

Mathematics 216
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Homework 2
Due January 25, 2012

1. Prove using induction that

$$\sum_{k=0}^n x^k = \frac{x^{n+1} - 1}{x - 1}$$

for $n \geq 0$.

2. Find a value of N so that $n^3 < 3^n$ if $n \geq N$, and prove that the inequality is true by using induction.

3. Prove that $F_n < \left(\frac{5}{3}\right)^n$.