

Integral Test

Determine if the following series converge or diverge.

1.
$$\sum_{n=8}^{\infty} \frac{3}{\sqrt[3]{n} \sqrt[7]{n^4}}$$

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

3.
$$\sum_{n=0}^{\infty} n e^{1-2n}$$

Comparison / Limit Comparison Test

Determine if the following series converge or diverge.

4.
$$\sum_{n=0}^{\infty} \frac{3 \sin^2(2n)}{n + 8^n}$$

5.
$$\sum_{n=1}^{\infty} \frac{3n^2 + \sin^2 n}{n^3 \cos^2 n}$$

6.
$$\sum_{n=1}^{\infty} \frac{5n - 9}{7n^2 - n + 8}$$

Alternating Series Test

Determine if the following series converge or diverge.

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

8.
$$\sum_{n=0}^{\infty} \frac{1}{(-2)^{n+2} (n^2 + 1)}$$

9.
$$\sum_{n=1}^{\infty} \frac{(-1)^n n}{n^2 + n + 4}$$

Continued on Back \Rightarrow

Ratio & Root Test

Determine if the following series converge or diverge.

10.
$$\sum_{n=0}^{\infty} \frac{(n-2)!}{(2n+1)!}$$

11.
$$\sum_{n=1}^{\infty} \frac{(-5)^{n+2} n}{2^{1+3n}}$$

12.
$$\sum_{n=0}^{\infty} n^2 3^{1-2n}$$

13.
$$\sum_{n=3}^{\infty} \left(\frac{13+6n^3}{7n+2n^3} \right)^{2n}$$

Strategy for Series

Determine if the following series converge or diverge. Clearly indicate the test used and you are allowed to use the p -series test only if the series is in the form $\sum_{n=k}^{\infty} \frac{a}{n^p}$.

NOTE : THESE PROBLEMS WILL NOT BE GRADED. THEY ARE ONLY FOR PRACTICE!!!

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

15.
$$\sum_{n=1}^{\infty} \frac{4}{(-1)^{n+2} (n+3)}$$

16.
$$\sum_{n=0}^{\infty} \frac{n^2}{3^{1-2n} (-4)^{4+n}}$$

17.
$$\sum_{n=1}^{\infty} \frac{[\ln n]^2}{n}$$

18.
$$\sum_{n=0}^{\infty} \frac{2^{n+1}}{(2n+1)!}$$