Real Analysis

Math 310 — MWF 10:30-11:25am
Fall 1996 — 127 Fowler

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Wednesday (09/25/96)

SUMMARY Infinite limits

READING §9

Warm-Up

(5-10 minutes) Let's look at that proof of $\lim_{n\to\infty} \dfrac{n^3-4}{n^2-2} = +\infty$

Examples

Let's do some more examples of finding the limits of sequences.
(formal proofs)

(a) $\lim n^3$

(b) $\lim(1.01)^n$

MORE USEFUL THEOREMS

Let (s_n) and (t_n) be sequences such that $\lim s_n = +\infty$ and $\lim t_n > 0$ [i.e. $\lim t_n = +\infty$ or is finite]. Then $\lim s_n t_n = +\infty$

For a sequence (s_n) of positive real numbers, $\lim s_n = 0$ *if and only if* $\lim(1/s_n) = 0$

Definition: Infinite limits

For a sequence (s_n) we say that $\lim s_n = +\infty$ provided that

$$\forall M > 0 \ \exists N \ni \quad n > N \Rightarrow s_n > M$$

and $\lim s_n = -\infty$ provided that

$$\forall M < 0 \ \exists N \ni \quad n > N \Rightarrow s_n < M$$

Homework Assignment (Due 9/30/96)

§9, page 40-41: **9.1(b), 9.2(b), 9.5, 9.6, 9.7, 9.8, 9.13, 9.15, 9.16, 9.17**