13.4: Cross Products

Calculus III

College of the Atlantic

Consider the following vectors:

- $\vec{a} = 3\vec{i} - 2\vec{j}$
- $\vec{b} = -2\vec{i} - 2\vec{j}$
- $\vec{c} = \vec{i} + 3\vec{j}$
- $\vec{v} = 3\vec{i} - 2\vec{j} + \vec{k}$
- $\vec{u} = 1\vec{i} + 2\vec{j} + \vec{k}$
- $\vec{w} = 6\vec{i} - 4\vec{j} + 2\vec{k}$

1. Calculate $\vec{a} \times \vec{b}$ using the geometric definition of the cross product.
2. Calculate $\vec{a} \times \vec{b}$ using the algebraic definition of the cross product.
3. Evaluate the following cross products:
   (a) $\vec{v} \times \vec{u}$
   (b) $\vec{u} \times \vec{v}$
   (c) $\vec{v} \times \vec{w}$
   (d) $\vec{u} \times \vec{w}$