20BCE1548-TIRTH VISHALBHAI DAVE

EXP - 8

Q1

Find the partial derivative of F(x,y)=4-x^2-2y^2 with respect to x at the point (1,1) and visualize it.

CODE: -

```
%% 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)
```

OUTPUT: -

Enter the two dimensional function f(x,y): 4-x^2-2*y^2

enter the x value at which the derivative has to be evaluated: 1

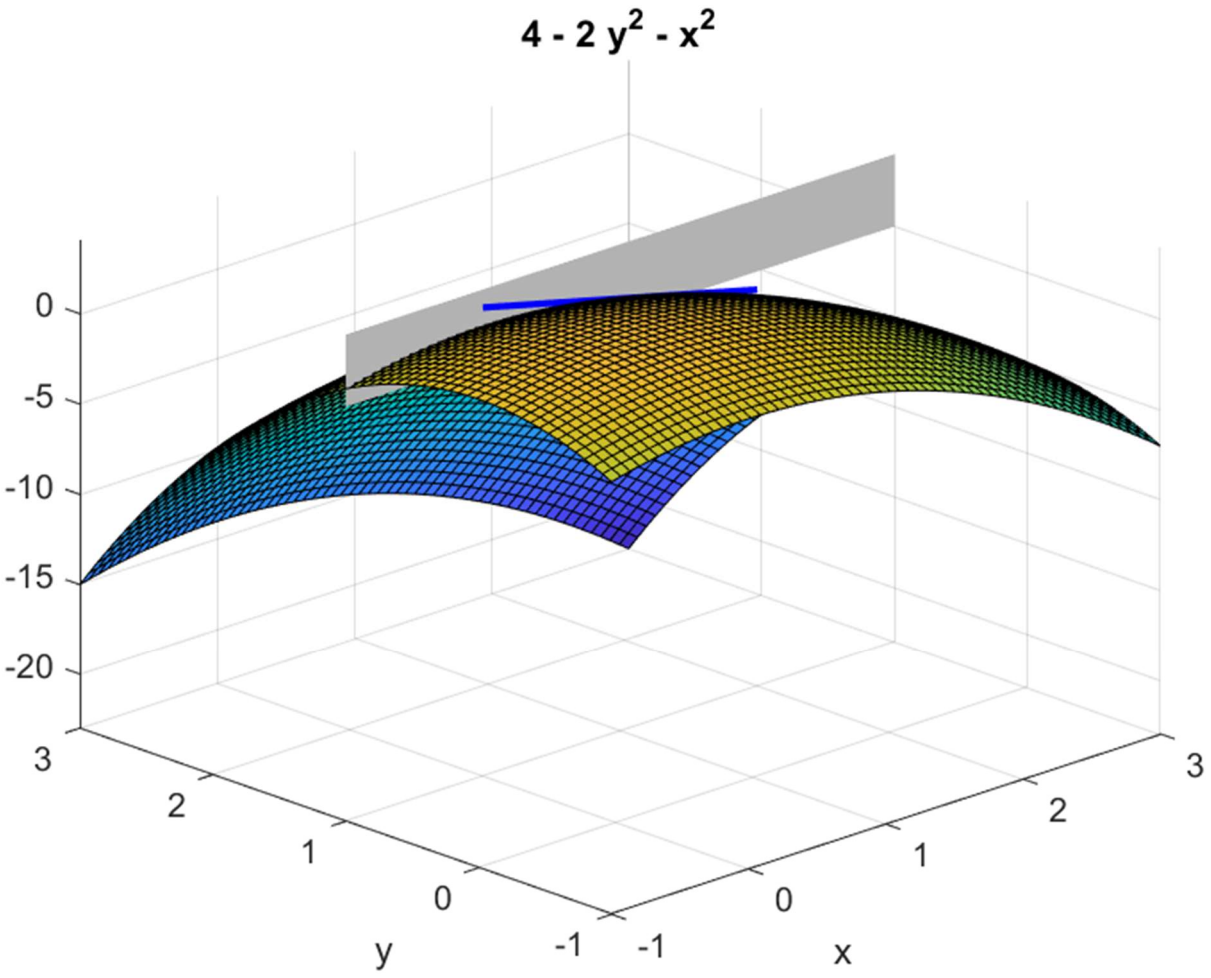
enter the y value at which the derivative has to be evaluated: 1

z1 =

1

f1 =

-2*x



Q2 Find the partial derivatives of F(x,y)=sin(x/(1+y)) with respect to x at the point (1,2).

CODE: -

```
%% 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)
```

OUTPUT: -

Enter the two dimensional function f(x,y): sin(x/(1+y))

enter the x value at which the derivative has to be evaluated: 1

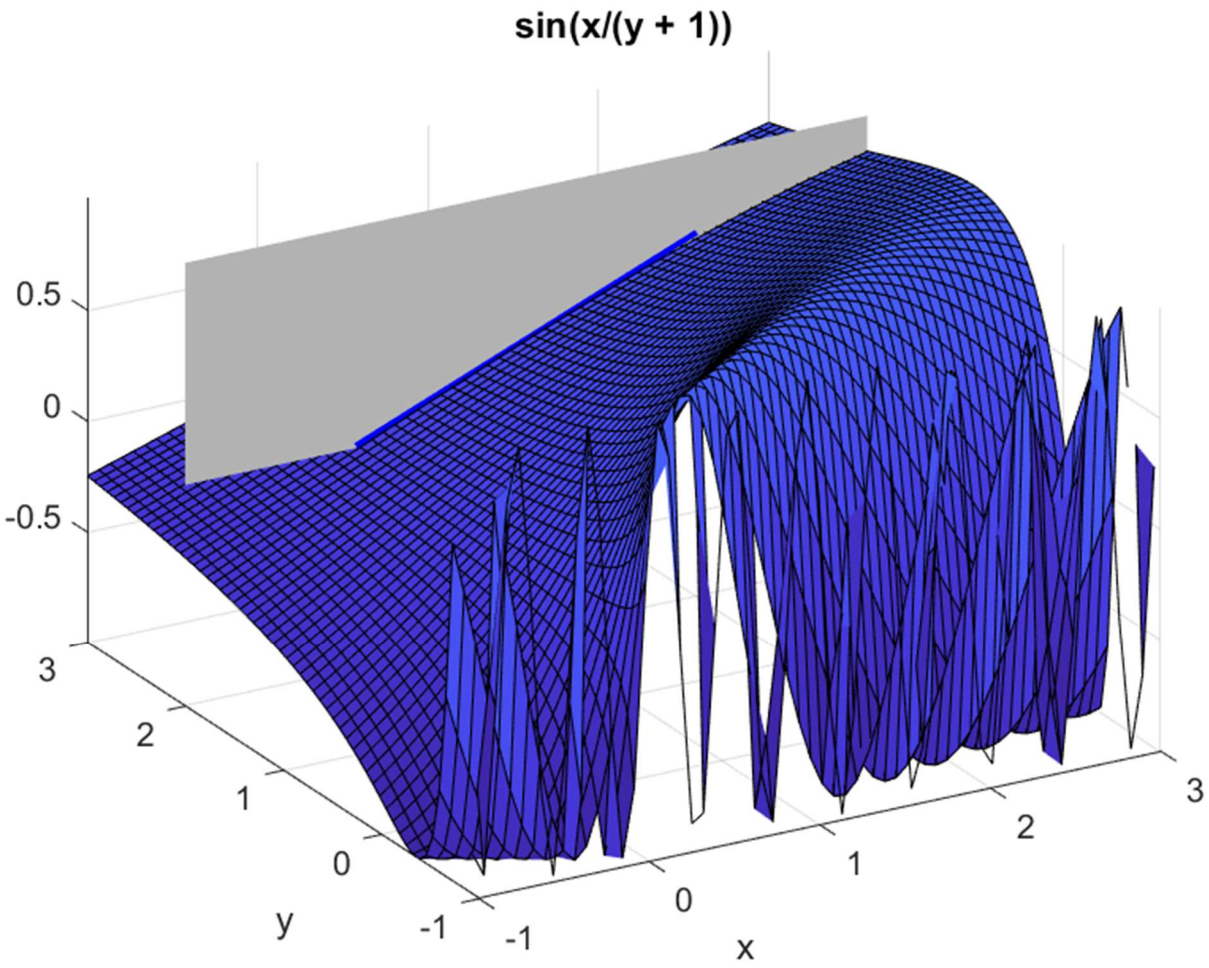
enter the y value at which the derivative has to be evaluated: 2

z1 =

sin(1/3)

f1 =

cos(x/(y + 1))/(y + 1)



Q3

Find the partial derivatives of F(x,y)=x^3+y^3+6xy-1 with respect to y at the point (1,1)

CODE: -

```
%% 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,y)
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)
```

