

3.5 Inequalities Involving Quadratic Functions

Review solving inequalities

1. $x + 5 < 8$

2. $2x - 3 \geq 4$

3. $\frac{x+1}{x-2} > 0$

4. $x^2 - 1 \leq 3$

Change signs $3 < x$ to

$-2x > 6$ to

Reciprocal rule

$(4x - 1)^{-1} > 0$ if $\frac{1}{a} > 0$ then $a > 0$

Steps in solving quadratic inequalities

1.) get into standard form $ax^2 + bx + c > 0$ (or $<, \geq, \leq$)

2.) determine if min or max (open up or down)

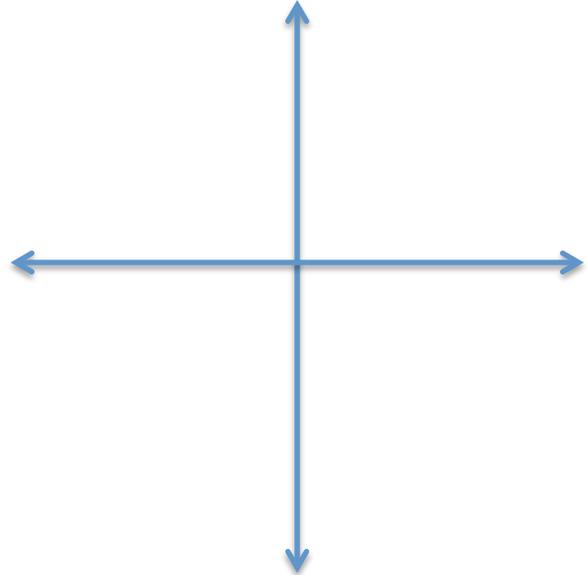
3.) find intercepts

4.) find axis of symmetry and vertex $(-\frac{b}{2a}, f(-\frac{b}{2a}))$

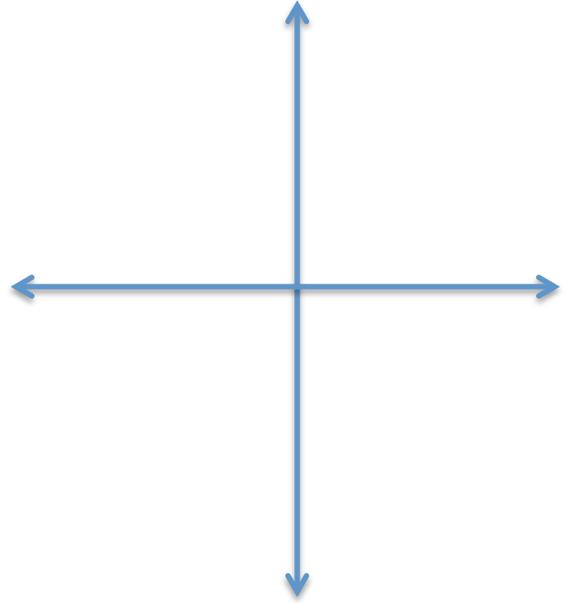
5.) find additional points if necessary (the intercepts may provide enough points)

6.) solve inequality (what x values make the inequality true)

Example 1: $x^2 - 4x - 12 \leq 0$



Example 2: $2x^2 < x + 10$



Example 3 $x^2 + x + 1 > 0$

Assign 25 pg 172 (3 - 15 odd and 35)

For 3 - 5 pick values that make the inequality true example

- a.) $f(x) < 0$
- b.) $f(x) \geq 0$

