



Tute 3

6.a) show that $B = \left\{ \begin{pmatrix} 1 \\ 5 \end{pmatrix}, \begin{pmatrix} 1 \\ 6 \end{pmatrix} \right\}$

6b) Suppose that $T: \mathbb{R}^2 \rightarrow \mathbb{R}^2$ is linear and has matrix $T_{B,sm} = \begin{pmatrix} -2 & 1 \\ 5 & 2 \end{pmatrix}$ with respect to standard basis of \mathbb{R}^2

what is matrix T with respect to $B = \left\{ \begin{pmatrix} 1 \\ 5 \end{pmatrix}, \begin{pmatrix} 1 \\ 6 \end{pmatrix} \right\}$

$$T_{C,B} = (T_{C,sm})^{-1} I_{B,sm}$$

$$I_{B,sm} = \begin{pmatrix} 1 & 1 \\ 5 & 6 \end{pmatrix} \text{ since } I \text{ is identity map}$$

function

$$T_{C,sm} = \begin{pmatrix} -2 & 1 \\ 5 & 2 \end{pmatrix} \quad (T_{C,sm})^{-1} = \frac{1}{-4-5} \begin{pmatrix} 2 & -1 \\ 5 & -2 \end{pmatrix}$$

$$(T_{C,sm})^{-1} = \frac{1}{-9} \begin{pmatrix} 2 & -1 \\ -5 & -2 \end{pmatrix}$$

$$\begin{aligned} T_{C,B} &= (T_{C,sm})^{-1} I_{B,sm} = \frac{1}{-9} \begin{pmatrix} 2 & -1 \\ -5 & -2 \end{pmatrix} \begin{pmatrix} 1 & 1 \\ 5 & 6 \end{pmatrix} \\ &= \frac{1}{-9} \begin{pmatrix} -3 & -4 \\ -15 & -17 \end{pmatrix} \end{aligned}$$