


Date Planned : __ / __ / __	Daily Tutorial Sheet – 16	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level – 3 	Exact Duration : _____

174. If $\Delta(x) = \begin{vmatrix} \alpha + x & \theta + x & \lambda + x \\ \beta + x & \phi + x & \mu + x \\ \gamma + x & \psi + x & \nu + x \end{vmatrix}$, show that $\Delta'(x) = 0$ and $\Delta(x) = \Delta(0) + Sx$, where S denotes the sum of all the cofactors of all elements in $\Delta(0)$ and dash denotes the derivative with respect to x .
175. Find the characteristic roots of the two rowed orthogonal matrix $\begin{bmatrix} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{bmatrix}$ and verify that they are of unit modulus.
176. Prove that the product of the characteristic roots of a square matrix of order n is equal to the determinant of the matrix.
177. If A is nonsingular, prove that the eigen values of A^{-1} are the reciprocals of the eigen value of A .
178. If α is a characteristic root of a nonsingular matrix, then prove that $|A/\alpha|$ is a characteristic root of $\text{adj } A$.
179. If one of the eigen values of a square matrix A order of 3×3 is zero, then prove that $\det A = 0$.