

Graphing Technology Lab

Quadratic Inequalities

Casio FX-9750G

Recall that the graph of a linear inequality consists of the boundary and the shaded half plane. The solution set of the inequality lies in the shaded region of the graph. You can use a **Casio FX-9750G** graphing calculator to graph quadratic inequalities since it is similar to graphing linear inequalities.

ACTIVITY 1 Shade Inside a Parabola

Graph $y \geq x^2 - 5x + 4$ in the standard viewing window.

First, clear all functions and the calculator memory.

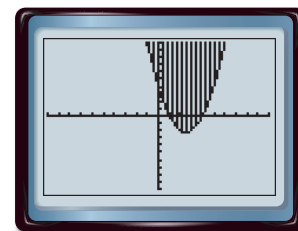
- Select **MEM** from the main menu, then \blacktriangledown **Reset** **F1** **MENU** 5.
- Set the viewing window to standard.

KEYSTROKES: **SHIFT** **[V-Window]** **F3** **EXE**

To graph $y \geq x^2 - 5x + 4$, enter the equation in the **Graph Func** list.

KEYSTROKES: **F3** **F6** **F3** **X, θ ,T** **x^2** **-** 5 **X, θ ,T** **+** 4
EXE **F6**

All ordered pairs for which y is *greater than or equal* to $x^2 - 5x + 4$ lie *above or on* the line and are solutions.



$[-10, 10]$ scl: 1 by $[-10, 10]$ scl: 1

A similar procedure will be used to graph an inequality in which the shading is outside of the parabola.

ACTIVITY 2 Shade Outside a Parabola

Graph $y - 4 \leq x^2 - 5x$ in the standard viewing window.

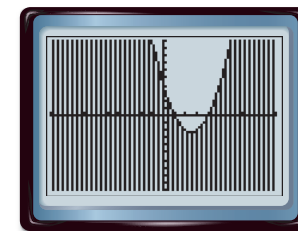
First, clear the graph that is displayed.

KEYSTROKES: **SHIFT** **[G \leftrightarrow T]** \blacktriangle **F2** **F1**

Then rewrite $y - 4 \leq x^2 - 5x$ as $y \leq x^2 - 5x + 4$ and graph it.

KEYSTROKES: **F3** **F6** **F4** **X, θ ,T** **x^2** **-** 5 **X, θ ,T** **+** 4 **EXE** **F6**

All ordered pairs for which y is *less than or equal* to $x^2 - 5x + 4$ lie *below or on* the line and are solutions.



$[-10, 10]$ scl: 1 by $[-10, 10]$ scl: 1

Exercises

1. Compare and contrast the two graphs shown above.
2. Graph $y - 2x + 6 \geq 5x^2$ in the standard viewing window. Name three solutions of the inequality.
3. Graph $y - 6x \leq -x^2 - 3$ in the standard viewing window. Name three solutions of the inequality.