Ортонормирование:

$$\vec{e}_1 = \frac{\vec{b}_1}{\|\vec{b}_1\|} = \left\{\frac{3}{\sqrt{12}}, -\frac{1}{\sqrt{12}}, -\frac{1}{\sqrt{12}}, \frac{1}{\sqrt{12}}\right\}$$

$$\vec{e}_2 = \frac{\vec{b}_2}{\|\vec{b}_2\|} = \left\{\frac{1}{\sqrt{12}}, \frac{3}{\sqrt{12}}, \frac{1}{\sqrt{12}}, \frac{1}{\sqrt{12}}\right\}$$

$$\vec{e}_3 = \frac{\vec{b}_3}{\|\vec{b}_3\|} = \left\{\frac{1}{\sqrt{12}}, -\frac{1}{\sqrt{12}}, \frac{3}{\sqrt{12}}, -\frac{1}{\sqrt{12}}\right\}$$

$$\vec{e}_4 = \frac{\vec{e}_4}{\|\vec{b}_4\|} = \left\{\frac{1}{\sqrt{12}}, \frac{1}{\sqrt{12}}, -\frac{1}{\sqrt{12}}, -\frac{3}{\sqrt{12}}\right\}$$

2) $T_{b \to a} - ?$

$$\vec{e}_1 = \frac{\vec{b}_1}{\sqrt{12}} = \frac{\vec{a}_1}{\sqrt{12}} \Rightarrow \vec{a}_1 = \vec{e}_1 \sqrt{12}$$

$$\vec{e}_2 = \frac{\vec{b}_2}{\sqrt{12}} = \frac{\vec{a}_2 + 2\vec{a}_1}{\sqrt{12}} \Rightarrow \vec{a}_2 = -2\vec{e}_1 \cdot \sqrt{12} + \vec{e}_2 \sqrt{12}$$

$$\vec{e}_3 = \frac{\vec{b}_3}{\sqrt{12}} = \frac{\vec{a}_3 - \vec{a}_1 - 3(\vec{a}_2 + 2\vec{a}_1)}{\sqrt{12}} \Rightarrow$$

$$\vec{a}_3 = \vec{e}_1 \sqrt{2} - 3\vec{e}_2 \sqrt{12} + \vec{e}_3 \sqrt{12}$$

$$\vec{e}_4 = \frac{\vec{b}_4}{\sqrt{12}} = \frac{\vec{a}_4}{\sqrt{12}} \Rightarrow \vec{a}_4 = \vec{e}_4 \sqrt{12}$$