Using The Ti 86/83 to find the Maximum Value of a Function:

Find the maximum value of $f(x) = x - x^2$, over [-1,2]

Go to GRAPH

Enter the function f using the x-VAR key

$$y_1 = x - x^2$$

In the GRAPH editor, select WINDOW, the following screen will appear

Enter the domain values and the range values in the appropriate space. If you can not find the range values, use a trial and error method.

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xMIin = Left end point of x axis
xMax =
xScl =This sets the scale marks on the axis
yMin =.
yMax = Largest y value displayed
yScl =
```

While in graph editor, select **TRACE** then use the left and right cursor keys to trace the curve. The up and down cursors are used to switch between two curves in the graph editor. Use The trace key to estimate the maximum value of the function.

To obtain a better estimate of the maximum value of f use the FMAx key.

Go to GRAPH MORE MATH fMAX, then respond to the calculator prompts:

(Assuming *f* attains a maximum value at *x*=c)

Left Bound? (Here enter x value left of c or use the cursor key to move to the left of c then ENTER) Right Bound? (Here enter x value right of c or use the cursor key to move to the right of c then ENTER) Guess? (Here enter x value between left and right bounds or use the cursor key to move to in between the bounds then ENTER)

The Calculator will display Maximum x =

An alternate method is to G0 to Home screen, then MATH fMAX, the calculator will display

y =

fMax(

Use 2^{nd} **ALPHA 0 1** to type in y_1 The maximum value f(x) must occur at value(s) x, where x is between a and b. then fill in the blanks as follows **FMAX**(y_1 , x, a, b).

The best viewing window contains the end points of the interval [-1,2]. For the y values, f(-1) and f(2), is a good start. produce the graph then adjust the window for better display. This could be challenging for certain types of functions over specific domains.