

# Experiment 3

```
In [1]: from matplotlib import pylab
```

```
In [2]: print(pylab.__version__)
```

```
1.23.3
```

```
In [3]: import numpy as np
```

```
In [4]: x = np.linspace(0,10,25)
```

```
In [5]: y = x * x + 2
```

```
In [6]: print(x)
```

```
[ 0.          0.41666667  0.83333333  1.25          1.66666667  2.08333333
 2.5          2.91666667  3.33333333  3.75          4.16666667  4.58333333
 5.          5.41666667  5.83333333  6.25          6.66666667  7.08333333
 7.5          7.91666667  8.33333333  8.75          9.16666667  9.58333333
10.          ]
```

```
In [7]: print(y)
```

```
[ 2.          2.17361111  2.69444444  3.5625         4.77777778
 6.34027778  8.25         10.50694444 13.11111111 16.0625
19.36111111 23.00694444 27.          31.34027778 36.02777778
41.0625      46.44444444 52.17361111 58.25         64.67361111
71.44444444 78.5625      86.02777778 93.84027778 102.          ]
```

```
In [8]: print(np.array([x,y]).reshape(25,2))
```

```
[[ 0.          0.41666667]
 [ 0.83333333  1.25         ]
 [ 1.66666667  2.08333333]
 [ 2.5         2.91666667]
 [ 3.33333333  3.75         ]
 [ 4.16666667  4.58333333]
 [ 5.          5.41666667]
 [ 5.83333333  6.25         ]
 [ 6.66666667  7.08333333]
 [ 7.5         7.91666667]
 [ 8.33333333  8.75         ]
 [ 9.16666667  9.58333333]
 [10.          2.         ]
 [ 2.17361111  2.69444444]
 [ 3.5625       4.77777778]
 [ 6.34027778  8.25         ]
 [10.50694444 13.11111111]
 [16.0625      19.36111111]
 [23.00694444 27.          ]
 [31.34027778 36.02777778]
 [41.0625      46.44444444]
 [52.17361111 58.25         ]
 [64.67361111 71.44444444]
 [78.5625      86.02777778]
 [93.84027778 102.          ]]
```

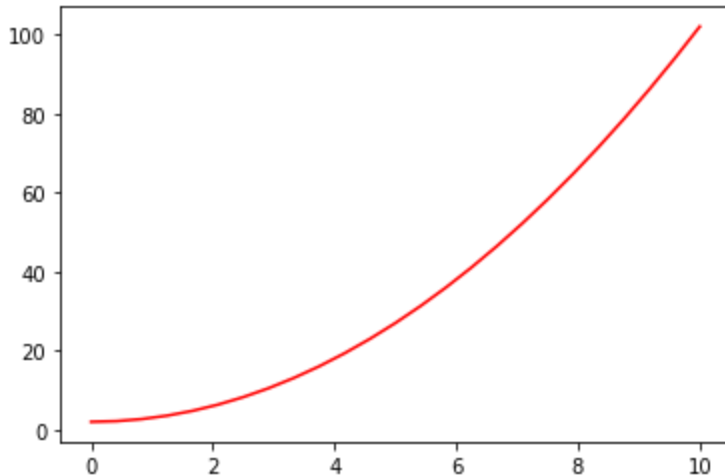
```
In [9]: print(np.array([x,y]).reshape(2,25))
```

```
[[ 0.          0.41666667  0.83333333  1.25          1.66666667
```

2.08333333	2.5	2.91666667	3.33333333	3.75
4.16666667	4.58333333	5.	5.41666667	5.83333333
6.25	6.66666667	7.08333333	7.5	7.91666667
8.33333333	8.75	9.16666667	9.58333333	10.
[ 2.	2.17361111	2.69444444	3.5625	4.77777778
6.34027778	8.25	10.50694444	13.11111111	16.0625
19.36111111	23.00694444	27.	31.34027778	36.02777778
41.0625	46.44444444	52.17361111	58.25	64.67361111
71.44444444	78.5625	86.02777778	93.84027778	102.

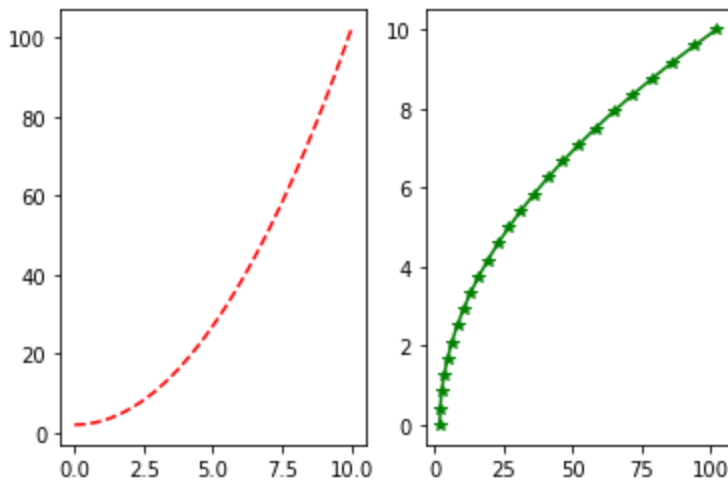
```
In [10]: pylab.plot(x,y,'r')
#Creates a plain canvas and draws the graph
```

```
Out[10]: [<matplotlib.lines.Line2D at 0x7fe268b22c70>]
```



