

title: Premier Proof Presentation: Axler 1.C.12
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1 | Lemma

Prove that the union of two subspaces of V is a subspace of V if and only if one of the subspaces is contained in the other.

#incomplete ... this got deleted? I guess see KBe20math530PremierProofPresentation-export.pdf

2 | Working it out

1.c ex 12 on 12 Sep 2020
 A, B sub V Union of A, B is sub V

if $A \cup B = A$ or $A \cup B = B$
 Now, assume $A \cup B$ is a subspace: \hookrightarrow directly shows union is

thus, it must be closed under a subspace, because A and B are already subspaces addition. if they were not

contained one within other, assume $a \in A, b \in B, a \notin B, b \notin A$
 $\Rightarrow a+b \in A \cup B$ (subspace closed) $\therefore a+b \in A$ or $a+b \in B$
 if $a+b \in A$ then $b = (a+b) + (-a) \in A \therefore b \in A$ contradiction