Software in Illustrating Graphs of Functions of Two Variables: Using Maple 13

1. Week   2
2. Software   : Maple 13
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   Objective   :
   Students are expected to be able to understand about the material of functions and graphs of two variables, Students can describe the function of two variables with the help of maple 13.
4.
5. Introductory Theory:

   A two-variable function maps every ordered pair of real numbers (x,y) in region D to a real number $z = f(x, y)$ in region R. The set D is called the domain (origin) and the set R is called the range (result) x and y are called independent variables, z is called the dependent variable. However, there are limitations to the two-dimensional depiction so that it requires software assistance to illustrate it in more detail, so this module will explain how to illustrate the graph of a two-parameter function using Maple 13 software.

Domain   Range

6. Work Steps:

   Example 1:

   Draw the function surface of($g\,x,y$) $= (\sin(\frac{x}{2}) + \sin(\frac{y}{64}) + 2\sin(\frac{x}{4})$

   First define the function, pi can be written with the symbol π or Pi for square root can be written with the command sqrt(f(x,y))

> $f := (x,y) \cdot \left(\sin\left(\frac{x}{2}\right) + \sin\left(\frac{x}{6}\right)\right) - 2\sin\left(\frac{x}{4}\right)$

$$f := (x, y) > \sin\left(\frac{1}{2}x\right) + \sin\left(\frac{1}{6}x\right) + 2\sin\left(\frac{1}{4}x\right)$$

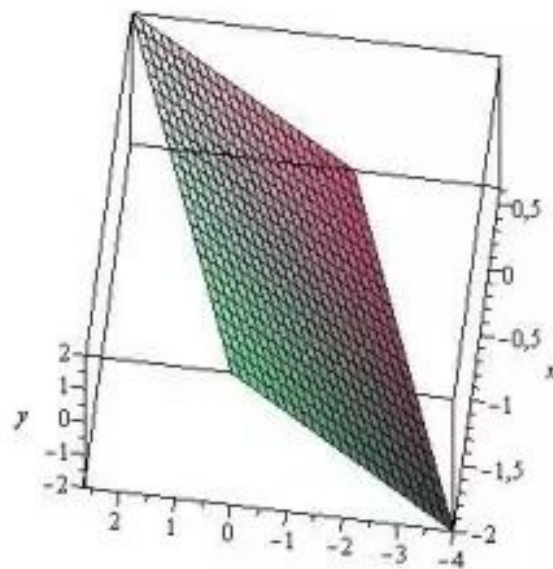> $plot3d(f(x,y), x = 0..3\pi, y = 0..3\,Pi, axes = boxed);$

Example 2
Draw the function surface of $h(x,y) = y(sinx) + x(cosx)$

> $h := (x, y) \rightarrow y(sinx) \quad x(cosx)$

$$h := (x, y) \rightarrow y(sinx) - x(cosx)$$

> $plot3d(h(x, y), x = -2 ...3, P, y -2 ..2, axes - boxed);$

7. Duties   :
   Draw the surface of the following function!

   $f(x, y) = \sqrt{y^2 + x^2 - 1}$
   $g(x, y) = \sin(x + 2y)$
   $h(x, y) = 2\cos(x + y) + 3\sin y$