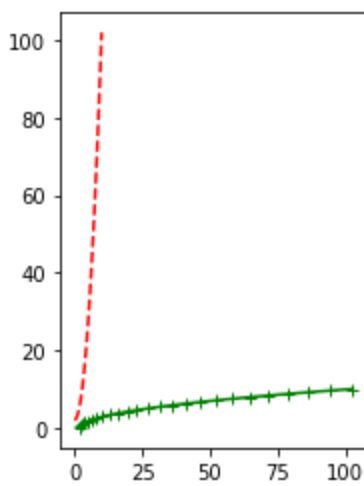
```
In [11]: pylab.subplot(1,2,1) #row, columns, index of current graph
pylab.plot(x,y, 'r--') #Third parameter denotes the color and the line style
pylab.subplot(1,2,2)
pylab.plot(y,x, 'g*-')
```

```
Out[11]: [<matplotlib.lines.Line2D at 0x7fe2585b7e50>]
```



```
In [12]: pylab.subplot(1,2,1) #row, columns, index of current graph
pylab.plot(x,y, 'r--') #Third parameter denotes the color and the line style
pylab.subplot(1,2,1)
pylab.plot(y,x, 'g+--')
```

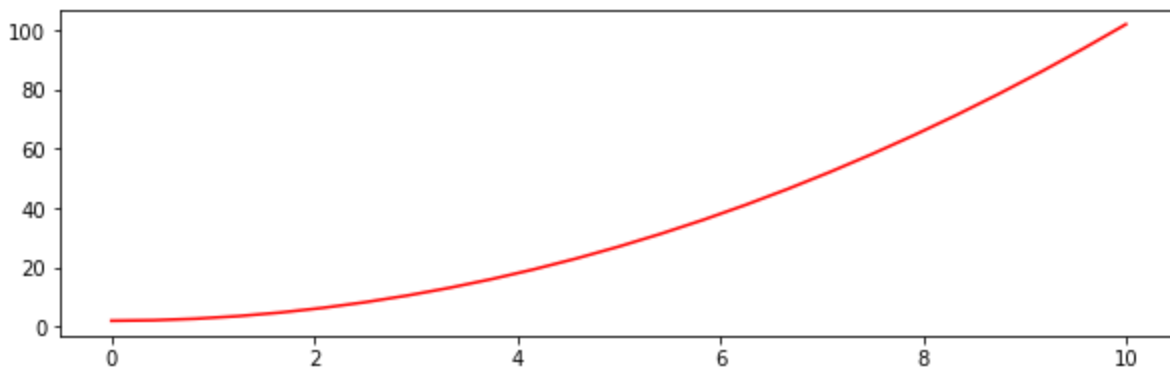
```
Out[12]: [<matplotlib.lines.Line2D at 0x7fe2491e8d00>]
```



In [14]: `from matplotlib import pyplot as plt`

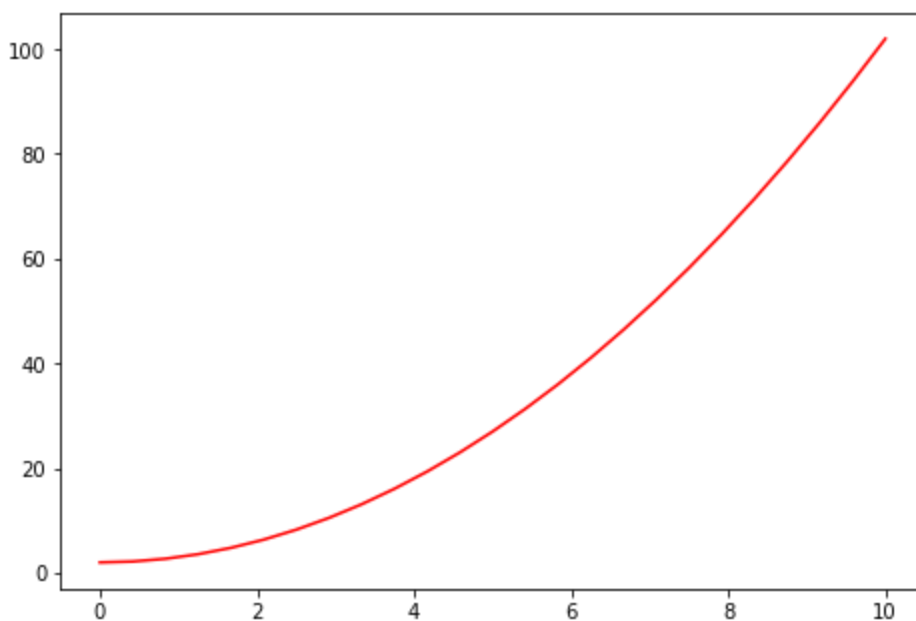
In [15]: `fig = plt.figure(figsize = (10,3)) #Change the y axis size and explore  
plt.plot(x,y,'r')`

