

Chapter 9.3: Convergence of Series
Calculus II
Spring 2021
College of the Atlantic

1. For each of the following series, do the following:

(a) Use wolfram alpha to compute the following partial sums: S_{10} , S_{100} , S_{1000} .

(b) Does the series appear to be converging? If so, what is it converging to?

$$\sum_{n=0}^{\infty} 3 \left(\frac{1}{2}\right)^n . \quad (1)$$

$$S = \sum_{n=1}^{\infty} \frac{1}{n} . \quad (2)$$

$$S = \sum_{n=1}^{\infty} (-1)^{n+1} \frac{1}{n} . \quad (3)$$

$$S = \sum_{n=1}^{\infty} \frac{6}{n^2} . \quad (4)$$

$$S = \sum_{n=0}^{\infty} \frac{1}{n!} . \quad (5)$$

2. Do the following series converge or diverge? Answer without using wolfram alpha.

$$\sum_{i=0}^{\infty} \left(\frac{5}{4}\right)^i \quad (6)$$

$$\sum_{n=1}^{\infty} \frac{4}{n^2} \quad (7)$$

$$\sum_{n=1}^{\infty} \frac{4}{n^2 + 3} \quad (8)$$

$$\sum_{n=1}^{\infty} \frac{4}{n^2 - 3} \quad (9)$$

$$\sum_{n=589}^{\infty} \frac{4}{n + 3} \quad (10)$$

$$\sum_{k=0}^{589,744,127} \frac{4}{n + 3} \quad (11)$$