

Part 1

Question: 1. (a)

Answer: We are given the matrix,

$$A = \begin{bmatrix} 1 & 3 \\ 3 & 9 \end{bmatrix} \quad (1)$$

Using MATLAB, it's Eigenvalues were found to be,

$$\Lambda = \begin{bmatrix} 0 & 0 \\ 0 & 10 \end{bmatrix} \quad (2)$$

\therefore the matrix A is *positive semidefinite*, i.e., $A \succcurlyeq 0$

Part 2

Question: 1.

Answer: