

Quiz 8 MATH 2502 Spring 2019

The series converges by comparison test:

let $b_n = \frac{1}{3^n}$, then note that

$$3^n + n > 3^n$$

\Downarrow

$$\frac{1}{3^n + n} < \frac{1}{3^n}$$

$$\Rightarrow a_n < b_n.$$

Now note that

$$\sum b_n = \sum_{n=0}^{\infty} \frac{1}{3^n} = \sum_{n=0}^{\infty} \left(\frac{1}{3}\right)^n = \frac{1}{1 - \frac{1}{3}} = \frac{1}{\frac{2}{3}} = \frac{3}{2}$$

So, by comparison test, series $\sum a_n$ converges.