# Graphing Inequalities

You can use a TI-83 Plus graphing calculator to investigate the graphs of inequalities. Since the graphing calculator only shades between two functions, enter a lower boundary as well as an upper boundary for each inequality.

Graph two different inequalities on your graphing calculator.

Step 1 *Graph $y \leq -x + 4$.*

• Clear all functions from the Y= list.
   KEYSTROKES: [Y=] [CLEAR]

• Graph $y \leq -x + 4$ in the standard window.
   KEYSTROKES: [2nd] [DRAW] 7 [(−)] 10 [,]
   [(−)] [X,T,θ,n] [+] 4 [)]
   [ENTER]
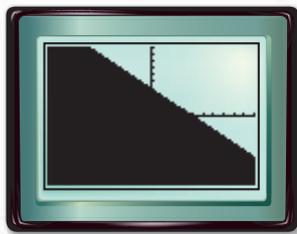
Ymin or −10 is used as the lower boundary and $y = -x + 4$ as the upper boundary. All ordered pairs in the shaded region satisfy the inequality $y \leq -x + 4$.

Step 2 *Graph $y \geq -x + 4$.*

• Clear the current drawing displayed.
   KEYSTROKES: [2nd] [DRAW] [ENTER]

• Graph $y \geq -x + 4$ in the standard window.
   KEYSTROKES: [2nd] [DRAW] 7 [(−)]
   [X,T,θ,n] [+] 4 [,] 10 [)]
   [ENTER]
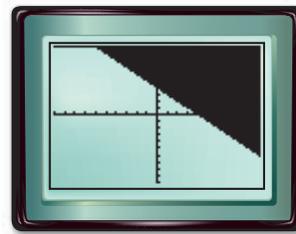
In this case, the lower boundary is $y = -x + 4$. The upper boundary is Ymax or 10. All ordered pairs in the shaded region satisfy the inequality $y \geq -x + 4$.

Exercises

1. Compare and contrast the two graphs shown above.

2. **a.** Graph $y \geq -2x - 6$ in the standard viewing window. Draw the graph on grid paper.

   b. What functions do you enter as the lower and upper boundaries?

   c. Use the graph to name four solutions of the inequality.

Use a graphing calculator to graph each inequality. Draw each graph on grid paper.

3. $y \leq x - 3$ 4. $y \leq -1$ 5. $x + y \geq 6$ 6. $y \geq 3x$

7. $y \leq 0$ 8. $y + 3 \leq -x$ 9. $x + y \leq 5$ 10. $2y - x \geq 2$