

Calculus BC 10.4 Alternating Series Test and Absolute Convergence Theorem

Lesson 340 | Calculus BC | Alternating series and absolute convergence

<https://www.youtube.com/watch?v=PyRgZjEcD5g>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01 For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)}4/m$, classify convergence and bound the error after 130 terms.

02 For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)}12/m$, classify convergence and bound the error after 70 terms.

03 For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)}11/m$, classify convergence and bound the error after 80 terms.

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04

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)}10/m$, classify convergence and bound the error after 40 terms.

05

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)}10/m$, classify convergence and bound the error after 30 terms.

06

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)}2/m$, classify convergence and bound the error after 70 terms.

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01

For Σ from $m=1$ to ∞ of $(-1)^{(m+1)}4/m$, classify convergence and bound the error after 130 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 $4/131=4/131$.

02

For Σ from $m=1$ to ∞ of $(-1)^{(m+1)}12/m$, classify convergence and bound the error after 70 terms.

Magnitudes $12/m$ decrease to zero; alternating series converges. Absolute series is a multiple of harmonic series, so diverges: conditional convergence. Error $\leq$ first omitted magnitude $12/71=12/71$.

03

For Σ from $m=1$ to ∞ of $(-1)^{(m+1)}11/m$, classify convergence and bound the error after 80 terms.

Magnitudes $11/m$ decrease to zero; alternating series converges. Absolute series is a multiple of harmonic series, so diverges: conditional convergence. Error $\leq$ first omitted magnitude $11/81=11/81$.

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04

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)}10/m$, classify convergence and bound the error after 40 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 $10/41=10/41$.

05

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)}10/m$, classify convergence and bound the error after 30 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 $10/31=10/31$.

06

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)}2/m$, classify convergence and bound the error after 70 terms.

Magnitudes $2/m$ decrease to zero; alternating series converges. Absolute series is a multiple of harmonic series, so diverges: conditional convergence. Error $\leq$ first omitted magnitude $2/71=2/71$.