Induction:

Use induction to prove each of the following:

a) $\sum_{i=1}^{n}(-1)^i i^2 = \dfrac{(-1)^n n(n+1)}{2}$ for all n >0

b) $2^n \leq n!$ for all n≥4

c) $\sum_{i=1}^{n}\dfrac{1}{i(i+1)} = \dfrac{n}{n+1}$ 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.