ECS20
Discussion: 11/10 to 11/16

Induction:

Use induction to prove each of the following:

a) \[ \sum_{i=1}^{n} (-1)^i i^2 = \frac{(-1)^n n(n+1)}{2} \text{ for all } n > 0 \]

b) \[ 2^n \leq n! \text{ for all } n \geq 4 \]

c) \[ \sum_{i=1}^{n} \frac{1}{i(i+1)} = \frac{n}{n+1} \text{ for all } n > 0 \]

Fibonacci:

The following problems refer to the Fibonacci numbers defined in class:

a) Show that for all \( n > 0 \), \( f_1 + f_2 + \cdots + f_n = f_{n+2} - 1 \)
b) Show that for all \( n > 0 \), \( f_{3n} \) is divisible by 3.