MTH 674 **HW #5** Spring 2005

1. Find a p-form $\alpha \in \bigwedge^p V$ for some vector space V satisfying $\alpha \wedge \alpha \neq 0$.

2. A p-form $\alpha \in \bigwedge^p V$ is called *decomposable* if and only if there exist 1-forms α^i such that

$$\alpha = \alpha^1 \wedge ... \wedge \alpha^p$$

(a) If $\dim(V) = 3$, show that all 2-forms are decomposable.

(b) If $\dim(V) = 4$, show that all 3-forms are decomposable.

(c) **EXTRA CREDIT:**
Show that all $(n-1)$-forms on an n-dimensional vector space are decomposable.