Assignment 2: Graphing Functions (0.2)   Name_____
**Please provide a handwritten response.**

1a. Functions $y = f(x)$ are readily graphed on the TI calculators. For example you can graph $y = x^2$ easily by entering it into the **Y=** screen as was done in Assignment 1. The default window for the TI calculators is $-10 \leq x \leq 10, \ -10 \leq y \leq 10$. The calculator viewing window is easily changed through the window screen.

WINDOW	TI-89	Voyage 200
$-2 \leq x \leq 2$ $0 \leq y \leq 4$	♦F2 (WINDOW)	♦ E (WINDOW)

Graph $y = x^2$ in both the window $-10 \leq x \leq 10, -10 \leq y \leq 10$ and the window $-2 \leq x \leq 2, \ 0 \leq y \leq 4$. Sketch the results below.

1b. Graph $y = x^2$ in the window $-2 \leq x \leq 2, \ -3 \leq y \leq 4$. Sketch the results below.

$-10 \leq x \leq 10, -10 \leq y \leq 10$ $-2 \leq x \leq 2, \ 0 \leq y \leq 4$ $-2 \leq x \leq 2, \ -3 \leq y \leq 4$
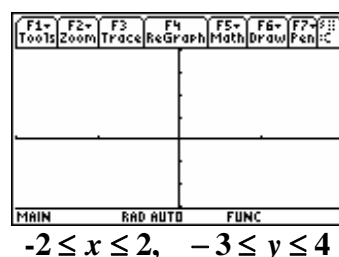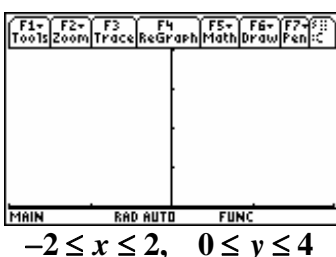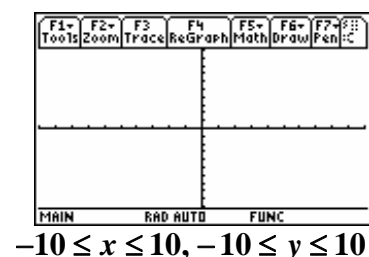
1c. You can also graph two or more functions together by entering them as $y_1 =$ and $y_2 =$. Your calculator will first graph y_1 and then y_2. Now graph $y_1 = x^2$ and $y_2 = 4 - x^2$ first in the standard window (remember **zoom standard** will get you there easily) and then in the window $-2 \leq x \leq 2, \ 0 \leq y \leq 4$. Sketch the results below.

$-10 \leq x \leq 10, -10 \leq y \leq 10$ $-2 \leq x \leq 2, \ 0 \leq y \leq 4$
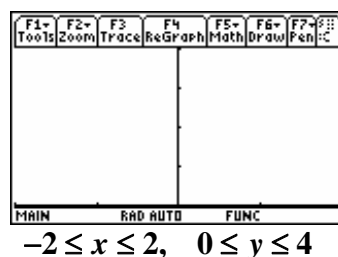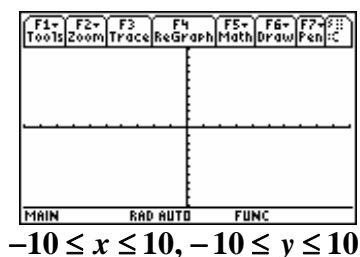
2a. You can easily "zoom in" on details of graphs like $y = x^3 + 4x^2 - 5x - 1$. The graph of this can be entered as $y_1 =$. To clear the function previously entered there press the **CLEAR** button. This function would be entered as $y_1 = x \wedge 3 + 4x \wedge 2 - 5x - 1$. Graph it in the standard window

and then in the window $-4 \le x \le 4, \ -20 \le y \le 100$. To avoid a thick **y**-axis set the **y**-scale (**y-scl**) to 20 in the window. Sketch the results below.
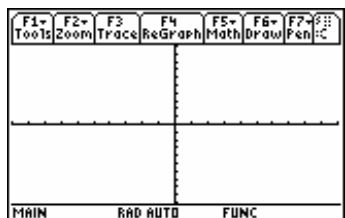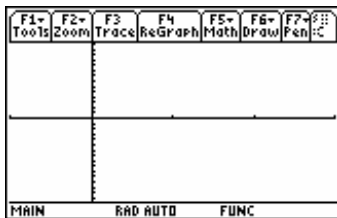

$-10 \le x \le 10, -10 \le y \le 10$
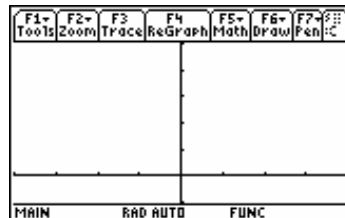
$-4 \le x \le 4, \ -20 \le y \le 100$

2b. The graph appears to have a local minimum between $x = 0$ and $x = 1$. You can use the **ZOOM IN** option to 'zoom in' on this local minimum. From **ZOOM IN**[1] move the cursor to where you want the window to be centered (place it as close to the minimum as you can) and hit enter. You can trace to estimate the minimum value and repeat as needed. Sketch the results below.


$-.5 \le x \le 1.5, -15.5 \le y \le 14$

As an alternative you can use the **ZOOM BOX**[2] option with tracing to locate this minimum. Repeated boxing and tracing will give you greater accuracy.

3. Graph $y = \dfrac{x-1}{x^2 - 5x + 6}$ in the standard window, then in the window $1 \le x \le 4, \ -10 \le y \le 8$.

Why do two vertical lines appear when you're in the standard window? If they appear in the second graph change to **DOT mode** redraw the graph. Do they appear now?
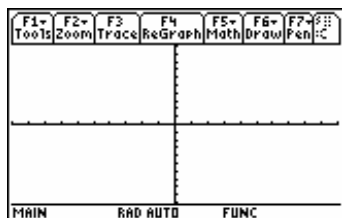
$-10 \le x \le 10, -10 \le y \le 10$
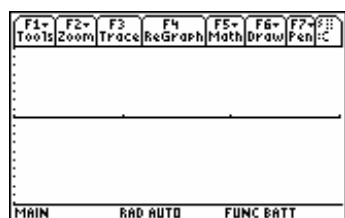
$1 \le x \le 4, \ -10 \le y \le 8$

Note that the TI-89 and the Voyage 200 will have vertical lines appear in different places in graphs of the same function due to differences in the number of pixels in their displays.

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[1] refer to Calculator Basics for the TI-89 and Voyage 200
[2] refer to Calculator Basics for the TI-89 and Voyage 200