EXPERIMENT 2

Array (Vector) and Matrix operations using MATLAB

Write MATLAB script files (M-files) for following tasks:

1. The sum of a geometric series $1+r+r^2+r^3+\ldots\ldots\ldots..+r^n= (1-r^N)/(1-r)$; N=number of terms in a series. Accept the value of r and n as input from keyboard. Verify the above equation.
2. Accept a square matrix A of any size from keyboard. Find:
    a. Size of A matrix
    b. Determinant of A matrix
    c. Display whether matrix A is singular or not
    d. Transpose of A matrix
    e. Perform A+A',A-A'
    f. Find inverse of A matrix
    g. Perform A*A' and A.*A'
    h. Find square of A matrix
    i. Find rank of A matrix
    j. Find eigenvalues and eigenvectors of A matrix
3. Create a vector and a matrix with the following commands: v=0:0.2:12 and M=[sin(v); cos(v)]. Find the sizes of v and M and extract the first 10 elements of each row of the matrix and display them as column vectors.
4. The polar equation of a circle is given by: $x=r\cos\theta$, $y=r\sin\theta$. Take $\theta= 0$ to 2π with step size of $\pi/16$ and plot the circle on x-y axis for given value of radius r. Give labels to axis and title to the figure. Make use of new figure and redraw the circle with distinct points shown by 'o' rather than a continuous plot. Now combine the two plots in new figure to show the line through the data points as well as the distinct data points.

Note: Students are required to store all the M-files in this MS-Word document along with results copied in the same document.