

2022 Calculus BC An Infinite Series, Arithmetic Series and Harmonic Series Rokawski 10....

Lesson 336 | Calculus BC | Infinite series and telescoping • Geometric sequences and series

<https://www.youtube.com/watch?v=8l9Lnj39hos>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01 Evaluate Σ from $m=1$ to ∞ of $3/((m+13)(m+14))$.

02 A geometric sequence starts at 9 with ratio 3. Find term 6 and the sum through that term.

03 Evaluate Σ from $m=1$ to ∞ of $14/((m+13)(m+14))$.

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04

Find the sum of the infinite geometric series with first term 91 and ratio $\frac{1}{7}$.

05

Evaluate $\sum$ from $m=1$ to ∞ of $\frac{13}{(m+8)(m+9)}$.

06

A geometric sequence starts at 3 with ratio 5. Find term 7 and the sum through that term.

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01 Evaluate Σ from $m=1$ to ∞ of $3/((m+13)(m+14))$.

Term= $3[1/(m+13)-1/(m+14)]$. Partial sum= $3[1/14-1/(N+14)]$. Limit= $3/14$.

02 A geometric sequence starts at 9 with ratio 3. Find term 6 and the sum through that term.

$a_m = 9 \cdot 3^{(m-1)}$, so $a_6 = 2187$. $S_6 = 9(3^6-1)/(3-1) = 3276$.

03 Evaluate Σ from $m=1$ to ∞ of $14/((m+13)(m+14))$.

Term= $14[1/(m+13)-1/(m+14)]$. Partial sum= $14[1/14-1/(N+14)]$. Limit= 1 .

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04

Find the sum of the infinite geometric series with first term 91 and ratio $1/7$.

$|r| = 1/7 < 1$, so $S = a_1/(1-r) = 91/(1-1/7) = 637/6$.

05

Evaluate $\sum$ from $m=1$ to ∞ of $13/((m+8)(m+9))$.

Term= $13[1/(m+8)-1/(m+9)]$. Partial sum= $13[1/9-1/(N+9)]$. Limit= $13/9$.

06

A geometric sequence starts at 3 with ratio 5. Find term 7 and the sum through that term.

$a_m = 3 \cdot 5^{(m-1)}$, so $a_7 = 46875$. $S_7 = 3(5^7-1)/(5-1) = 58593$.