Homework 3, Math 215

1. Show by induction that

\[ \sum_{j=1}^{n} j^2 = \frac{n(n + 1)(2n + 1)}{6}. \]

2. Show by induction that for \( m \geq 4 \),

\[ m^3 \leq 3^m. \]

3. Show by induction that \( 1^3 + 2^3 + \ldots + n^3 = (1 + 2 + \ldots + n)^2 \).