Out[15]: [`<matplotlib.lines.Line2D at 0x7fe24921ffa0>`]



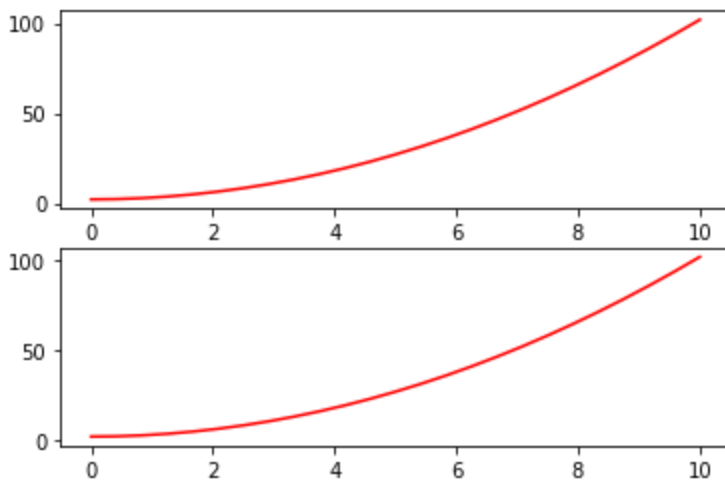
In [16]: `fig = plt.figure()  
axis = fig.add_axes([1,1,1,1]) #Controls the left, bottom, width and height, (0-1)  
axis.plot(x,y,'r') #change the axes proportions and explore`

Out[16]: [`<matplotlib.lines.Line2D at 0x7fe2395162b0>`]



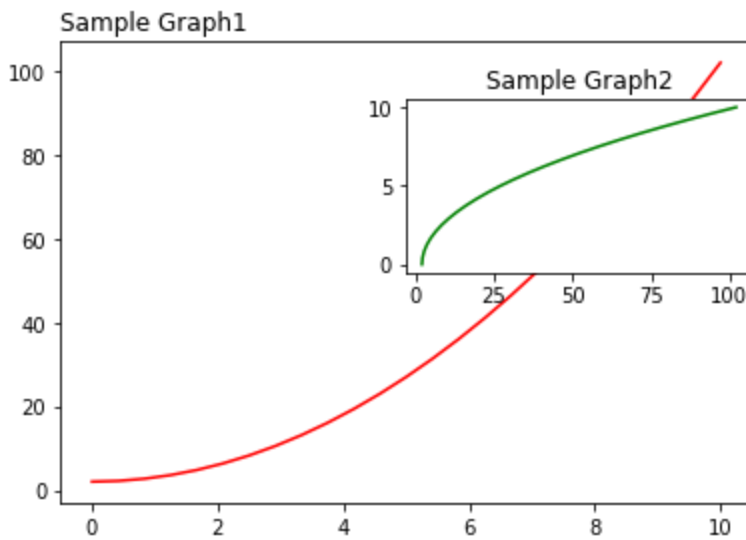
In [17]: `fig, axes = plt.subplots(nrows=2, ncols=1) #Change the values and explore  
for ax in axes:`

```
ax.plot(x,y,'r')
```



