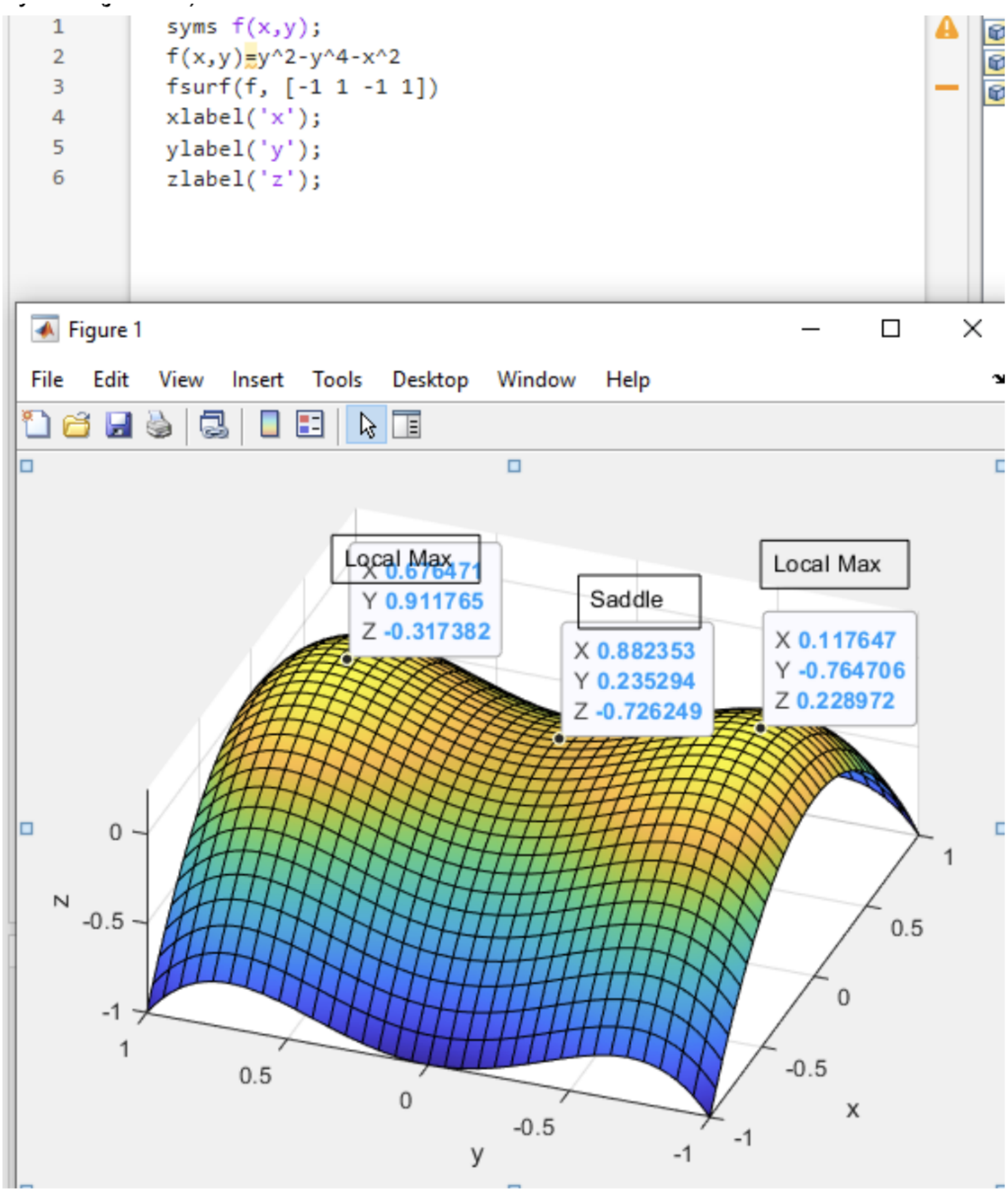
1).

