

## Tips and Tricks

In case you missed them, here's a list of previous tips and tricks from 2006.

### Volume 1

- Name your calculator
- Friendly decimals: Norm1 v Norm2
- Choose Math or Linear display in Run-Mat
- Cut, Copy and Paste between applications
- Add vectors in RUN-MAT
- Leave a shadow trail when using dynamic graph
- PHYSIUM

### Volume 2

- Jump to any exact coordinate whilst tracing in Graph
- Find the equation of the tangent to any function in Graph
- Recursive calculations with matrices in Run
- Substitution in a function in Run

### Volume 3

- Graphing tricky functions
- Using the Catalog
- Graphs of logs to any base
- Geometry

### Volume 4

- Solving  $f(x)=0$  in Solver
- Solve in RUN
- Solving quadratics in Solver
- Working with Lists
- Sub Names
- List Differences

Now for some more...

### Restrict domain when graphing

This is particularly useful when graphing piecewise defined functions.

To restrict the domain of any function simply follow it by  $[a, b]$  where  $a$  and  $b$  are the upper and lower limits required. There is no way to choose between including or excluding the endpoints.

Some examples:

For  $-2 < x < 1$  use  $[-2,1]$

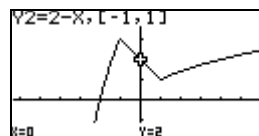
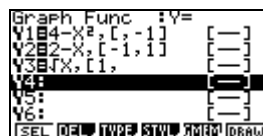
For  $x \geq 1$  use  $[1,]$

For  $x < 2$  use  $[,2]$

Try this...

$$f(x) = \begin{cases} 4 - x^2 & x < -1 \\ 2 - x & -1 \leq x \leq 1 \\ \sqrt{x} & x > 1 \end{cases}$$

Tip: The square brackets are found using **SHIFT**, **+** and **SHIFT**, **-**. Don't forget the comma after the function and before the brackets begin!



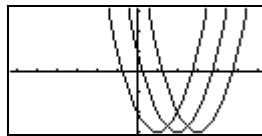
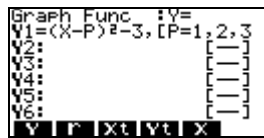
Note that closing brackets are optional for most Casio commands as shown in Y3.

## Graphing families of functions

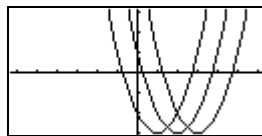
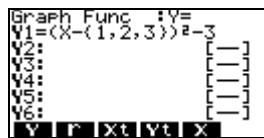
Whilst we're in graph here's another few tricks that allow you to plot a whole family of functions very easily.

Consider the curves given by  $y = (x - p)^2 - 3$ .

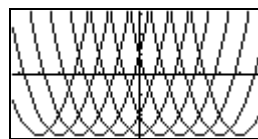
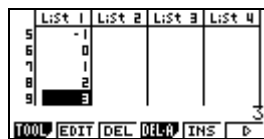
Enter the function and follow it by a [P=a, b, c, ...



Here are a couple of variations.



In the following example create List 1 = {-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5} in Stats first. To enter List 1 tap OPTN, F1



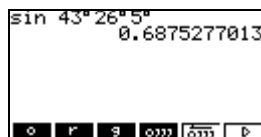
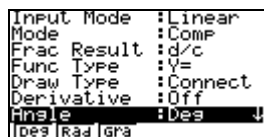
## Using degrees, minutes and seconds for angle sizes

*Example 1. Find  $\sin 43^\circ 26' 5''$ .*

Start in RUN-MAT and check that angle mode is degrees.

(Tap SHIFT, MENU and set Angle to Deg, then EXIT).

Now enter sin 43, tap OPTN F6 F5 F4, type 26, tap F4, type 5, tap F4 and EXE.



*Example 2. Find the angle  $\theta$  if  $\cos \theta = 0.351$*

Tap SHIFT COS, type in 0.351 and tap EXE.

The angle is  $69.45^\circ$  in decimal format.

Then tap OPTN F6 F5 F5. The angle is  $69^\circ 27' 05.43''$  in degrees, minutes and seconds format.

Pressing EXE returns the angle back to decimal format again.

