Course 2BA1: Michaelmas Term 2002.

Assignment I.

To be handed in by Friday 1st November, 2002.
Please include both name and student number on any work handed in.

1. Prove by induction on n that

$$\sum_{i=1}^{n} 4^{i-1} i(i+1) = \frac{1}{27}((9n^2 + 3n + 2)4^n - 2)$$

   for all natural numbers n.

2. Prove by induction on n that $(n!)^2 \geq 2^{2n-2}$ for all natural numbers n (where $n!$ denotes the product of all natural numbers from 1 to n inclusive).