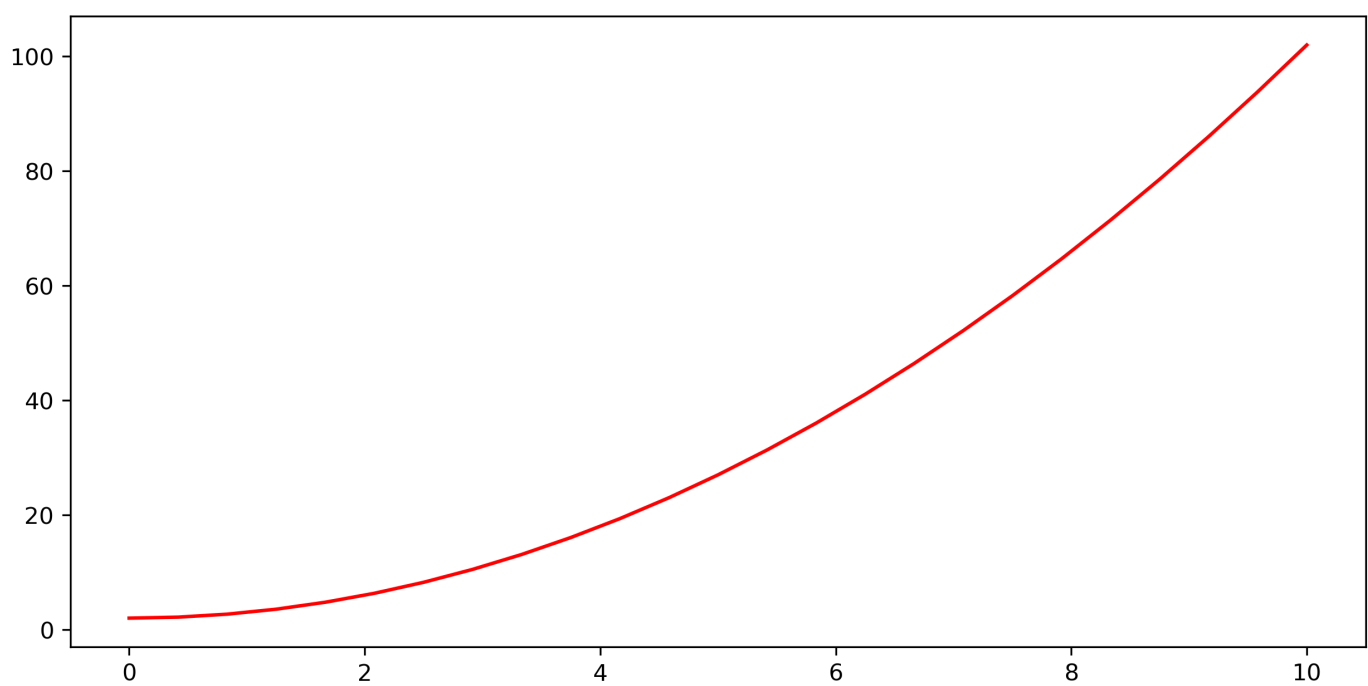
```
In [18]: fig = plt.figure()
axes1 = fig.add_axes([0.1,0.1,0.8,0.8]) #bigger Canvas
axes1 = plt.plot(x,y,'r')
plt.title("Sample Graph1", loc = 'left')
axes2 = fig.add_axes([0.5,0.5,0.4,0.3]) #Smaller Canvas
axes2 = plt.plot(y,x, 'g') #Change the order of statements and explore
plt.title("Sample Graph2")
```

```
Out[18]: Text(0.5, 1.0, 'Sample Graph2')
```



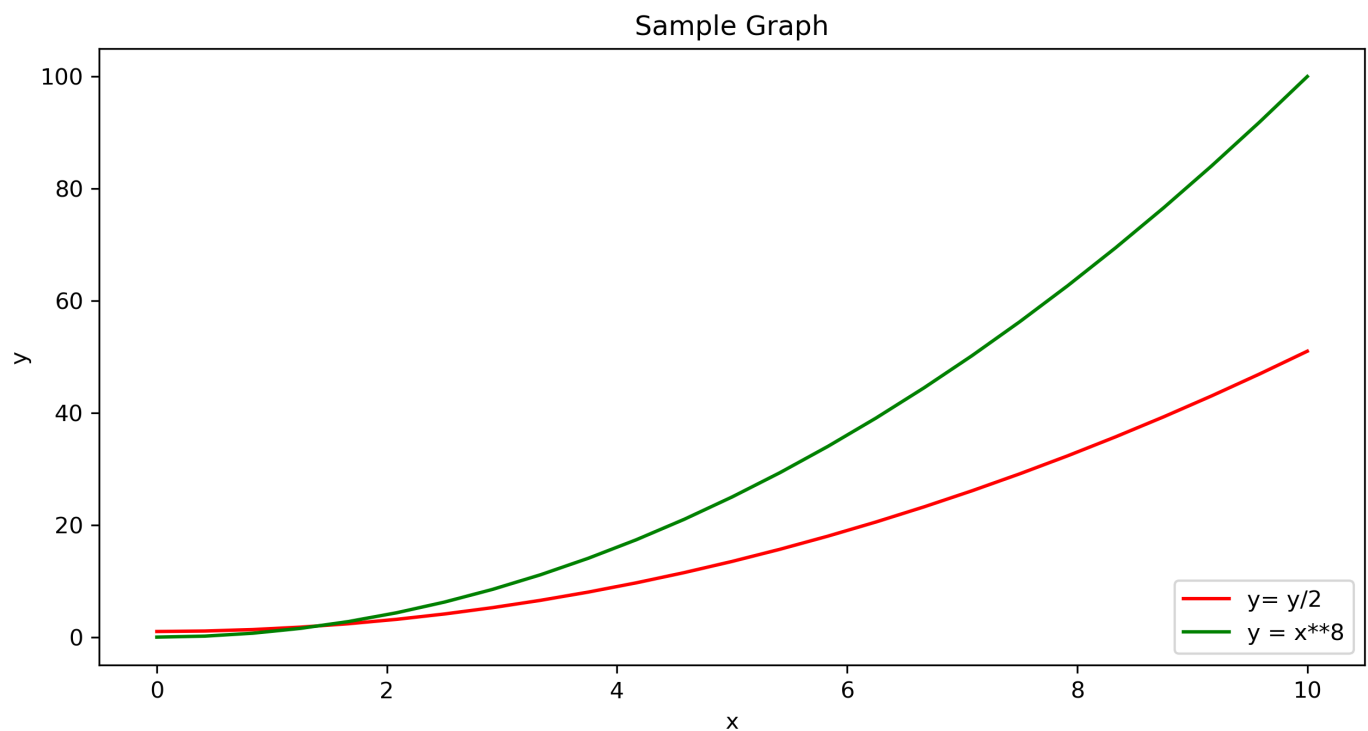
```
In [19]: fig = plt.figure(figsize = (10,5), dpi = 300)
plt.plot(x,y,'r') #increasing the dpi will take time to process the graph
```

```
Out[19]: [<matplotlib.lines.Line2D at 0x7fe2583ebd00>]
```



