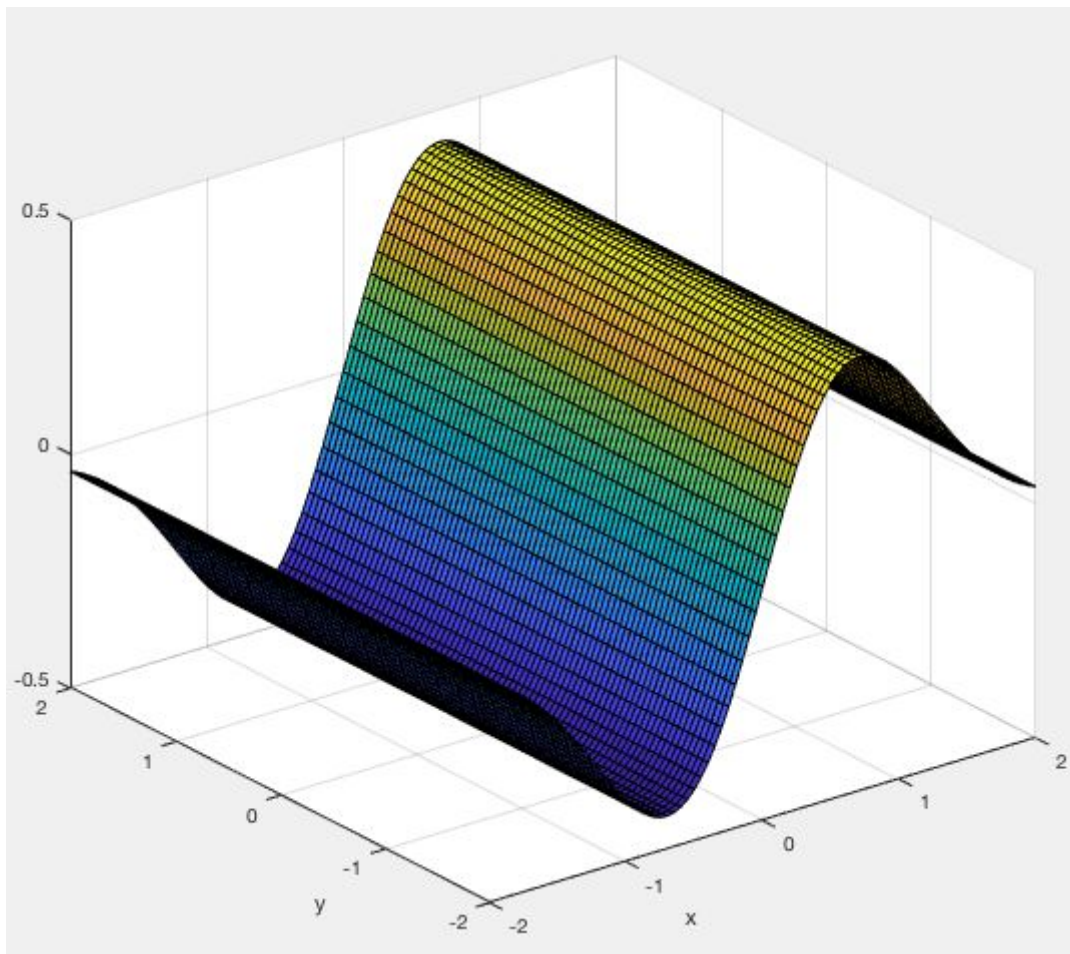


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1. a)

```
domain_x=[-2:0.05:2]  
domain_y=[-2:0.05:2]  
[X,Y]=meshgrid(domain_x,domain_y)  
Z=X.*exp(-X.^2-Y.^2)  
surf(X,Y,Z)  
xlabel('x')  
ylabel('y')  
zlabel('g(x,y)')
```



