

Name _____ Score _____ Teacher _____ Date _____

Infinite Series Convergence Tests

Name a valid convergence test, apply it with enough exact work, and state whether the series converges or diverges.

1. Determine convergence of sum from $n=1$ to infinity of $n!/4^n$. Name and apply a valid test.

2. Determine convergence of sum from $n=1$ to infinity of $n/(n+1)$. Name and apply a valid test.

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Infinite Series Convergence Tests

Name a valid convergence test, apply it with enough exact work, and state whether the series converges or diverges.

3. Determine convergence of sum from $n=1$ to infinity of $1/(n^2+1)$. Name and apply a valid test.

4. Determine convergence of sum from $n=1$ to infinity of $1/n^2$. Name and apply a valid test.

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Infinite Series Convergence Tests

Name a valid convergence test, apply it with enough exact work, and state whether the series converges or diverges.

5. Determine convergence of sum from $n=1$ to infinity of $3^n/n!$. Name and apply a valid test.

6. Determine convergence of sum from $n=1$ to infinity of $1/(n+1)$. Name and apply a valid test.

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Infinite Series Convergence Tests

Worked Answer Key

Name a valid convergence test, apply it with enough exact work, and state whether the series converges or diverges.

1. Determine convergence of sum from $n=1$ to infinity of $n!/4^n$. Name and apply a valid test.

Diverges by the ratio test.

1. $|a_{n+1}/a_n| = (n+1)/4$.
2. The ratio limit is infinity > 1 , so the series diverges.

Infinite Series Convergence Tests

Worked Answer Key

Name a valid convergence test, apply it with enough exact work, and state whether the series converges or diverges.

2. Determine convergence of sum from $n=1$ to infinity of $n/(n+1)$. Name and apply a valid test.

Diverges by the nth-term test.

1. $\lim n/(n+1) = 1$.
2. The terms fail to approach 0, so the series diverges.

Infinite Series Convergence Tests

Worked Answer Key

Name a valid convergence test, apply it with enough exact work, and state whether the series converges or diverges.

3. Determine convergence of sum from $n=1$ to infinity of $1/(n^2+1)$. Name and apply a valid test.

Converges by the direct comparison test.

1. For $n \geq 1$, $0 < 1/(n^2+1) \leq 1/n^2$.
2. The comparison p-series converges, so the given series converges.

Infinite Series Convergence Tests

Worked Answer Key

Name a valid convergence test, apply it with enough exact work, and state whether the series converges or diverges.

4. Determine convergence of sum from $n=1$ to infinity of $1/n^2$. Name and apply a valid test.

Converges by the p-series test.

1. This is a p-series with $p = 2$.
2. Because $p > 1$, the series converges.

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Infinite Series Convergence Tests

Worked Answer Key

Name a valid convergence test, apply it with enough exact work, and state whether the series converges or diverges.

5. Determine convergence of sum from $n=1$ to infinity of $3^n/n!$. Name and apply a valid test.

Converges by the ratio test.

1. $|a_{n+1}/a_n| = 3/(n+1)$.
2. The limit is $0 < 1$, so the ratio test gives absolute convergence.

Infinite Series Convergence Tests

Worked Answer Key

Name a valid convergence test, apply it with enough exact work, and state whether the series converges or diverges.

6. Determine convergence of sum from $n=1$ to infinity of $1/(n+1)$. Name and apply a valid test.

Diverges by the limit comparison test.

1. Compare with $b_n = 1/n$.
2. $\lim [1/(n+1)]/[1/n] = \lim n/(n+1) = 1$, and the harmonic series diverges.