1 Integral Test

1. Use the integral test to determine whether or not the series converges.

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

2. Use the integral test to determine whether or not the series converges.

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

3. Use the integral test to determine whether or not the series converges.

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

2 Comparison Test

1. Determine the convergence of the series given below. If it converges, find the limit.

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

2. Determine the convergence of the series given below. If it converges, find the limit.

$$\sum_{k=1}^{\infty} \frac{k \sin^2 k}{1+k^3}$$

3. Determine the convergence of the series given below. If it converges, find the limit.

$$\sum_{k=1}^{\infty} \frac{\ln k}{k}$$

3 Alternating Series Test

1. Determine whether or not the series shown below converges:

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

2. Determine whether or not the series shown below converges:

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

3. Determine the convergence of $-\frac{2}{5} + \frac{4}{6} - \frac{6}{7} + \frac{8}{8} - \frac{10}{9} + \cdots$

4. Determine the convergence of $\frac{2}{3} - \frac{2}{5} + \frac{2}{7} - \frac{2}{9} + \cdots$