Lesson 42: Systems of Non-Linear Equations & Inequalities

By the end of the lesson, you will be able to:

~ Solve systems of equations - linear and nonlinear

~ Solve systems of inequalities - linear and nonlinear

Solving Systems of Equations on the Calculator

1. Write down original equations.
2. Solve for y.
3. Plug in equations in the " y=" on your calculator.
4. Graph. Sketch on paper.
5. Find the solution(s). (Remember "solutions" means find the intersections. On calc: 2nd, Trace, #5 intersection .) Answers should be in point form.

Example 1: Use your calculator to solve the system of equations. Round to 2 decimal places if needed.

$$y = 2x - 3$$

$$y = (x - 5)^2 + 2$$

Example 2: Use your calculator to solve the system of equations. Round to 2 decimal places if needed.

$$y + 5 = -4x$$

$$y = (x - 2)^2 + 1$$

Example 3: Use your calculator to solve the system of equations. Round to 2 decimal places if needed.

$$y = x + 2$$

$$y = x^2$$

Example 4: Use your calculator to solve the system of equations. Round to 2 decimal places if needed.

$$y = x + 8$$
$$y = -|x - 3| + 2$$

Example 5: Use your calculator to solve the system of equations. Round to 2 decimal places if needed.

$$y = 2|x + 2| - 3$$

$$y = -(x)^2 + 7$$

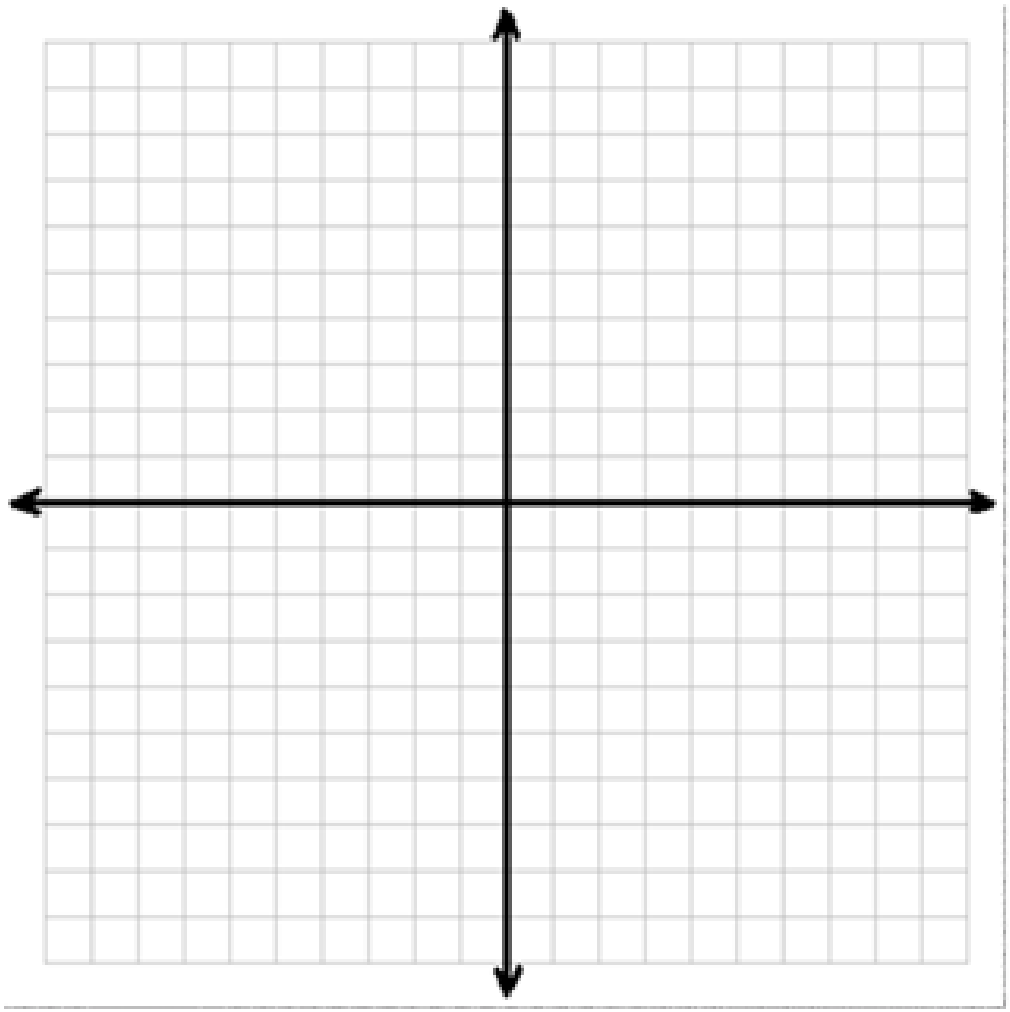
Solve the system of Inequalities - no calculator

