

- The first part of FTLA

$$C(\mathbf{A}), N(\mathbf{A}^T) \leq \mathbb{R}^m, C(\mathbf{A}) \perp N(\mathbf{A}^T), \quad C(\mathbf{A}) \cap N(\mathbf{A}^T) = \{\mathbf{0}\}, \quad C(\mathbf{A}) \oplus N(\mathbf{A}^T) = \mathbb{R}^m$$

has been proven.

- New concepts:

- Prove the second part

$$C(\mathbf{A}^T), N(\mathbf{A}) \leq \mathbb{R}^n, C(\mathbf{A}^T) \perp N(\mathbf{A}), \quad C(\mathbf{A}^T) \cap N(\mathbf{A}) = \{\mathbf{0}\}, \quad C(\mathbf{A}^T) \oplus N(\mathbf{A}) = \mathbb{R}^n$$

using the same techniques.

- Implications for solving linear systems