Merit Worksheet 14: More on Series

March 25, 2022

Determine whether the following series converge or diverge. NOte that it is not always possible to use alternating series test

1.

$$\sum_0^\infty (-1)^n \frac{n+1}{2n+1}$$

2. Estimate the error by its first 10 terms, using some inequality we had last time

$$\sum_1^\infty \frac{(-1)^{n+1}}{n^2}$$

3.

$$\sum_0^\infty \frac{n!}{(2n)!}$$

4.

$$\sum_1^\infty n(3/4)^n$$

5. Study this series

$$1 - \frac{2^2 + 1}{2^3 + 1} + \frac{3^2 + 1}{3^3 + 1} + \cdots$$

6.

$$\sum_1^\infty \frac{n^3}{(\ln 2)^n}$$

7.

$$\sum_1^\infty \frac{n^3}{(\ln 3)^n}$$

8.

$$\sum \frac{x^n}{n!}$$

9.

$$\sum n! x^n$$

10.

$$\sum \frac{2}{3 + 5n}$$

11.

$$\sum \frac{n^2}{n^3 + 1}$$