Problem 1. Consider matrix $A$ such that

$$A = \begin{bmatrix} 1 & -1 & 0 & 2 \\ 0 & 1 & 1 & -3 \\ -1 & 4 & 2 & -10 \end{bmatrix}.$$ 

Please, find

- Basis and dimension of the row space of $A$.
- Basis and dimension of the column space of $A$.
- Null set of $A$. (We will learn this on Monday).
- $\text{nullity}(A)$. (We will learn this on Monday)

Problem 2. Consider $n \times n$ matrix $A$ such that

$$\det(A) \neq 0$$

Please, find

- Basis and dimension of the row space of $A$.
- Basis and dimension of the column space of $A$.
- Null set of $A$. (We will learn this on Monday)
- $\text{nullity}(A)$. (We will learn this on Monday)

**HINT!** Problem 2 is simple! Please, think about $\det(A) \neq 0$ and dependence or independence of rows (columns) vectors of $A$.

Problem 3. Please, read, understand and write the proof of Theorem 4.15 from the book (row and Columns Spaces have equal dimension). Please, let me know if you need a copy of this theorem!!