Math 347F1, HW #7

Due Wednesday, March 18, 2009

1. Use $\varepsilon - N$ definition to show that

a) $\lim_{n\to\infty} \frac{n^2-n}{2n^2+1} = \frac{1}{2}$

b) $\lim_{n\to\infty} \frac{3n+7}{6n-5} = \frac{1}{2}$.

2. Use the $\varepsilon - N$ definition to show that $a_n = (-1)^n + \frac{1}{n}$ does not converge to 1.

3. Let $s_1 = 1$ and $s_{n+1} = \frac{(s_n+1)}{3}$.

a) List the first four terms of this sequence.

b) Show that this sequence (s_n) is monotone decreasing and bounded below.

c) Find the limit.

4. Let (a_n) be a sequence. Show that $\lim_{n\to\infty} a_n = 0$ if and only if $\lim_{n\to\infty} |a_n| = 0$.