**Math 104, Section 1** **Fall 2004**
**Sarason**

## HOMEWORK ASSIGNMENT 4

Due in class on Wednesday, September 29.

12. Let $A$ and $B$ be nonempty sets of the same cardinality. Let $a_0$ be a point of $A$ and $b_0$ a point of $B$. Prove the sets $A\backslash\{a_0\}$ and $B\backslash\{b_0\}$ have the same cardinality.

13. A real number is called algebraic if it is the root of a polynomial of positive degree with integer coefficients. Prove the set of real algebraic numbers is denumerable.

14. Prove the set of irrational real numbers has the same cardinality as $\mathbb{R}$.

15. Prove the set of finite subsets of $\mathbb{N}$ is denumerable.

16. Let $S$ be the set of nondecreasing functions of $\mathbb{Q}$ into $\{0, 1\}$. Is $S$ countable? Explain.