Linear Algebra Done Right of Sheldon Axler Notes

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Contents

Chapter 1

Vector Spaces

1.1 R^n and C^n

1.2 Definition of a Vector Space

1.3 Subspaces

1.3.1 exercises

Exercise 1. 7 $U = \{(a_1, a_2) \in R^2 : a_1, a_2 \in N\}$.

Exercise 2. 8 Let $A = c(a_1, a_2), B = d(b_1, b_2)$, one example is $A \cup B$.

Exercise 3. 9 It is not subspace because it is true that for some $P = p_1 * p_2$, then $(f + g)(x + P) = f(x + P) + g(x + P) = f(x) + g(x) = (f + g)(x)$. But only iff p_1 and p_2 are both rational numbers. The reason for that if not, then you can write some irrational number p_1 or p_2 as a rational which is a contradiction.

Exercise 4. 10 clear

Exercise 5. 11 clear

Exercise 6. 12 We have that $u + w \in U \cup W$, then assume that $W \nsubseteq U$ and $U \nsubseteq W$, then $\exists u$ such that$u \in U$ and $u \notin W$. Similarly, $\exists w$ such that $w \in W$ and $w \notin U$. Then $u + w \notin U \cup W$ which is a contradiction.