

WORKSHEET 3/30/23
MATH 2331, SPRING 2023

- (1) Decide whether the following matrix is diagonalizable:

$$\begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 0 & 2 & 3 & 4 & 5 & 6 \\ 0 & 0 & 3 & 4 & 5 & 6 \\ 0 & 0 & 0 & 4 & 5 & 6 \\ 0 & 0 & 0 & 0 & 5 & 6 \\ 0 & 0 & 0 & 0 & 0 & 6 \end{bmatrix}$$

- (2) Find the eigenvalues of the matrix $A = \begin{bmatrix} 1 & 0 & 0 \\ -4 & 0 & 2 \\ 0 & 0 & 1 \end{bmatrix}$.

- (3) Find a basis for each of the eigenspaces of the matrix from #3.

- (4) Is A diagonalizable? If so, write down an invertible matrix S and a diagonal matrix B such that $B = S^{-1}AS$.