Due **Tuesday** March 6, at the start of the recitation.

Explain your reasoning. A correct answer poorly explained will not get full marks.

. 5 1. Do the following series converge or diverge?

$$\text{(a)} \sum_{n=1}^{\infty} \frac{2^n n!}{n^n}, \qquad \text{(b)} \sum_{n=1}^{\infty} \frac{3^n n!}{n^n}.$$

HINT: Use the ratio test. It will help to remember that

$$\lim_{n\to\infty} \left(\frac{n+1}{n}\right)^n = \lim_{n\to\infty} \left(1+\frac{1}{n}\right)^n = e \approx 2.718.$$