1. Give an example of a non-increasing sequence with a limit.

3. Give an example of a bounded sequence without a limit.

2. Give an example of a non-increasing sequence without a limit.

Find the limit of the following sequences

4. $a_n = \frac{n}{\sqrt{4n^2 + 2n + 1}}$
5. $a_n = \frac{n}{e^n + 2n}$

6. $a_n = \left(1 + \frac{3}{n}\right)^{3n}$

7. $a_n = \ln(\sin\left(\frac{1}{n}\right)) + \ln(n)$

8. $a_n = \frac{\cos(n)}{2^n}$
9. \( a_n = \frac{4n^3 + 3}{\sqrt{n + 2n^6}} \)

10. \( b_n = \frac{4 + \cos n}{2n} \)

11. Express the sequence \( \{2n + 1\}_{n=1}^{\infty} \) as an equivalent sequence of the form \( \{b_n\}_{n=4}^{\infty} \).

12. Given \( a_1 = 0 \) and \( a_{n+1} = \frac{6}{3 - a_n} \) for \( n \geq 1 \), the first four terms of the sequence \( \{a_n\}_{n=1}^{\infty} \) are nonnegative.