Consider the vector $\mathbf{x} \in \mathbb{R}^2$, and the bases $\mathscr{E} = \{\mathbf{e}_1, \mathbf{e}_2\}$ and $\mathscr{B} = \{\mathbf{b}_1, \mathbf{b}_2\}$.
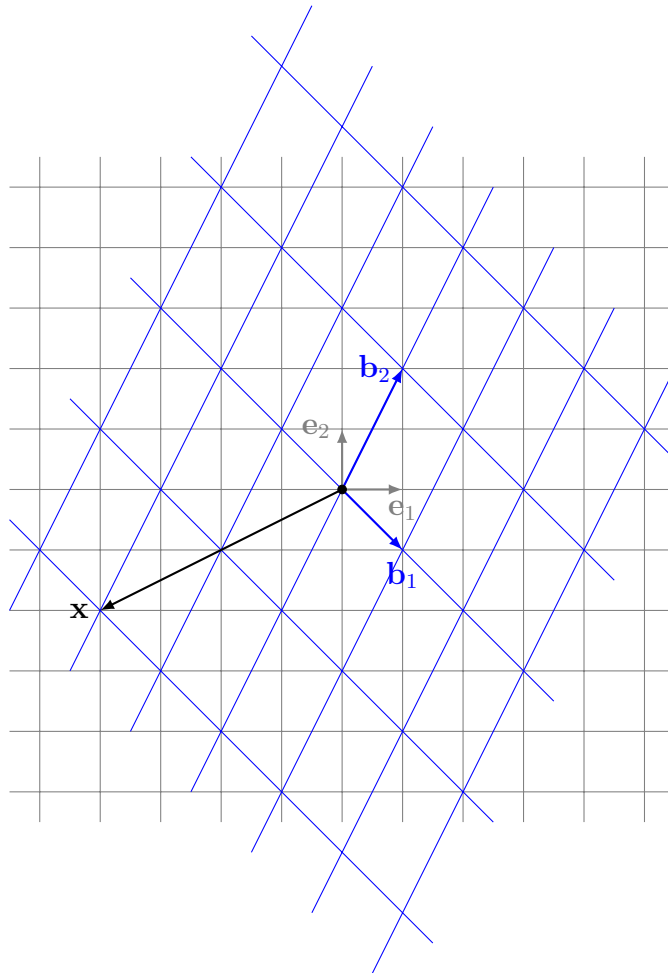
What is $[\mathbf{x}]_{\mathscr{E}}$?

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

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

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

Compute $_{\mathscr{E}}[\mathrm{id}]_{\mathscr{B}}$ and $_{\mathscr{B}}[\mathrm{id}]_{\mathscr{E}}$.

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