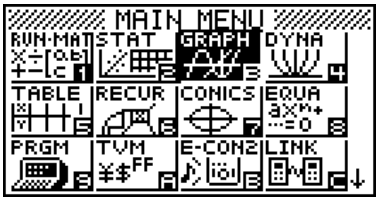
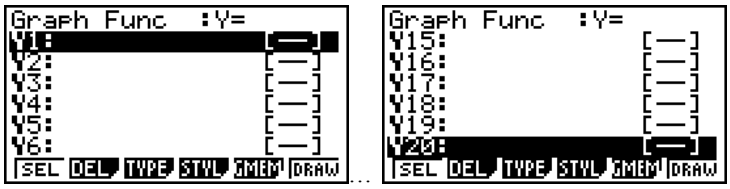
Creating pictures using piecewise graphs.

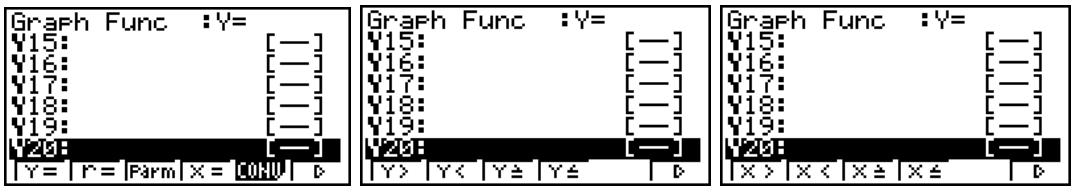


Select the **GRAPH** icon from the **Main Menu** by using the arrow keys to highlight the **GRAPH** icon followed by [**EXE**] or by pressing the [**3**] key.

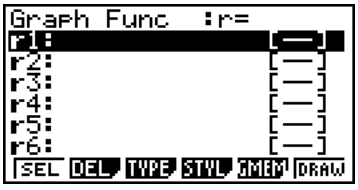
There are 20 places to store graphs in the **GRAPH** mode of the FX9750GII.



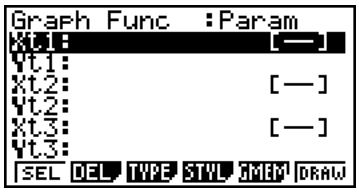
The graphs created and stored can be a combination of rectangular, polar or parametric equations or inequalities (for shading).



These can be accessed via **TYPE** [**F3**], then [**F6**], [**F6**], selecting the required equation or inequation type using the appropriate **[F1**] to [**F6**] key.
Polar involves '*r* =' and 'θ' and is accessed via [**F3**], then [**F2**].

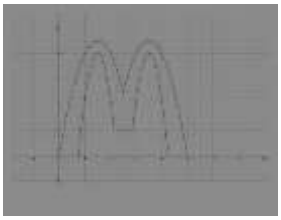


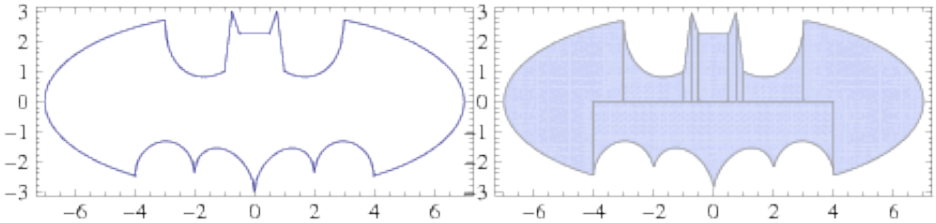
Parametric involves a '*x* =' and '*y* =' to define the equation and is accessed via [**F3**], then [**F3**].



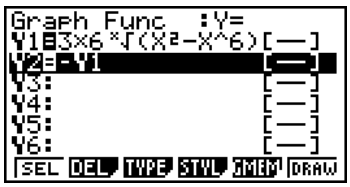
[**Note:** The '*x* =' cannot be restricted in its vertical length. Only the domain can be restricted on the FX9750GII.]

