

## Matrices Tutorial 2

**Q1. Write down the transpose of the following:**

$$i) \quad A = \begin{bmatrix} 1 & 6 & 9 \\ 7 & 8 & -12 \\ 3 & 0 & 1 \end{bmatrix} \quad ii) \quad B = \begin{bmatrix} 1 \\ -3 \\ 0 \end{bmatrix} \quad iii) \quad C = \begin{bmatrix} 3 & 4 \\ -3 & 0 \end{bmatrix}$$

**Q2. Using the matrices above, determine:**

$$(i) \quad AA^T \quad (ii) \quad BB^T \quad (iii) \quad CC^T$$

What property do all these matrices share?

**Q3. Write down the identity matrix for a 2x2 and a 3x3 matrix respectively**

**Q4. Find the determinant and inverse of each of the following matrices:**

$$i) \quad A = \begin{bmatrix} 1 & 2 \\ 0 & -1 \end{bmatrix} \quad ii) \quad B = \begin{bmatrix} 3 & 4 \\ 5 & 2 \end{bmatrix} \quad iii) \quad C = \begin{bmatrix} 2 & -1 \\ 3 & 2 \end{bmatrix}$$

**Q5. Find the determinant of the matrix A given below:**

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 1 & 5 \\ 6 & 0 & 2 \end{bmatrix}$$

**Q6. Calculate the inverse of the matrices:**

$$i) \quad A = \begin{bmatrix} 2 & -3 & 1 \\ 5 & -1 & 2 \\ 3 & 2 & -1 \end{bmatrix} \quad ii) \quad B = \begin{bmatrix} 1 & 1 & 1 \\ 3 & -2 & -3 \\ 2 & 1 & -3 \end{bmatrix}$$