1. Section 10.3: 9, 13, 16, 19, 24

2. Section 10.4: 7, 9, 16, 18, 30

3. Show that

\[(\vec{u} \times \vec{v}) \times \vec{w} = (\vec{u} \cdot \vec{w})\vec{v} - (\vec{v} \cdot \vec{w})\vec{u}\]

4. A hyperplane in \(\mathbb{R}^n\) is a set of the form:

\[\{(x_1, \ldots, x_n) \in \mathbb{R}^n : A_1x_1 + A_2x_2 + \ldots + A_nx_n = D\}\]

where at least one of \(A_1, \ldots, A_n\) is not zero. This equation is called the standard form of the hyperplane.

The vector parametric form of a hyperplane is

\[\{t_1\vec{u}^1 + \ldots + t_{n-1}\vec{u}^{n-1} + \vec{r}_0 : t_1, \ldots, t_{n-1} \in \mathbb{R}\}\]

where \(\vec{r}_0 \in \mathbb{R}^n\) and \(\{\vec{u}^1, \ldots, \vec{u}^{n-1}\}\) is a linearly independent set of vectors in \(\mathbb{R}^n\), i.e. none of these vectors can be expressed as a linear combination of the others (a linear combination of a set of vectors is a sum of scalar multiples of the vectors).

Describe explicitly how to construct the vector parametric form from the standard form of a hyperplane.