

Experiment:3 Two Dimensional Plots

1. Plotting of the functions

1. Plot the below functions and label the axes.

(a) Plot the function $f(t) = (x + 5)^2$ for $-3 \leq x \leq 5$.

(b) Plot the function $f(t) = \frac{5\sin(x)}{x+e^{-0.75x}} - \frac{3}{5}x$ for $-5 \leq x \leq 10$

(c) Use the fplot command to plot the function

$$f(x) = \sqrt{|\cos(3x)|} + \sin^2(4x)$$

2. Plot the $\cos(x)$ and $\sin(x)$ for $-\pi \leq x \leq \pi$ into the same plot.

2. Span of Vectors using quiver3 command

1. Using the quiver3 command together with hold on, plot the vectors. Check whether the column vectors are linearly dependent or independent by observing their geometric structure.

$$(a) \ v_1 = \begin{bmatrix} 1 \\ 3 \\ -5 \end{bmatrix}, v_2 = \begin{bmatrix} 2 \\ 3 \\ 1 \end{bmatrix}, v_3 = \begin{bmatrix} 5 \\ 9 \\ -3 \end{bmatrix}$$

2. Write a MATLAB program as a function to create a plot of the span of the two vectors $v_1 = \begin{bmatrix} 5 \\ 4 \\ 0 \end{bmatrix}$ and $v_2 = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ in R^3

3. Classification of singular and non singular matrix using if statement

Check Whether the given matrices are non-singular or not and if matrix is non singular find its inverse.

$$\begin{bmatrix} 1 & 3 \\ 2 & 5 \end{bmatrix}, \begin{bmatrix} 1 & 3 & 3 \\ 3 & 4 & 6 \\ 8 & 9 & 0 \end{bmatrix}$$

Algorithm

```
// Input: Matrix A
// Output: if matrix is singular than print singular otherwise show its inverse
```

Step1: Input one matrix.

Step2:

if the determinant of A is not equal to zero.

 print A is non singular.

 print inverse of A

else

 print A is singular

end if

4. Matrix multiplication using for loop

For the given matrices

$$A = \begin{bmatrix} 1 & 3 & 4 \\ 5 & -9 & -8 \\ 4 & 7 & 8 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 6 & 7 \\ -1 & -5 & 1 \\ 1 & 9 & 0 \end{bmatrix}$$

Find AB .

Algorithm

```
// Input: Matrix A and B
```

```
// Output: Matrix AB
```

Step1: Input two matrix.

Step2: Define one resultant matrix which is initially contains all 0 of required order

Step 3:

for i from 1 to m_1 (iterate through rows of A)

 for j from 1 to m_2 (iterate through columns of B)

 for k from 1 to m_3 (iterate through rows of B)

 element for resultant matrix

 end for

 end for

end for