

Graphing Quadratic Inequalities

Solutions are the shaded area within or outside the graphed parabola. The parabola itself may or may not be part of the solution.

To graph:

1) Find and plot the vertex $x = \frac{-b}{2a}$ then substitute "x" and solve for "y".

2) Use the quadratic formula to find the x-intercepts

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

3) Sketch the parabola. Dashed ($>$ and $<$) Solid (\geq and \leq)

4) Test point inside the parabola; (0, 0) is the easiest.

5) Shade either inside or outside the parabola.

Sketch the graph of $y < x^2 - 2x - 2$

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vertex $(1, -3)$

$$x = \frac{-b}{2a}$$

$$x = \frac{-2}{2(1)} = \frac{2}{2} = 1$$

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

$$y = 1 - 2 - 2$$

$$y = -3$$

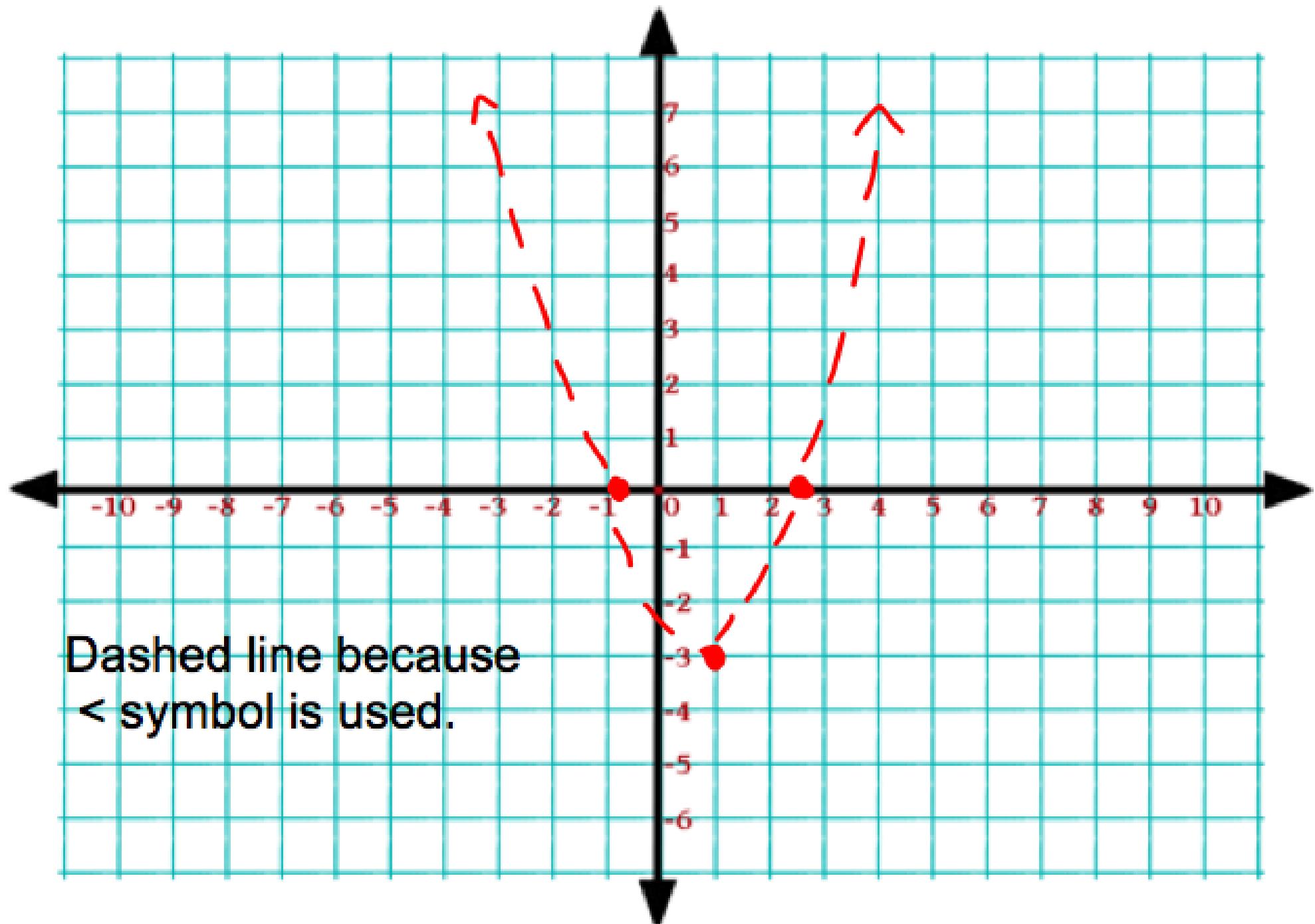
x-intercepts $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$$x = \frac{-2 \pm \sqrt{-2^2 - 4(1)(-2)}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{4 + 8}}{2}$$

$$x = \frac{2 + \sqrt{12}}{2} \quad x = \frac{2 - \sqrt{12}}{2}$$

$$x = 2.73 \quad x = -0.73$$



Test Point $(0, 0)$

$$0 < 0^2 - 2(0) - 2$$

$$0 < -2$$

False statement; shade outside the parabola.

