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 $\mathbf{a} = \mathbf{b}$.

Solution:

Given,

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

Also, A is symmetric

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

As

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

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,

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

$$\implies a = b$$
 (5)

Where,

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

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