Lesson 6

1.6

Dimension of subspaces

Th if $W \leq V$ and V is finite dimensional then W is finite dimensional and $\dim W \leq \dim V$.

Proof:

Th: If U_1 and U_2 are subspaces of a finite dimensional vector space then

$$\dim(U_1+U_2)=\dim U_1+\dim U_2-\dim(U_1\cap U_2)$$

$$\dim(U_1\oplus U_2)=\dim U_1+\dim(U_2)$$

Proof:

Th $V = U_1 + U_2 + \cdots + U_n$ is a direct sum iff
$\dim V = \dim U_1 + \dim U_2 + \cdots + \dim U_n$

Proof:

Th: suppose V is finite dimensional and $W \leq V$

then there exists $U \leq V$. s.t $V = U \oplus W$