Math 4242 Homework 2

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

(2) Let V be a vector space, and $U_1, \cdot, U_m$ subspaces of V. Prove that
$$\operatorname{span}(U_1 \cup \cdots \cup U_m) = U_1 + \cdots + U_m$$

(3) Prove that $\operatorname{span}(v_1, \cdots, v_n) = \operatorname{span}(v_1) \oplus \cdots \oplus \operatorname{span}(v_n)$ if and only if $v_1, \cdots, v_n$ 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