Tutorial

Week 2

October 26, 2024

- 1. Consider the sequence $a_n = (-1)^n$:
 - (a) For $\epsilon = 0,005$, determine *n* such that $|a_n 0| < \epsilon$.
 - (b) Prove that $\lim_{n \to \infty} \frac{(-1)^n}{n} = 0$
- 2. Verify, using the definition of convergence of a sequence that the following sequences converge to the proposed L:

(a)
$$\lim_{n \to \infty} \frac{2n^2}{n^3 + 3} = 0$$

(b)
$$\lim_{n \to \infty} \frac{2n + 1}{5n + 4} = 2/5$$

(c)
$$\lim_{n \to \infty} \frac{\sin(n^2)}{\sqrt[3]{n}} = 0$$

(d)
$$\lim_{n \to \infty} \sqrt{n^2 + 1} - n = 0$$

3. Suppose a_n and b_n sequences such that $\lim_{n \to \infty} a_n = a$ and $\lim_{n \to \infty} b_n = b$ then $\lim_{n \to \infty} a_n + b_n = a + b$.