

MATH 300 Practise Exam 1

February, 2007

The actual exam consists of two parts. In the first part, you will be asked to state 5 definitions/theorems from the lectures. In the second part of the exam, you will be asked to prove the following 3 theorems.

1. Prove that, if $f : A \rightarrow B$ and $g : B \rightarrow C$ are functions with $g \circ f : A \rightarrow C$ bijective, then f is injective and g is surjective.
2. Prove Cantor's Theorem. That is, for any set A , $|A| < |\mathcal{P}(A)|$.
3. Prove that, if A and B are countable sets, then $A \cup B$ is also countable.