Homework 7 (Due Tues, March 25)

Math 2710 − Spring 2014

Professor Hohn

Using the proof techniques we have learned in class, prove each statement.

1. * Prove that the inequality $n^2 \geqslant n$ holds *for every integer.*

2. (pg.105 #33) Use induction to prove that

$$\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \ldots + \frac{1}{2^n} \geqslant 1 + \frac{n}{2}.$$

3. (pg. 108 #63) If $a = \dfrac{1 + \sqrt{5}}{2}$ and $b = \dfrac{1 - \sqrt{5}}{2}$, prove that $f_n = \dfrac{a^n - b^n}{\sqrt{5}}$ for all $n \in \mathbb{N}$.