Worksheet: eigenstuff, and diagonalizing matrices

(a) For each matrix, compute the eigenvalues and eigenvectors by hand. Confirm your result using computer assistance.

(b) Is the matrix diagonalizable? If it is, form a (convenient) invertible matrix X of eigenvectors, and a diagonal matrix Λ of eigenvalues

(c) If the matrix was diagonalizable, confirm that $A = X\Lambda X^{-1}$. This step may be done with computer assistance.

1. $A = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 2 & 1 \\ 0 & 0 & 3 \end{bmatrix}$

2. $B = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$

3. $C = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 1 \end{bmatrix}$