

WORKSHEET 3/15/23
MATH 2331, SPRING 2023

- (1) Calculate the determinant of the following matrix:

$$A = \begin{bmatrix} 0 & 2 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 8 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 2 \\ 3 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 5 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \end{bmatrix}$$

- (2) Calculate the determinant of the following matrix:

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

Do you notice anything?

- (3) Compare the determinant of the 2×2 matrix A with the determinant of each of the following matrices:
- (a) the matrix obtained by swapping the rows of A ;
 - (b) the matrix obtained by scaling a row of A ;
 - (c) the matrix obtained by adding a multiple of one row of A to another.

- (4) Use row reduction to calculate the determinant of the matrix

$$A = \begin{bmatrix} 0 & 7 & 5 & 3 \\ 1 & 1 & 2 & 1 \\ 1 & 1 & 2 & -1 \\ 1 & 1 & 1 & 2 \end{bmatrix}.$$