

Homework 2

March 7, 2025

1. Determine whether the following series converges or diverges:

$$\sum_{n=2}^{\infty} a_n, \quad \text{where} \quad a_n = \frac{1}{n(\ln n)^p}, \quad p > 0$$

2. Determine the convergence or divergence of

$$\sum_{n=1}^{\infty} \frac{1}{n!}$$

3. Determine the convergence or divergence of

$$\sum_{n=1}^{\infty} \frac{\ln n}{n^{\frac{3}{2}}}$$

4. Determine the convergence or divergence of

$$\sum_{n=1}^{\infty} \frac{\cos(n\pi)}{n}$$