

Simple Uses of Gnuplot

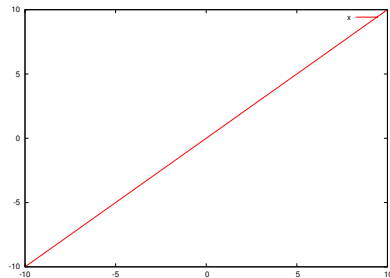
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You can run `gnuplot` on the departmental UNIX machines. Use the X11 client to connect to the graphical user interface (X window). From a terminal window, simply type `gnuplot` to start the commandline interface.

1 2D plot

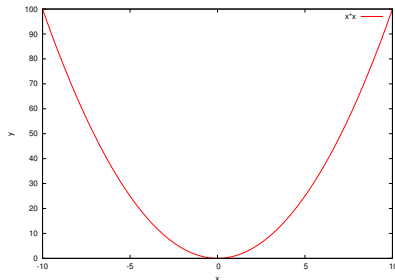
1. Basic plotting: just express the function you want to plot, as a function of the variable x .

```
plot x
```



2. Adding x and y axis labels.

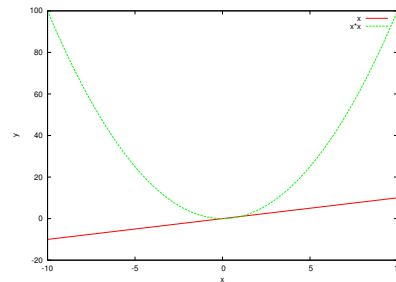
```
set xlabel "x"
set ylabel "y"
plot x*x
```



Below, I will assume that you have set the axis labels, so those command lines will be omitted from the following examples.

3. You can plot multiple functions in one plot too.

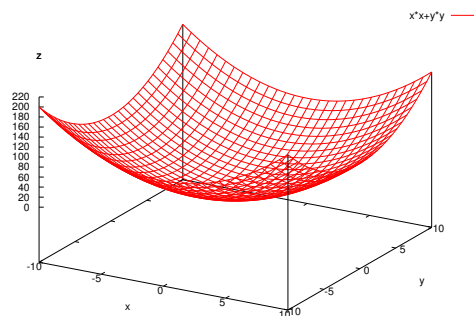
```
plot x, x*x
```



2 3D plot

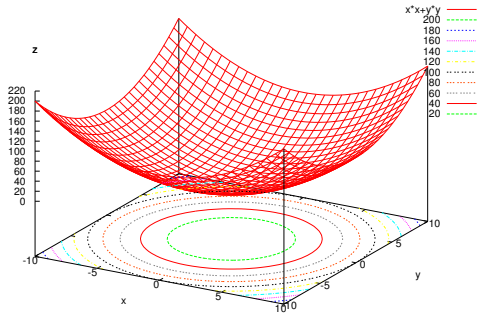
1. Basic plotting: express function as a function of x and y . Use `set isosamples <n>` to set the plotting resolution.

```
set isosamples 30
splot x*x+y*y
```



2. Use `set contour` to turn on contours. Use `set cntrparam levels incremental <begin>,<step>,<end>` to set the contour heights.

```
set contour
set cntrparam levels incremental 0,20,200
splot x*x+y*y
```



Say `set contour both` to turn on contour on the surface as well. Say `set cntrparam levels auto` to reset to the automatic levels.

3 Vector Plots

1. First, in a text file, save the data in the following format:

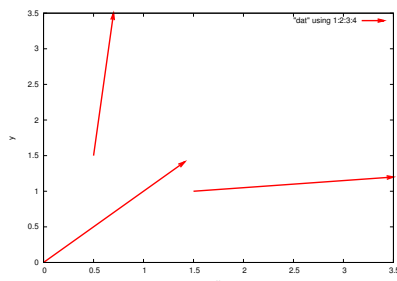
```
start-x start-y x-length y-length
start-x start-y x-length y-length
...
...
```

For example, save the following to a file named `dat`,

```
0 0 1.414 1.414
1.5 1 2 0.2
0.5 1.5 0.2 2
```

and then run the following (write it all in one line):

```
plot "dat" using 1:2:3:4 with vectors
linewidth 5
```



Note that the `linewidth 5` option at the end can be used with most any plot commands.

4 Saving to a File

You need to follow three steps: (1) set file type, (2) set output filename, and (3) plot again.

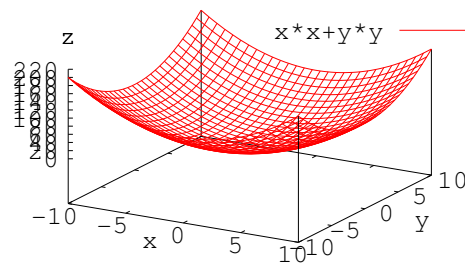
```
set term png color
set output "file.png"
replot
```

The `replot` command will replot the figure. So, for the above to work, you already should have made a plot with a plot command and viewed it in a pop-up window.

You can also plot into a postscript file:

```
set term postscript eps color "helvetica" 25
set output "file.ps"
replot
```

The `eps color` option sets makes the PS file an EPS file, and uses color. The `"helvetica" 25` option sets the font size. For example, the 3D plot in section 2 can will be saved like this, with font size 35.



To revert back to your interactive display, do

```
set term x11
```

5 Other Commands

1. To set the name for the function, use the `title "function name"` with the plot command.

```
plot x title "linear", x*x title "quadratic"
```

2. To plot a data file (e.g., filename `dat`) with the following format:

```
x-index y-value  
x-index y-value  
x-index y-value  
x-index y-value  
...  
...
```

simply say one of the following:

```
plot "dat" using 1:2 with lines  
plot "dat" using 1:2 with linespoints  
plot "dat" using 1:2 with impulse
```

3. To set the axis range, use the following command with the `[min:max]` range.

```
set xrange [-10:10]  
set yrange [-10:10]  
set zrange [-10:10]
```

4. To set the title of the plot,

```
set title "Plot Title"
```