OUTPUT: -

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

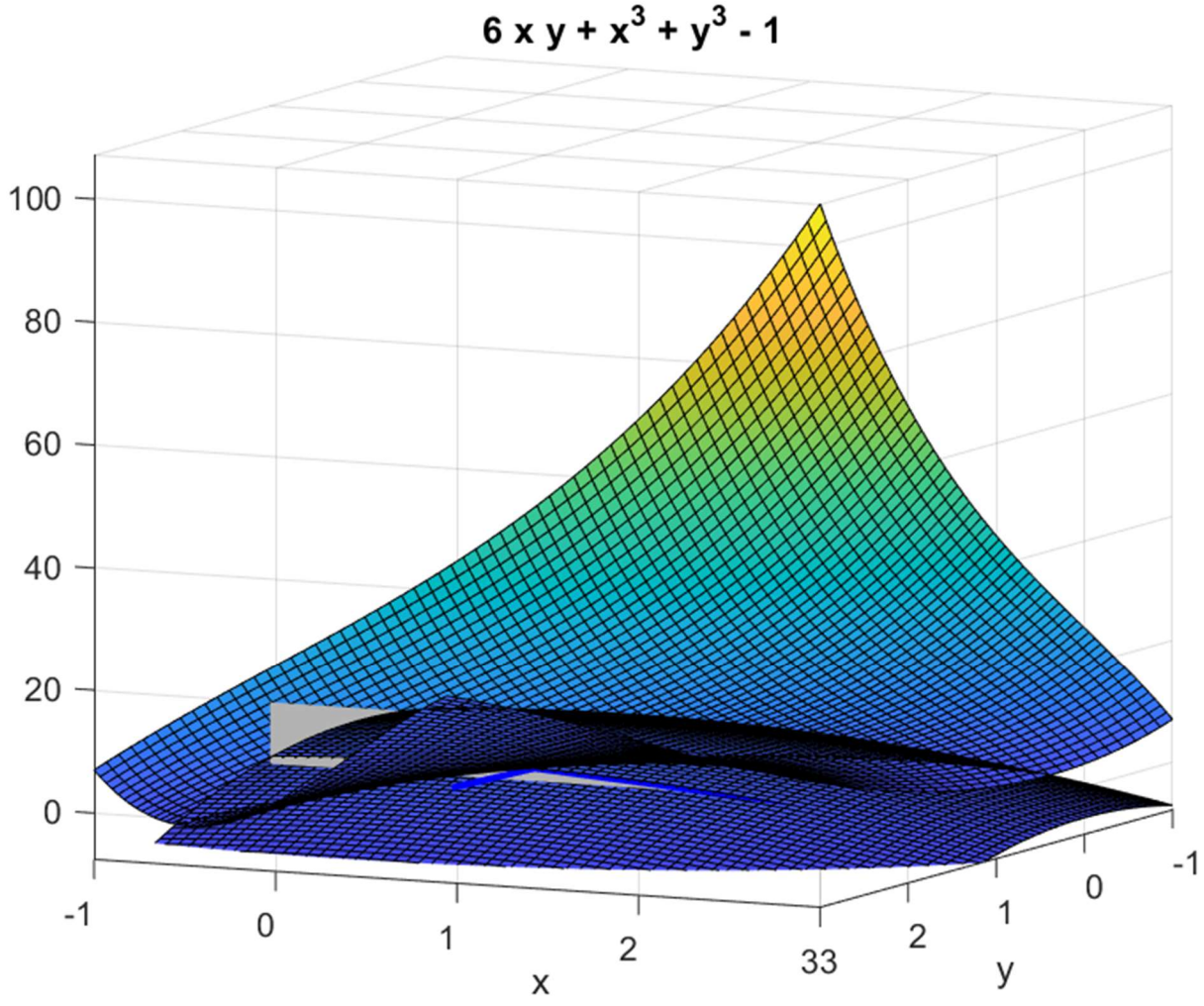
enter the y value at which the derivative has to be evaluated: 1

z1 =

7

f1 =

3*y^2 + 6*x


6 x y + x^3 + y^3 - 1
100
80
60
40
20
0
-1
0
1
2
33
x
2
1
0
-1
y

Q4

Find the partial derivative of F(x,y)=4-x^2-2y^2 with respect to y at the point (1,1)

CODE: -

```
%% 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,y)
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)
```

OUTPUT: -

Enter the two dimensional function f(x,y): 4-x^2-2*y^2

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 =

1

f1 =

-4*y