

Quiz 2, Math 441

Due Wed. Sept. 22, No late quiz will be accepted

Name ----- (*Last*) ----- (*First*)

Problem 1 (3pts). Prove that if A and B are finite sets, then their product $A \times B$ is finite.

Problem. 2 (2pts). Prove that there is a bijection between the set of all functions $f : X \rightarrow \{0, 1\}$ and the set of all subsets of X .

Problem 3.(12pts) Determine which of the following is a countable set. Justify your assertions.

- (a) A is the set of all finite subsets of \mathbf{Z} .
- (b) B is the set of all functions from \mathbf{Z} to \mathbf{Z} .
- (c) C is the set of all functions from $\{1, 2, 3\}$ to \mathbf{Z} .
- (d) E is the set of all polynomials with rational coefficients.

Problem 4 (3pts). Prove that if A is infinite, then there is a bijection between A and the subset $B = A - \{a\}$ where $a \in A$ is an element.