Homework 2   Foundations   1/28/08

Unless otherwise stated, n represents an integer, and x a real number.

1. $n^2 \leq 2^n$ for all $n \geq 4$.

2. The product of n odd integers is odd for any $n \geq 1$.

3. Suppose $x \geq -1$. Then $(1 + x)^n \geq 1 + n\,x$ for $n \geq 0$.

4. 5 divides $n^5 - n$.

5. Conjecture a formula for $\displaystyle\sum_{i=1}^{n} \frac{1}{i(i+1)}$ and verify it by induction.