1. Find a value of $N$ so that $F_n > \left(\frac{3}{2}\right)^n$ if $n > N$, and then prove that the inequality is true by using induction.

2. Let $n$ be a positive integer. Prove using induction (and l’Hôpital’s rule) that

$$\lim_{x \to \infty} \frac{(\log x)^n}{x} = 0.$$ 

3. Let $n$ be a positive integer. Prove using induction that $n^3 + 2n$ is always a multiple of 3.