

Math 1AA3/1ZB3: Week 3 Tutorial Problems

January 18, 2019

1. Prove or disprove the following: There exists a positive integer k such that $f(k) = 10$, where f is the recursive function defined by $f(1) = 1$ and $f(n) = \sqrt{f(n-1)} + 2$
2. Determine whether the following sequences converge as n approaches infinity:

(a)

$$a_n = \ln(4e^{-\sin(1/n)})$$

(b)

$$a_n = \tan\left(\frac{\pi}{4} + n\pi\right)$$

(c)

$$a_n = \frac{(-6)^n}{2^{n-1} \cdot 3^{n-3}}$$

3. Find the sum of the following series:

$$\sum_{n=0}^{\infty} \frac{5}{n^2 + 4n + 3}$$