

Sequences & Series: Exercise 2

Due date: 2025-12-09

1. Given the sequence $a_n = \frac{n}{n+1}$, determine whether the sequence converges. If it does, find its limit.
2. Given the sequence $a_n = \left(1 + \frac{1}{n}\right)^n$, determine whether the sequence converges. If it does, find its limit.
3. Given the sequence $a_n = \frac{\sin n}{n}$, determine whether the sequence converges. If it does, find its limit.
4. Given the sequence $a_n = \frac{(-1)^n n}{n+1}$, determine whether the sequence converges. If it does, whether it is absolutely convergent or conditionally convergent.
5. Given the sequence $a_n = \sqrt{n+1} - \sqrt{n}$, determine whether the sequence converges. If it does, find its limit.