

Graphing Quadratic Inequalities

Quadratic Inequalities in Two Variables

$$y < ax^2 + bx + c$$

$$y > ax^2 + bx + c$$

$$y \leq ax^2 + bx + c$$

$$y \geq ax^2 + bx + c$$

The graph of any such inequality consists of all solutions (x,y) of the inequality. The steps used to graph a quadratic inequality are very much like those used to graph a linear inequality.

- 1) Draw the parabola with equation $y = ax^2 + bx + c$. Make the parabola **dashed** or inequalities with $<$ or $>$ and **solid** for inequalities with \leq or \geq .
- 2) Choose a point (x,y) inside the parabola and check whether the point is a solution of the inequality.
- 3) If the point from Step 2 is a solution, shade the region inside the parabola. If it is not a solution, shade the region outside the parabola..

Graph $y > x^2 - 2x - 3$

$$x = \frac{-b}{2a} = \frac{-(-2)}{2(1)} = \frac{2}{2} = 1 \quad V(1, -4)$$

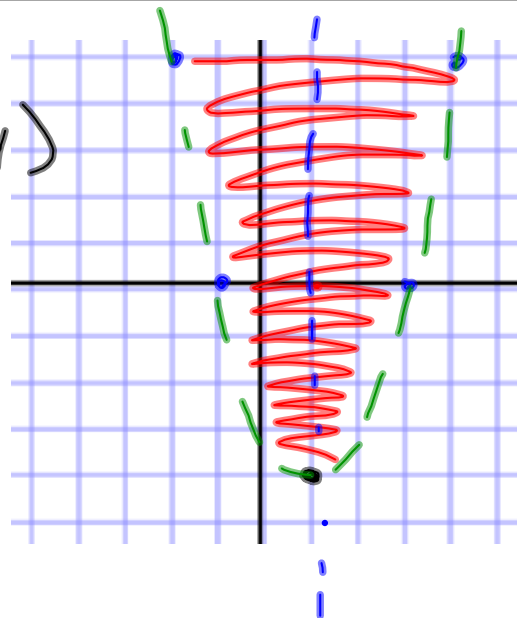
$$y = (1)^2 - 2(1) - 3$$

$$y = -4$$

x	-1	-2
y	0	5

$$0 > (1)^2 - 2(1) - 3$$

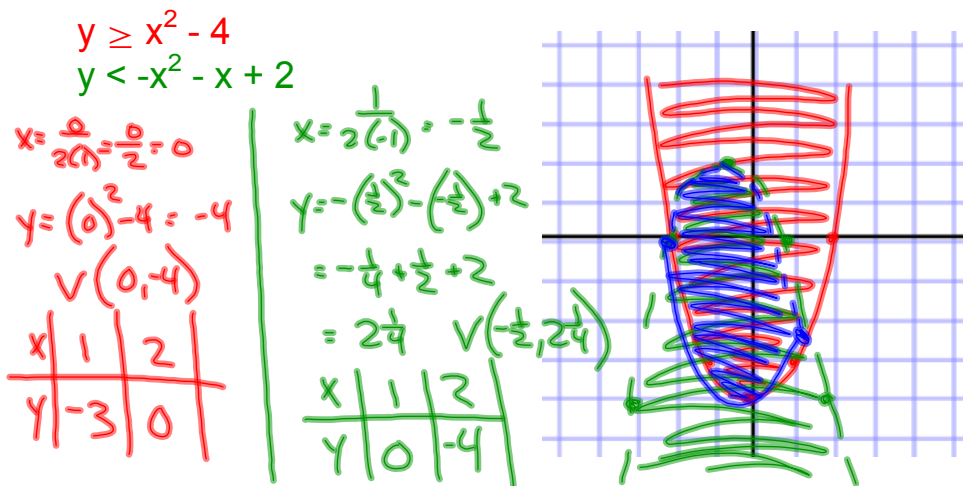
$$0 > -4$$



Graphing a System of Quadratic Inequalities

Graphing a **system** of quadratic inequalities is similar to graphing a system of linear inequalities. First graph each inequality in the system. Then identify the region in the coordinate plane common to all the graphs. This region is called the graph of the system.

Graph the system of quadratic inequalities.



Assignment:

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18-24 EVEN,
30-32 EVEN