

11.2 Geometric Series

Initial term: a_1

Nth term: a_n

Common ratio: q

Number of terms in the series: n

Sum of the first n terms: S_n

Sum to infinity: S

$$1188. a_n = qa_{n-1} = a_1 q^{n-1}$$

$$1189. a_1 \cdot a_n = a_2 \cdot a_{n-1} = \dots = a_i \cdot a_{n+1-i}$$

$$1190. a_i = \sqrt{a_{i-1} \cdot a_{i+1}}$$

$$1191. S_n = \frac{a_n q - a_1}{q - 1} = \frac{a_1 (q^n - 1)}{q - 1}$$

$$1192. S = \lim_{n \rightarrow \infty} S_n = \frac{a_1}{1 - q}$$

For $|q| < 1$, the sum S converges as $n \rightarrow \infty$.