

More Series

1. Determine whether each of the following series converges or diverges (with explanation).

(a) $\sum_{n=0}^{\infty} \frac{1}{2^n + 7}$

(b) $\sum_{n=0}^{\infty} \frac{4^n + n}{3^n}$

(c) $\sum_{n=1}^{\infty} \frac{1}{n^4 - n + 5}$

(d) $\sum_{n=10}^{\infty} \frac{1}{n^{0.9} - 6}$

(e) $\sum_{n=0}^{\infty} \frac{4^n}{n!}$

2. Use a calculator or computer to compute the first ten partial sums of $\sum_{n=1}^{\infty} \frac{(-1)^n}{n}$. Then plot these ten values on a number line. What do you notice?

3. Which of the following alternating series converges?

(a) $\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{n}}$

(b) $\sum_{n=1}^{\infty} \frac{(-1)^{n+1} n}{2n+3}$

4. Determine whether each alternating series is absolutely convergent, conditionally convergent, or divergent.

(a) $\sum_{n=1}^{\infty} \frac{(-1)^n n!}{2^n}$

(b) $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{\sqrt{n+5}}$

(c) $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n^{1.5}}$

(d) $\sum_{n=2}^{\infty} \frac{(-1)^n n}{n^3 - 1}$

5. Suppose you want to help a friend study for the next exam. Write down several infinite series that you could give your friend as practice for determine convergence or divergence? Try to write down a selection of series that together involve *all* of the series concepts we have studied so far!