1. Let $\vec{a} = \langle 1, 3, -1 \rangle$ and $\vec{b} = \langle 0, 4, -2 \rangle$. Compute $\vec{a} \times \vec{b}$ and $\vec{b} \times \vec{a}$.

2. With the same vectors as above, show that $\vec{a} \times \vec{b}$ is orthogonal to both $\vec{a}$ and $\vec{b}$ by computing dot products.

3. Show this in more generality. Show $(\vec{u} \times \vec{v}) \cdot \vec{u} = 0$ for $\vec{u} = \langle u_1, u_2, u_3 \rangle, \vec{v} = \langle u_1, u_2, u_3 \rangle$.

4. (a) Compute $k \times (2i - j)$ by converting both vectors to component form first.

   (b) Compute $2(k \times i) - k \times j$ by using your knowledge about the right-hand rule.

   (c) What do you know notice about the answers to part (a) and (b)? Can you draw some conclusions about the cross product?