CSC236 Worksheet 1 Review

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Question 4

- **Rough Works:**

For convenience, define $H(n) : 4^{\geq} 5n^4 + 6$.

I will prove that $\forall n \in \mathbb{N}, n \geq 7 \Rightarrow 4^n \geq 5n^4 + 6$.

1. Base Case ($n = 7$)

   Let $n = 7$.

   Then,

$$\begin{aligned} 4^n &= 16384 && (1)\\ &\geq 12011 && (2)\\ &= 5(7)^4 + 6 && (3)\\ &= 5n^4 + 6 && (4) \end{aligned}$$

   So, $H(n)$ is verified.

2. Inductive Step