

## QUADRATIC GRAPHING INVESTIGATION

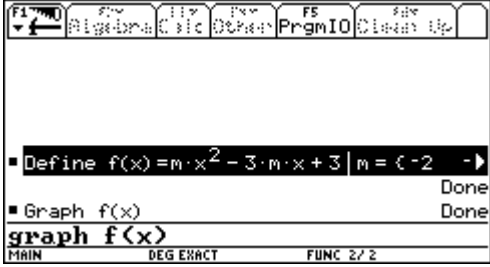
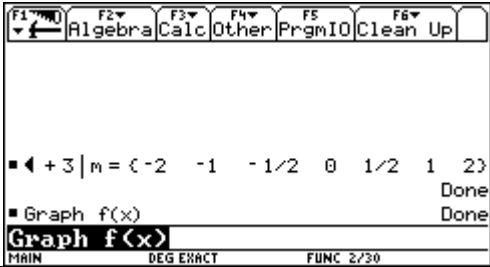
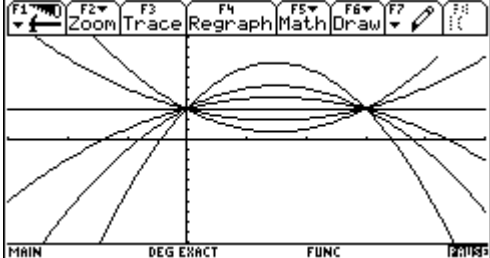
THIS SHEET IS TO BE PASTED INTO YOUR BINDER BOOK and **ALL** QUESTIONS MUST BE FULLY ANSWERED.

A polynomial of degree 2 is called a Quadratic and it is of a general form

$$f(x) = ax^2 + bx + c$$

In this investigation you are going to investigate what effect the constant coefficient has on the shape of the quadratic and the number of solutions to the equation:

$$ax^2 + bx + c = 0$$

<p>Using the general equation  <math>f(x) = ax^2 + bx + c</math>, let <math>a = m</math>, <math>b = -3m</math>  and <math>c = 3</math>.  Let <math>m = -2, -1, -1/2, 0, 1/2, 1, 2</math></p> <p>Please sketch each graph. And clearly label the equation. (no need to determine the intercepts.)</p> <p><b><u>If you wish to pause the graphing, press ENTER. This will give you a chance to sketch each graph as it appears.</u></b></p>	 
<p>You will need to change the window to a suitable scale.  You should get some graphs like the ones shown to the right.</p>	

Q1. For what values of  $m$  did the quadratic have 2 real solutions? Justify.

Q2. For what values of  $m$  did the quadratic have one solution? How do you know from the shape of the graph that it had 1 solution?

Q3. For what values of  $m$  did the quadratic have no REAL solutions? How do you know that it had no real solutions?

Q4. Using the graph of the determinant, algebraically justify your findings in questions 1, 2 and 3.