

PRINT Your Name: _____

Quiz 9 — October 14, 2011 – Section 7 – 10:10 – 11:00

Remove everything from your desk except a pencil or pen.

The quiz is worth 5 points.

Find the limit of the sequence whose n^{th} term is $a_n = \ln(2n^2 + 1) - \ln(n^2 + 1)$.

Answer: We see that

$$\lim_{n \rightarrow \infty} a_n = \lim_{n \rightarrow \infty} [\ln(2n^2 + 1) - \ln(n^2 + 1)] = \lim_{n \rightarrow \infty} \ln \left(\frac{2n^2 + 1}{n^2 + 1} \right) = \lim_{n \rightarrow \infty} \ln \left(\frac{2 + \frac{1}{n^2}}{1 + \frac{1}{n^2}} \right) = \ln 2.$$

We conclude that the sequence $\{a_n\}$ converges to $\boxed{\ln 2}$.