

To receive credit you **MUST SHOW ALL YOUR WORK**. Due Tuesday, Nov. 3

1. (9 pts) Show that the sequence  $a_n = \frac{n!}{n^n}$  is bounded and strictly decreasing. Find  $\lim_{n \rightarrow \infty} \frac{n!}{n^n}$ .

2. (6 pts) Determine whether the following series converges and, if so, find its sum

$$\sum_{k=2}^{\infty} \frac{2^{3k+2}}{3^{2k+3}}$$