CALCULUS 1501 WINTER 2010

HOMEWORK ASSIGNMENT 5.

Due February 12.

5.1. Using only the ϵ-N definition of convergence of a sequence prove
$$\lim_{n \to \infty} \frac{2n+1}{3n+2} = \frac{2}{3}.$$

5.2. Determine without proof $\sup S$, the *supremum* of the set S given by
$$S = \left\{ \frac{n}{n+m}, \text{ where } n, m \in \mathbb{N} \right\}.$$

5.3. Recall that the Fibonacci sequence is defined by
$$f_1 = f_2 = 1, \quad f_n = f_{n-1} + f_{n-2}, \quad \text{for } n > 2.$$

Consider a sequence
$$s_1 = 1, \quad s_n = \frac{f_{n+1}}{f_n} \text{ for } n > 1.$$

Assume that s_n converges. Find its limit.

5.4. Let $\{s_n\}$ be defined as
$$s_1 = 0.3, \ s_2 = 0.33, \ s_3 = 0.333, \ldots$$

Prove that $\{s_n\}$ converges.