CS208 In-class Quiz 1 (Spring 2013)

Time: 20 mins **Date: Jan 10, 2012**

- *The exam is closed book.*

- *Be brief, complete and stick to what has been asked. If needed, you may cite results/proofs covered in class without reproducing them.*

- *Do not copy solutions from others*

- *Penalty for copying: FR grade (and you know we mean it!)*

1. *[10 marks]* Let E be the set of positive even natural numbers and O be the set of positive odd natural numbers that can be expressed as the square of another natural number. For example, $2 \in E$ and $9 \in O$, and $3 \notin E \cup O$.

   Give a formal proof that both E and O have the same cardinality.

2. *[10 marks]* Let A be the set of all countably infinitely long strings over $\{0, 1\}$. Thus each string in A is an infinitely long binary string, and the number of letters (0 or 1) in each such string is the same as the cardinality of natural numbers. Is the cardinality of A countably infinite? Give justification in support of your answer.