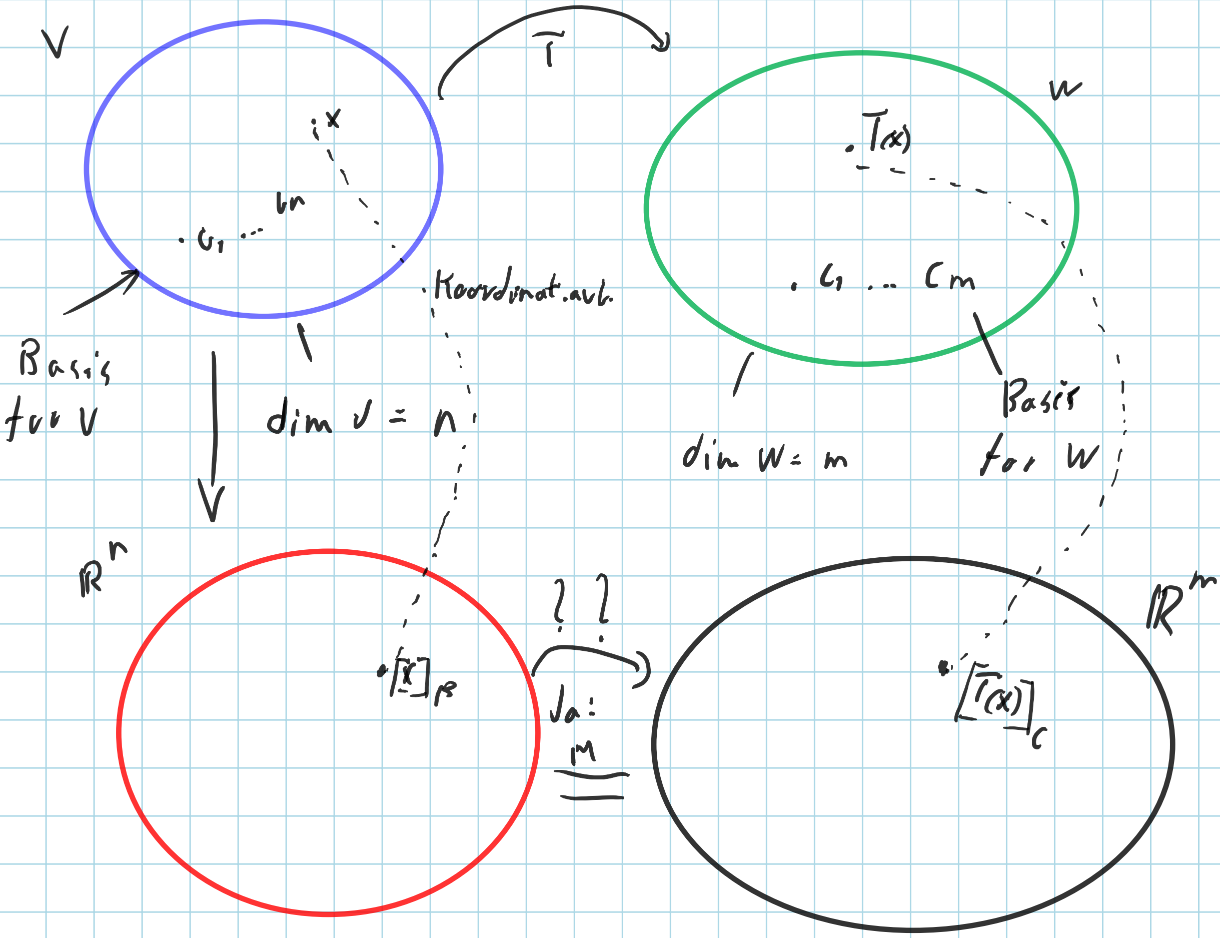

Mål: $[T(x)]_C = M[x]_B$

Matrisen til T (koordinatmatrisen) relativt til B

$$M = \big[\,[T(b_1)]_C \;\; [T(b_2)]_C \;\; \cdots \;\; [T(b_n)]_C\,\big]$$

La $x \in V$. Da er $x = \alpha_1 b_1 + \dots + \alpha_n b_n$ for entydige $\alpha_1, \dots, \alpha_n$

$$[T(x)]_C = [T(\alpha_1 b_1 + \dots + \alpha_n b_n)]_C \overset{T \text{ lin. avb.}}{=} [\alpha_1 T(b_1) + \dots + \alpha_n T(b_n)]_C$$

$$= \alpha_1 [T(b_1)]_C + \dots + \alpha_n [T(b_n)]_C$$

matrise vektor produkt

$$= \big[\,[T(b_1)]_C \;\cdots\; [T(b_n)]_C\,\big] \begin{bmatrix} \alpha_1 \\ \vdots \\ \alpha_n \end{bmatrix}$$

$$= \underline{\underline{M[x]_B}}$$

Ex) $B = \{b_1, b_2\}$ for v.rom V

$C = \{c_1, c_2, c_3\}$ for v.rom W

$T: V \to W$ gitt ved

$T(b_1) = 3c_1 - 2c_2 + 5c_3$

$T(b_2) = c_1 + c_2 + c_3$

$T(\alpha_1 b_1 + \alpha_2 b_2)$

$= \alpha_1 T(b_1) + \alpha_2 T(b_2)$

Finne matrisen til T relativt til B og C

$$M = \left[[T(b_1)]_C \quad [T(b_2)]_C \right] = \begin{bmatrix} 3 & 1 \\ -2 & 1 \\ 5 & 1 \end{bmatrix}$$

går videre

#

Da er $[T(x)]_C = M[x]_B$

Ex) $x = b_1 + 2b_2 \Rightarrow [x]_B = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$

$$\Rightarrow M[x]_B = \begin{bmatrix} 3 & 1 \\ -2 & 1 \\ 5 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \end{bmatrix} = \begin{bmatrix} 5 \\ 0 \\ 7 \end{bmatrix}$$

$$T(x) = T(b_1 + 2b_2) = T(b_1) + 2T(b_2)$$

$$= (3c_1 - 2c_2 + 5c_3) + 2(c_1 + c_2 + c_3)$$

$$= 5c_1 + 0c_2 + 7c_3$$

Finner koordinat vektoren

$$= \begin{bmatrix} 5 \\ 0 \\ 7 \end{bmatrix}$$