

Lesson 25 - Functions of Several Variables**Objectives**

- Determine the domain and range of a function of more than one variable.
- Understand how to use level curves.
- Understand how to use tabular data to represent a function of more than one variable.
- Plot a 3D function in Mathematica.

READ

- Review Stewart, Chapter 14.1, pages 855-865

THINK ABOUT

- Where have you seen level curves before?
- Why would you need two dependent variables in a math model?

MATHEMATICA COMMANDS AND TASKS YOU NEED TO KNOW

Entering and manipulating multivariable functions. When entering a multivariable function you should use the following command:

```
f[x_,y_] :=  
or  
g[t_,v_] :=
```

You can then do anything you would like to with this function $f[x, y]$ or $g[t, v]$ there is no need to use the underscore anymore.

Plotting. To plot a function of several variables that you have entered into mathematica the command is:

```
Plot3D[f[x,y],{x,-5,5},{y,-5,5},AxesLabel->{x,y,z}]
```

To produce a contour plot of the function $f[x, y]$ the command is:

```
ContourPlot[f[x,y],{x,-5,5},{y,-5,5}]
```

You can change the domain for either variable to whatever you might need to look at.