Version 2 of the QUAD1 Program

Objective: Edit the program named QUAD1
add the commands needed to calculate the
roots of a quadratic equation.

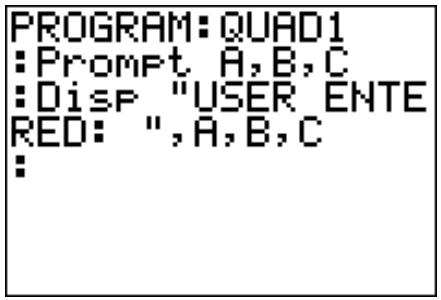
This will demonstrate the following key components of program development:

1) That you are able to create a program
2) That you are able to accept user input
3) That you are able to send the user some output
4) That you are able to run (or execute) a program that you created.
5) That you are able to perform some calculations data processing) on input provided from the user.

These are valuable first steps for developing programs in any programming language, on any computing platform.

Version 2 of the QUAD1 Program

Step 1: Open the QUAD1 program for editing:



Step 2: Use the arrow keys to go to the end of the program, we will add the statements needed to calculate the roots of a quadratic equation, using the quadratic formula one step at a time.

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$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Steps for solving a quadratic equation

1) Identify a value for a
2) Identify a value for b
3) Identify a value of c

} we do these with the Prompt command

4) calculate $b^2 - 4ac$

5) calculate $\frac{-b + \sqrt{(b^2 - 4ac)}}{2a}$

6) calculate $\frac{-b - \sqrt{(b^2 - 4ac)}}{2a}$

We will store in variable d the value of $b^2 - 4ac$

We will store in variable e the value of $\frac{-b + \sqrt{(b^2 - 4ac)}}{2a}$

We will store in variable f the value of $\frac{-b - \sqrt{(b^2 - 4ac)}}{2a}$

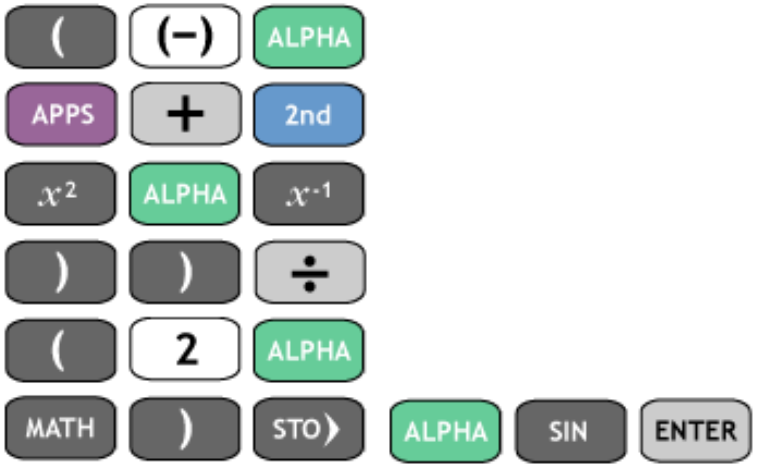
We will store in variable d the value of $b^2 - 4ac$

```
PROGRAM:QUAD1
:Prompt A,B,C
:Disp "USER ENTE
RED: ",A,B,C
:B²-4AC→D
:
```

We will store in variable e the value of $\frac{-b + \sqrt{(b^2 - 4ac)}}{2a}$

The value of $b^2 - 4ac$
is already in variable D

```
PROGRAM:QUAD1
:Prompt A,B,C
:Disp "USER ENTE
RED: ",A,B,C
:B²-4AC→D
:(-B+√(D))/(2A)→
E
:
```



We will store in variable f the value of $\frac{-b - \sqrt{(b^2 - 4ac)}}{2a}$

The value of
is already in variable D

```
PROGRAM:QUAD1
RED: ",A,B,C
:B²-4AC→D
:(-B+√(D))/(2A)→
E
:(-B-√(D))/(2A)→
F
:
```

Step 3: Show the user the results of the calculations:
the positive root has been stored in variable E
and the negative root has been stored in variable F.

```
PROGRAM:QUAD1
:(-B+√(D))/(2A)→
E
:(-B-√(D))/(2A)→
F
:Disp "ROOTS: ",
E,F
:
```

You may notice that prior to entering a : after ROOTS I had entered a ?, then backed over it and changed it to a :

? (−)

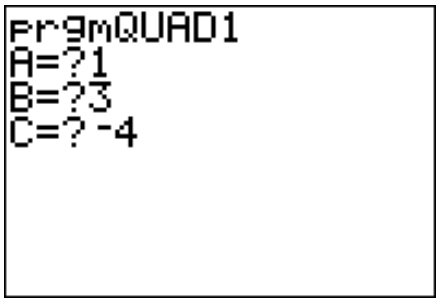
: .

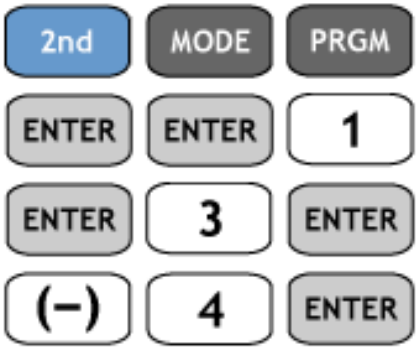
Step 4: Exit the program editor, and test the program.

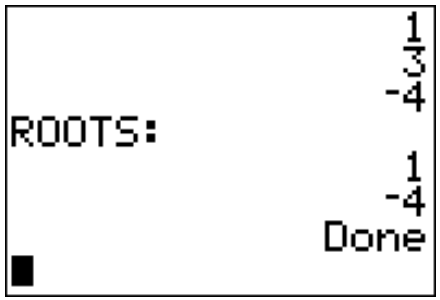
Solve $x^2 + 3x - 4 = 0$

A = 1
B = 3
C = -4

Then, as expected, the solution is $x = -4, x = 1$.







When you get -4 and 1 as roots for A=1, B=3, and C=-4 then you have finished version 2 of program QUAD1.