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

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

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,

$$\mathbf{A} = \mathbf{A^T} \implies A_{12} = A_{21}^T \tag{4}$$

$$\implies a = b \tag{5}$$

Where,

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

$A_{21}^T \implies$ The element in the first column of the second row of matrix $\mathbf{A^T}$