1. Graph each equation by hand. Some may need special points.
2. Decide if lines are dashed or solid.
3. Pick a test point for each equation to determine which side to shade.
4. Shade the solution. (Remember: The solution is where both shadings intersect.)

Example 1: Solve the system of inequalities.

$$y \geq -2x + 9$$

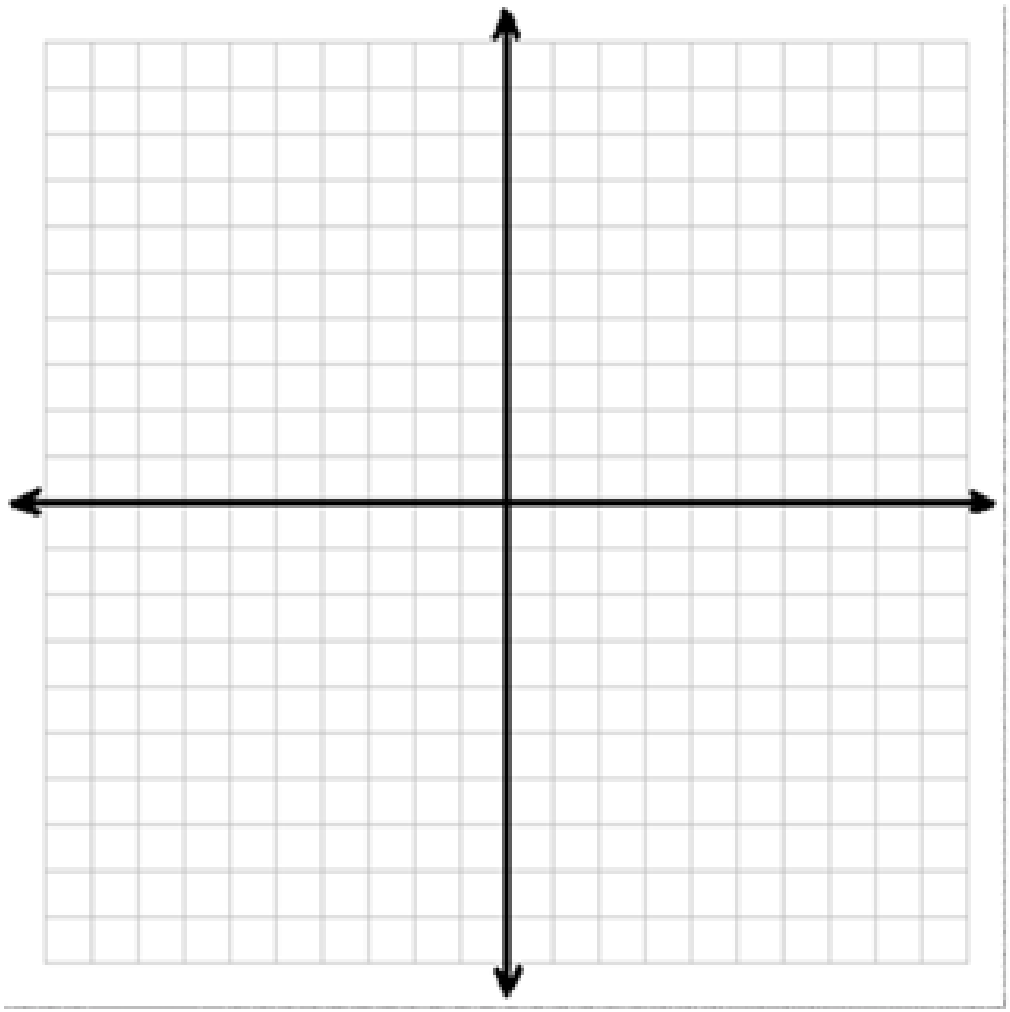
$$y \leq (x - 5)^2 + 5$$



Example 2: Solve the system of inequalities.

