

Notes of "Subspace"

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1 Overview

- The sum of two subspaces of a vector space
 - Def: The sum of two subspaces of a vector space
 - * Rmk: The sum of two subspaces is still a subspace
 - Prop: The existence of a basis of a subspace and the relation between the dimension of a space and the dimension of its subspace
 - Def: 向量空间的基与子空间相合
 - * Rmk: A method to find a basis of a vector space 与其一个子空间相合
 - Thm: The existence of a basis 与两个子空间相合
 - * Eg: An example that the theorem does not hold for three or more subspaces
 - Cor: The formula of the basis of the sum of two subspaces
 - TNta: k -dimensional plane, codimension (余维数) of a subspace, hyperplane (超平面), flag variety (旗簇)
- The direct sum of two subspaces of a vector space
 - Def: The linear independence and dependence of a class of subspaces
 - Prop: A necessary and sufficient condition for two subspaces to be linear independent
 - * Rmk: This proposition cannot be generalized to three or more subspaces
 - Thm: A necessary and sufficient condition for a class of subspaces to be linear independent in terms of intersection
 - Thm: A necessary and sufficient condition for a class of subspaces to be linear independent in terms of basis
 - Thm: A necessary and sufficient condition for a class of subspaces to be linear independent in terms of dimension
 - Def: The (internal) direct sum of a class of subspaces of a vector space
 - Thm: The existence of the complement subspace of a subspace
 - Def: The (external) direct sum of two vector spaces
 - Rmk: There is no difference in nature between internal direct sums and external direct sums