**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 \( n > 0 \)