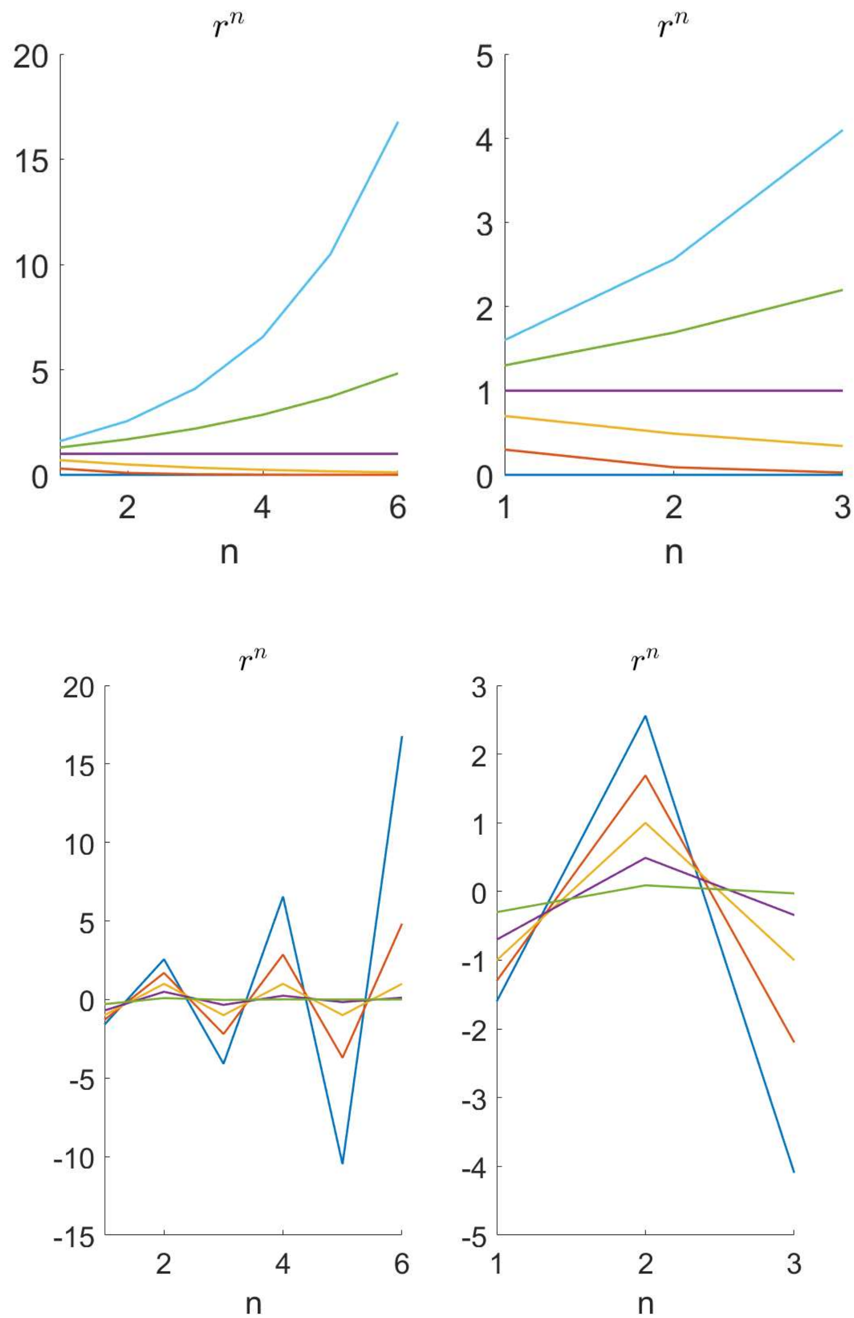
Example: Let $a_1 = \sqrt{2}$ and define $a_n = \sqrt{2 + a_n}$ for all $n > 1$.

Decide if $\{a_n\}$ converges.


r^n
n
r^n
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r^n
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r^n
n

4.1 Series (Chapter 11.2)

An **infinite series**, or short **series**, is given by ________________.

We define the **partial sum** S_n by ______________________.

Relation: _________________________.

We say that the series is **convergent** if _________________________, else, the series is ____________.

Any number can be expressed as a series. How?

- 10

- 0.34

- 4.12345678

- π

Let $a \neq 0$ and $r \in \mathbb{R}$, then the geometric series is

Can we calculate the value of this series?

Hint: Look at $S_n - rS_n$.

general rule:

Example: Find

1. $\sum_{n=1}^{\infty} \frac{1}{5^n}$

2. $\sum_{n=0}^{\infty} 2^{n+1}3^{-n}$

A **telescoping series** is a series, where the terms can be written as $a_n = c_n - c_{n+1}$ for some c_n.

Example: $\sum_{n=1}^{\infty} \frac{1}{n(n+1)}$

Result: Assume $\sum_{n=1}^{\infty} a_n$ converges, then $\lim_{n\to\infty} a_n =$, because