

Quiz 9 — October 20, 2010 – Section 10 – 11:15 – 12:05

Does the series $\sum_{n=1}^{\infty} \frac{9^n}{3+10^n}$ converge? **Justify your answer very thoroughly.**

Answer. We compare the given series to $\sum_{n=1}^{\infty} \frac{9^n}{10^n}$, which is a geometric series with ratio $\frac{9}{10}$ which is less than 1. Thus $\sum_{n=1}^{\infty} \frac{9^n}{10^n}$ converges. We see that $0 < \frac{9^n}{3+10^n} < \frac{9^n}{10^n}$.

We apply the comparison test to conclude that $\sum_{n=1}^{\infty} \frac{9^n}{3+10^n}$ also converges.