Problem 1. Find the transition matrix from basis $B$ to basis $B'$ if
$$B = \{(1,0,0), (0,1,0), (0,0,1)\}$$
and
$$B' = \{(2,4,-6), (1,-4,-6), (1,2,-1)\}.$$

Problem 2. Find eigenvalues and corresponding eigenvectors of

(a) \[ A = \begin{bmatrix} 1 & -1 & 4 \\ 0 & 1 & 1 \\ 0 & 0 & 2 \end{bmatrix} \]

(b) \[ B = \begin{bmatrix} 6 & -3 & 2 \\ -2 & 1 & 2 \\ 0 & 0 & -3 \end{bmatrix}. \]

Problem 3. Is it true that matrices $A$ and $B$ from Problem 2 are similar?

Problem 4. Please, check if matrices $A$ and $B$ from Problem 2 are diagonalizable. If yes, please, find a corresponding diagonal matrix.