

21001, Section 01, Linear Algebra and applications
HW 8, DUE Friday, November 19
Instructor: Prof. Artem Zvavitch
GOOD LUCK!!!

Problem 1. Consider matrix A such that

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

Find

- Basis and dimension of the row space of A .
- Basis and dimension of the column space of A .
- $\text{rank}(A)$.
- Null set of A .
- $\text{nullity}(A)$.

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

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

Find

- Basis and dimension of the row space of A .
- Basis and dimension of the column space of A .
- $\text{rank}(A)$.
- Null set of A .
- $\text{nullity}(A)$.

Problem 3. (10 EXTRA! Points) Please, read, understand and write the proof of Theorem 4.15 from the book (row and Column Spaces have equal dimension).