

Calculus II

Basic divergence test

Todor Milev

2019

Example

Show that the series $\sum_{n=1}^{\infty} \frac{n^2}{5n^2+4}$ diverges.

$$\lim_{n \rightarrow \infty} a_n = \lim_{n \rightarrow \infty} \frac{n^2}{5n^2+4} \cdot \frac{\frac{1}{n^2}}{\frac{1}{n^2}} = \lim_{n \rightarrow \infty} \frac{1}{5 + \frac{4}{n^2}} = \frac{1}{5} \neq 0$$

Therefore, by the Divergence Test, the series diverges.