Sequence and Series

Chapter 11
Section 2
MATH182A

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What is a series?

A series is the summation of the components of a sequence.

If $\lim_{n\to\infty} S_n = S$, $\sum a_n$ converges, such that $\sum a_n = S$ and $\sum a_n < \infty$.

Geometric Series

$$a + an + an^2 + an^3 + \dots$$
$$S_n = a + an + an^2 + \dots$$
$$(s)S_n = an + an^2 + an^3 + \dots$$
$$(1-s)S_n = a - as^n$$
$$S_n = \frac{a(1-r^n)}{1-r}$$
$$\lim_{n\to\infty} S_n = \lim_{n\to\infty} \frac{a(1-r^n)}{1-r}$$
$$= \frac{a}{1-r} \text{ when } -1 \leq r \leq 1$$
$$= \infty \text{ when } r \geq 1$$