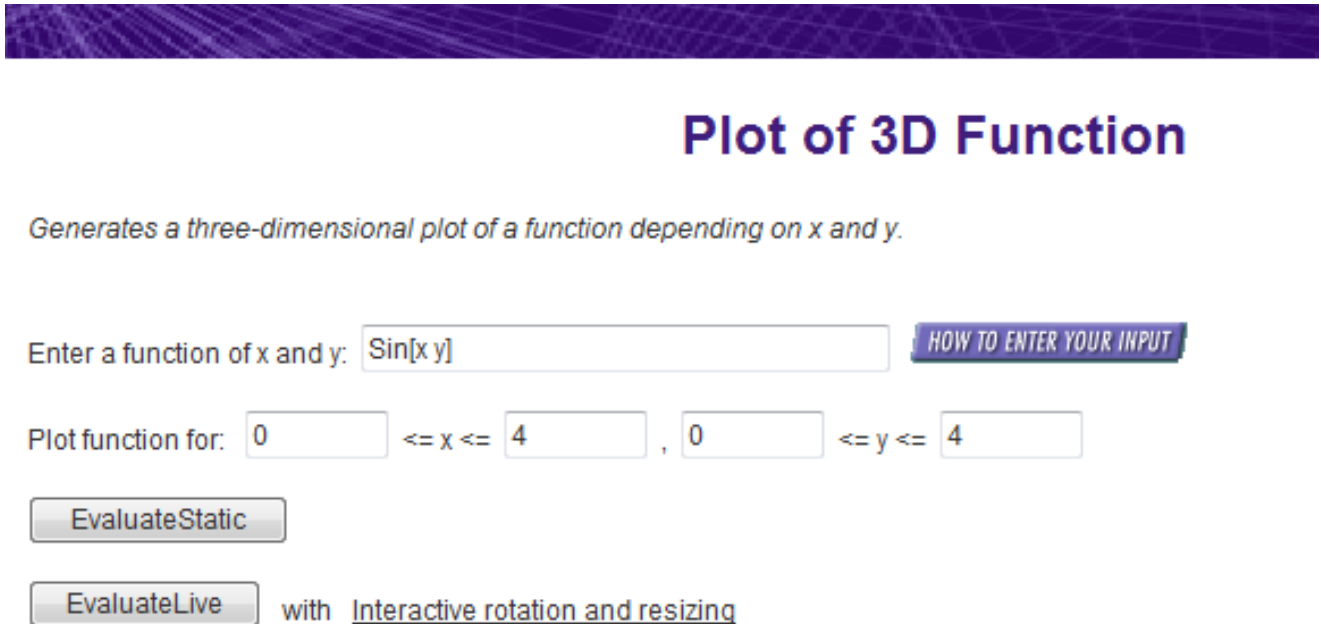


BASICS

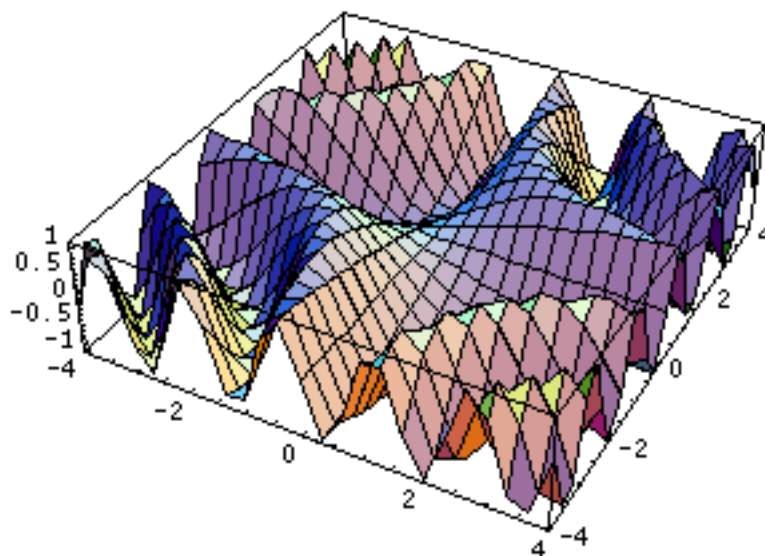
Enter the website

http://cose.math.bas.bg/webMathematica/MSP/Sci_Visualization/3DFunctionPlot

The upper part of the website should resemble the following picture:



Exercise 1. Press the “EvaluateStatic” button and look at the graph. Then change the domain to $[-4, 4] \times [-4, 4]$ and press the button again. the following graph should appear:



Exercise 2. Now, press the “EvaluateLive” button and wait a few seconds. As the graph appears, drag the mouse about the picture to rotate it. Read the contents of “Interactive rotation

and resizing” link next to the “EvaluateLive” button.

FUNCTION INPUT

The function plotted in previous exercises is $\sin(x \cdot y)$, which is written as **Sin[x y]** — note that there is a space between x and y . It can be also written as **Sin[x*y]** — check it by yourself.

Other most common expressions should be written as:

- **Cos** – for example **Cos[x+y]-1**
- **Tan** – for example **Tan[x/y]+3**
- **Cot** – for example **Cot[x]*y**
- **ArcSin, ArcCos, ArcTan, ArcCot**
- powers: **x^2, E^x, 2^y**
- constants: **Pi, E** – for example **-Pi/2**
- **Log[x]** – the natural logarithm
- **Log[b,x]** - a logarithm to the base b
- **Abs** – the absolute value, for example **Abs[x+y]**
- **Sqrt** – the square root, for example **Sqrt[x^2-y^2]**
- division and fractions – for example **(x^2-y)/(y^2-x)**

Exercise 3. Plot the following functions in $[-2\pi, 2\pi] \times [-2\pi, 2\pi]$ (unless stated otherwise):

- a) $xy - \mathbf{x*y}$
- b) $|xy| - \mathbf{Abs[x*y]}$
- c) $\cos(x^2 - y^2) - \mathbf{Cos[x^2-y^2]}$
- d) $\frac{x^2-y}{y^2-x} - \mathbf{(x^2-y)/(y^2-x)}$
- e) $\ln(|xy| + 1) - \mathbf{Log[Abs[x*y]+1]}$

f) $\arcsin \frac{x+y}{2} - \text{ArcSin}[(x+y)/2]$

g) $\sqrt{9 - x^2 - y^2} - \text{Sqrt}[9-x^2-y^2]$

h) $\sin x + \cos x - \text{Sin}[x]+\text{Cos}[x]$

i) $5 - \sqrt{|xy|} - 5\text{-Sqrt}[Abs[x*y]]$

j) $\sin x - \text{Sin}[x]$

k) $\sin x \cos y - \text{Sin}[x]*\text{Cos}[y]$

l) $\sin(x \cos y) - \text{Sin}[x*\text{Cos}[y]]$

m) $10 \frac{\cos(x^2+y^2)}{3+x^2+y^2} - 10\text{Cos}[x^2+y^2]/(3+x^2+y^2)$

n) $-y\sqrt{\arctan|\cos x|} - y*\text{ArcTan}[Abs[\text{Cos}[x]]]$

o) $x^2 - y^2 - x^2-y^2$

p) $4x^3y - 4xy^3$ (in $[-1, 1] \times [-1, 1]$) - $4*(x^3)*y-4*x*(y^3)$

q) 2^{x+y} (in $[-\frac{1}{2}, \frac{1}{2}] \times [-\frac{1}{2}, \frac{1}{2}]$) - $2^{(x+y)}$