

## 9.4 Direct Comparison Test

Thm. Direct Comparison Test

Let  $0 < a_n < b_n$  for all  $n$  beyond some value.

if the series of  
this term diverges,

if the series of  
this term converges,

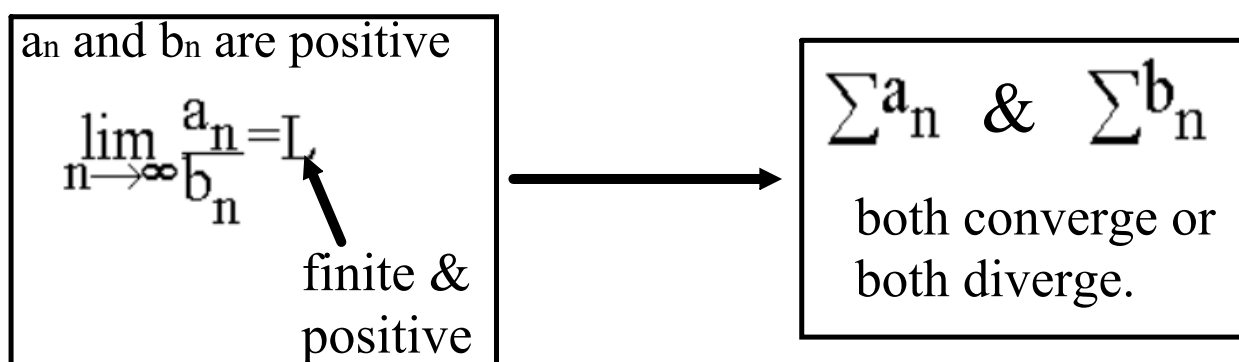
then so does the other series.

ex. Determine the convergence of  $\sum_{n=1}^{\infty} \frac{1}{5+3^n}$

ex. Determine the convergence of  $\sum_{n=1}^{\infty} \frac{1}{3n^2+2}$

ex. Determine the convergence of  $\sum_{n=1}^{\infty} \frac{5^n}{3^{n-2}}$

ex. Determine the convergence of  $\sum_{n=2}^{\infty} \frac{1}{\sqrt{n} - 1}$

Thm. Limit Comparison Test

Comparison series: keep only the highest powers of  $n$  in the numerator or denominator.

ex. Determine the convergence of  $\sum_{n=1}^{\infty} \frac{2n^2-1}{3n^5+2n+1}$

ex. Determine the convergence of  $\sum_{n=1}^{\infty} \frac{n+3}{n(n+4)}$



ex. Determine the convergence of  $\sum_{n=2}^{\infty} \frac{1}{\sqrt{n^2 - 1}}$