

Math 366: Honors Analysis II
Quiz 3 *March 2, 2001*

Name: _____

1. Define:

a) metric space

b) normed vector space

2. a) State the Cauchy-Schwartz Inequality.

b) Use the Cauchy-Schwartz Inequality to show that an inner product space has a natural norm.

Prove two of the following:

4. Let M be a metric space. Prove that A is closed if and only if A^c is open.

5. $C[a, b]$ with the sup-norm is a complete metric space.

6. Prove that if A is a compact subset of a metric space M , then every sequence $\{x_n\} \subset M$ has a convergent subsequence.