Extra Problems

1) Prove that $\lim_{n\to\infty} \dfrac{2n+11}{n+3} = 1$ using the definition of convergence (similar to homework 3b) & 2.1 page 34).

2) Prove that $\lim_{n\to\infty} \sqrt{\dfrac{5n+3}{n}} = \sqrt{5}$ using the definition of convergence (similar to Example 2 page 30).

3) Prove that $a_n = \dfrac{5}{\sqrt{n}} + 3$ is a Cauchy sequence using just the definition (similar to homework 1) & 2.4 page 50) .

4) Prove that $a_n = \dfrac{4n-3}{n+7}$ is a Cauchy sequence using just the definition (similar to Example 1 & 2.4 page 45) .

5) Prove by definition that $a_n = \frac{4^n}{3^{n-2}}$ diverges to ∞.

6) Prove by definition that $a_n = \ln(\dfrac{1}{n})$ diverges to $-\infty$.

7) Suppose that $|a_n| < 3^{-n}$. Show that $\sum_{n=1}^{\infty} a_n$ converges.