CSC236 Term Test 1 Version 2 Review

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Question 1

- **Rough Works:**

Define $P(n) : f(n) = 3^n$.

I will use complete induction to prove that $\forall n \in \mathbb{N}, P(n)$.

1. Inductive Step

   Let $n \in \mathbb{N}$. Assume $H(n) : \bigwedge_{i=0}^{n-1} P(i)$. I will show $P(n)$ follows.

2. Base Case ($n = 0$)

   Let $n = 0$.

   Then,

   $$\begin{aligned} f(n) &= 1 && \text{[By def.]} && (1)\\ &\leq 3^0 && && (2)\\ &= 3^n && && (3) \end{aligned}$$

   Thus, $P(n)$ follows in this step.

3. Base Case ($n = 1$)
4. Base Case ($n = 2$)
5. Case ($n > 2$)