Mathematics 216
Robert Gross
Homework 1
Due January 23, 2012

1. Prove that $\sqrt{10}$ is irrational by using an even–odd argument.

2. Prove that $\sqrt{7}$ is irrational.

3. Prove that $\sqrt{90}$ is irrational without using the words "even" or "odd."

4. Prove that
$$1^2 + 2^2 + 3^2 + \cdots + n^2 = \frac{n(n+1)(2n+1)}{6}.$$