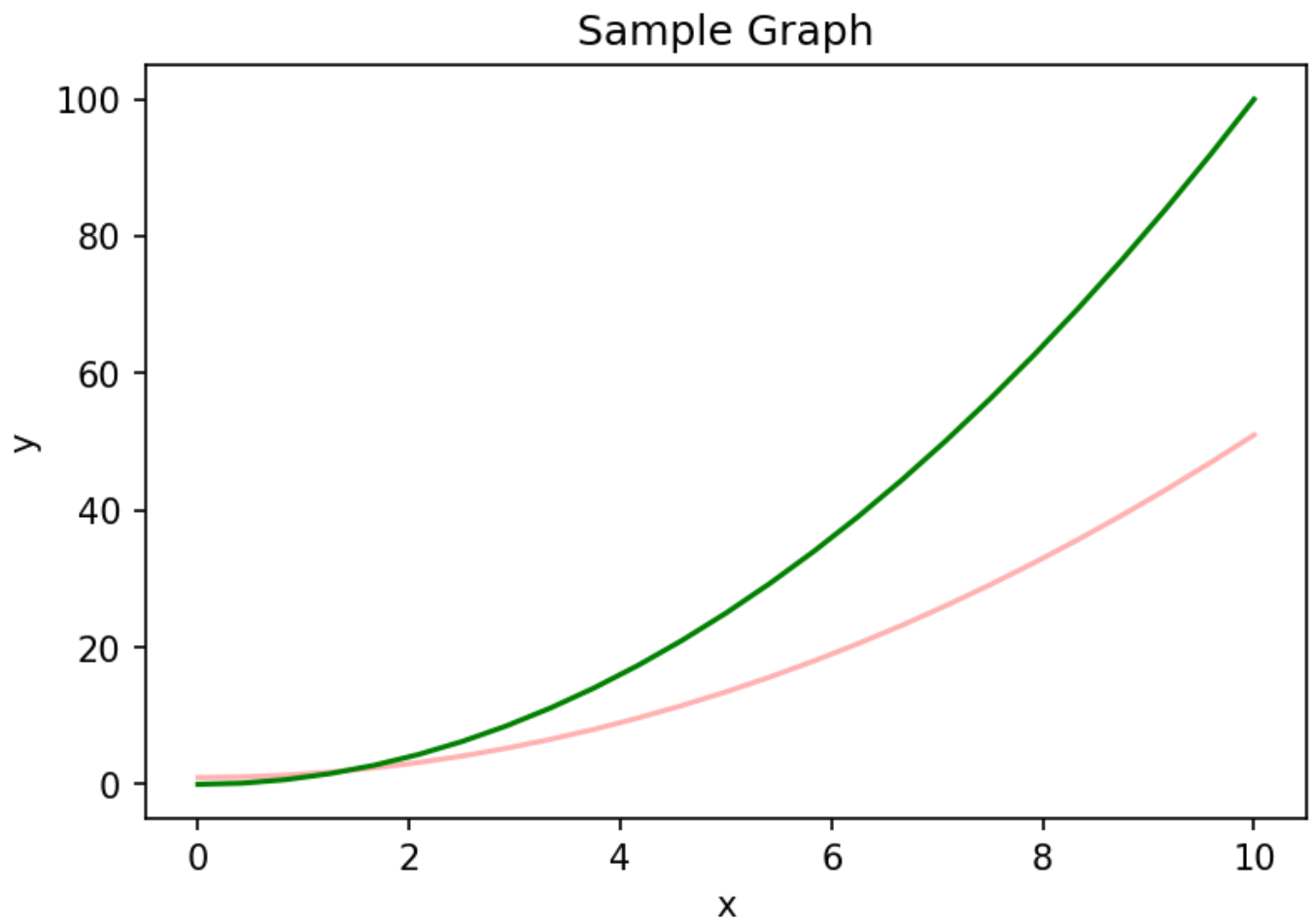
```
In [20]: fig, axes = plt.subplots(figsize = (10,5), dpi=300)
axes.plot(x,y/2, 'r')
axes.plot(x, x**2, 'g')
axes.set_title("Sample Graph")
axes.set_xlabel('x')
axes.set_ylabel('y')
axes.legend(['y= y/2', 'y = x**8'], loc=4)
```

