Math - Calculus II POWER SERIES (Radius, Interval of Convergence)

State the “centre” for the power series.

Determine the radius and interval of convergence for the power series.

(1) $\sum_{n=1}^{\infty} \frac{(-1)^n (x-1)^n}{n!}$ center = 1 ; radius = ∞ ; interval of convergence = $(-\infty , \infty)$

(2) $\sum_{n=1}^{\infty} \frac{(-1)^n n x^n}{2^{n+1}}$ center = 0 ; radius = 2 ; interval of convergence = (-2 , 2)

(3) $\sum_{n=1}^{\infty} \frac{(-1)^n (x+2)^n}{n 3^n}$ center = -2 ; radius = 3 ; interval of convergence = (-5 , 1]

(4) $\sum_{n=2}^{\infty} (n-2)! x^n$ center = 0 ; radius = 0 ; interval of convergence = { 0 }

(5) $\sum_{n=1}^{\infty} \frac{(x-6)^n}{2^n \sqrt{n}}$ center = 6 ; radius = 2 ; interval of convergence = [4 , 8)

(6) $\sum_{n=2}^{\infty} \frac{(x+2)^n}{n \ln(n)}$ center = -2 ; radius = 1 ; interval of convergence = [-3 , -1)

(7) $\sum_{n=1}^{\infty} \frac{(-1)^{n+1} 5^n (x+1)^n}{n^2+2}$

center = -1 ; radius = $\frac{1}{5}$; interval of convergence = $\left[-\frac{6}{5} , -\frac{4}{5} \right]$

(8) $\sum_{n=2}^{\infty} \frac{x^n}{(\ln(n))^n}$ center = 0 ; radius = ∞ ; interval of convergence = $(-\infty , \infty)$

(9) $\sum_{n=1}^{\infty} \frac{4^n x^{2n}}{2n+1}$ center = 0 ; radius = $\frac{1}{2}$; interval of convergence = $\left(-\frac{1}{2} , \frac{1}{2} \right)$

(10) $\sum_{n=1}^{\infty} \frac{(4x+1)^n}{n^3}$

center = $-\frac{1}{4}$; radius = $\frac{1}{4}$; interval of convergence = $\left[-\frac{1}{2}, 0 \right]$