

1) Start MATLAB.

Enter the following commands to plot A and B functions versus theta.

```
theta=-pi/2:0.01:pi/2;
B=7.5*cos(theta);
Ax=0.6*B-3*sin(theta);
Ay=3*cos(theta)-0.8*B;
A=sqrt(Ax.^2+Ay.^2);
plot(theta,B,theta,A),grid
xlabel('\theta_{0} (rads)')
ylabel('Force (kN)')
Try to use different colors for each plot.
```

2) the growth of the US population between 1790 to 2000 is given by

$$P(t) = 197,273,000 / (1 + e^{-0.0313(t - 1913.25)})$$

where t is the date, in years. What population is predicted in the year 1800?

Ans:

```
t = 1790:2000;
term = 1 + exp(-0.0313*(t - 1913.25));
P = 197273000./term;
plot(t,P)
xlabel('year'), ylabel('population')
P1800 = 197273000/(1 + exp(-0.0313*(1800 - 1913.25)))
```

Use appropriate title for the plot.

3) Use the following MATLAB commands to plot

$$Z=5x^2+3y^2$$

Interval x  
€ [-1,1] and y € [-1,1]

```
[x,y]=meshgrid(-1:0.1:1,-1:0.1:1);
z=5*x.^2+3*y.^2;
contour(x,y,z);
prism;
mesh(x,y,z)
surf(x,y,z)
view([10 30])
```

The mesh grid function creates a 'mesh grid' of x and y values ranging from -1 to 1 in steps of 0.1. If you look at x and y you might get a better idea of how z (a 2D array) is created. The mesh function displays z as a wire mesh and surf displays it as a faceted surface. Prism simply changes the set of colors in the contour plot.