

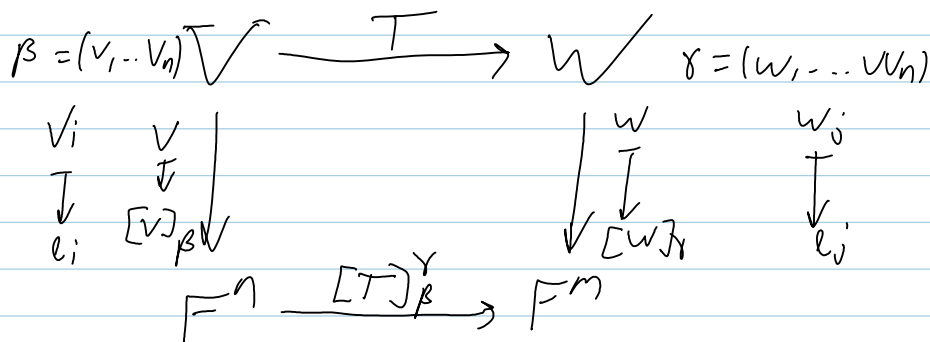
November-04-09
4:02 PM

Question A matrix $A \in M_{m \times n}$ defines a linear trans^{started}
 $T_A: F^n \rightarrow F^m$ by $v \in F^n = M_{n \times 1} \mapsto T_A v = A \cdot v \in M_{m \times 1} = F^m$.
 What's the matrix corresponding to T_A ?

... Thus from now hence we will often automatically think of a matrix A also as a l.t. $F^n \rightarrow F^m$.

untouched.

Another way of seeing $[T]_{\beta}^{\gamma}$:



The good and the bad about "matrix algebra":

Good	Bad
1. $A+B=B+A$, $(A+B)+C=A+(B+C)$ (basically, all works for addition)	1. Addition is defined only for matrices of same dims. same line
2. $A(B \cdot C) = (A \cdot B)C$ $\exists I$ s.t. $A \cdot I = A$, $I \cdot A = A$	2. mult. is defined only if "input" dimension matches & produces an output of yet other dims.
3. If $A \cdot A^{-1} = I$, then $A^{-1} \cdot A = I$	3. A^{-1} may not exist even if $A \neq 0$.
4. $(A+B)C = AC + BC$ $A(B+C) = AB + AC$	4. Generally, $A \cdot B \neq B \cdot A$, even when both make sense.

$$A(B+C) = AB+AC$$

| even when both make sense.

Next goals: 1. Compute rank T/A .

2. Compute A^{-1} (when possible)

3. Solve systems of linear eqn's.
