

QUESTION

Show that if λ is a non-zero eigenvalue of the invertible $n \times n$ matrix A then λ^{-1} is an eigenvalue of A^{-1} . Illustrate the theorem with a matrix of your choice.

ANSWER

If $A\mathbf{x} = \lambda\mathbf{x}$ then $\frac{1}{\lambda}\mathbf{x} = A^{-1}\mathbf{x}$. Any invertible matrix will do for the illustration (but one hopes that students will not choose a 1×1 matrix).