1. **Claim:** For all $n \in N$ prove that $3^n \geq 2^n$

   Let $P(n)$ be the proposition $3^n \geq 2^n$.

   Base Case: for $n = 0$, we have

$$3^0 \geq 2^0$$

$$1 \geq 1$$

   which is true. So the Base Case holds.

   Inductive Step: Suppose that $P(n)$ is true. So $P(n+1)$ is

$$3^{n+1} \geq 2^{n+1}$$

   Taking the LHS

$$3^{n+1} = 3^n \cdot 3$$

   From the Inductive hypothesis We know that $3^n \geq 2^n$. So

$$3^{n+1} \geq 3 \cdot 2^n \geq 2 \cdot 2^n \geq 2^{n+1}$$

   Proved.