

Calculus BC Convergent and Divergent Series Test

Lesson 345 | Calculus BC | Integral test and p-series • Comparison tests • Alternating series and absolute convergence

<https://www.youtube.com/watch?v=ywn2Y9X3mjk>

Related review: exact coverage needs teacher confirmation.

Name: _____ Date: _____ Show your reasoning.

01

Determine whether $\sum$ from $m=1$ to ∞ of $14/m^{(6/8)}$ converges. Justify with the p-test.

02

Test $\sum$ from $m=1$ to ∞ of $13/(8m^2+10)$ by limit comparison.

03

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)}10/m$, classify convergence and bound the error after 80 terms.

Calculus BC Convergent and Divergent Series Test

Lesson 345 | Calculus BC | Integral test and p-series • Comparison tests • Alternating series and absolute convergence

<https://www.youtube.com/watch?v=ywn2Y9X3mjk>

Related review: exact coverage needs teacher confirmation.

Name: _____ Date: _____ Show your reasoning.

04

Determine whether $\sum$ from $m=1$ to ∞ of $8/m^{(6/12)}$ converges. Justify with the p-test.

05

Test $\sum$ from $m=1$ to ∞ of $7/(4m^2+12)$ by limit comparison.

06

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)4/m}$, classify convergence and bound the error after 70 terms.

Calculus BC Convergent and Divergent Series Test

Lesson 345 | Calculus BC | Integral test and p-series • Comparison tests • Alternating series and absolute convergence

<https://www.youtube.com/watch?v=ywn2Y9X3mjk>

Related review: exact coverage needs teacher confirmation.

01

Determine whether $\sum$ from $m=1$ to ∞ of $14/m^{(6/8)}$ converges. Justify with the p-test.

$p=3/4$. A p-series converges exactly when $p>1$. This series diverges; multiplying by 14 does not change convergence.

02

Test $\sum$ from $m=1$ to ∞ of $13/(8m^2+10)$ by limit comparison.

Compare with $1/m^2$. The ratio $13m^2/(8m^2+10)$ tends to $13/8$, finite and positive. Since $\sum 1/m^2$ converges, the given series converges.

03

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)}10/m$, classify convergence and bound the error after 80 terms.

Magnitudes $10/m$ decrease to zero; alternating series converges. Absolute series is a multiple of harmonic series, so diverges: conditional convergence. Error $\leq$ first omitted magnitude $10/81=10/81$.

Calculus BC Convergent and Divergent Series Test

Lesson 345 | Calculus BC | Integral test and p-series • Comparison tests • Alternating series and absolute convergence

<https://www.youtube.com/watch?v=ywn2Y9X3mjk>

Related review: exact coverage needs teacher confirmation.

04

Determine whether $\sum$ from $m=1$ to ∞ of $8/m^{(6/12)}$ converges. Justify with the p-test.

$p=1/2$. A p-series converges exactly when $p>1$. This series diverges; multiplying by 8 does not change convergence.

05

Test $\sum$ from $m=1$ to ∞ of $7/(4m^2+12)$ by limit comparison.

Compare with $1/m^2$. The ratio $7m^2/(4m^2+12)$ tends to $7/4$, finite and positive. Since $\sum 1/m^2$ converges, the given series converges.

06

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)4/m}$, classify convergence and bound the error after 70 terms.

Magnitudes $4/m$ decrease to zero; alternating series converges. Absolute series is a multiple of harmonic series, so diverges: conditional convergence. Error $\leq$ first omitted magnitude $4/71=4/71$.