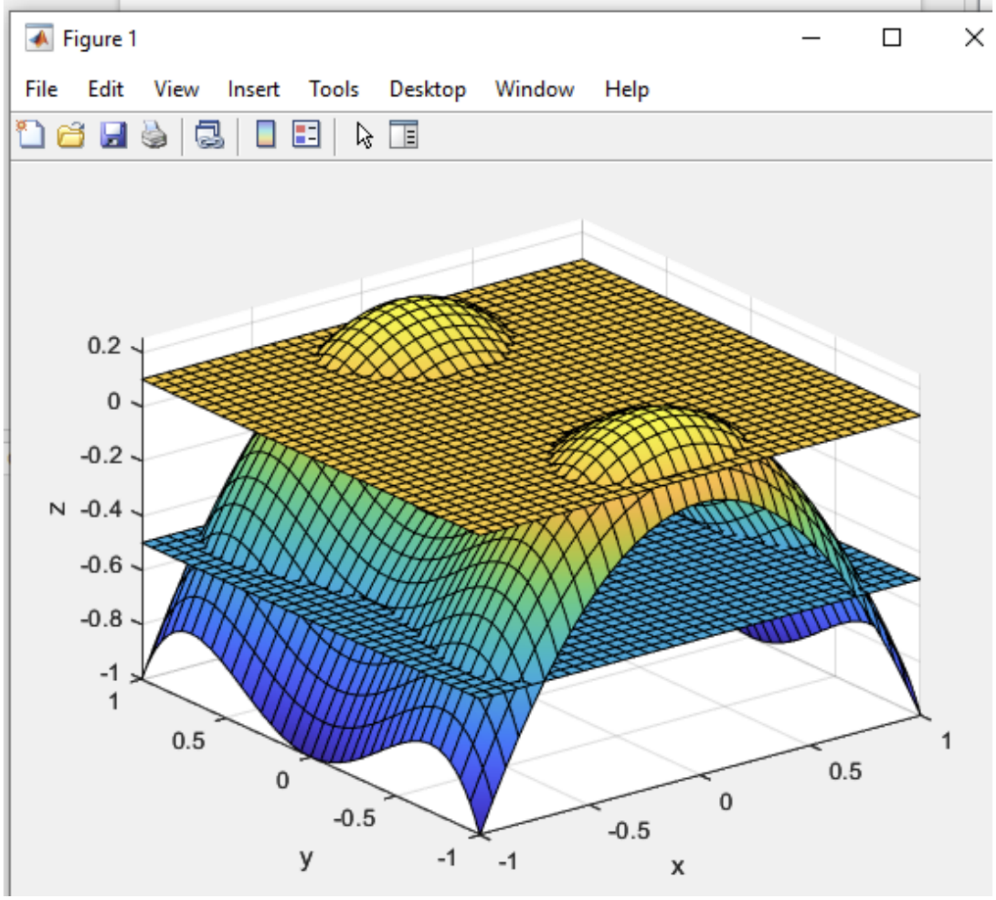
a).


syms f(x,y);
f(x,y)=y^2-y^4-x^2
fsurf(f, [-1 1 -1 1])
xlabel('x');
ylabel('y');
zlabel('z');
Figure 1
File Edit View Insert Tools Desktop Window Help
Local Max
X 0.676471
Y 0.911765
Z -0.317382
Saddle
X 0.882353
Y 0.235294
Z -0.726249
Local Max
X 0.117647
Y -0.764706
Z 0.228972
z
y
x

1).

b).

