Theorem.

a) In a convergent series, the general term tends to zero,
b) If, in a series, the general terms does not tend to zero, the series is divergent.

We call Part b test for divergence by general-term test.
Proof.

a) Let $\sum_1 a_n = s$. Then $a_n = s_{n+1} - s_n \to s - s = 0$
b) Let $a_n \to k \neq 0$, but suppose the series is convergent.

Then by a), $a_n \to 0$ contradicting $k \neq 0$.

Remark. As the harmonic series shows, the approach of a_n to zero does not imply the convergence of the series, that is, the series in which $a_n \to 0$ may converge or diverge. Test for convergence and divergence are generally given for series of positive terms.

B.SERIES OF POSITIVE TERMS

A series having almost every term (all terms except perhaps finitely many ones) positive is called a series of positive terms.
Thus the series

$$\sum_1 \tfrac{1}{n},\ \sum_0 |a_n|,\ \sum_1 \tfrac{n^2-2n-3}{n^2} = -4 - \tfrac{3}{4} - 0 + \tfrac{5}{6} + \ldots + \tfrac{n^2-2n-3}{n^2} + .$$

are series of positive terms, while $\sum_0 \left(\frac{-1}{2}\right)^n$ is not.

The tests that are given here are comparison tests by which a given series of positive terms is compared either with a positive improper integral or with another series of positive terms. There are also intrinsic tests which are applied directly to a given series itself.