Out[20]: <matplotlib.legend.Legend at 0x7fe23953fe80>



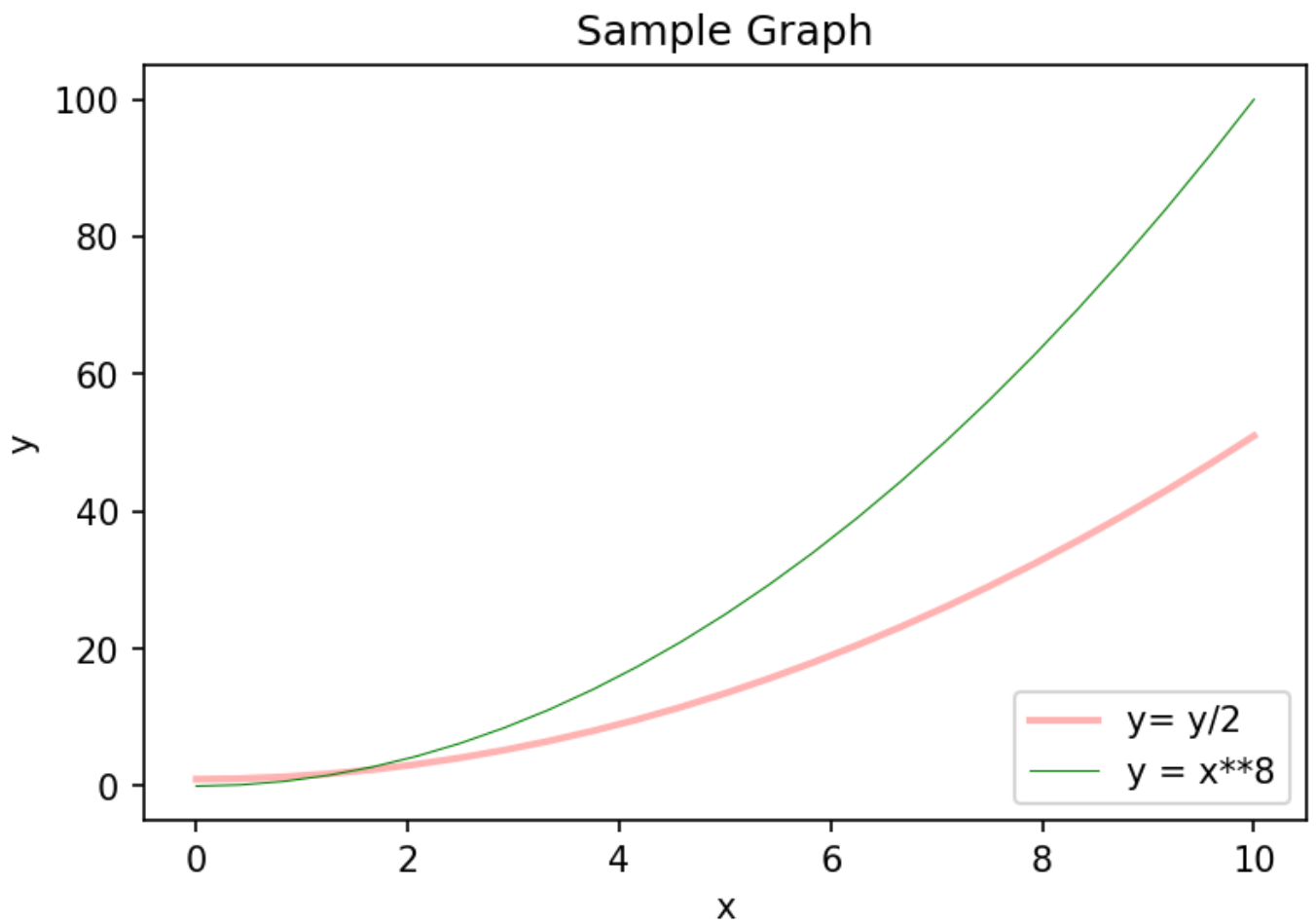
```
In [21]: fig, axes = plt.subplots(dpi=150)
axes.plot(x,y/2, 'r', alpha=0.3)
axes.plot(x, x**2, 'g')
axes.set_title("Sample Graph")
axes.set_xlabel('x')
axes.set_ylabel('y')
```