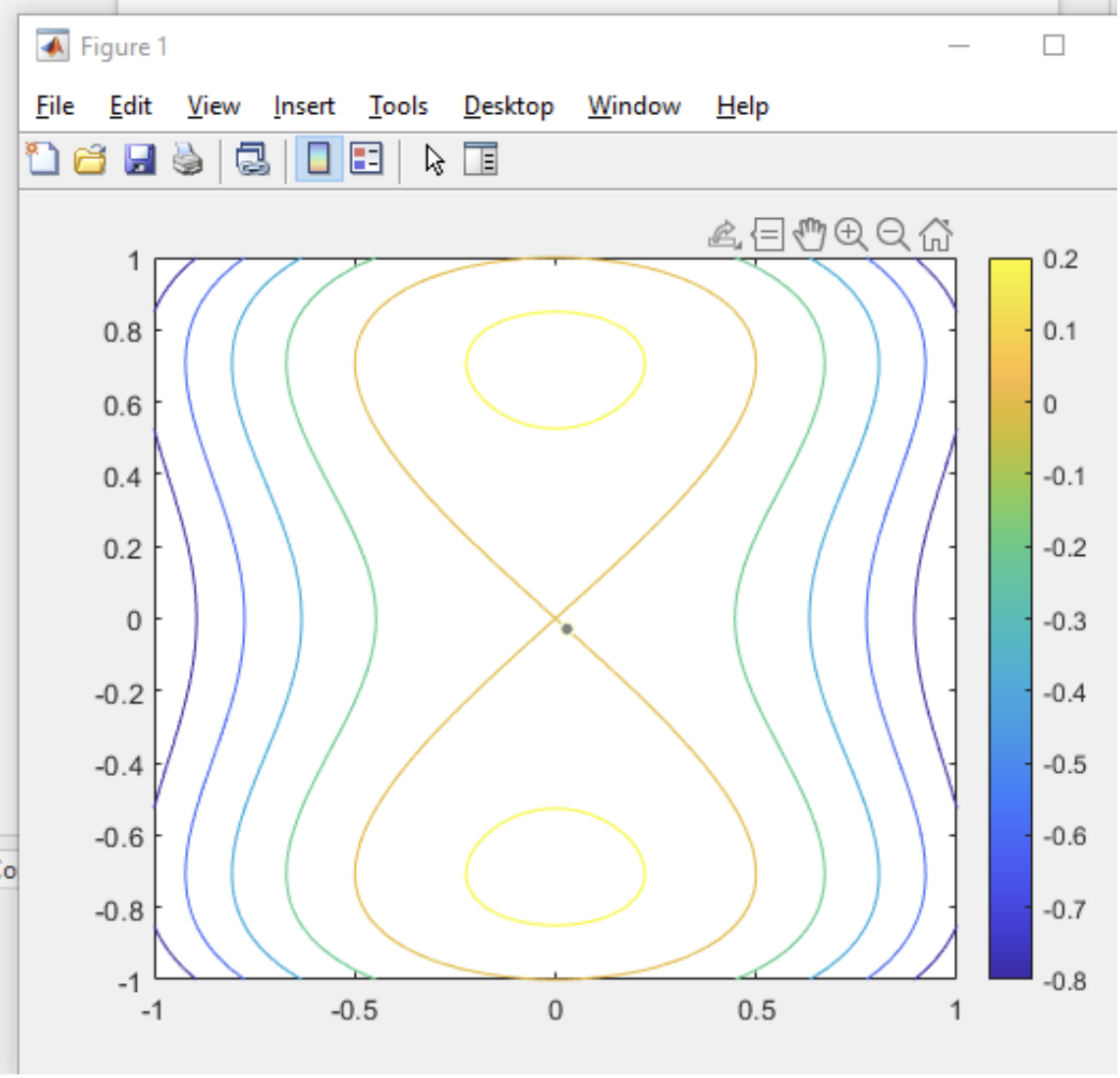
```
syms f(x,y) f2(x,y) f3(x,y);
f(x,y) = y^2-y^4-x^2
fsurf(f, [-1 1 -1 1])

f2(x,y) = 0.1;
f3(x,y) = -0.5;

xlabel('x');
ylabel('y');
zlabel('z');

hold on
fsurf(f2,[-1 1 -1 1]);
fsurf(f3,[-1 1 -1 1]);
hold off
```



1).

c).

