Ch4 : Spectra theory

→ Finding eigen vectors and eigenvalues

1. Finding eigen values (λ) :
$\det(xI - A) = 0$

2. For each (λ) finding the basic eigen vector :
$(\lambda I - A)X = 0$

→ Diagonalisable

$A_{n\times n}$ is diagonalisable if there exist an invertible matrix P such that $P^{-1}AP = D$

$$D = \begin{bmatrix} \lambda_1 & 0 & 0 \\ 0 & \lambda_2 & 0 \\ 0 & 0 & \lambda_3 \end{bmatrix}$$

$P = [x_1 \; x_2 \; \dots \; x_n]$
x : eigenvectors of A.

N.B !!

. A and D are similar
→ $\det(A) = \det(D)$
→ $trace(A) = trace(D)$

$trace = a_{11} + a_{22} + a_{33} + \dots + a_{nn}$

. $A^n = PD^nP^{-1}$