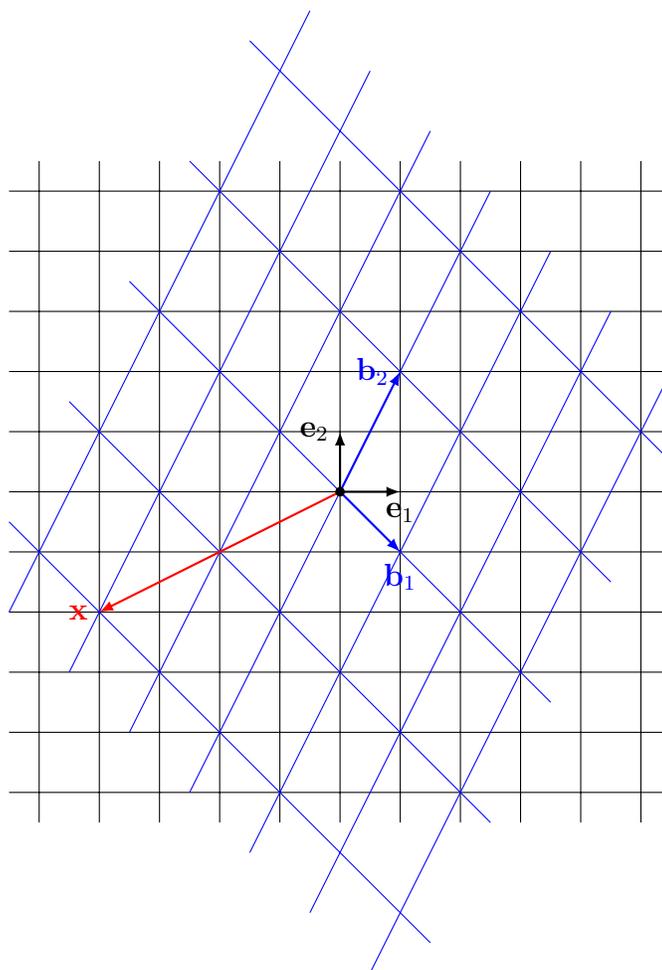


COORDINATE VECTOR WORKSHEET

OCTOBER 13, 2017

Consider the vector $\mathbf{x} \in \mathbb{R}^2$, and the bases $\mathcal{E} = \{\mathbf{e}_1, \mathbf{e}_2\}$ and $\mathcal{B} = \{\mathbf{b}_1, \mathbf{b}_2\}$.



What is $[\mathbf{x}]_{\mathcal{E}}$?

What is $[\mathbf{x}]_{\mathcal{B}}$?

Let $[\mathbf{y}]_{\mathcal{E}} = \begin{bmatrix} 2 \\ -5 \end{bmatrix}$. What is $[\mathbf{y}]_{\mathcal{B}}$?

Let $[\mathbf{y}]_{\mathcal{B}} = \begin{bmatrix} 3 \\ -1 \end{bmatrix}$. What is $[\mathbf{y}]_{\mathcal{E}}$?

Compute ${}_{\mathcal{E}}[\text{id}]_{\mathcal{B}}$ and ${}_{\mathcal{B}}[\text{id}]_{\mathcal{E}}$.

Relate $[\mathbf{x}]_{\mathcal{B}}$, $[\mathbf{x}]_{\mathcal{E}}$, $[\mathbf{y}]_{\mathcal{B}}$, $[\mathbf{y}]_{\mathcal{E}}$ using the above change of basis matrices.