Exercises October 25, 2016

I Calculate A^n by dividing λ^n by $\Phi_A(\lambda)$ and using C-H.

(X of oct 18)

(i) $A = \begin{pmatrix} 7 & 4 \\ -1 & 3 \end{pmatrix}$ (ii) $A = \begin{pmatrix} 5 & -1 \\ 9 & -1 \end{pmatrix}$

II Calculate A^n by dividing λ^n by $\Phi_A(\lambda)$ and using C-H.

(i) $A = \begin{pmatrix} 1 & 2 \\ 3 & -4 \end{pmatrix}$ (ii) $A = \begin{pmatrix} -4 & -2 \\ 3 & 1 \end{pmatrix}$

(iii) $A = \begin{pmatrix} 1 & 12 \\ 3 & 1 \end{pmatrix}$

III Try to calculate A^n without dividing λ^n by $\Phi_A(n)$

(i) $A = \begin{pmatrix} 7 & 4 \\ -1 & 3 \end{pmatrix}$ (ii) $A = \begin{pmatrix} 5 & -1 \\ 9 & -1 \end{pmatrix}$.

IV Calculate $A^3 - A^2 - 8A + I_2$ for

(XII of oct 18) $A = \begin{pmatrix} 1 & 1 \\ 3 & 2 \end{pmatrix}$ by using C-H.

V Calculate the following.

(i) $\begin{pmatrix} 1 & 0 & \lambda \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}\begin{pmatrix} x & p \\ y & q \\ z & r \end{pmatrix}$

(ii) $\begin{pmatrix} 1 & 0 & 0 \\ \lambda & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}\begin{pmatrix} x & p \\ y & q \\ z & r \end{pmatrix}$

(iii) $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & \lambda \\ 0 & 0 & 1 \end{pmatrix}\begin{pmatrix} x & p \\ y & q \\ z & r \end{pmatrix}$

(iv) $\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}\begin{pmatrix} x & p \\ y & q \\ z & r \end{pmatrix}$

(v) $\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}\begin{pmatrix} x & p \\ y & q \\ z & r \end{pmatrix}$

(vi) $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}\begin{pmatrix} x & p \\ y & q \\ z & r \end{pmatrix}$

(vii) $\begin{pmatrix} 1 & 0 & 0 \\ 0 & \lambda & 0 \\ 0 & 0 & 1 \end{pmatrix}\begin{pmatrix} x & p \\ y & q \\ z & r \end{pmatrix}$

(viii) $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & \lambda \end{pmatrix}\begin{pmatrix} x & p \\ y & q \\ z & r \end{pmatrix}$

(ix) $\begin{pmatrix} x & p & \alpha \\ y & q & \beta \\ z & r & \gamma \end{pmatrix}\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ \lambda & 0 & 1 \end{pmatrix}$

(x) $\begin{pmatrix} x & p & \alpha \\ y & q & \beta \\ z & r & \gamma \end{pmatrix}\begin{pmatrix} 1 & 0 & 0 \\ \lambda & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

(xi) $\begin{pmatrix} x & p & \alpha \\ y & q & \beta \\ z & r & \gamma \end{pmatrix}\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & \lambda \\ 0 & 0 & 1 \end{pmatrix}$

(xii) $\begin{pmatrix} x & p & \alpha \\ y & q & \beta \\ z & r & \gamma \end{pmatrix}\begin{pmatrix} \lambda & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

(xiii) $\begin{pmatrix} 1 & 0 & \lambda \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}\begin{pmatrix} 1 & 0 & \mu \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

(xiv) $\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$

(xv) $\begin{pmatrix} a & d & e \\ 0 & b & f \\ 0 & 0 & c \end{pmatrix}\begin{pmatrix} x & u & v \\ 0 & y & w \\ 0 & 0 & z \end{pmatrix}$

(xvi) $\begin{pmatrix} a & 0 & 0 \\ d & b & 0 \\ e & f & c \end{pmatrix}\begin{pmatrix} x & 0 & 0 \\ u & y & 0 \\ v & w & z \end{pmatrix}$