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Homework 3
Mathematics 2216.01
Due September 9, 2022

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

2. Prove that $n^2 + 5n + 2$ is even using induction. You may assume that even $+$ even $=$ even.

3. As usual, define the Fibonacci numbers with

$$F_1 = 1$$
$$F_2 = 1$$
$$F_n = F_{n-1} + F_{n-2}, \quad n \geq 3$$

Find the smallest integer N so that $F_N > 1.1^N$, and prove that $F_n > 1.1^n$ if $n \geq N$ using induction.