MATH 1B WEEK 8, TUESDAY

Do the following series converge?

Exercise 1. $\displaystyle\sum_{n=0}^{\infty} \frac{(n!)^2}{(2n)!}$

Exercise 2. $\displaystyle\sum_{n=1}^{\infty} \frac{2^n}{n^{1,000,000}}$

★ **Exercise 3.** $\displaystyle\sum_{n=1}^{\infty} \frac{n^n}{n!}$ (*Hint:* Use the ratio test, and the fact that $\displaystyle\lim_{n\to\infty} \left(1+\frac{1}{n}\right)^n = e$.)

For which values of x do the following series converge?

Exercise 4. $\displaystyle\sum_{n=0}^{\infty} \frac{x^n}{4^n}$

Exercise 5. $\displaystyle\sum_{n=0}^{\infty} (n^3+1)x^n$

★ **Exercise 6.** $\displaystyle\sum_{n=1}^{\infty} \frac{n^2+1}{n^x}$ (This is *not* a power series!)