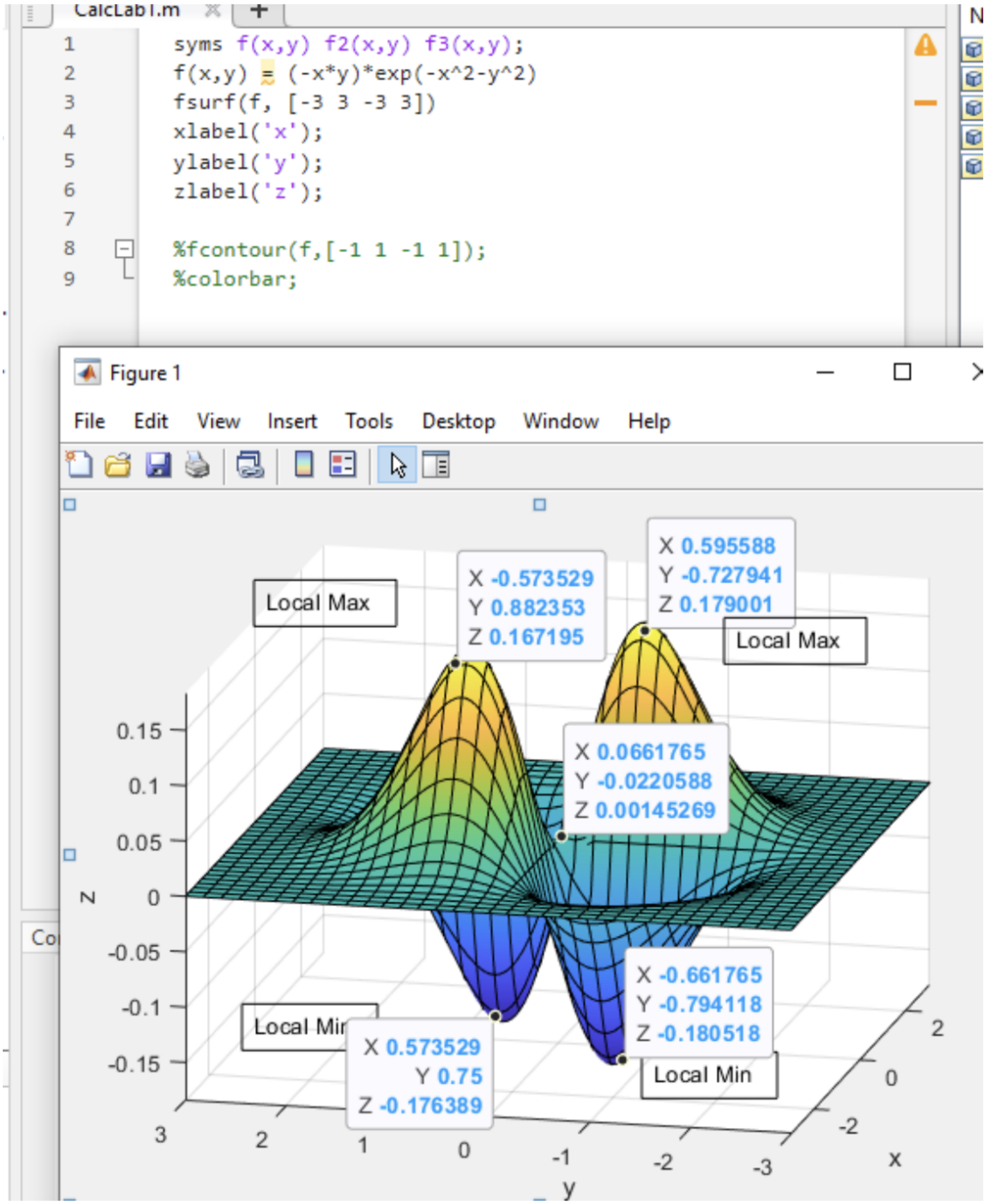
```
syms f(x,y);
f(x,y) = y^2-y^4-x^2
fsurf(f, [-1 1 -1 1])

fcontour(f,[-1 1 -1 1]);
colorbar;
```



miss label -2 pt

2).

a).

