

Problem Set 10

Problem from Me (Please hand in.)

1. Let $L : \mathbb{F}^n \longrightarrow \mathbb{F}^m$ be linear map. Prove that there exists a unique matrix $A \in \mathbb{F}^{m \times n}$ such that $L(\mathbf{x}) = A \cdot \mathbf{x}$, for each $\mathbf{x} \in \mathbb{F}^n$.

(Note: This essentially shows that EVERY linear map $\mathbb{F}^n \longrightarrow \mathbb{F}^m$ is the left multiplication on \mathbb{F}^n by some matrix in $\mathbb{F}^{m \times n}$.)

Problems from Textbook (Please hand in.)

Section	Problem(s)
5.1	7, 10, 18(b), 30
5.3	3(d), 6, 11, 13

Recommended Exercises from Textbook (Do NOT hand in, but know these for tests/exam.)

Section	Problem(s)
5.1	1, 2, 8, 22, 23
5.3	1(a,c), 2(a,c), 4(i), 5, 7, 12