

ECS20
Discussion 8: 2/27 to 3/4

Induction:

Use induction to prove each of the following:

- a) $\sum_{i=1}^n (-1)^i i^2 = \frac{(-1)^n n(n+1)}{2}$ for all $n > 0$
- b) $2^n \leq n!$ for all $n \geq 4$
- c) $\sum_{i=1}^n \frac{1}{i(i+1)} = \frac{n}{n+1}$ 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_{4n} is divisible by 3.