

CHANGE OF BASIS

C.O.B. operator

$$\tilde{P}: \left\{ \begin{array}{l} \text{Bases for} \\ V \end{array} \right\} \longrightarrow \left\{ \begin{array}{l} \text{Bases for} \\ V \end{array} \right\}$$

$$\{e\} \longmapsto \{e\} P = \{f\}$$

↑
matrix

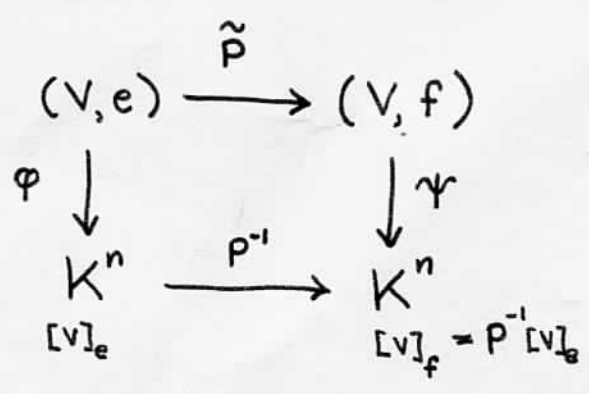
Then in co-ords

$$[v]_f = P^{-1} [v]_e \text{ and } P v_f = v_e$$

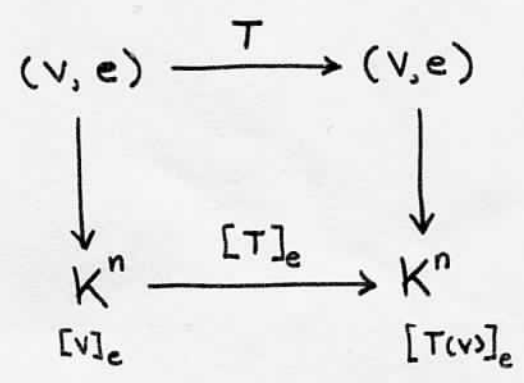
Also, since $[f_i]_f = \begin{bmatrix} 0 \\ \vdots \\ 1 \\ \vdots \\ 0 \end{bmatrix} \Rightarrow p_i = [f_i]_e$

$$\Rightarrow P = \begin{bmatrix} | & & | \\ [f_1]_e & \dots & [f_n]_e \\ | & & | \end{bmatrix}$$

Change of Basis diagram



Matrix representation of a Linear Operator



Change of Basis affecting a linear map $T: V \rightarrow V$

