CSCI 241H:
HOMEWORK 6

Show your work.

Prove the following by induction. Show all steps.

1. $\Sigma_{i=1}^{n} i^3 = (n(n+1)/2)^2$ for positive integer n.
2. $\Sigma_{j=0}^{n} (-\frac{1}{2})^j = \frac{2^{n+1}+(-1)^n}{3 \cdot 2^n}$ for nonnegative integer n. **Hint:** You might want to consider two different cases for n.
3. $3^n < n!$ if n is an integer greater than 6.
4. $4^{n+1} + 5^{2n-1}$ is divisible by 21 if n is a positive integer.