

Math 221
Class Exercises: Jan. 26

1. Determine the LU factorization for B .

$$B = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 3 & 7 \\ 0 & 2 & -2 \end{bmatrix}$$

2. Solve the linear system $Ax = b$ with $A = LU$ where L , U , and b given as

$$L = \begin{bmatrix} 1 & 0 \\ 2 & 1 \end{bmatrix} \quad U = \begin{bmatrix} 3 & 0 & 2 & -1 \\ 0 & 4 & 2 & 1 \end{bmatrix} \quad b = \begin{bmatrix} 4 \\ 6 \end{bmatrix}$$

Do not reconstruct A and perform elimination. Make use of the factorization.

3. Let A be an $n \times n$ singular matrix and B be any other $n \times n$ matrix. Explain why the matrix AB is singular.
4. Let E be an elementary matrix. Explain why $\det E = \det E^T$.