

10.3 Find Minimum and Maximum Values and Zeros

TEKS A.9.D, A.10.A, A.10.B; 2A.8.D

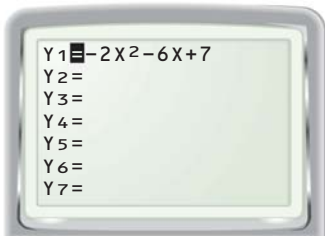
QUESTION How can you find the minimum or maximum value and the zeros of a quadratic function using a graphing calculator?

EXAMPLE 1 Find the maximum value of a function

Find the maximum value of the function $y = -2x^2 - 6x + 7$.

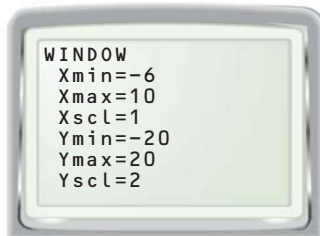
STEP 1 Enter the function

Press Y= and enter the function $y = -2x^2 - 6x + 7$.



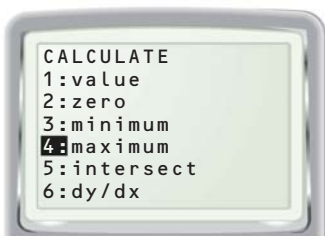
STEP 2 Adjust the window

Display the graph. Adjust the viewing window as needed so that the vertex of the parabola is visible.



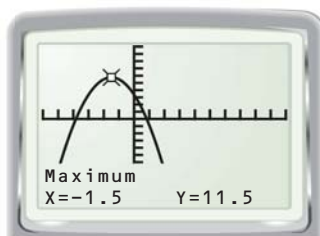
STEP 3 Use the maximum feature

The *maximum* feature is located under the CALCULATE menu.



STEP 4 Find the maximum value

Follow the graphing calculator's procedure to find the maximum of the function.



► The maximum value of the function $y = -2x^2 - 6x + 7$ is 11.5.

PRACTICE

Find the maximum or minimum value of the function.

1. $y = 3x^2 - 8x + 7$
2. $y = -x^2 + 3x + 10$
3. $y = -4x^2 - 6x - 6$
4. $y = 5x^2 + 10x - 8$
5. $y = -1.4x^2 + 3.8x - 6.1$
6. $y = 2.57x^2 - 8.45x - 5.04$