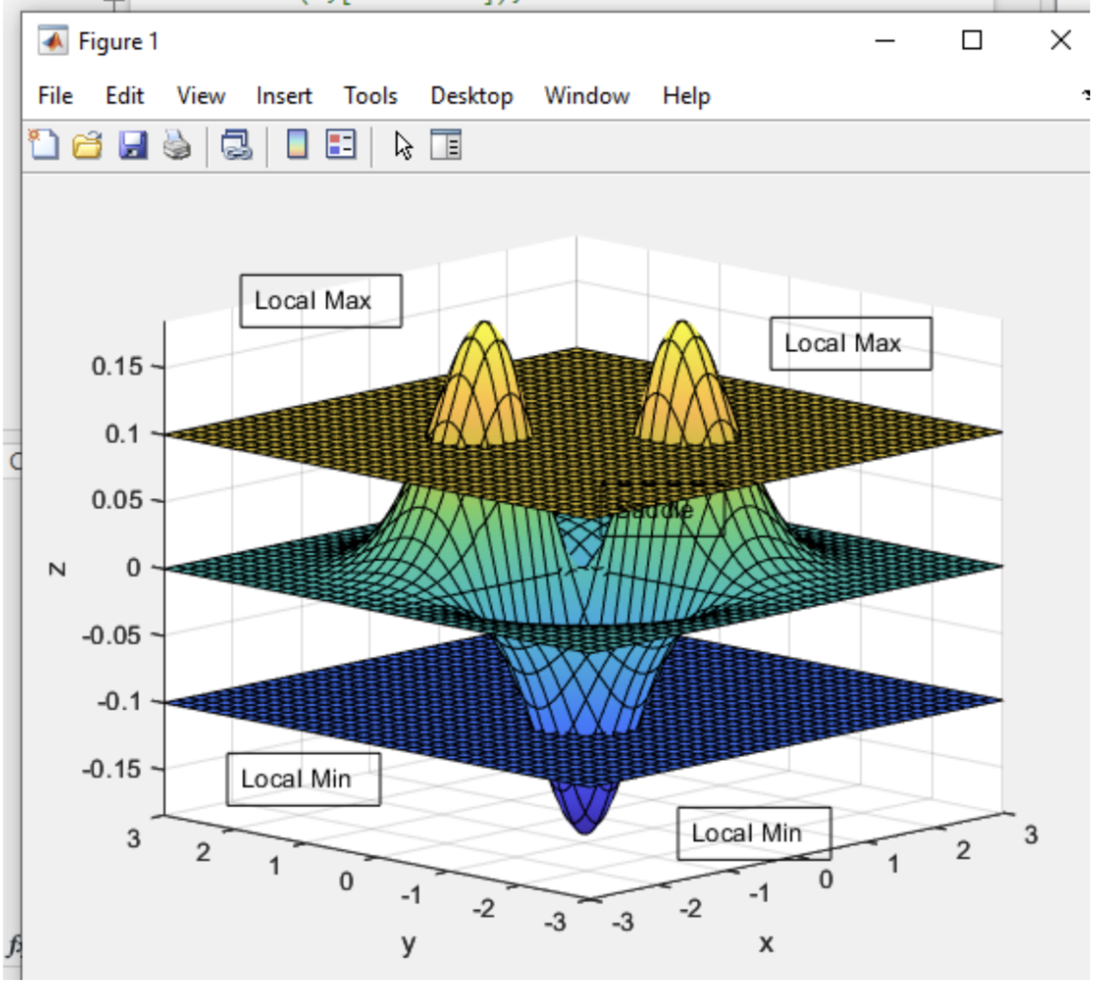


CalcLab1.m
syms f(x,y) f2(x,y) f3(x,y);
f(x,y) = (-x*y)*exp(-x^2-y^2)
fsurf(f, [-3 3 -3 3])
xlabel('x');
ylabel('y');
zlabel('z');
%fcontour(f,[-1 1 -1 1]);
%colorbar;
Figure 1
File
Edit
View
Insert
Tools
Desktop
Window
Help
Local Max
X -0.573529
Y 0.882353
Z 0.167195
X 0.595588
Y -0.727941
Z 0.179001
Local Max
X 0.0661765
Y -0.0220588
Z 0.00145269
X -0.661765
Y -0.794118
Z -0.180518
Local Min
X 0.573529
Y 0.75
Z -0.176389
Local Min
z
y
x

2).

b).

