

12.665

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Question

The product of eigenvalues of

$$\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$$

- 1 -1
- 2 1
- 3 0
- 4 2

Equation 1

Let

$$\mathbf{A} = \begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix} \quad (1)$$

Let λ be the eigen value of the \mathbf{A} . Then,

$$|\mathbf{A} - \lambda \mathbf{I}| = 0 \quad (2)$$

Theoretical Solution

$$\begin{vmatrix} -\lambda & 0 & 1 \\ 0 & 1-\lambda & 0 \\ 1 & 0 & -\lambda \end{vmatrix} = 0 \quad (3)$$

$$-\lambda(1-\lambda)(-\lambda) + 1(-(1-\lambda)) = 0 \quad (4)$$

$$\lambda^2(1-\lambda) - (1-\lambda) = 0 \quad (5)$$

$$(\lambda^2 - 1)(1-\lambda) = 0 \quad (6)$$

$$\lambda = 1 \text{ and } \lambda = -1 \quad (7)$$

Product of two eigen values is -1