ChE381 Computer Lab
Matlab Exercise

1. Write a MATLAB assignment statement for each of the following functions, assuming that w, x, y, and z are vector quantities of equal length, and that c and d are scalars.

$$f = \frac{1}{\sqrt{(2\pi c)/x}} \qquad E = \frac{x + w/(y+z)}{x + w/(y-z)}$$

$$A = \frac{e^{-c/(2x)}}{(\ln y)\sqrt{dz}} \qquad S = \frac{x(2.15 + 0.35y)^{1.8}}{z(1-x)^y}$$

2.
   Use MATLAB to find the roots of $13s^3 + 182s^2 - 184s + 2503 = 0$, and use `poly` to confirm your answer.

3.
   Use MATLAB to find the polynomial whose roots are $3 \pm 6j$, 8, 8, and 20. Use MATLAB to confirm your answer.

4.
   Use MATLAB to plot the polynomials $y = 3x^4 - 6x^3 + 8x^2 + 4x + 90$ and $z = 3x^3 + 5x^2 - 8x + 70$ over the interval $-3 \le x \le 3$. Properly label the plot and each curve. The variables y and z represent current in milliamps; the variable x represents voltage in volts.

5. Use 'eig( )' to find the eigen values and eigen vectors of the given matrix and also find the coefficients of its characteristic equation using 'poly( )':

$$A = \begin{bmatrix} 3 & 2 & 4 \\ 2 & 0 & 2 \\ 4 & 2 & 3 \end{bmatrix}$$