24BMH1112

Rahul LJ

Partial Derivative

```
clc
clear all
close all
%%     Initialization:
clc
clear all
format compact
syms x y
z = input('Enter the two dimensional function f(x,y): ');
x1 = input('enter the x value at which the derivative has to be evaluated: ');
y1 = input('enter the y value at which the derivative has to be evaluated: ');

%%     Slope Calculation:
z1 = subs(subs(z,x,x1),y,y1)
ezsurf(z,[x1-2 x1+2])
f1 = diff(z,x)
slopex = subs(subs(f1,x,x1),y,y1);

%%     Visualization of the plane in which the partial derivative is sought:
[x2,z2]=meshgrid(x1-2:.25:x1+2,0:0.5:10);
y2=y1*ones(size(x2));
hold on
h1=surf(x2,y2,z2);
set(h1,'FaceColor',[0.7,0.7,0.7],'EdgeColor','none')

%%     The Tangent line:
t=linspace(-1,1);
x3=x1+t;
y3=y1*ones(size(t));
z3=z1+slopex*t;
line(x3,y3,z3,'color','blue','linewidth',2)
```


Command Window

```
Enter the two dimensional function f(x,y):
x^3+y^3+6*x*y-1
enter the x value at which the derivative has to be evaluated:
1
enter the y value at which the derivative has to be evaluated:
1
z1 =
7
f1 =
3*x^2 + 6*y
>>
```


$6\,x\,y + x^3 + y^3 - 1$