MATH 201 QUIZ 2

1. Find the area of the region that lies inside the curve $r = 1 + \sin\theta$ and outside the curve $r = 1$.

2. For $P(-2, 1, 0)$ and $Q(-3, 0, 2)$, find the point R such that $\overrightarrow{PR} = -2\overrightarrow{PQ}$ and compute $|\overrightarrow{OR}|$, where $O(0, 0, 0)$ is the origin.

3. Find $\text{proj}_{\vec{a}}\vec{b}$ for $\vec{a} = \langle 3, -3, 1\rangle$ and $\vec{b} = \langle 2, 4, -1\rangle$.

4. Suppose that two vectors $\vec{a}$ and $\vec{b}$ satisfy

$$|\vec{a}| = |\vec{b}|, \quad \vec{a}\cdot\vec{b} = 4, \quad \text{and} \quad \vec{a}\times\vec{b} = \langle 4, 4, 4\rangle.$$

Find $|\vec{a}|$.