Foundations of Neuroimaging
Homework #0: MATLAB warmup

The goal of this homework is to use MATLAB to plot a few simple functions in 1D and 2D (surface) graphs. Here are some useful commands. The goal is to understand the meaning of (reason for) every character in each expression:

```
>> x = 0:0.1:5.0;
>> a = sin(x).*cos(3*x);
>> b = exp(-x.^2);
>> plot(a.*b)
>> [mx,mxindex] = max(a.*b)
>> [X,Y] = meshgrid(x,x);
>> C = sin(X).*exp(-Y.^2);
>> surf(C)
>> Im = double(imread('t1sag.tiff'));
>> FT = fft2(Im);
>> imagesc(abs(fftshift(FT)),[-10000 10000])
```

1. Plot y = x, title graph, label both axes
2. Plot x^2, 1 + x^2, and (x + 1)^2, note different effects of differently positioned 1's.
3. Plot two cycles of a cosine using cosd() and cos(), then plot cos(2x), cos(pi/2+x).
4. Plot a Gaussian function using exp(-x^2), then offset the Gaussian in x.
5. Plot exp(-x^2)*cos(y), find max
6. Plot Fourier transform of: https://pages.ucsd.edu/~msereno/neuroimaging/t1sag.tiff