
Exercise 1 Let $A = \begin{bmatrix} 2 & 3 & -3 \\ 1 & 0 & -1 \\ 1 & 1 & -2 \end{bmatrix}$ and let $B = \begin{bmatrix} 0 & 1 & 0 \\ 3 & 0 & 1 \\ 2 & 0 & 0 \end{bmatrix}$.

Each of these matrices has the same characteristic polynomial, $(2 - \lambda)(1 + \lambda)^2$. Which of the following is true? (Justify your answer.)

Multiple Choice:

1. *A is diagonalizable but B is not diagonalizable.*
2. *A is not diagonalizable but B is diagonalizable.*
3. *Both A and B are diagonalizable.*
4. *Neither A nor B is diagonalizable.*

Source

[Nicholson] W. Keith Nicholson, *Linear Algebra with Applications*, Lyryx 2021, Open Edition, Problem 3.3.26.