
Exercise 1 Suppose that $\mathcal{B}_1 = \{\mathbf{v}_1, \mathbf{v}_2\}$ is an ordered basis for some subspace V of $\mathbb{R}^n$. Let $\mathcal{B}_2 = \{-\mathbf{v}_2, -2\mathbf{v}_1\}$. Verify that $\mathcal{B}_2$ is also an ordered basis for V .

Let $\mathbf{w}$ be a vector in V . If the coordinate vector for $\mathbf{w}$ with respect to $\mathcal{B}_1$ is $\begin{bmatrix} 2 \\ -1 \end{bmatrix}$, find the coordinate vector for $\mathbf{w}$ with respect to $\mathcal{B}_2$.

$$\begin{bmatrix} \dots \dots \\ \dots \dots \end{bmatrix}$$