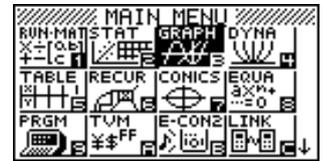


## Restricted domains of graphs.

*This resource was written by Derek Smith with the support of CASIO New Zealand. It may be freely distributed but remains the intellectual property of the author and CASIO.*

Select **GRAPH** mode from the **MAIN MENU** by using the arrow keys to highlight the **GRAPH** icon or by pressing **3**.



Restricting the domain (and range) can be done by using the notation **[a,b]** after the **Y#=#** entry. The **domain** is a set of  $x$ -values of the independent variable for which a function or relation is defined. The **range** is the set of  $y$ -values of the function or relation defined.

Examples of functions with 'natural' domain and/or range restrictions:

Function or Relation	Domain	Range
$f(x) = x^2 - 2x + 5$	$-\infty < x < \infty$ and $-\infty < x < \infty$	$(4, \infty)$ or $4 < y < \infty$
$f(x) = \frac{x+4}{x-2}$	$(-\infty, 2)$ and $(2, \infty)$ or $-\infty < x < 2$ and $2 < x < \infty$ or $x \in R$ , except $x \neq 2$	$(-\infty, 1)$ and $(1, \infty)$ or $-\infty < y < 1$ and $1 < y < \infty$ or $y \in R$ , except $y \neq 2$
$f(x) = \sqrt{x+5}$	$[-5, \infty)$ or $-5 \leq x < \infty$	$[0, \infty)$ or $0 \leq y < \infty$
$f(x) = \log_{10}(x-7)$	$(7, \infty)$ or $7 \leq x < \infty$	$(0, \infty)$ or $0 \leq y < \infty$

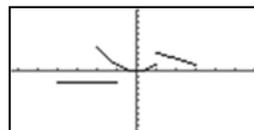
Drawing pieces of different graphs means that you will need to restrict the domain further by using the command **[a,b]** after the **Y#=#** entry.

**Example:** Draw the graphs of:  
 $y = x^2, -2 \leq x \leq 1$   
 $y = -x + 4, 1 \leq x \leq 3$   
 $y = -2, -4 \leq x \leq -2$

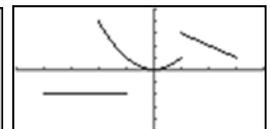
**Answer:** Enter the functions in the **Y1, Y2** and **Y3** spaces. To restrict the domain values **[a,b]** is used.



Next, set up the **View-Window** by pressing **SHIFT** then **[F3]** and edit.

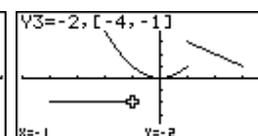
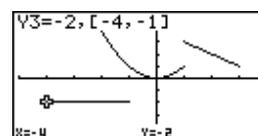
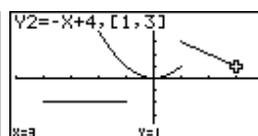
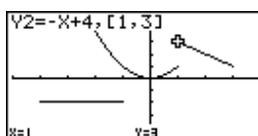
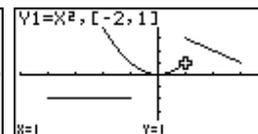
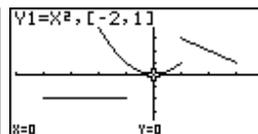
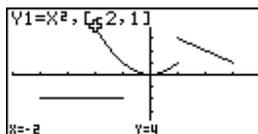


Press **EXIT**, then **[F6]** to draw the graphs.



If you want to, change the **View-Window** to 'zoom' in on the graphs, to get a better picture (view). Now, redraw.

You can '**trace**' over the graphs by pressing **SHIFT** **[F1]** the use the left **▶**, right **◀**, up **▲**, or down **▼** arrows to scroll each of the graphs on the screen and read off the domain and range values.



For further tips, more helpful information and software support visit our websites:

[www.casio.edu.monacocorp.co.nz](http://www.casio.edu.monacocorp.co.nz) or <http://graphic-technologies.co.nz>