Notes and exercises from *Linear Algebra and Geometry*

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Introduction

This document contains notes and exercises from [1].

Chapter III

Section 1

Exercise (4)**.** Let V, W be a pair of supplementary subspaces of E. Every subspace U containing V is the direct sum of V with $U \cap W$.

Proof. If $u \in U$, then $u = v + w$ for some $v \in V$ and $w \in W$, and $w = u - v \in U$. So $U = V + (U \cap W)$, and $V \cap U \cap W = \{0\}$. □

References

[1] Dieudonné, J. *Linear Algebra and Geometry.* Hermann, 1969.