

Math 4242 Homework 2

(1) Let V be a vector space over \mathbb{F} , and $v_1, \dots, v_n \in V$. Show that $\text{span}(v_1, \dots, v_n)$ is the smallest subspace of V that contains all of v_1, \dots, v_n .

(2) Let V be a vector space, and U_1, \dots, U_m subspaces of V . Prove that

$$\text{span}(U_1 \cup \dots \cup U_m) = U_1 + \dots + U_m$$

(3) Prove that $\text{span}(v_1, \dots, v_n) = \text{span}(v_1) \oplus \dots \oplus \text{span}(v_n)$ if and only if v_1, \dots, v_n are linearly independent.

(4) OS 2.1.12

(5) OS 2.1.13

(6) OS 2.2.29

(7) OS 2.3.3

(8) OS 2.3.18

(9) OS 2.4.22

(10) OS 2.4.27

(11) ~~OS 3.1.9~~

(12) ~~OS 3.1.17~~

Optional (do not submit)

- 2.4.23
- 2.4.27
- 3.1.27