Sri Lanka Institute of Information Technology
B. Sc Degree in IT/IS/CSN, Diploma in Information Technology
Year 01 – Semester I – 2021
Mathematics for Computing (IT1030)
Tutorial 11

1. Calculate the determinates

a) $\begin{vmatrix} 1 & 2 \\ -1 & 3 \end{vmatrix}$

b) $\begin{vmatrix} 1 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 1 \end{vmatrix}$

c) $\begin{vmatrix} 1 & -1 & 2 \\ 3 & 1 & -1 \\ 2 & 1 & -1 \end{vmatrix}$

d) $\begin{vmatrix} 2 & 1 & 0 & -1 \\ 0 & 0 & 2 & 0 \\ 3 & -1 & 2 & 1 \\ 0 & 1 & -1 & 1 \end{vmatrix}$

e) $\begin{vmatrix} 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \end{vmatrix}$

f) $\begin{vmatrix} 2 & 1 & 0 & 0 & 0 \\ 1 & 2 & 1 & 0 & 0 \\ 0 & 1 & 2 & 1 & 0 \\ 0 & 0 & 1 & 2 & 1 \\ 0 & 0 & 0 & 1 & 2 \end{vmatrix}$

6. Find the value of a which makes the determinant

$$\begin{vmatrix} 1 & 1 & -1 \\ 1 & a & 2 \\ -1 & 1 & 2 \end{vmatrix}$$ equal to zero.

7. Calculate det A , det B , det (AB) , A^{T} ,det (A^{T}) ,adj A,det(adj A), A^{-1} and det A^{-1} for A and B given below:

$$A = \begin{bmatrix} 1 & 2 & -1 \\ 0 & 1 & 2 \\ 1 & 3 & -1 \end{bmatrix}, \qquad B = \begin{bmatrix} 1 & 2 & -1 \\ 0 & 3 & 1 \\ 2 & 1 & 3 \end{bmatrix},$$

8. Find the products AB and BA, and confirm that B is the inverse of A for A and B given below:

$$A = \begin{bmatrix} 2 & 0 & 1 \\ 2 & -2 & 2 \\ 0 & 4 & -4 \end{bmatrix} \qquad B = \begin{bmatrix} 0 & \frac{1}{2} & \frac{1}{4} \\ 1 & -1 & -\frac{1}{4} \\ 1 & -1 & -\frac{1}{2} \end{bmatrix}$$

9. Find the inverse of

$$\begin{bmatrix} 1 & \lambda & 0 \\ 0 & 1 & \lambda \\ 0 & 0 & 1 \end{bmatrix} \text{ and } \begin{bmatrix} 1 & 0 & 0 \\ \mu & 1 & 0 \\ 0 & \mu & 1 \end{bmatrix}$$

Hence find the inverse of $\begin{bmatrix} 1+\lambda\mu & \lambda & 0 \\ \mu & 1+\lambda\mu & \lambda \\ 0 & \mu & 1 \end{bmatrix}$ and $\begin{bmatrix} 13 & 3 & 0 \\ 4 & 13 & 3 \\ 0 & 4 & 1 \end{bmatrix}$.