WS 2- Power Series with Intervals of Convergence and Radii

1. Find the radius and interval of convergence for the series $\sum_{n=0}^{\infty} 4^n x^n$

2. Find the radius and interval of convergence for the series $\sum_{n=0}^{\infty} (-1)^n \frac{x^{2n}}{(2n)!}$ ★

3. Determine the interval of convergence for the series $\sum_{n=0}^{\infty} \frac{x^n}{3^n}$

4. Determine the interval of convergence for the series $\sum_{n=1}^{\infty} \frac{(x-2)^n}{n \cdot 5^n}$

5. Determine the radius and interval of convergence for the series $\sum_{n=1}^{\infty} \frac{2^{2n} x^n}{n^2}$

6. Determine the interval of convergence for the series $\sum_{n=0}^{\infty} \frac{(x+3)^n}{n+1}$

7. Consider the power series

$$5 + (x-1) + \frac{(x-1)^2}{2!} + \frac{(x-1)^3}{3!} + \frac{(x-1)^4}{4!} + \frac{(x-1)^5}{5!} + \dots$$

Determine the radius and interval of convergence for this series.

8. Determine the interval of convergence for the series: $\frac{\ln 3}{3}x^3 + \frac{\ln 4}{4}x^4 + \dots + \frac{\ln n}{n}x^n + \dots$

9. Find the radius of convergence of $f(x) = \sum_{n=0}^{\infty} \frac{(x-3)^n}{2^n}$

*Should be closed open bracket on right side

10. the Maclurin series for the function f is given by

$f(x) = \sum_{n=0}^{\infty} \frac{(2x)^{n+1}}{n+1} = 2x + \frac{4x^2}{2} + \frac{8x^3}{3} + \frac{16x^4}{4} + \dots + \frac{(2x)^{n+1}}{n+1} + \dots$

on its interval of convergence.

Find the interval of convergence of the Maclurin series for f. Justify your answer. * Diverges by comparison test, or recognizing harmonic series.