1. Prove, using the definition of a limit, that
\[ \lim_{n \to \infty} \frac{n}{n^2 + 1} = 0. \]

2. Prove, using the definition of a limit, that
\[ \lim_{n \to \infty} \frac{2n^2 + n + 1}{n^2 + 3} = 2. \]

3. Let \( c \) be a fixed positive number and
\[ a_n = \frac{1}{1 + nc} \quad \text{where} \quad c > 0. \]

Use the definition of a limit to prove that \( \langle a_n \rangle \) converges.

4. Prove that the sequence \( \langle n^{1/3} \rangle \) diverges.

5. Suppose that the sequence \( \langle a_n \rangle \) converges to \( l \). Let
\[ s_n = \frac{a_1 + a_2 + \cdots + a_n}{n}. \]

Using only the definition of limit, prove that \( \langle s_n \rangle \) converges to \( l \).