

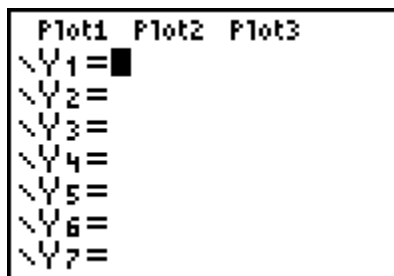
Name: \_\_\_\_\_  
Date: \_\_\_\_\_

# FINDING MAX AND MIN

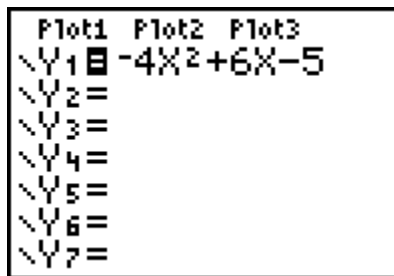
Investigation : Finding maxima and minima using the TI-83 Plus by graphing parabolas.

Step 1: Turn on the TI-83 Plus by pressing the **ON** button in the bottom left hand corner of the calculator.

Step 2: Press the **Y=** button in the upper left hand corner of the calculator. Your new screen should look like the picture below.

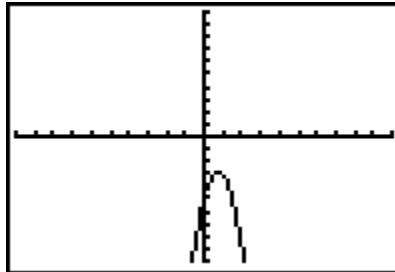


Step 3: With the cursor blinking in the **Y=** location, type the following equation:  $y = -4x^2 + 6x - 5$



Step 4: Press the **GRAPH** button in the upper right hand corner of the calculator.

Step 5: The following graph should appear on your screen.



Step 6: Press the yellow  $\boxed{2nd}$  button on the calculator and then press the  $\boxed{TRACE}$  button. You should get a menu that looks like the following

```
CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
```

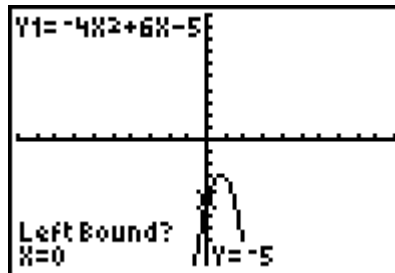
Question: Based on the graph shown on our screen, do you think we will be finding the maximum or the minimum value?

Step 7: Using the down arrow  $\boxed{\downarrow}$ , scroll down until the number 4, maximum is highlighted.

```
CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
```

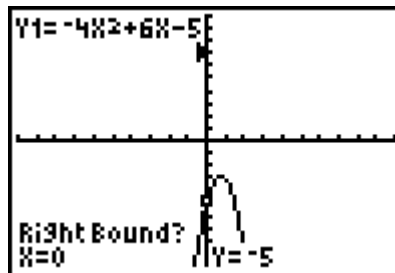
Step 8: Press the **ENTER** key in the bottom right hand corner of the calculator.

Step 9: There should be a blinking cursor located on your graph. There should also be the equation shown in the upper left hand corner, the words **LEFT BOUND?**

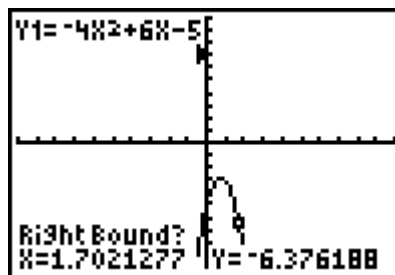


Step 10: Press the **ENTER** key.

Step 11: There should be a blinking cursor still located on your graph. In the bottom left hand corner should now be the words **RIGHT BOUND?**

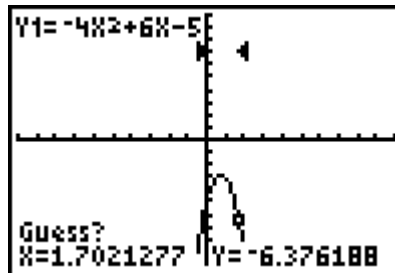


Step 12: Using the right arrow key **→**, move the cursor to the right until it is beyond the expected maximum value.

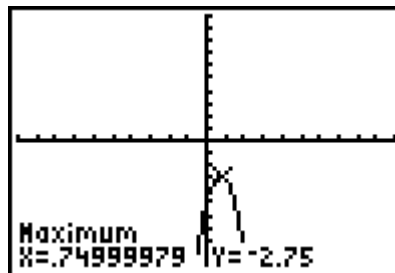


Step 13: Press the **ENTER** key

Step 14: There should be a blinking cursor still located on your graph. In the bottom left hand corner should now be the words GUESS?



Step 15: Move the cursor using the left arrow key **←** as close to the maximum as possible. Press the **ENTER** key.



**Maximum value:** Your calculator should give you a maximum value of -2.75

Cleanup: Press the **Y=** button and then **CLEAR** to remove the equation.

**Exploration:**

**Using steps 3-15, find the minimum or maximum value of the following equations. Indicate which equation has a minimum value or a maximum value. Record your answers.**

1.  $y = 3x^2 - 2x + 1$

2.  $y = -2x^2 + 4x + 3$

3.  $y = 2x^2 - x - 3$

4.  $y = \frac{3}{4}x^2 + 2x + 1$