Out[21]: Text(0, 0.5, 'y')



```
In [22]: fig, axes = plt.subplots(dpi=150)
axes.plot(x,y/2, 'r', alpha=0.3, lw = 2)
axes.plot(x, x**2, 'g', linewidth=0.5)
axes.set_title("Sample Graph")
axes.set_xlabel('x')
axes.set_ylabel('y')
axes.legend(['y= y/2', 'y = x**8'], loc=4)

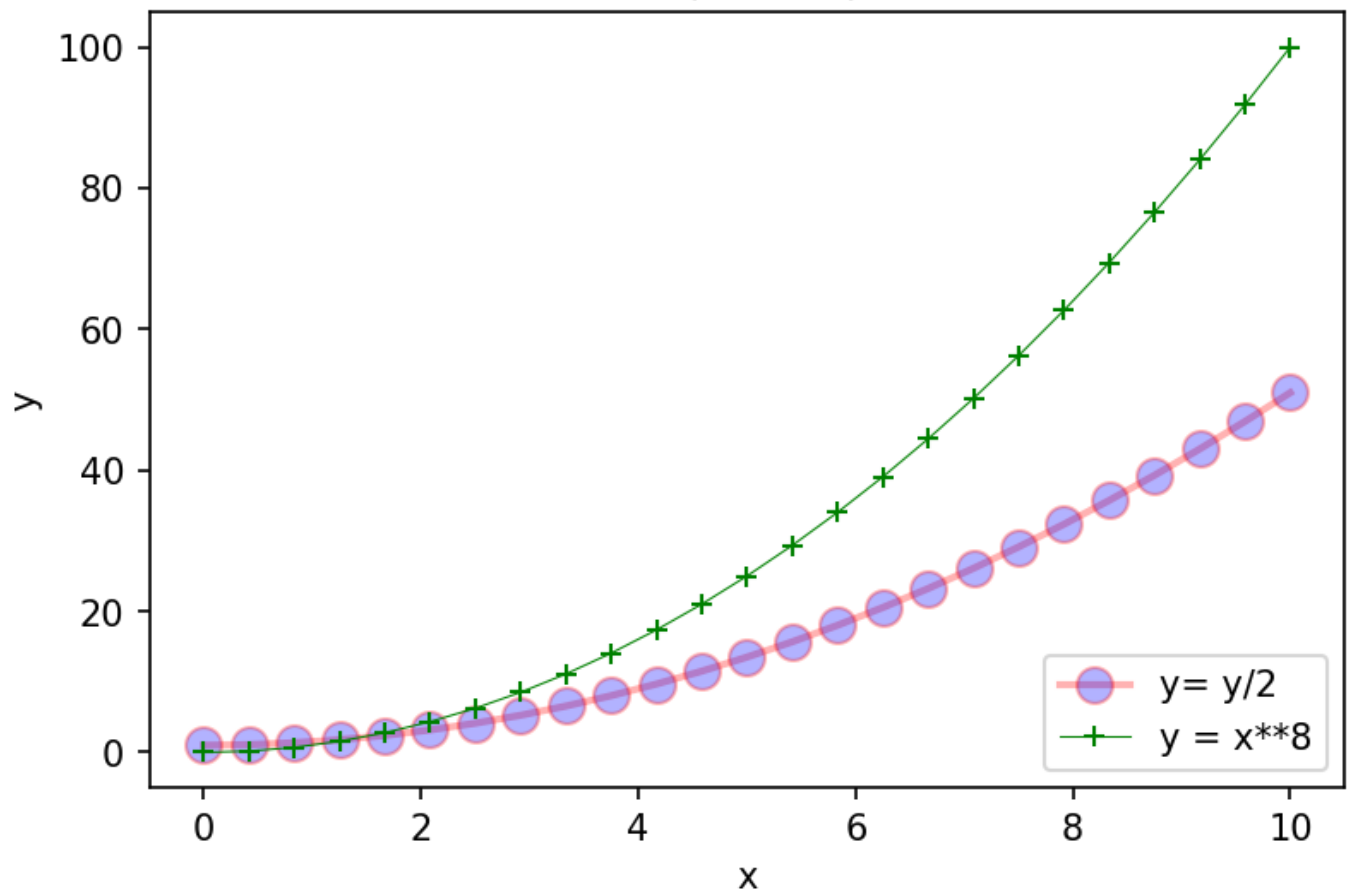
Out[22]: <matplotlib.legend.Legend at 0x7fe258324dc0>
```



