② Cho các ma trận

$A=\begin{vmatrix} 2 & 0 \\ 0 & 1 \end{vmatrix}$ $P=\begin{vmatrix} 1 & 2 \\ 1 & 3 \end{vmatrix}$ $Q=\begin{vmatrix} 3 & -2 \\ -1 & 1 \end{vmatrix}$

a) Tính PAQ

b) Tính $(PAQ)^5$

BG

a) $P.A=\begin{vmatrix} 1 & 2 \\ 1 & 3 \end{vmatrix}.\begin{vmatrix} 2 & 0 \\ 0 & 1 \end{vmatrix}=\begin{vmatrix} x_{11} & x_{12} \\ x_{21} & x_{22} \end{vmatrix}$

⊕

$\left.\begin{array}{l} x_{11}=1.2+2.0=2 \\ x_{12}=1.0+2.1=2 \\ x_{21}=1.2+3.0=2 \\ x_{22}=1.0+3.1=3 \end{array}\right\} \Rightarrow P.Q=\begin{vmatrix} 2 & 2 \\ 2 & 3 \end{vmatrix}$

⊕ $PA.Q=(P.A).Q=\begin{vmatrix} 2 & 2 \\ 2 & 3 \end{vmatrix}.\begin{vmatrix} 3 & -2 \\ -1 & 1 \end{vmatrix}=\begin{vmatrix} y_{11} & y_{12} \\ y_{21} & y_{22} \end{vmatrix}$

$\left.\begin{array}{l} y_{11}=2.3+2.(-1)=4 \\ y_{12}=2.(-2)+2.1=-2 \\ y_{22}=2.(-2)+3.1=-1 \\ y_{21}=2.3+3.(-1)=3 \end{array}\right\} \Rightarrow PAQ=\begin{vmatrix} 4 & -2 \\ 3 & -1 \end{vmatrix}$

b) $(PAQ)^{\$1}=\begin{vmatrix} 4 & -2 \\ 3 & -1 \end{vmatrix}$

$(PAQ)^2=\begin{vmatrix} 4 & -2 \\ 3 & -1 \end{vmatrix}.\begin{vmatrix} 4 & -2 \\ 3 & -1 \end{vmatrix}=\begin{vmatrix} 10 & -6 \\ 9 & 5 \end{vmatrix}$

$(PAQ)^3=(PAQ)^2.(PAQ)=\begin{vmatrix} 10 & -6 \\ 9 & 5 \end{vmatrix}.\begin{vmatrix} 4 & -2 \\ 3 & -1 \end{vmatrix}=\begin{vmatrix} 22 & -14 \\ 51 & -23 \end{vmatrix}$

Thứ

Ngày . . No.

$$(PAQ)^4 = (PAQ)^3 \cdot (PAQ) = \begin{vmatrix} 22 & -14 \\ 51 & -23 \end{vmatrix} \cdot \begin{vmatrix} 4 & -2 \\ 3 & -1 \end{vmatrix} = \begin{vmatrix} 46 & -30 \\ 135 & -79 \end{vmatrix}$$

$$(PAQ)^5 = (PAQ)^4 \cdot (PAQ) = \begin{vmatrix} 46 & -30 \\ 135 & -79 \end{vmatrix} \cdot \begin{vmatrix} 4 & -3 \\ 3 & -1 \end{vmatrix} = \begin{vmatrix} 94 & -108 \\ 803 & -326 \end{vmatrix}$$