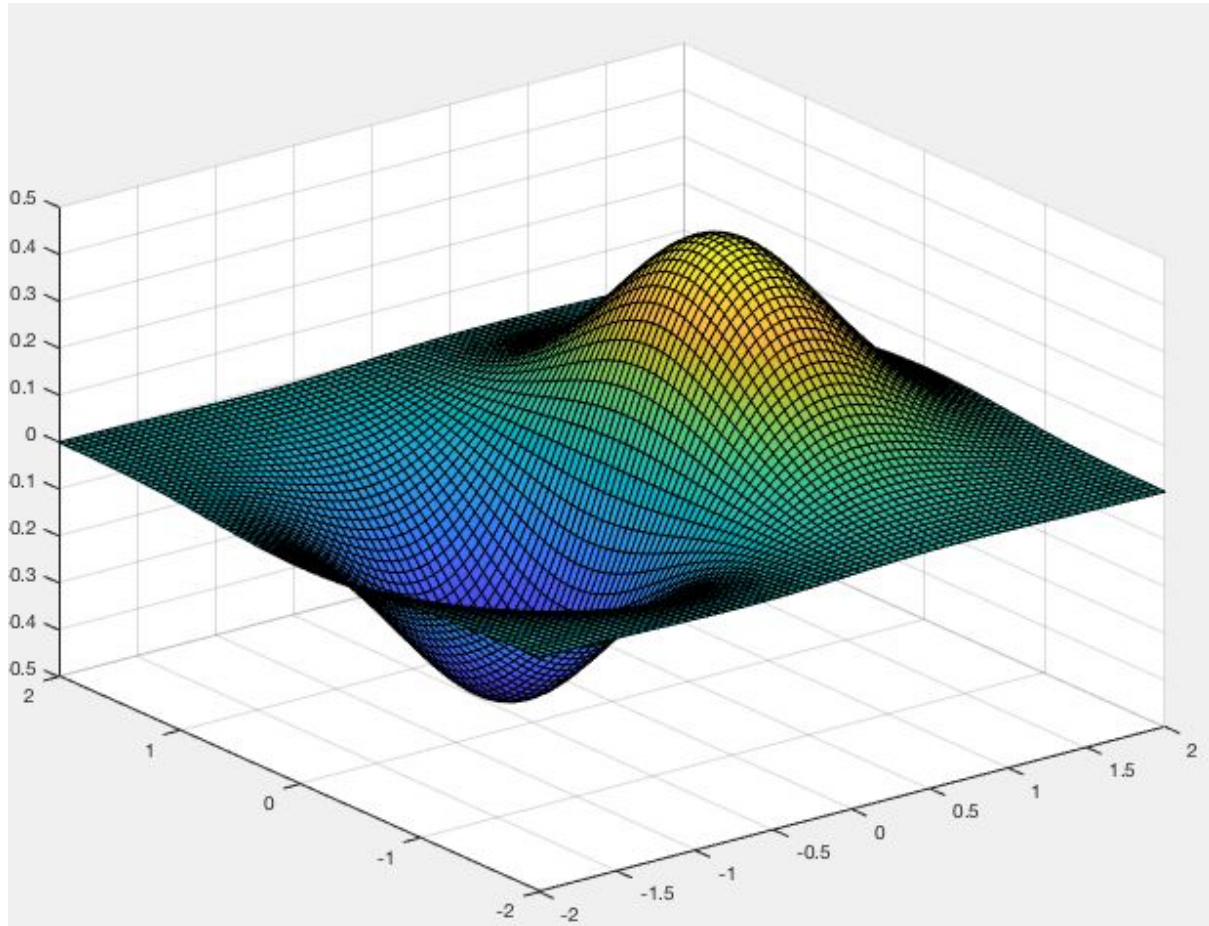
b)

```
domain_x=[-2:0.05:2]  
domain_y=[-2:0.05:2]  
[X,Y]=meshgrid(domain_x,domain_y)  
Z=X.*exp(-X.^2-Y.^2)  
surf(X,Y,Z)  
xlabel('x')  
ylabel('y')  
zlabel('g(x,y)')
```

```

plot(domain_x,Z(1,:),'b-');
plot(domain_x,Z(41,:),'r-');
plot(domain_y,Z(:,21),'g-');
grid on;

