

Due date: Shown on the Blackboard.

Please submit:

1. Your MATLAB code for section (1) and (2).
2. Copy of two screenshots (a screenshot for each section) after your program is executed.

You are going to generate (1) a graph and (2) a surface plot.

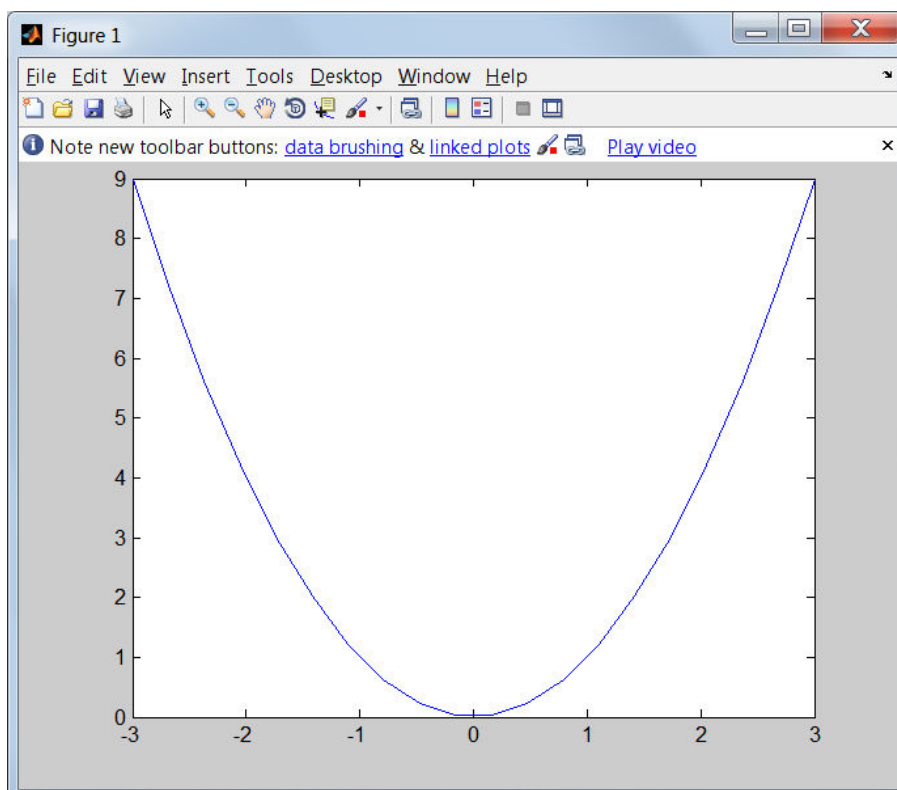
(1) Generate a graph of the following equation. $y = x^4 - 6 * x^2$ (4 pts)

The following example code (range -3 to 3), which generates the example, should help you generating the graph. You may have to explore the range and the pitch.

When you create MATLAB code, make sure you understand the vectorized evaluation of your equation (“.” in the following example).

```
x = linspace(-3, 3, 20);  
y = x.^2;  
plot(x,y)
```

Example output of : $y = x^2$



(2) Generate a surface plot of the following equation.

(6 pts)

$$Z = \sin(\sqrt{X * X + Y * Y}) / (\sqrt{X * X + Y * Y})$$

You should explore the range (start with -10 to 10) and the pitch (how small each square will be), so that the output shows the ripple effect of the function.

Please note when $X = 0$ and $Y = 0$, the denominator becomes 0. You need to add a very small value, epsilon (eps in MATLAB), so that $(X * X + Y * Y + \text{eps})$ should be used above equation. Please make sure you understand the vectorized evaluation of your equation (“.” in the following example).

The following example code (range -5 to 5) generates the surface plot of $z = 2 - x^2 - y^2$.

```
xg = linspace(-5,5,20);  
[X,Y] = meshgrid(xg, xg);  
Z = 2 - X.^2 - Y.^2;  
surf(X,Y,Z)
```

Example output of: $z = 2 - x^2 - y^2$

