KRONECKER PRODUCT :

A is MATRIX $m \times m$
B is MATRIX $p \times q$
$A \otimes B$ is MATRIX $mp \times mq$

$$A \otimes B = \begin{bmatrix} a_{11} B & \cdots & a_{1m} B \\ \vdots & \ddots & \vdots \\ a_{m1} B & \cdots & a_{mm} B \end{bmatrix}$$

FOR $A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}$ AND $B = \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix}$

WE HAVE

$$A \otimes B = \begin{bmatrix} a_{11} b_{11} & a_{11} b_{12} & a_{12} b_{11} & a_{12} b_{12} \\ a_{11} b_{21} & a_{11} b_{22} & a_{12} b_{21} & a_{12} b_{22} \\ a_{21} b_{11} & a_{21} b_{12} & a_{22} b_{11} & a_{22} b_{12} \\ a_{21} b_{21} & a_{21} b_{22} & a_{22} b_{21} & a_{22} b_{22} \end{bmatrix}$$

GEOMETRIC SERIES :

$$\sum_{n=0}^{\infty} \lambda^n A_x^n = 1 + \lambda A_x \sum_{n=0}^{\infty} \lambda^n A_x^n \Rightarrow \sum_{n=0}^{\infty} \lambda^n A_x^n = \left[I - \lambda A_x \right]^{-1}$$