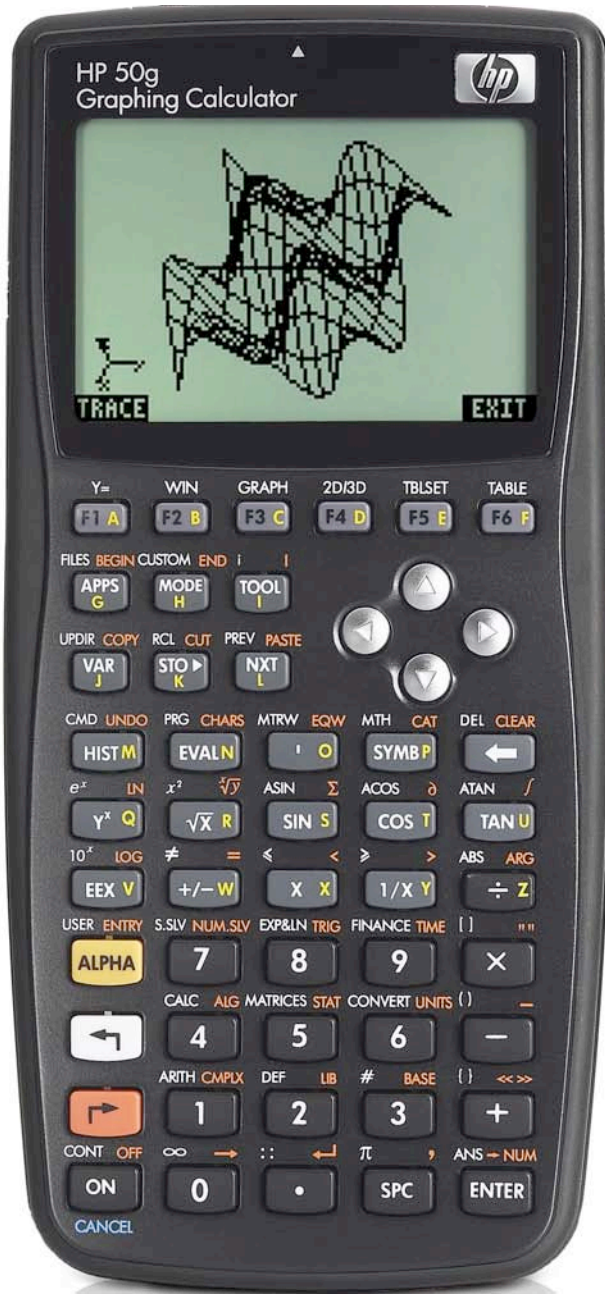
hp calculators



HP 50g The basics of plotting functions

Plotting on the HP 50g

The 2D/3D (PLOT SETUP) Form

The WIN Form

Examples of plotting functions

Plotting on the HP 50g

The HP 50g calculator provides a host of plots to allow the user to visualize data or relationships between them. The WHITE shifted functions of the top row of keys on the HP 50g allow access to many of the input forms where plotting specifications may be entered.

The 2D/3D (PLOT SETUP) Form

The 2D/3D (PLOT SETUP) Form is accessed from the LEFT shifted function of the F4 key by pressing and **holding** down ↰ and then pressing F4 , to access 2D/3D . When pressed, a form is displayed with a number of choices related to plotting.

Figure 1

The first choice deals with choosing the plot type. The selections for plot type are displayed by pressing F2 , which has the label CHOOS right above it. The plot types include plotting functions, polar plots, parametric plots, differential equation plots, conic plots, truth plots, histograms, bar charts, scatter charts, slopefield charts, fast 3D charts, wireframe plots, Ps-contour plots, Y-slice plots, gridmap plots, and Pr-surface plots. A CHOOSE Box appears as shown below.

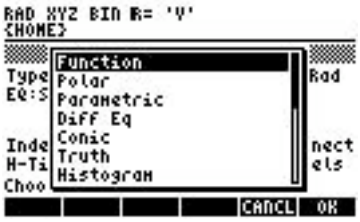


Figure 2

The Plot Setup form also allows the user to specify the equation being plotted if the cursor is placed on the EQ: field and the EDIT menu label is pressed – this invokes the EquationWriter to allow for the construction of the equation to be plotted. The form also allows the angle measure used and the independent variable to be specified (note: the default is often 'X', but for parametric plots, this will be changed to 't'). In addition, several check boxes that are used to indicate whether the plotted points should be automatically connected together by the calculator and the horizontal and vertical tick marks used for the graph. The form also allows for the plotting of more than one function at a time.

