

MA114 Summer 2018
Worksheet 9a – Infinite Series – 6/25/18

1. Identify the following statements as true or false and explain your answers.

(a) If the sequence of partial sums of an infinite series is bounded then the series converges.

(b) $\sum_{n=1}^{\infty} a_n = \lim_{n \rightarrow \infty} a_n$ if the series converges.

(c) $\sum_{n=1}^{\infty} a_n = \sum_{n=0}^{\infty} a_{n+1}$ if both series converge.

(d) Every infinite series with only finitely many nonzero terms converges.

(e) A finite number of terms of an infinite series can be changed without affecting whether or not the series converges.

2. Find the first four partial sums of the series

$$\sum_{n=0}^{\infty} \frac{1}{n+3} - \frac{1}{n+5}$$

and find its sum S .

3. For each of the following series, determine whether the series converges or diverges. If it converges, find what value it converges to.

(a)
$$\sum_{n=0}^{\infty} \frac{2 + 3^n}{5^n}$$

(b)
$$\sum_{n=0}^{\infty} \frac{2n + 3}{4n + 1}$$

(c)
$$\sum_{n=0}^{\infty} (-1)^{n-1} \frac{n}{n + 1}$$

(d)
$$\sum_{n=1}^{\infty} e^{-n}.$$