Recall – The Ratio Test:

Suppose that $\sum_{k=1}^{\infty} a_k$ is a series of non-zero terms, and that

$$\lim_{k\to\infty} \left| \frac{a_{k+1}}{a_k} \right| = L.$$

Then

1. If $L < 1$, then $\sum a_k$ converges absolutely.
2. If $L > 1$ (or if $L = \infty$), then $\sum a_k$ diverges.
3. If $L = 1$, the Ratio Test is inconclusive.

2(c). Determine the convergence or divergence of $\displaystyle\sum_{k=5}^{\infty} \frac{k^4 + 400k^3}{1000k^4 + k}$

3. Determine the absolute convergence, conditional convergence, or divergence of:

(a) $\displaystyle\sum_{j=1}^{\infty} \frac{(-1)^j}{j + e^j}$ (b) $\displaystyle\sum_{n=1}^{\infty} n\left(-\frac{2}{3}\right)^n$ (c) $\displaystyle\sum_{m=2}^{\infty} \frac{(-1)^m m}{(m^2 - 1)^5}$

4. *(All new!)* Find all x for which the following series converge absolutely.

(a) $\displaystyle\sum_{n=0}^{\infty} (-1)^n (2x)^n$ (b) $\displaystyle\sum_{j=1}^{\infty} \frac{(-1)^j 2x^j}{j}$