The WIN Form

The WIN form allows for the plot window specifications to be entered and changed. The lower and upper horizontal and vertical values displayed on the graph can be changed. The lower and upper value for the independent variable can also be specified on this form. To open the WIN form, press and **hold** down ↰ and press F2 , which is WIN . The following form appears:

Figure 3

The menu label ERASE will discard the results of a previous plot and the menu label DRAW will begin the plot.

Examples of plotting functions

Example 1: Plot Y = X² – 4 from X = -3 to +3. Display values of Y from –6 to +6.

Solution: ◀ 2D/3D ▶ ▲ ENTER (do not forget to press AND hold the ◀ key while pressing the 2D/3D key)
▼ EDIT ▶ CLEAR X y^x 2 ▶ — 4 ENTER X ENTER

Figure 4

ENTER ◀ WIN 6 +/- ENTER 6 ENTER 6 +/- ENTER 6 ENTER 3 +/- ENTER 3 ENTER

Figure 5

ERASE DRAW

Answer: The plot is displayed.

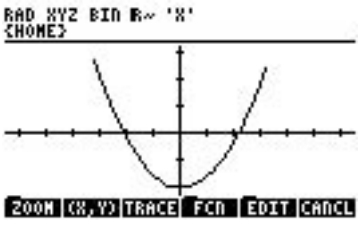


Figure 6

To move the cursor along the graph and read the (X,Y) coordinates of the cursor's position, press TRACE and (X,Y) (which is actually displayed as (X,Y) in the reverse menu label font on the calculator screen) then move the cursor using the ◀ and ▶ arrow keys. Press F2 to bring the menu labels back on the screen. To get out of the Plot Environment press CANCEL.

Example 2: Plot the equation Y = SIN(X)/X from –2π to +2π. Assume Radians angle mode.

Solution: ◀ 2D/3D ▶ ▲ ENTER (do not forget to press AND hold the ◀ key while pressing the 2D/3D key)
▼ EDIT ▶ CLEAR SIN X ÷ X ENTER X ENTER

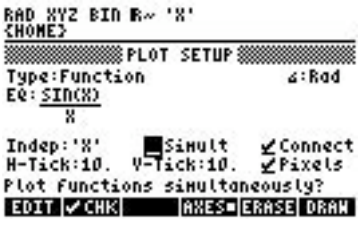


Figure 7

ENTER ↰ WIN 6 +/- ENTER 6 ENTER 1 +/- ENTER 1 ENTER 2 ↰ π ( ) × +/-
↱ →NUM ENTER 2 ↰ π ( ) × ↱ →NUM ENTER

Figure 8

ERASE DRAW

Answer: The plot is displayed.

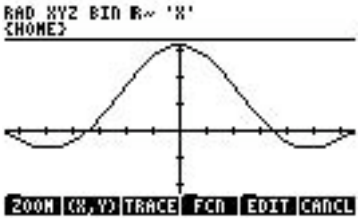


Figure 9

To move the cursor along the graph and read the (X,Y) coordinates of the cursor's position, press TRACE and ENTER (which is actually displayed as (X,Y) in the reverse menu label font on the calculator screen) then move the cursor using the ◀ and ▶ arrow keys. Press F2 to bring the menu labels back on the screen. To get out of the Plot Environment press ON.

Example 3: Plot the equation Y = LN(X)/TAN(X) from 0 to +2π. Assume Radians angle mode. Display the horizontal view from 0 to +2π. Display the vertical view from –10 to +10.

Solution: ↰ 2D/3D PLOT ↱ ▲ ENTER (do not forget to press AND hold the ↰ key while pressing the 2D/3D key)
▼ EDIT ↱ CLEAR LN TAN X ÷ TAN X ENTER X ENTER

Figure 10

ENTER ↰ WIN 0 ENTER 2 ↰ π ( ) × ↱ →NUM ENTER 1 0 +/- ENTER 1 0 ENTER
0 ENTER 2 ↰ π ( ) × ↱ →NUM ENTER

Figure 11

ERASE DRAW

Answer: The plot is displayed.

Figure 12

To move the cursor along the graph and read the (X,Y) coordinates of the cursor's position, press [TRACE] and [SHIFT] [TRACE] (which is actually displayed as (X,Y) in the reverse menu label font on the calculator screen) then move the cursor using the ◀ and ▶ arrow keys. Press [F2] to bring the menu labels back on the screen. To get out of the Plot Environment press [ON].