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 Methods 323: Schaeffer
 Graphing Calculator Worksheet
 November 30, 2006

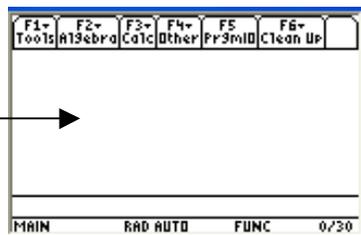
Investigation: Graphing Implicit Functions on a TI-89

In the investigation, you will discover how to graph implicit functions. Follow the instructions to create the graph and complete the investigation. Once you have finished the worksheet, turn in the Investigation portion of the worksheet.

Getting Started:

1. Turn on your Graphing Calculator

Home screen



Before we can graph an implicit function we must first change the graph mode of the calculator. The first item on the mode list reads graph. Your calculator's graph mode is usually already set at function. We must change the mode in accordance with implicit functions.

2. Press the **MODE** key

The mode screen will appear.



3. Located next to graph there should be a highlighted mode. We want to use the blue arrow keys and change the mode to option "5: 3D".

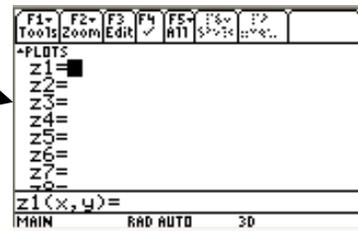


- Next, once “3D” is highlighted, press the blue “ENTER” key on your calculator twice. This will save the graph mode and take you back to the home screen.

Entering the Function:

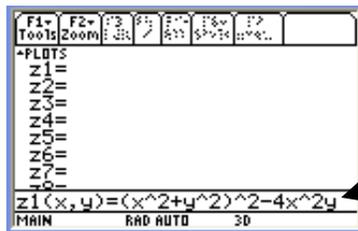
- Select the green  key and then the blue  key.

The “z = ” screen will appear



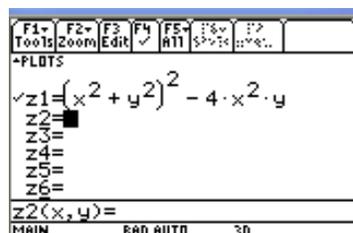
- Now begin to type in any implicit function. In this case we will use the equation $(x^2 + y^2)^2 = 4x^2y$

However, since the function must be entered where “z1 ” is on the left side of the equals sign we must convert the equation to $=(x^2 + y^2)^2 - 4x^2y$



NOTE: Be careful that you put an explicit multiplication symbol between variables! If you type xy , the calculator will interpret it as a single variable named “ xy ” – if you mean “ x times y ”, type “ x ”  then “ y ”.

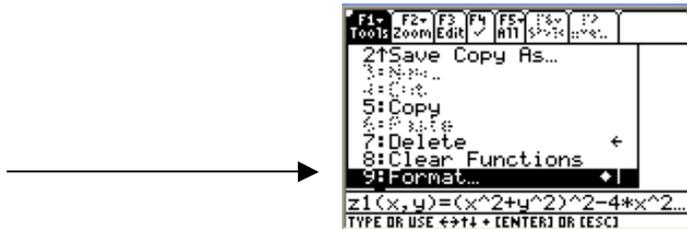
Once you have typed in your implicit function, press the blue “ENTER” key on your calculator. Your screen should now appear as follows:



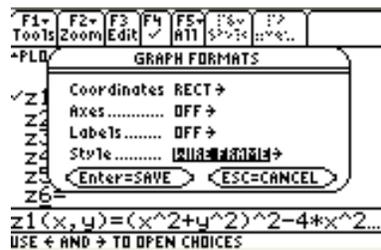
Graph your Function:

- Next – from the same screen where you typed your function – press the blue **F1** key.

Then using the blue arrow keys, select option “9: Format”.



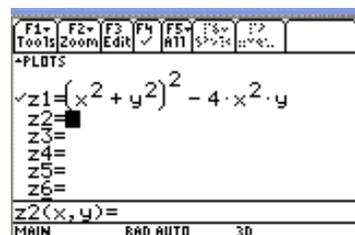
- Press the blue “ENTER” key on your calculator.
- The ‘GRAPH FORMATS’ screen will appear. Use the blue arrow keys to down select until you reach the fourth option STYLE.



With the blue arrow keys change the style of the graph to option “5: IMPLICIT PLOT”.



- Press the blue “ENTER” key on your calculator twice. This will save the graph format and take you back to the “z =” screen.



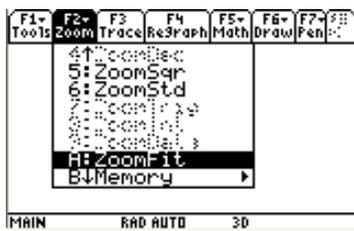
5. Now, you can graph the function. Press the green  key and then the blue  F3 key on your calculator. Your graph will appear.

Be warned! It takes a while for the calculator to draw the graph, but it will keep you informed of progress as it calculates the plot.

Enlarge the Graph:

1. If you want to enlarge the graph simply press the blue  “F2” key to ‘zoom’ in on your graph.

Use the blue arrow keys to highlight option “A: ZoomFit”. Then press the blue ENTER key on your calculator.



Your graph will shortly appear on your screen.

Investigation:

1. What does your screen look like when you first tell the calculator to graph your function? Explain why you think this is.

_____ it is blank similar to the home screen. Possibly because my graph window options are too large or too small for the final graph. So zooming in or out allows the graph to become visible. _____

2. Is it possible to type in our implicit function as $(x^2 + y^2)^2 = 4x^2y$?

Explain. _____ No because it is an equation and we must type in a function where it is equal to z1 so it must be converted. _____

3. What does your final graph look like? Explain or draw.

4. With your final graph on your screen, what happens if you were to press the blue arrow keys? _____ you would rotate the graph _____
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Present your Findings:

After you have completed your investigation, discuss in writing what you have completed. Be sure to include any comments, questions and/or concerns.