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

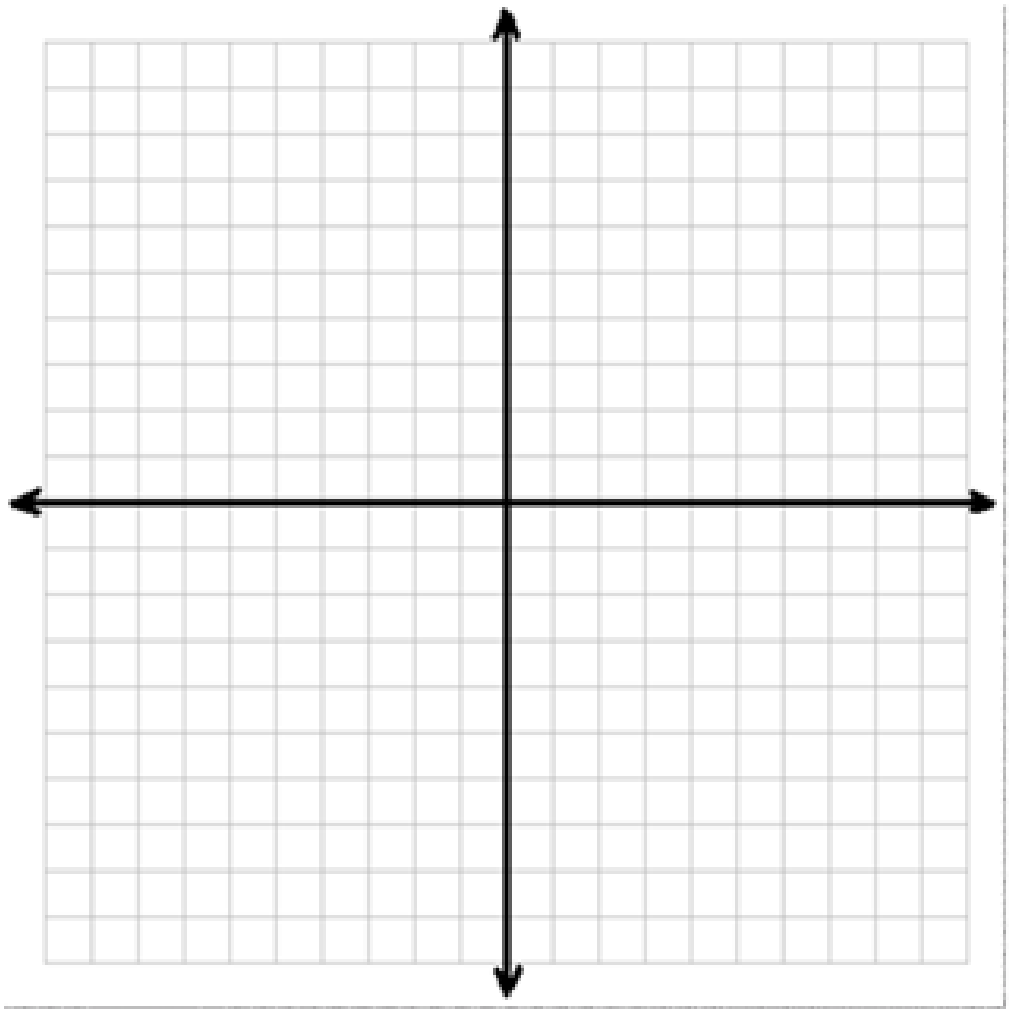
$$y < |x| - 3$$



Example 3: Solve the system of inequalities.

$$y \leq -|x| + 3$$

$$y > (x+5)^2 - 5$$



Example 3: Solve the system of inequalities. (WORK)

$$y \leq -|x| + 3 \qquad y > (x+5)^2 - 5$$

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By the end of the lesson, you will be able to:

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Can you?

Homework:

Assignment 42

Instructions: Write down original problem and show work. Sketch graphs.