

## Matrices Tutorial 2

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

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

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

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

What property do all these matrices share?

**Q3.** Write down the identity matrix for a  $2 \times 2$  and a  $3 \times 3$  matrix respectively

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

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

**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:

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