

Math 2142 Homework 7 Part 2: Due Friday March 23

Problem 1. For each of the following power series, determine for which values of x the series converges. With the Ratio or Root Tests, you often find an open interval of the form $(-r, r)$ on which the series converges. Be sure to check whether the series converges or diverges at the endpoints of this interval.

1(a).

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

1(b).

$$\sum_{n=1}^{\infty} \frac{(-2)^n x^n}{\sqrt[4]{n}}$$

1(c).

$$\sum_{n=0}^{\infty} \sqrt{n} x^n$$

1(d).

$$\sum_{n=0}^{\infty} \frac{(x-2)^n}{n^n}$$

1(e).

$$\sum_{n=1}^{\infty} (-1)^n \frac{(x+5)^n}{n5^n}$$

Problem 2. Each of the following series can be rewritten as a geometric series. Use this fact to determine for which values of x the series converges and what the value of the series is for each such x .

2(a).

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

2(b).

$$\sum_{n=0}^{\infty} (-1)^n x^{2n}$$