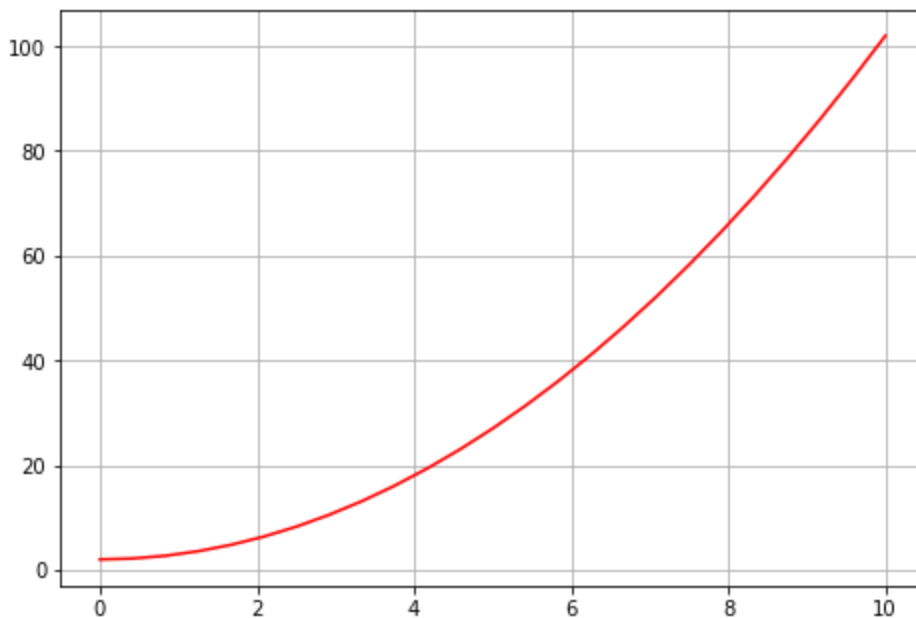
```
In [23]: fig, axes = plt.subplots(dpi=150)
axes.plot(x,y/2, 'r', alpha=0.3, lw = 2, marker = 'o', markersize =10,markerfacecolor ='b')
axes.plot(x, x**2, 'g', linewidth=0.5, marker = '+')
axes.set_title("Sample Graph")
axes.set_xlabel('x')
axes.set_ylabel('y')
axes.legend(['y= y/2', 'y = x**8'], loc=4)
```

Out[23]: <matplotlib.legend.Legend at 0x7fe278088d30>

# Sample Graph



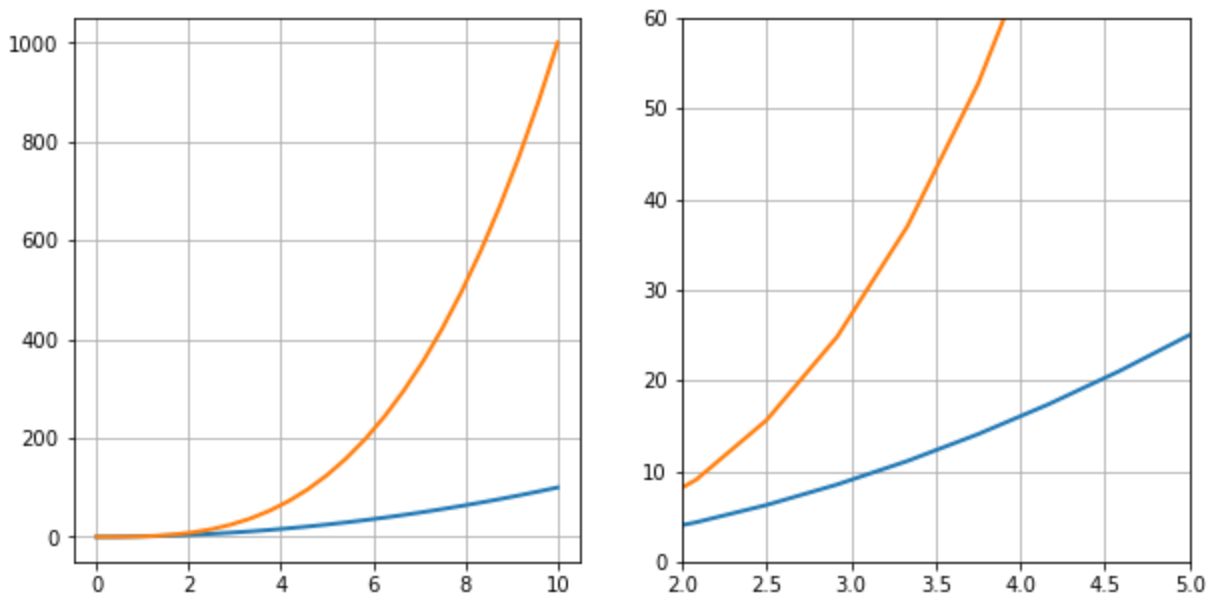
```
In [24]: fig = plt.figure()
axis = fig.add_axes([1,1,1,1]) #Controls the left, bottom, width and height, (0-1)
axis.plot(x,y,'r')
axis.grid(True)
```



```
In [25]: fig, axes = plt.subplots(1,2, figsize = (10,5))
axes[0].plot(x,x**2, x, x**3, lw=2)
axes[0].grid(True)
axes[1].plot(x,x**2, x, x**3, lw=2)
axes[1].grid(True)
axes[1].set_xlim([2,5])
axes[1].set_ylim([0,60])
```



Out[25]: (0.0, 60.0)



```
In [26]: import seaborn as sns
```

```
In [27]: conda install seaborn
```

```
Collecting package metadata (current_repodata.json): done  
Solving environment: done
```

```
# All requested packages already installed.
```

```
Retrieving notices: ...working... done
```

```
Note: you may need to restart the kernel to use updated packages.
```

```
In [28]: sns.color_palette()
```