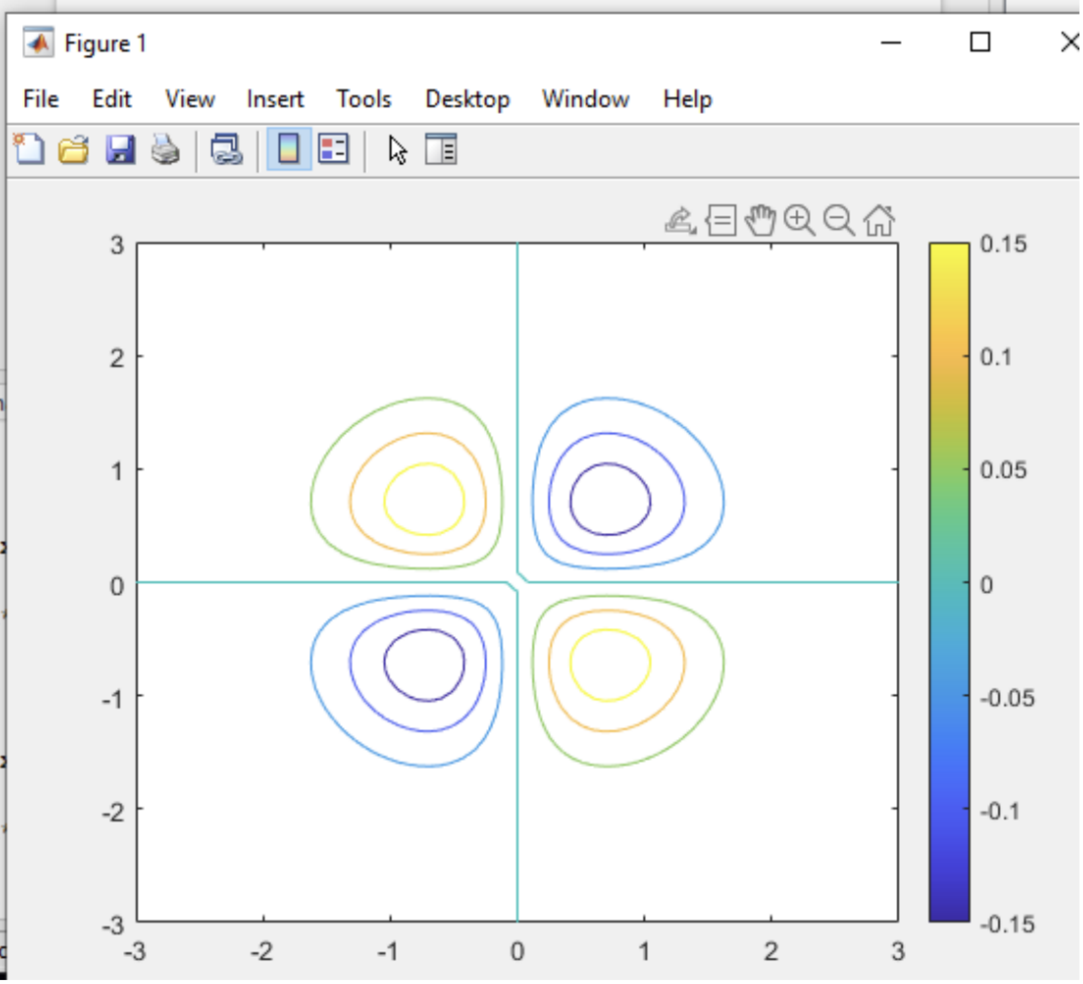
```
syms f(x,y) f2(x,y) f3(x,y);
f(x,y) = (-x*y)*exp(-x^2-y^2)
fsurf(f, [-3 3 -3 3])

f2(x,y) = 0.1;
f3(x,y) = -0.1;

xlabel('x');
ylabel('y');
zlabel('z');

hold on
fsurf(f2,[-3 3 -3 3]);
fsurf(f3,[-3 3 -3 3]);
hold off

%fcontour(f,[-1 1 -1 1]);
```



2).

c).

```
syms f(x,y) f2(x,y) f3(x,y);
f(x,y) = (-x*y)*exp(-x^2-y^2)
fsurf(f, [-3 3 -3 3])

f2(x,y) = 0.1;
f3(x,y) = -0.1;

xlabel('x');
ylabel('y');
zlabel('z');

%hold on
%fsurf(f2,[-3 3 -3 3]);
%fsurf(f3,[-3 3 -3 3]);
%hold off

fcontour(f,[-3 3 -3 3]);
colorbar;
```



 miss label

3).

a).

$$f(x, y, z) = e^{x^2+y^2+z^2}$$

$$c = e^{x^2+y^2+z^2}, c \geq 1$$

$$\ln c = x^2 + y^2 + z^2$$

b).

The contour map of the function will resemble a group of concentric circles, with the inside shaded blue and the outside red. The level surfaces will appear as concentric spheres centered at the origin, this is because the function $x^2 + y^2 + z^2$ is the equation for a sphere. The radius of these spheres will be equal to ln(c). For instance, when c equals e, the sphere will have a radius of 1, and when c equals e^4, the sphere will have a radius of 2.