

Homework 1

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

1. $\lim_{n \rightarrow \infty} \frac{2}{3n+4} = 0$
2. $\lim_{n \rightarrow \infty} \frac{1}{\sqrt{7n+5}} = 0$
3. $\lim_{n \rightarrow \infty} \frac{5n+7}{7n+5} = \frac{5}{7}$
4. $\lim_{n \rightarrow \infty} \frac{2n+3}{n^2+2n+4} = 0$
5. $\lim_{n \rightarrow \infty} (\sqrt{n^2+1} - n) = 0$
6. $\lim_{n \rightarrow \infty} (\sqrt[3]{n+1} - \sqrt[3]{n}) = 0$
7. $\lim_{n \rightarrow \infty} \frac{1}{n!} = 0$
8. $\lim_{n \rightarrow \infty} \frac{\sqrt{n}-1}{\sqrt{n}+1} = 1$
9. $\lim_{n \rightarrow \infty} \frac{3n^2-4n+1}{2n^2-3n+1} = \frac{3}{2}$
10. $\lim_{n \rightarrow \infty} \sqrt[n]{5} = 1.$