

Determine whether each of the following series converges, diverges, or (in case it is an alternating series) conditionally converges.

1.  $\sum_{n=1}^{\infty} \frac{1}{n^{3/4}}$

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

3.  $\sum_{n=1}^{\infty} \frac{n}{1+n}$

4.  $\sum_{n=1}^{\infty} \frac{1}{n} - \frac{1}{n^2}$

5.  $\sum_{n=1}^{\infty} \frac{n+1}{n(n+2)}$

6.  $\sum_{n=1}^{\infty} \frac{4}{3^n}$

7.  $\sum_{n=1}^{\infty} \frac{4^n}{3^n}$

8.  $\sum_{n=1}^{\infty} \frac{1}{3^n - 5}$

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

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

11.  $\sum_{n=1}^{\infty} \frac{n}{2^n}$

12.  $\sum_{n=1}^{\infty} \frac{n!}{3^n}$

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

14.  $\sum_{n=1}^{\infty} \frac{n+1}{2n-1}$

15.  $\sum_{n=1}^{\infty} \frac{1}{n} - \frac{1}{n+2}$

16.  $\sum_{n=1}^{\infty} \frac{1}{n(n+3)}$

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

18.  $\sum_{n=1}^{\infty} \frac{\ln(n)}{n}$

19.  $\sum_{n=1}^{\infty} \frac{(2n)!}{n^5}$

20.  $\sum_{n=1}^{\infty} \frac{(2n)!}{(2n+1)!}$