Cross Product Part II

1. Calculate $\mathbf{a} \times \mathbf{b}$ using cofactor expansion:
$\mathbf{a} = [0, 1, 1], \mathbf{b} = [3, -1, 2]$

2. Find the volume of the parallelepiped (slanted box) determined by
$\mathbf{u} = [1, 4, 9], \mathbf{v} = [2, -6, 3]$ and $\mathbf{w} = [-1, 1, 1]$.

3. Determine whether the following vectors lie in a plane: $\mathbf{u} = [1, 7, -2]$,
$\mathbf{v} = [2, 3, -2]$ and $\mathbf{w} = [-2, 5, -2]$.

4. Find the area of the parallelogram determined by $\mathbf{u} = [-2, 3]$ and
$\mathbf{v} = [4, 9]$.

Answers:

1. $[3, 3, -3]$

2. 65

3. No. The volume of the parallelepiped is nonzero. (The exact volume is 28.)

4. 30