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## Divergence or $n$ th Term Test

Series:  $\sum_{n=1}^{\infty} a_n$

Condition(s) of Convergence:

None. This test cannot be used to show convergence.

Condition(s) of Divergence:

$$\lim_{n \rightarrow \infty} a_n \neq 0$$

### TEST FOR DIVERGENCE

Does  $\lim_{n \rightarrow \infty} a_n = 0$ ?

NO

$\sum a_n$  Diverges

The  $n$ -th Term Test for Divergence: If  $\lim_{n \rightarrow \infty} a_n \neq 0$ , then the series diverges.

Note that the converse is *false*, that is, if  $\lim_{n \rightarrow \infty} a_n = 0$ , the series may or may not converge.