

Math 232 Worksheet 12 - Series Convergence Tests

1. Use the *Limit/Comparison Test* to determine if the series converges or diverges.

$$(a) \sum_{n=1}^{\infty} \frac{|\sin n|}{n^2 + 1}$$

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

2. Use the *Ratio/Root Test* to determine if the series converges or diverges.

$$(a) \sum_{n=1}^{\infty} \frac{e^n}{n!}$$

$$(b) \sum_{n=1}^{\infty} \left(\frac{n}{2n-1} \right)^n$$

3. Determine whether the series is absolutely convergent, conditionally convergent, or divergent. Use the *Alternating Series Test* where appropriate.

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

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

4. Use the *Integral Test* to determine if the series is convergent or divergent.

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

Answer Keys:

1. (a) converges (b) diverges **2.** (a) converges (b) converges

3. (a) absolutely convergent (b) conditionally convergent **4.** divergent