MATH 108—WRITING ASSIGNMENT 07

Due: Friday March 31—3:00PM

Get the template for this assignment. Here's how to do it:
- **Team Member 1:** Go to https://www.sharelatex.com, and make sure you are logged in.

- **Team Member 1:** In a new window, go here:

   https://www.sharelatex.com/project/58cae1e2d41a84937504f4e6

- **Team Member 1:** Click on the menu icon (upper-left corner - 3 horizontal lines); select "Copy Project"

- **Team Member 1:** When prompted for a name, choose something like "Math 108 - Assignment 07" and click "Copy"

- **Team Member 1:** When this completes you will be back in your own workspace (instead of mine).

- **Team Member 1:** Click on the share icon (upper-right - 5 headed beast). Enter your team member's email address, make sure they "can edit" it, and "Share."

- **Team Member 1 and 2:** After solving the problems (possibly by yourself), work together to make a beautiful write up.

- **Team Member 1 or 2:** Email me (or print and turn in) *one* copy of your final draft.

The problems are below.

1. **Use induction to prove** $\dfrac{1}{2!} + \dfrac{2}{3!} + \cdots + \dfrac{n}{(n+1)!} = 1 - \dfrac{1}{(n+1)!}$ for all $n \in \mathbb{Z}^+$.

   Recall that $n! = n \cdot (n-1) \cdots 3 \cdot 2 \cdot 1$. (For example $5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$.) Also, $(n+1)! = (n+1) \cdot n!$

2. **Use induction to prove** that $3^n \geq 1 + 2^n$ for all $n \in \mathbb{Z}^+$.

3. **Use induction to prove** that for all $n \in \mathbb{Z}^+$, $n^3 - n$ is divisible by 6.