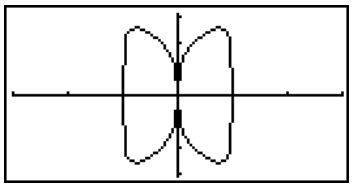
Examples: The McDonalds logo can be modeled by a set of parabolas and horizontal lines. The Batman logo can be modeled with the ellipse, linear, quadratic and hyperbola (and/or exponential) functions.



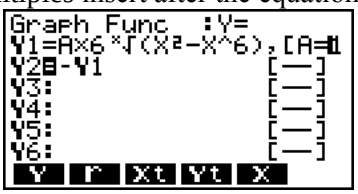


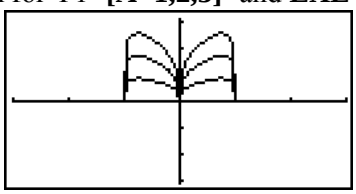
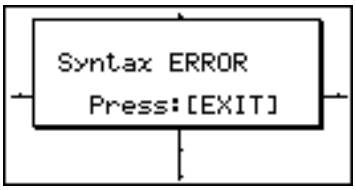
The basic butterfly wings have an equation: $ay^6 + bx^6 = cx^2$, where a, b, c ε R.
Consider: The algebraic butterfly curve is given by the equation: $y^6 + x^6 = x^2$
Using a = b = c = 1, in this instance. This can be entered into the calculator as shown in the example below:



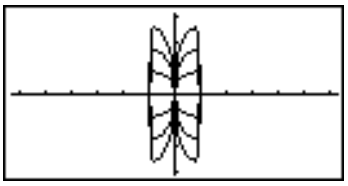


To draw multiples insert after the equation for Y1 '**[A=1,2,3]**' and **EXE** to store



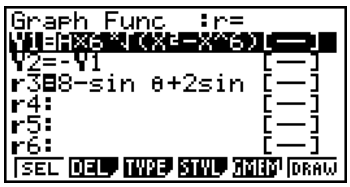



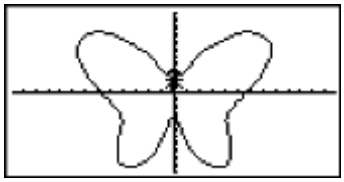
Why is there an error message for the calculators attempt to draw Y2?
How can you get around this issue to produce this?



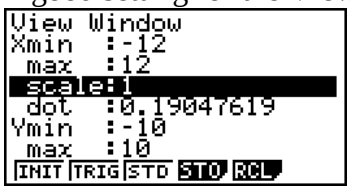
Another butterfly wings example as a polar formatted equation is:

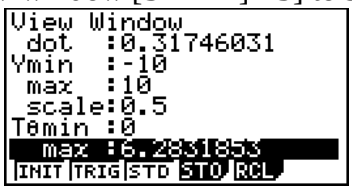
r(θ) = 8 - sin(θ) + 2sin(3θ) + 2sin(5θ) - sin(7θ) + 3cos(2θ) - 2cos(4θ)





A good setting for the View-window [**SHIFT**] **F3**] to see this butterfly is:





What can you create?

External links:
Butterfly:
https://en.wikipedia.org/wiki/Butterfly_curve_(algebraic) - Wikipedia, the free encyclopedia.
http://mathworld.wolfram.com/ButterflyCurve.html - Wolfram MathWorld.
https://owlcation.com/misc/Butterfly-Curves-in-Polar-Coordinates-on-a-Graphing-Calculator
Butterfly-shaped closed curves using polar equations of the general form:
r(θ) = constant + sum{coeff × sin(odd#×θ) } + sum{coeff × cos(even#×θ) }
Batman:
http://mathworld.wolfram.com/BatmanCurve.html Batman Curve - Wolfram MathWorld.
http://www.pacifict.com/Examples/Batman/