Contour Plots

Math 113

This Maple session gives some examples of creating contour plots.

First, load the "plots" library:

```
> with(plots):
```

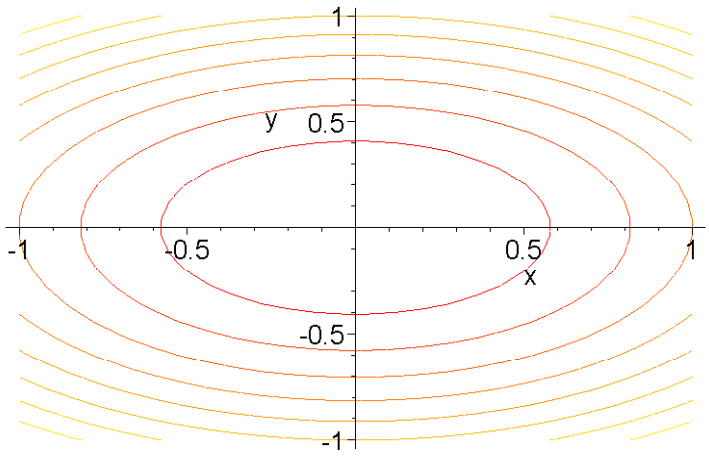
Define an expression to hold f(x,y). We'll do a contour plot for
f(x,y) = x^2+2*y^2.

```
> f := x^2 + 2*y^2;
```

$$f := x^2 + 2\,y^2$$

The **contourplot** command creates a contour plot. The first argument is the function; the second and third arguments are the x and y ranges, respectively.

```
> contourplot(f,x=-1..1,y=-1..1);
```



After the first three arguments, you can include many optional arguments. The following are just a small sample.

You can specify the exact number of contours to draw with "contours=N" (replace N with the number). The default is 8.

OR, you can specify the actual contour values to be used to create the contour lines with "contours=[z1,z2,...,zn]". For example, the option **contours=[0,0.5,1,1.5,2,2.5]** would create a contour plot with the six given contour values.

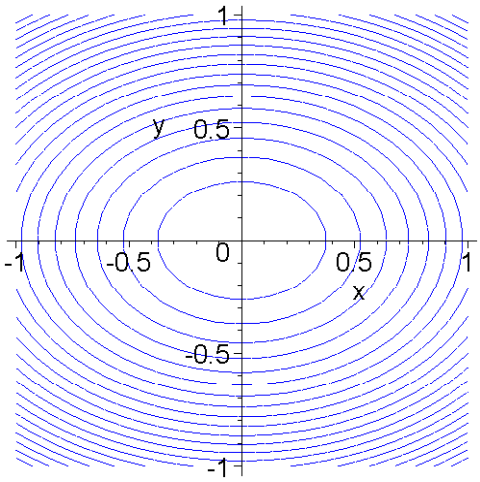
You can change the color of the contour lines; for example, "color=green".

You can force the plot to use the same scaling on the x and y axes (so a circle really looks like a circle) with "scaling=constrained".

If the curves in the contour plot look jagged, you can increase the resolution with the option "grid=[Nx,Ny]", where you replace Nx and Ny with integers that give the x and y resolutions. The default is [25,25].

Here are some examples that use these options:

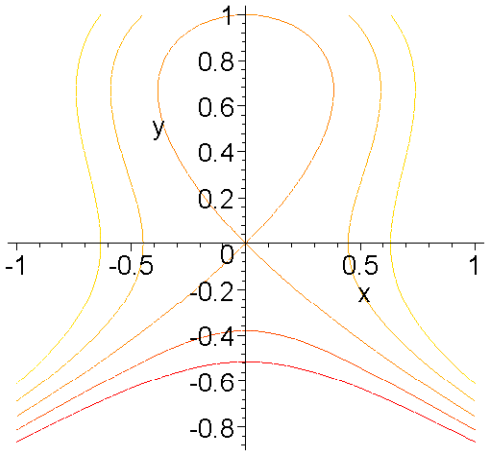
```
> contourplot(f,x=-1..1,y=-1..1,contours=21,color=blue,scaling=const
  rained);
```




```
> g := x^2-y^2+y^3;
```

$$g := x^2 - y^2 + y^3$$

```
> contourplot(g,x=-1..1,y=-1..1,contours=[-0.4,-0.2,0,0.2,0.4],grid=
  [41,41],scaling=constrained);
```




```
>
```