

## ACTIVITY 9.5

### Using Technology

Graphing Calculator Activity for use with Lesson 9.5

# Writing a Program for the Quadratic Formula

A graphing calculator or a computer can be programmed to use the quadratic formula to solve a quadratic equation. Both graphing calculators and computers use step-by-step instructions to perform operations.

### EXAMPLE

Write a graphing calculator program to solve the equation  $5x^2 - 5.5x + 1.5 = 0$ .

### SOLUTION

An algorithm is a step-by-step model. The algorithm below shows the steps needed when writing a program that uses the quadratic formula to solve a quadratic equation.

- 1 Enter values for  $a$ ,  $b$ , and  $c$ .
- 2 Calculate the value of  $b^2 - 4ac$ .
- 3 If  $b^2 - 4ac < 0$ , display “No solution.”
- 4 If  $b^2 - 4ac \geq 0$ , proceed to the next step.
- 5 Find the first solution:  $\frac{-b + \sqrt{b^2 - 4ac}}{2a}$ .
- 6 Display the first solution.
- 7 Find the second solution:  $\frac{-b - \sqrt{b^2 - 4ac}}{2a}$ .
- 8 Display the second solution.

```
PROGRAM:QUADFORM
:Prompt A,B,C
:B2-4AC→D
:If D<0
:Then
:Disp "NO
SOLUTION"
:Pause
```

```
prgmQUADFORM
A=?5
B=?-5.5
C=?1.5
THE FIRST
SOLUTION IS...
.6
```

Follow your graphing calculator's procedure to enter a program. Run the program. The program produces the solutions 0.6 and 0.5.

✓ Check these solutions in the original equation.

### EXERCISES

**QUADRATIC FORMULA** Use your graphing calculator or a computer program to find the solutions of the quadratic equation.

1.  $x^2 + x - 30 = 0$
2.  $2x^2 + x - 21 = 0$
3.  $x^2 + 4x + 4 = 0$
4.  $x^2 - 6x + 10 = 0$
5.  $-3x^2 - 6x - 4 = 0$
6.  $x^2 - 3x + 3 = 0$
7.  $0.25x^2 + 0.35x - 0.60 = 0$
8.  $x^2 - 1.38x - 4.32 = 0$
9.  $x^2 + 8.51x + 13.716 = 0$
10.  $0.032x^2 + 0.712x - 9 = 0$

**STUDENT HELP**

INTERNET KEYSTROKE HELP

Visit our Web site [www.mcdougallittell.com](http://www.mcdougallittell.com) to see keystrokes for programming several models of calculators.