Assignment - 2

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***Abstract*—This document contains ICSE Class 12 Maths 2018 1(ii).**

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If matrix $\mathbf{A} = \begin{pmatrix} 5 & a \\ b & 0 \end{pmatrix}$ and $\mathbf{A}$ is symmetric matrix, then show that a = b .

Solution:

Given,

$$\mathbf{A} = \begin{pmatrix} 5 & a \\ b & 0 \end{pmatrix} \tag{1}$$

Also, $\mathbf{A}$ is symmetric

$$\implies \mathbf{A} = \mathbf{A^T} \tag{2}$$

As

$$\mathbf{A} = \{a_{ij}\} = \begin{pmatrix} 5 & a \\ b & 0 \end{pmatrix}, \tag{3}$$

$$\mathbf{A^T} = \{b_{ij}\} = \begin{pmatrix} 5 & b \\ a & 0 \end{pmatrix}. \tag{4}$$

And,

We also know that two matrices are said to be equal if and only if all the elements in the corresponding positions are equal.

So, Comparing the element in the second column of the first row of both the matrices.

$$\mathbf{A} = \mathbf{A^T} \implies a_{12} = b_{12} \tag{5}$$

$$\implies a = b \tag{6}$$

Where,

$a_{12} \implies$ The element in the second column of the first row of matrix $\mathbf{A}$ and

$b_{12} \implies$ The element in the second column of the first row of matrix $\mathbf{A^T}$