```

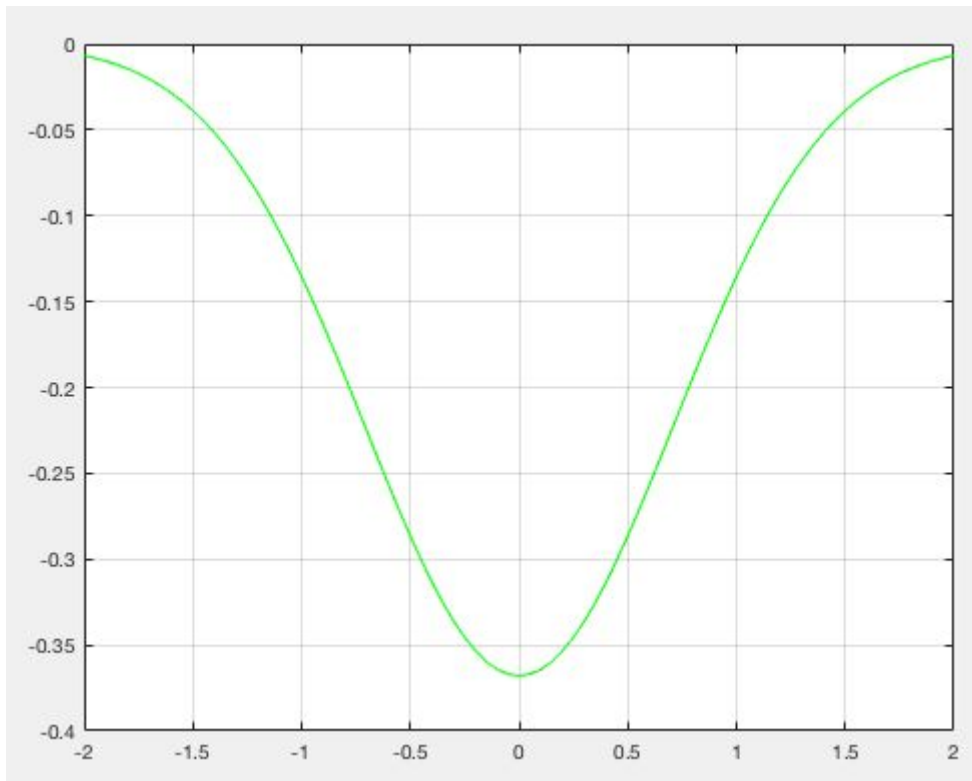


c)

```

domain_x=[-2:0.05:2]
domain_y=[-2:0.05:2]
[X,Y]=meshgrid(domain_x,domain_y)
Z=X.*exp(-X.^2-Y.^2)
surf(X,Y,Z)
xlabel('x')
ylabel('y')
zlabel('g(x,y)')
plot(domain_x,Z(1,:),'b-');
plot(domain_x,Z(41,:),'r-');
plot(domain_y,Z(:,21),'g-');
grid on;

```



$M = \max(\max(Z))$

$V = \min(\min(Z))$

**$M = 0.4288$**

**$V = -0.4288$**

The minimum value is -0.4288 is at (-.700,0) and the maximum value is at (.700,0).

How do the 2D plots relate to the main 3D plot of  $f(x, y)$ ?

The 3-D plot of  $f(x,y)$  has depth in the illustration. The 2-D plot is a plane of the 3-D plot which means that the 2-D plot is a singular variable (one input to one output) whereas the the 3-D plot is multivariable (2 inputs for one output).

Are the maximum and minimum values what you would expect?

Yes this is expected as the the minimum value being -0.4288 has a corresponding negative x value.  $\exp(-X.^2-Y.^2)$  will always output a positive value. This must be the case as 'x' being multiplied by  $\exp(-X.^2-Y.^2)$  will be negative if x is negative (-.700). Conversely, if the output is positive, then X must be a positive value (.700).