

2022 The Secret of Finding Alternating Series Remainder and Accuracy on TI-84

Lesson 341 | Calculus BC | Alternating series and absolute convergence

<https://www.youtube.com/watch?v=eYtXyD0Ypws>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)}10/m$, classify convergence and bound the error after 140 terms.

02

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)}7/m$, classify convergence and bound the error after 100 terms.

03

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)}13/m$, classify convergence and bound the error after 140 terms.

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04

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)9/m}$, classify convergence and bound the error after 30 terms.

05

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)5/m}$, classify convergence and bound the error after 110 terms.

06

For $\sum$ from $m=1$ to ∞ of $(-1)^{(m+1)4/m}$, classify convergence and bound the error after 20 terms.

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- 01** For Σ from $m=1$ to ∞ of $(-1)^{(m+1)}10/m$, classify convergence and bound the error after 140 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 $10/141=10/141$.

- 02** For Σ from $m=1$ to ∞ of $(-1)^{(m+1)}7/m$, classify convergence and bound the error after 100 terms.

Magnitudes $7/m$ decrease to zero; alternating series converges. Absolute series is a multiple of harmonic series, so diverges: conditional convergence. Error $\leq$ first omitted magnitude $7/101=7/101$.

- 03** For Σ from $m=1$ to ∞ of $(-1)^{(m+1)}13/m$, classify convergence and bound the error after 140 terms.

Magnitudes $13/m$ decrease to zero; alternating series converges. Absolute series is a multiple of harmonic series, so diverges: conditional convergence. Error $\leq$ first omitted magnitude $13/141=13/141$.

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- 04** For Σ from $m=1$ to ∞ of $(-1)^{(m+1)}9/m$, classify convergence and bound the error after 30 terms.

Magnitudes $9/m$ decrease to zero; alternating series converges. Absolute series is a multiple of harmonic series, so diverges: conditional convergence. Error $\leq$ first omitted magnitude $9/31=9/31$.

- 05** For Σ from $m=1$ to ∞ of $(-1)^{(m+1)}5/m$, classify convergence and bound the error after 110 terms.

Magnitudes $5/m$ decrease to zero; alternating series converges. Absolute series is a multiple of harmonic series, so diverges: conditional convergence. Error $\leq$ first omitted magnitude $5/111=5/111$.

- 06** For Σ from $m=1$ to ∞ of $(-1)^{(m+1)}4/m$, classify convergence and bound the error after 20 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 $4/21=4/21$.