The matrix $A$ is diagonalizable if there exist $n$ linearly independent eigenvectors $v_1, v_2, \ldots, v_n$ such that

$$A = SD S^{-1}$$

where $D$ is a diagonal matrix.

For the given matrix $A = \begin{bmatrix} 2 & 2 \\ 1 & 3 \end{bmatrix}$,

$$D = \begin{bmatrix} 1 & 2 \\ 1 & -1 \end{bmatrix}$$

and

$$S = \begin{bmatrix} 4/3 & 8/3 \\ 1/3 & -1/3 \end{bmatrix}$$

are the diagonal matrix and the matrix of eigenvectors, respectively.