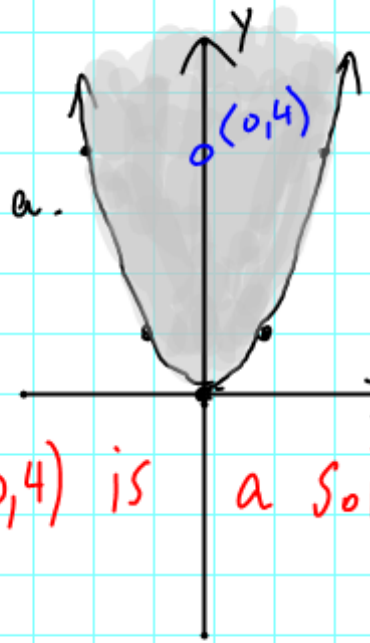
Solving and Graphing Quadratic Inequalities

Determine whether the given ordered pair is a solution of each inequality.

a. $y \geq x^2$

(0, 4)

$4 \geq 0$ yes



a.

(0,4) is a solution

b. $y < -x^2 + 6x$

x y

(6, -5)

is a Solution

$-5 < -(6)^2 + 6(6)$

$-5 < -36 + 36$

$-5 < 0$

yes

c. $y \geq 2x^2 + 3x + 2$

(-3, 4)

is NOT a solution

$4 \geq 2(-3)^2 + 3(-3) + 2$

$4 \geq 2(9) - 9 + 2$

$4 \geq 11$

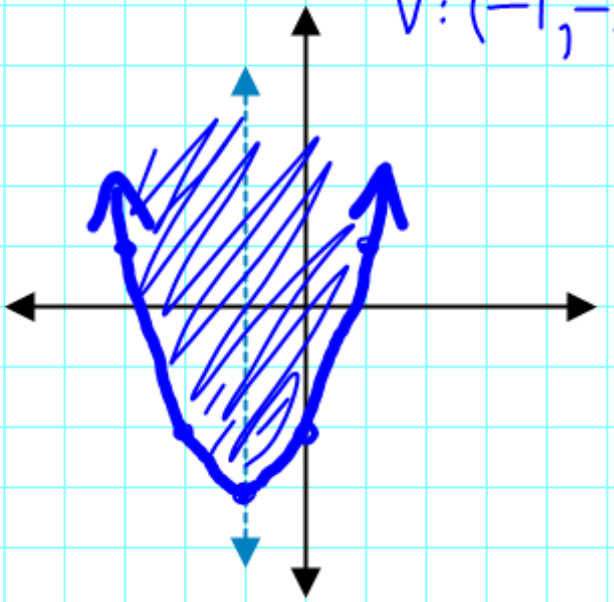
Graph each inequality.

a. $y \geq x^2 + 2x - 2$

$y = x^2 + 2x - 2$

$x = -1$

$V: (-1, -3)$



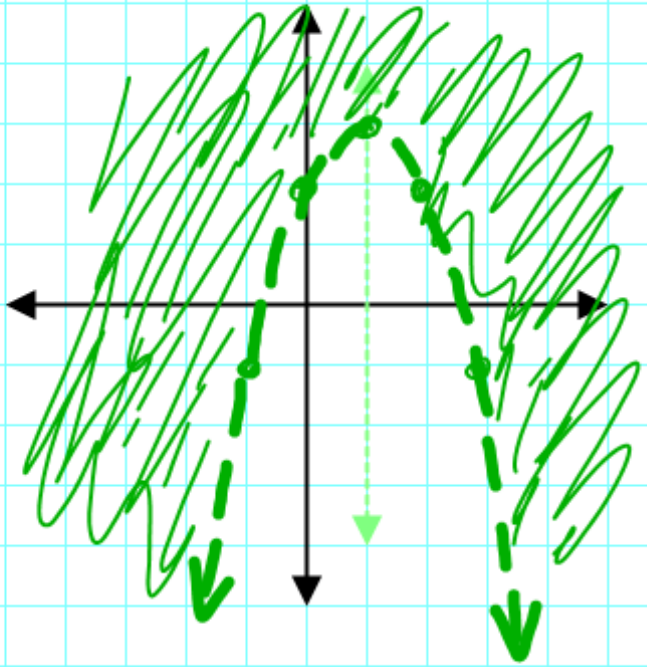
b. $y > -x^2 + 2x + 2$

dotted line

upside down

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

$V: (1, 3)$



Solve each inequality algebraically.

a. $x^2 + 2x \leq 3$

$x^2 + 2x = 3$

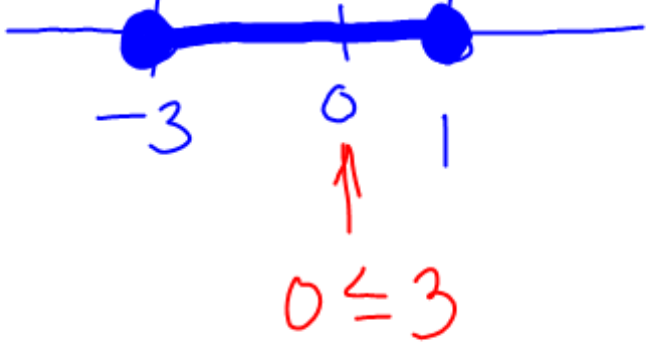
$x^2 + 2x - 3 = 0$

$(x+3)(x-1) = 0$

$x + 3 = 0 \qquad x - 1 = 0$

$x = -3 \qquad x = 1$

Sol: $[-3, 1]$



b. $2x^2 + 3x > 5$

$2x^2 + 3x - 5 = 0$

$(2x+5)(x-1) = 0$

$x = \frac{-5}{2} \qquad x = 1$

Sol: $(-\infty, -\frac{5}{2}) \cup (1, \infty)$