

Math 276 Discussion Worksheet 15

1. Determine the divergence or convergence of the series. Justify your answers.

$$\text{a. } \sum_{n=1}^{\infty} \frac{1}{n(n+1)} \quad \text{b. } \sum_{n=2}^{\infty} \frac{\sin(n)}{n(\log n)^{1.1}} \quad \text{c. } \sum_{n=1}^{\infty} \frac{10^{\log n} n^2}{2^n} \quad \text{d. } \sum_{n=1}^{\infty} \frac{n! \sin(2^n)}{n^n}$$

2. Define $f(x) = \sum_{n=1}^{\infty} \frac{\sin(nx)}{n^2}$. (a) Find the set of x at which $f(x)$ is well defined. (b) Find the set of x at which $f(x)$ is continuous. (c) Evaluate $\int_0^{2\pi} f(x) dx$.

3. Determine the set of all x for which the power series converges.

$$\text{a. } \sum_{n=1}^{\infty} nx^n \quad \text{b. } \sum_{n=1}^{\infty} \frac{x^n}{n} \quad \text{c. } \sum_{n=0}^{\infty} \frac{x^n}{n!} \quad \text{d. } \sum_{n=0}^{\infty} (2^n + 3^n)x^n$$