MATH 1120 Calculus II - Fall 2018 31 Oct 2018

Problem Set 25

1) (10.2.2) Find a formula for the nth partial sum of the following series and use it to find the series' sum if the series converges:

$$\frac{9}{100} + \frac{9}{100^2} + \frac{9}{100^3} + \cdots + \frac{9}{100^n} + \cdots$$

2) (10.2.4) Find a formula for the nth partial sum of the following series and use it to find the series' sum if the series converges:

$$1 - 2 + 4 - 8 + \cdots + (-1)^{n-1}2^{n-1} + \cdots$$

3) (10.2.12) Write out the first eight terms of each series to show how the series starts. Then find the sum of the series or show that it diverges

$$\sum_{n=0}^{\infty} \left(\frac{5}{2^n} - \frac{1}{3^n} \right).$$

4) (10.2.32/34) Check if the following series is divergent using the nth term test:

$$\sum_{n=0}^{\infty} \frac{e^n}{e^n + n} \quad \text{and} \quad \sum_{n=0}^{\infty} \cos n\pi.$$

5) (10.2.44) Find the sum of the series:

$$\sum_{n=1}^{\infty} \frac{2n+1}{n^2(n+1)^2}$$

6) (10.2.78) Find the values of x for which the given geometric series converges. Also find the sum of the series (as a function of x) for those values of x:

$$\sum_{n=0}^{\infty} (\ln x)^n.$$