Name _____ Score _____

Fall 2008

Math 560 Homework 3

Due Friday, September 3 2008

1. On page 51 of Keener textbook: Number 5a.

2. Let $\{q_1, q_2, \ldots, q_n\}$ be an orthonormal basis of $\mathbb{R}^n$, and let

$$S = \text{span}\{q_1, q_2, \ldots, q_k\},$$

with $1 \leq k \leq n-1$. Show that

$$S^{\perp} = \text{span}\{q_{k+1}, q_{k+2}, \ldots, q_n\}.$$

3. On page 51 of Keener textbook: Number 8. To clarify, assume that the manifold $M \subset \mathbb{R}^n$. In class, I have used the term **subspace** instead of manifold to denote a set that is closed under addition and scalar multiplication so that M forms a vector space on its own.