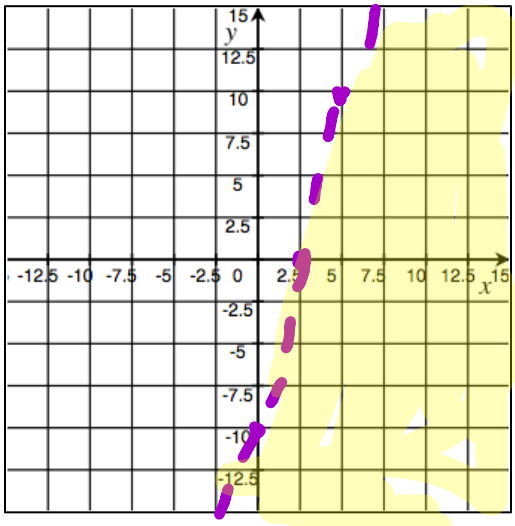


Graph $4x - y > 10$

$-4x \quad -4x$

$-y > -4x + 10$

$y < 4x - 10$



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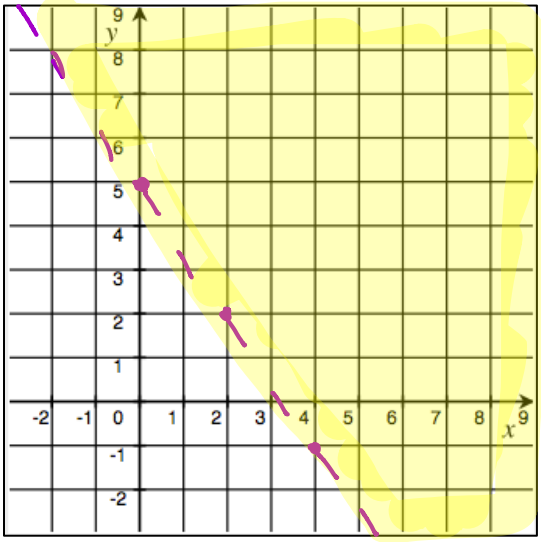
Graph $3x + 2y > 10$ DASHED

$-3x \quad -3x$

$\frac{\cancel{2}y}{\cancel{2}} > \frac{-3x}{2} + \frac{10}{2}$

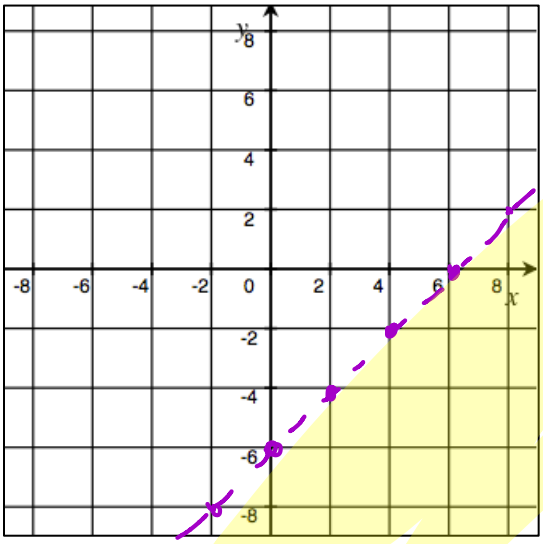
$y > -\frac{3}{2}x + 5$



Graph $x - y > 6$ DASHED

$-y > -x + 6$

$y < x - 6$



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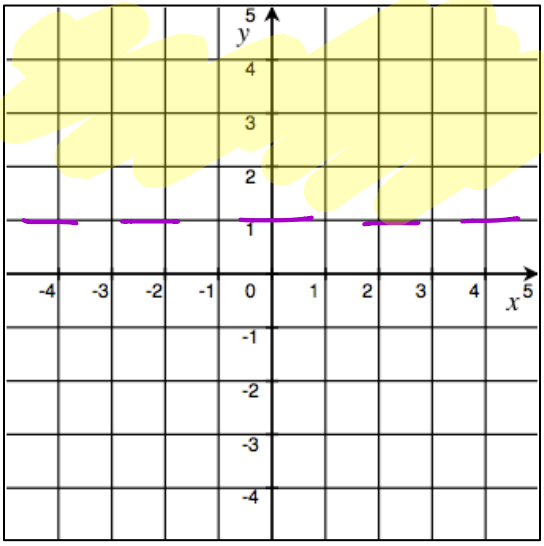
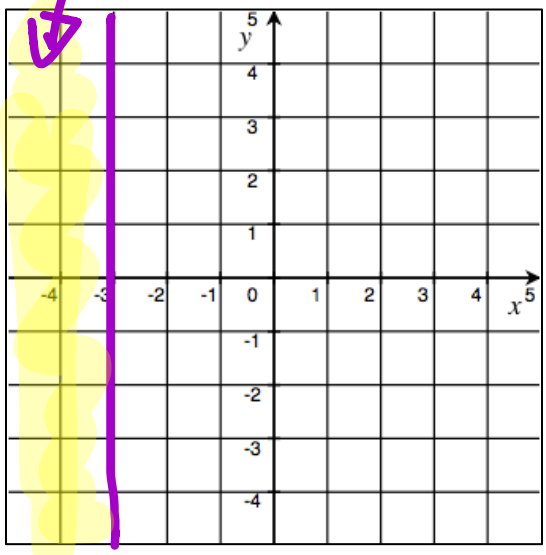
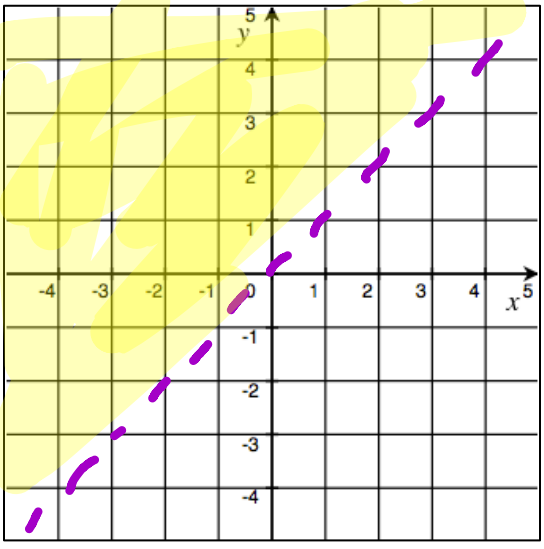
Graph $y > 1$



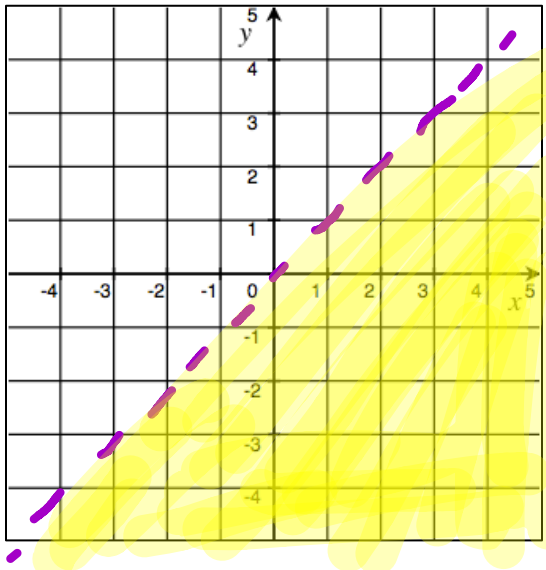
Graph $x \leq -3$



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