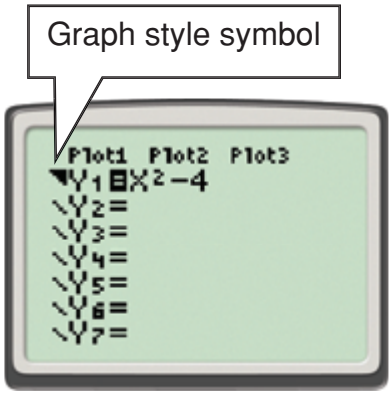
EXPLORATION

5-7 Solving Quadratic Inequalities

You can use a graphing calculator to explore quadratic inequalities.

Graph the inequality $y \geq x^2 - 4$ as follows. Press **Y=** and enter $x^2 - 4$ for **Y1**. Then use the arrow keys to move the cursor to the left of **Y1**. Press **ENTER** until the graph style changes to the symbol shown. This symbol indicates that the area above the graph will be shaded. Press **GRAPH** to view the graph.



1. Describe the graph of the inequality $y \geq x^2 - 4$.

2. The shaded area of the graph represents the solution set of the inequality. Tell whether each of the following points is in the solution set of $y \geq x^2 - 4$.

   a. $(0, 0)$ **b.** $(3, 0)$

   c. $(1, 6)$ **d.** $(-3, -3)$

3. What are the possible values of y for $x = 0$?

4. What is the least possible value of y?

THINK AND DISCUSS

5. **Discuss** how the graph of $y \leq x^2 - 4$ would differ from the graph of $y \geq x^2 - 4$.

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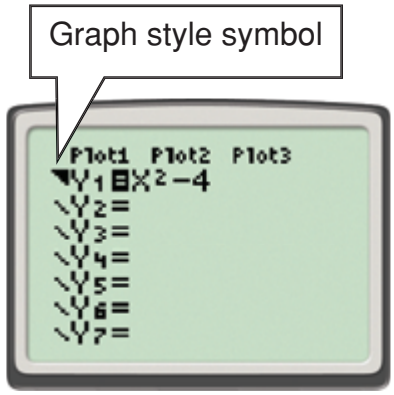

1. Describe the graph of the inequality $y \geq x^2 - 4$.

2. The shaded area of the graph represents the solution set of the inequality. Tell whether each of the following points is in the solution set of $y \geq x^2 - 4$.

   a. $(0, 0)$ yes

   b. $(3, 0)$ no

   c. $(1, 6)$ yes

   d. $(-3, -3)$ no

3. What are the possible values of y for $x = 0$? $\{y | y \geq -4\}$

4. What is the least possible value of y? -4

THINK AND DISCUSS

5. **Discuss** how the graph of $y \leq x^2 - 4$ would differ from the graph of $y \geq x^2 - 4$.

1. The graph is a parabola, and the area above the parabola is shaded.

5. The graphs would be identical except that for $y \leq x^2 - 4$ the area below the parabola would be shaded instead of the area above the parabola.