

In [1]:

```
# import lib

import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

In [2]:

```
import math
```

In [3]:

```
# pi = 22/7 = 3.14-----

data1 = math.pi
data1
```

Out[3]:

```
3.141592653589793
```

In [4]:

```
data2 = np.arange(0,math.pi)
data2
```

Out[4]:

```
array([0., 1., 2., 3.])
```

In [5]:

```
data3 = np.arange(0,math.pi,0.05)
data3
```

Out[5]:

```
array([0.   , 0.05, 0.1  , 0.15, 0.2  , 0.25, 0.3  , 0.35, 0.4  , 0.45, 0.5  ,
       0.55, 0.6  , 0.65, 0.7  , 0.75, 0.8  , 0.85, 0.9  , 0.95, 1.   , 1.05,
       1.1  , 1.15, 1.2  , 1.25, 1.3  , 1.35, 1.4  , 1.45, 1.5  , 1.55, 1.6  ,
       1.65, 1.7  , 1.75, 1.8  , 1.85, 1.9  , 1.95, 2.   , 2.05, 2.1  , 2.15,
       2.2  , 2.25, 2.3  , 2.35, 2.4  , 2.45, 2.5  , 2.55, 2.6  , 2.65, 2.7  ,
       2.75, 2.8  , 2.85, 2.9  , 2.95, 3.   , 3.05, 3.1  ])
```

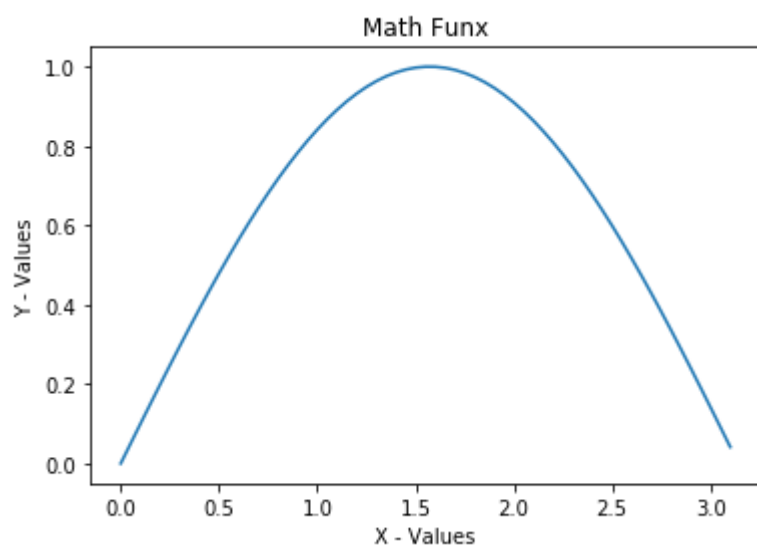
In []:

In [7]:

```
x = np.arange(0,math.pi,0.05)
y = np.sin(x)

plt.plot(x,y)

plt.title('Math Funx')
plt.xlabel('X - Values')
plt.ylabel('Y - Values')
plt.show()
```



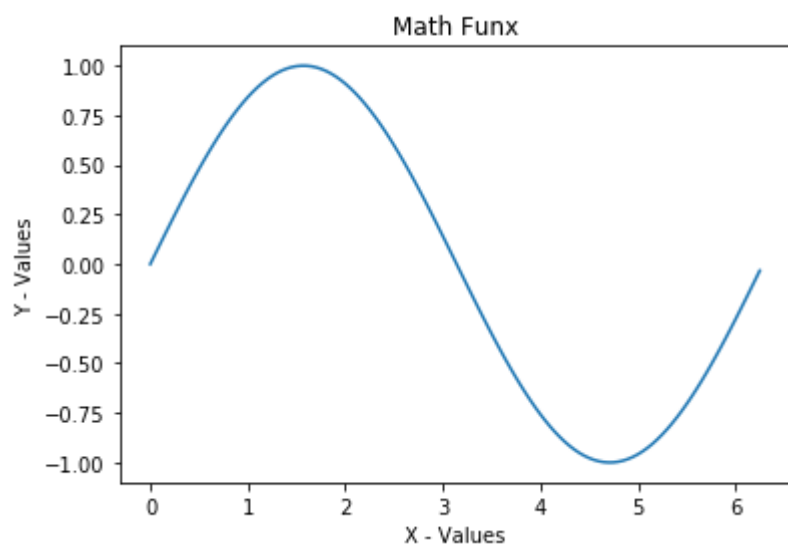
In []:

In [8]:

```
x = np.arange(0,math.pi*2,0.05)
y = np.sin(x)

plt.plot(x,y)

plt.title('Math Funx')
plt.xlabel('X - Values')
plt.ylabel('Y - Values')
plt.show()
```



In []:

In []:

In [9]:

```
# PlyLab =>

from pylab import *
```

In [11]:

```
res1 = linspace(0,10)
res1
```

Out[11]:

```
array([ 0.          ,  0.20408163,  0.40816327,  0.6122449 ,  0.81632653,
        1.02040816,  1.2244898 ,  1.42857143,  1.63265306,  1.83673469,
        2.04081633,  2.24489796,  2.44897959,  2.65306122,  2.85714286,
        3.06122449,  3.26530612,  3.46938776,  3.67346939,  3.87755102,
        4.08163265,  4.28571429,  4.48979592,  4.69387755,  4.89795918,
        5.10204082,  5.30612245,  5.51020408,  5.71428571,  5.91836735,
        6.12244898,  6.32653061,  6.53061224,  6.73469388,  6.93877551,
        7.14285714,  7.34693878,  7.55102041,  7.75510204,  7.95918367,
        8.16326531,  8.36734694,  8.57142857,  8.7755102 ,  8.97959184,
        9.18367347,  9.3877551 ,  9.59183673,  9.79591837, 10.          ])
```

In [12]:

```
len(res1)
```

Out[12]:

50

In []:

In [13]:

```
res2 = linspace(0,10,30)
res2
```

Out[13]:

```
array([ 0.          ,  0.34482759,  0.68965517,  1.03448276,  1.37931034,
        1.72413793,  2.06896552,  2.4137931 ,  2.75862069,  3.10344828,
        3.44827586,  3.79310345,  4.13793103,  4.48275862,  4.82758621,
        5.17241379,  5.51724138,  5.86206897,  6.20689655,  6.55172414,
        6.89655172,  7.24137931,  7.5862069 ,  7.93103448,  8.27586207,
        8.62068966,  8.96551724,  9.31034483,  9.65517241, 10.          ])
```

In [14]:

```
len(res2)
```

Out[14]:

30

In []:

In []:

In [15]:

```
res3 = linspace(-5,5,100)
res3
```

Out[15]:

```
array([-5.          , -4.8989899 , -4.7979798 , -4.6969697 , -4.5959596 ,
       -4.49494949, -4.39393939, -4.29292929, -4.19191919, -4.09090909,
       -3.98989899, -3.88888889, -3.78787879, -3.68686869, -3.58585859,
       -3.48484848, -3.38383838, -3.28282828, -3.18181818, -3.08080808,
       -2.97979798, -2.87878788, -2.77777778, -2.67676768, -2.57575758,
       -2.47474747, -2.37373737, -2.27272727, -2.17171717, -2.07070707,
       -1.96969697, -1.86868687, -1.76767677, -1.66666667, -1.56565657,
       -1.46464646, -1.36363636, -1.26262626, -1.16161616, -1.06060606,
       -0.95959596, -0.85858586, -0.75757576, -0.65656566, -0.55555556,
       -0.45454545, -0.35353535, -0.25252525, -0.15151515, -0.05050505,
        0.05050505,  0.15151515,  0.25252525,  0.35353535,  0.45454545,
        0.55555556,  0.65656566,  0.75757576,  0.85858586,  0.95959596,
        1.06060606,  1.16161616,  1.26262626,  1.36363636,  1.46464646,
        1.56565657,  1.66666667,  1.76767677,  1.86868687,  1.96969697,
        2.07070707,  2.17171717,  2.27272727,  2.37373737,  2.47474747,
        2.57575758,  2.67676768,  2.77777778,  2.87878788,  2.97979798,
        3.08080808,  3.18181818,  3.28282828,  3.38383838,  3.48484848,
        3.58585859,  3.68686869,  3.78787879,  3.88888889,  3.98989899,
        4.09090909,  4.19191919,  4.29292929,  4.39393939,  4.49494949,
        4.5959596 ,  4.6969697 ,  4.7979798 ,  4.8989899 ,  5.          ])
```

In [16]:

```
len(res3)
```

Out[16]:

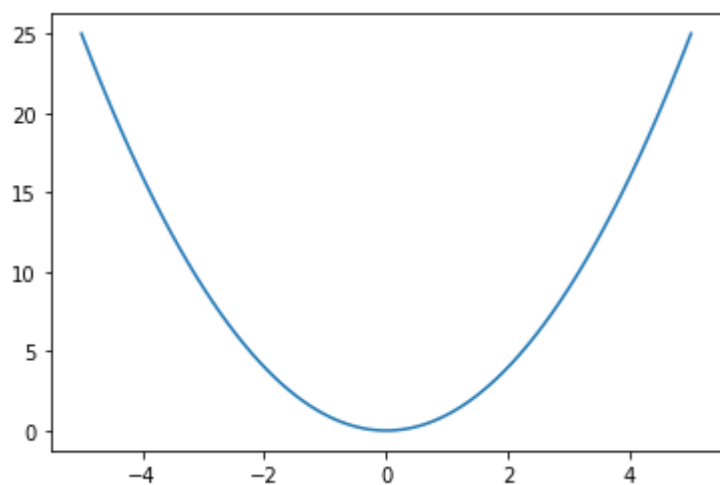
100

In []:

In [19]:

```
x = linspace(-5,5,100)
y = x**2

plot(x,y)
show()
```



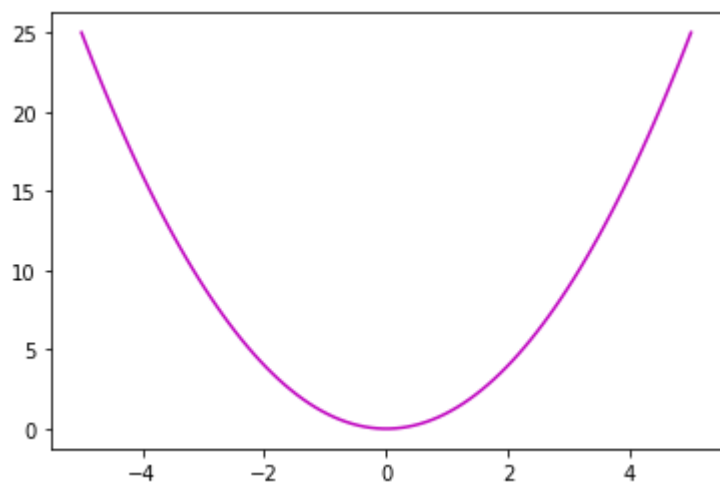
In []:

In []:

In [21]:

```
x = linspace(-5,5,100)
y = x**2

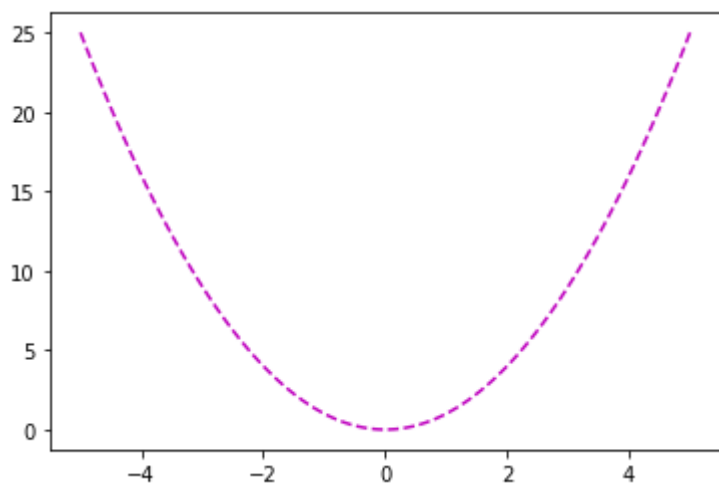
plot(x,y,'m')
show()
```



In [22]:

```
x = linspace(-5,5,100)
y = x**2

plot(x,y,'m--')
show()
```



In []:

In []:

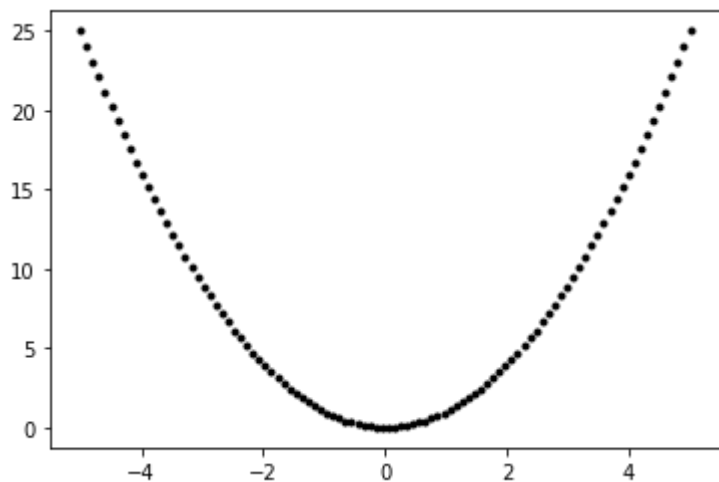
```
# symbols => - , -- , -. , . , , , o , ^ , > , < , s
# colors  => b,r,g,c,m,y,k,w
```

In []:

In [23]:

```
x = linspace(-5,5,100)
y = x**2

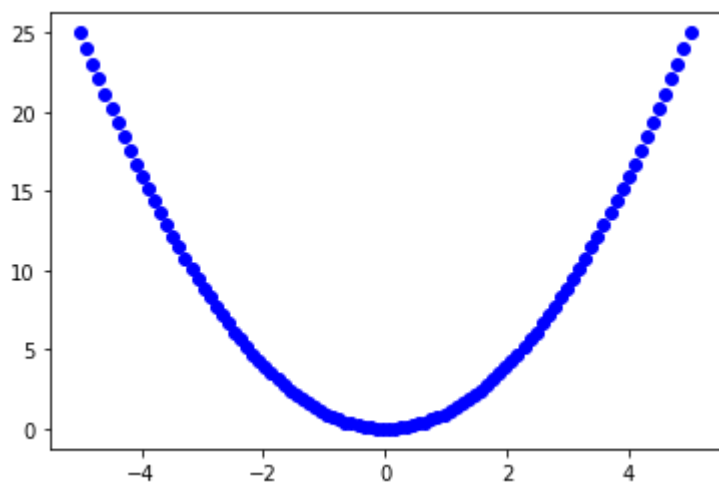
plot(x,y,'k.')
show()
```



In [24]:

```
x = linspace(-5,5,100)
y = x**2

plot(x,y,'bo')
show()
```

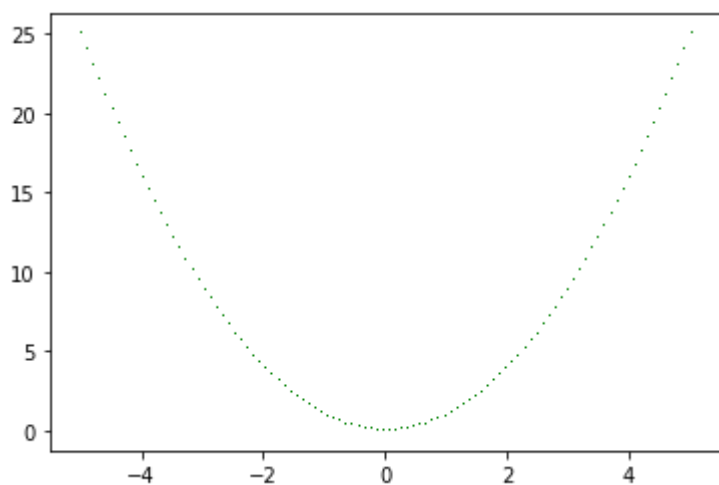


In []:

In [25]:

```
x = linspace(-5,5,100)
y = x**2

plot(x,y,'g,')
show()
```



In []:

In []:

In []:

In [26]:

```
# Three Lines
# Three Data sets

x1 = [5,10,15,20,25,30,35]
y1 = [50,60,66,65,63,62,58]

x2 = [3,6,9,12,15,18,21,26]
y2 = [30,36,42,45,41,38,36,31]

x3 = [4,8,12,16,20,24,28,32]
y3 = [42,45,50,52,55,50,45,40]
```

In [29]:

```
plt.plot(x1,y1, 'r-')  
plt.plot(x2,y2, 'g--')  
plt.plot(x3,y3, 'co')  
plt.show()
```

