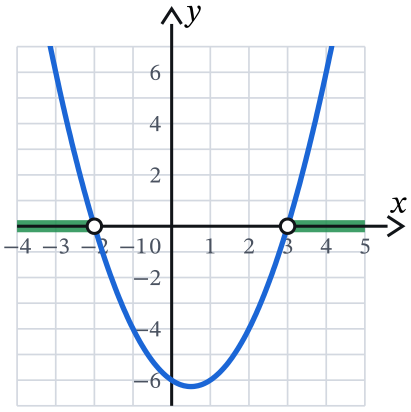
Name _____ Date _____

Quadratic Inequalities: Graphically

Example



$x^2 - x - 6 > 0$

1. Zeros: -2 and 3. 2. $a > 0$: the parabola opens upwards.

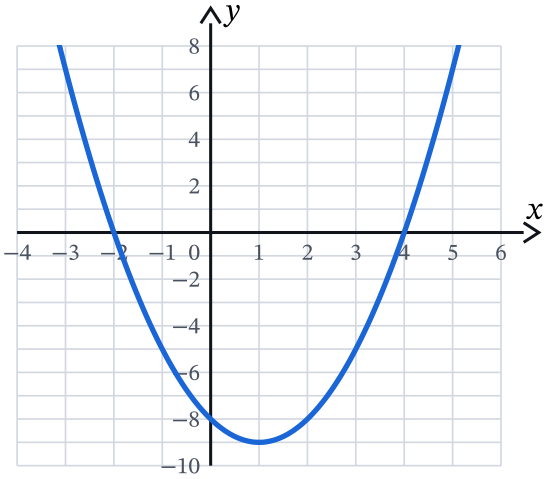
3. The parabola is **above** the x-axis to the left of -2 and to the right of 3.

$x \in (-\infty, -2) \cup (3, +\infty)$

Remember

The inequality $f(x) > 0$ asks: **where is the parabola above the x-axis?** For $f(x) < 0$ we look for where it is below. With $\geq$ and $\leq$ the zeros belong to the solution (square bracket); with $>$ and $<$ they do not.

1 ON YOUR OWN The graph of $f(x) = x^2 - 2x - 8$ is drawn. Solve the inequalities.



$f(x) > 0$: $x \in$ _____

$f(x) \geq 0$: $x \in$ _____

$f(x) < 0$: $x \in$ _____

$f(x) \leq 0$: $x \in$ _____

Names (pair) _____ Date _____

2 ON YOUR OWN Sketch the parabola and solve the inequality.

$x^2 - 9 < 0$



$x \in$ ☐

$-x^2 + 4x \geq 0$



$x \in$ ☐

$x^2 - 5x + 4 > 0$



$x \in$ ☐

$-(x + 1)(x - 3) \leq 0$



$x \in$ ☐

3 IN A GROUP **A mistake.** Luka solved $x^2 > 4$ like this: $x > 2$. What did he forget? Solve it with a sketch.



$x \in$ ☐

_____

The Parabola app · otooly.com/parabola-explorer

Mode **Sign and inequalities**: check your solutions: choose the sign and look at the x-axis.

★ ON YOUR OWN **Exit card.** $x^2 - 4x < 0$: $x \in$ ☐