PRINT Your Name:_____

Quiz 9 — March 16, 2012 – Section 8 – 10:10 – 11:00

Remove everything from your desk except a pencil or pen.

Write in complete sentences.
The quiz is worth 5 points.

Let $a_n = \frac{2n}{3n+1}$.

1. Does the sequence $\{a_n\}$ converge? Explain very thoroughly.
2. Does the series $\sum_{n=1}^{\infty} a_n$ converge? Explain very thoroughly.

Answer:

(1) YES. We compute $\lim_{n\to\infty} a_n = \lim_{n\to\infty} \frac{2n}{3n+1} = \lim_{n\to\infty} \frac{2}{3+\frac{1}{n}} = \frac{2}{3}$. Thus the sequence $\{a_n\}$ converges to 2/3.

(2) NO. Apply the Individual Term Test for Divergence. We saw in (1), that $\lim_{n\to\infty} a_n \neq 0$, we conclude (from the ITTforD) that the series $\sum_{n=1}^{\infty} a_n$ diverges.