

Homework 1

Prove the following using the $\epsilon - K(\epsilon)$ definition of limits of sequences:

1. $\lim_{n \rightarrow \infty} \frac{1}{7n + 5} = 0$

2. $\lim_{n \rightarrow \infty} \frac{n^2 - 1}{n^2 + 1} = 1$

3. $\lim_{n \rightarrow \infty} \frac{2n + 3}{n^2 + 2n + 4} = 0$

4. $\lim_{n \rightarrow \infty} (\sqrt{n + 1} - \sqrt{n}) = 0$

5. $\lim_{n \rightarrow \infty} \frac{1}{n!} = 0$

6. $\lim_{n \rightarrow \infty} \frac{\sqrt{n} - 1}{\sqrt{n} + 1} = 1$

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

8. $\lim_{n \rightarrow \infty} \sqrt[n]{n} = 1.$