LESSON MAKER PRO

Where Curves Count

Use a parabola's position to solve inequalities.

HIGH SCHOOL · A3.A.22

A3.A.22 "Graph and solve quadratic inequalities."

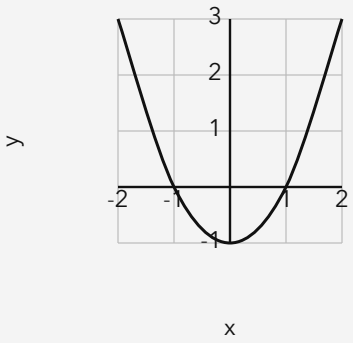
NAME _____ DATE _____

READ THE GRAPH

A quadratic inequality asks where a parabola is above or below a given height. Find the boundary points first, then check which part of the curve fits the inequality. Include boundary points for ≤ or ≥, but not for < or >.

WORKED EXAMPLE

Use the graph to solve $y < 0$.



1. The curve crosses the x-axis at -1 and 1.
2. The curve is below the x-axis between those points.

Answer: -1 < x < 1

PRACTICE 4 problems

1 Use a quick sketch to solve $x^2 - 4x < 0$.

ANSWER _____

2 Use a quick sketch to solve $x^2 - 8x + 12 \geq 0$.

ANSWER _____

3 Use a quick sketch to solve $-x^2 + 7x - 10 > 0$.

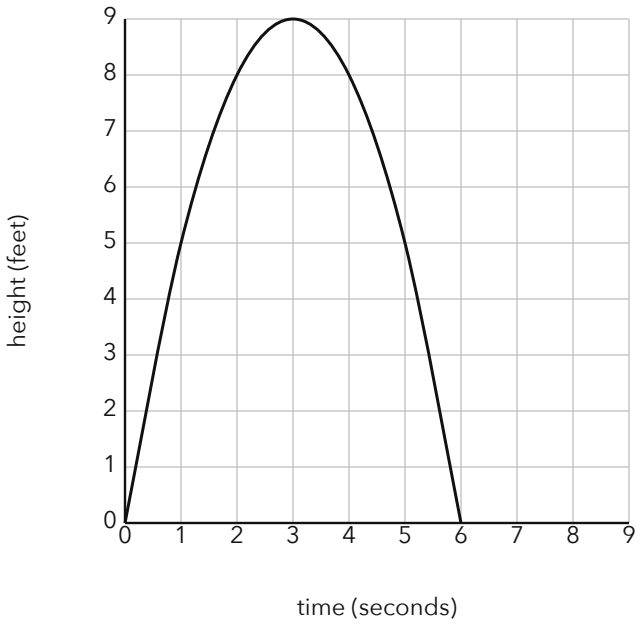
ANSWER _____

4 Use a quick sketch to solve $x^2 + 1 \leq 0$.

ANSWER _____

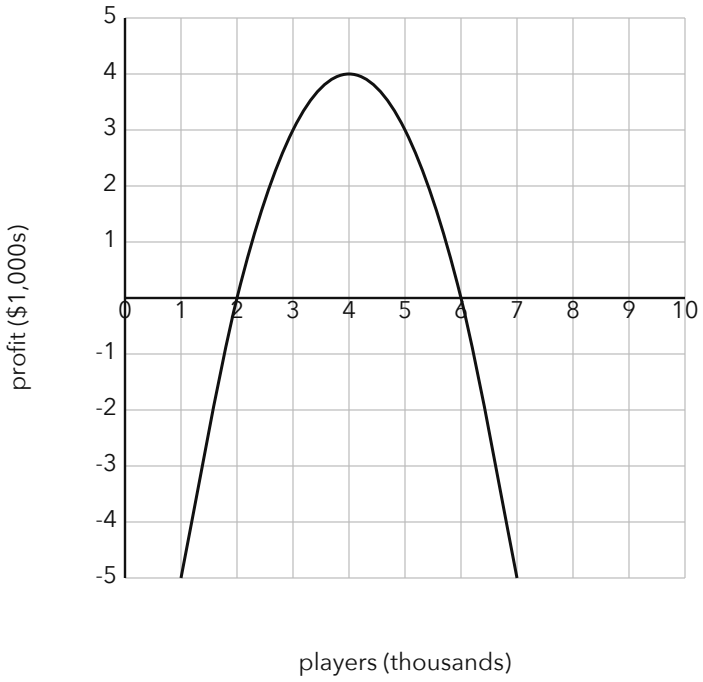
APPLY IT Show your work

1 A skater's height during a jump is shown. When is the skater at least 8 feet high?



ANSWER _____

2 This graph models a game developer's profit as the number of players changes. For what player counts is profit positive?



ANSWER _____

CHALLENGE One step up

Solve $x^2 - 8x + 16 > 0$. Explain why one value is missing.

WORK SPACE AND ANSWER

Where Curves Count

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use a quick sketch to solve $x^2 - 4x < 0$.	**$0 < x < 4$**
2	Use a quick sketch to solve $x^2 - 8x + 12 \geq 0$.	**$x \leq 2$ or $x \geq 6$**
3	Use a quick sketch to solve $-x^2 + 7x - 10 > 0$.	**$2 < x < 5$**
4	Use a quick sketch to solve $x^2 + 1 \leq 0$.	**No real solutions**

PART 2 · APPLY IT

1. **From 2 through 4 seconds, inclusive** The curve is at or above 8 feet from t = 2 to t = 4.
2. **More than 2,000 and fewer than 6,000 players** Profit is positive where the curve is above the horizontal axis, between 2 and 6 thousand players.

CHALLENGE

All real x except 4. The expression equals $(x - 4)^2$, which is zero only when x = 4.

Accept equivalent interval notation. For graph-based answers, check whether students include endpoints only when the inequality allows equality.