



Reporting Measure: Finite Geometric Sequences

Level	Description
Above & Beyond (4.0)	The student will: • Solve real-world problems involving the sum of a geometric sequence (for example, given a savings account with a 5% annual interest rate into which \$100 is deposited at the end of every year, calculate the value of the savings account after 10, 25, and 50 years).
3.5	In addition to score 3.0 performance, partial success at score 4.0 content
Proficient (3.0)	The student will: FGS1—Derive the formula for the sum of a finite geometric sequence (for example, represent the sum of a finite geometric sequence as $\sum_{i=0}^n ar^i$, then set up the equation $\sum_{i=0}^n ar^i - r\left(\sum_{i=0}^n ar^i\right) = a - ar^{n+1}$ and solve for $\sum_{i=0}^n ar^i$). FGS2—Use the formula for the sum of a geometric sequence to solve problems (for example, calculate the sum of the geometric sequence $1 - 0.27 + 0.27^2 - 0.27^3 + 0.27^4 + \dots - 0.27^9$).
2.5	No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content
Getting There (2.0)	FGS1—The student will recognize or recall specific vocabulary (for example, <i>finite geometric series</i>, <i>sigma notation</i>) and perform basic processes such as: • Explain that a finite geometric series of n terms takes the form $ar^0 + ar^1 + ar^2 + \dots ar^n$ in which a is the first term and r is the common ratio. • Represent a finite geometric series in sigma notation. For example, represent the finite geometric series $AR^0 + ar^1 + ar^2 + \dots ar^n$ as $\sum_{i=0}^n ar^i$. • Explain that $r\left(\sum_{i=0}^n ar^i\right)$ represents the finite geometric series $ar^1 + ar^2 + ar^3 + \dots ar^{n+1}$. • Explain why $\sum_{i=0}^n ar^i - r\left(\sum_{i=0}^n ar^i\right) = (AR^0 + ar^1 + ar^2 + \dots ar^n) - (ar^1 + ar^2 + ar^3 + \dots ar^{n+1}) = ar^0$. • Solve for $\sum_{i=0}^n ar^i$ in the equation $\sum_{i=0}^n ar^i - r\left(\sum_{i=0}^n ar^i\right) = a - ar^{n+1}$. • State the formula for a finite geometric series: $\sum_{i=0}^n ar^i = \frac{a-ar^{n+1}}{1-r}$. FGS2—The student will recognize or recall specific vocabulary (for example, <i>geometric series</i>) and perform basic processes such as: • Identify geometric sequences in numerical relationships.

	• Use the formula for a finite geometric series to calculate the value of a given geometric series.
1.5	Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content
Beginning (1.0)	With help, partial success at score 2.0 content and score 3.0 content