

Consider the following definitions.

Definition

- If $\forall M > 0, \exists N$ such that $\forall n > N, n \in \mathbb{N}, s_n > M$, then the sequence diverges to $+\infty$. We write $\lim_{n \rightarrow \infty} s_n = +\infty$.
- If $\forall M < 0, \exists N$ such that $\forall n > N, n \in \mathbb{N}, s_n < M$, then the sequence diverges to $-\infty$. We write $\lim_{n \rightarrow \infty} s_n = -\infty$.

Using the above definitions,

1. prove that $\lim_{n \rightarrow \infty} \frac{n^2 + 4}{n + 2} = +\infty$.
2. Prove that $\lim_{n \rightarrow \infty} \frac{n^3}{1 - n} = -\infty$.