

SECTION 3.5.1 AND 3.5.2 CHANGE OF BASIS  
OBSERVATIONS FROM MONDAY'S MOTIVATING EXAMPLE

**Example:**

$$\mathcal{E}_3 = \left\langle \vec{e}_1 = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}, \vec{e}_2 = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}, \vec{e}_3 = \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} \right\rangle \quad B = \left\langle \vec{b}_1 = \begin{pmatrix} 1 \\ -1 \\ 0 \end{pmatrix}, \vec{b}_2 = \begin{pmatrix} 1 \\ 1 \\ -2 \end{pmatrix}, \vec{b}_3 = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} \right\rangle$$

$$h : \mathbb{R}^3 \rightarrow \mathbb{R}^3 \text{ defined by } \begin{pmatrix} x \\ y \\ z \end{pmatrix} \mapsto \begin{pmatrix} y + z \\ x + z \\ x + y \end{pmatrix} \text{ w.r.t } \mathcal{E}_3$$