AUC apCalculus BC

Assignment 13

Problem 18.3. Find the radius and the interval of convergence for the following Power Series:

(1) $\sum_{n=1}^{+\infty} \frac{(-1)^n (x-1)^n}{2^n \sqrt[11]{n}}$.
(2) $\sum_{n=1}^{+\infty} \frac{(-1)^n x^{3n}}{(2n+1)!}$.
(3) $\sum_{n=1}^{+\infty} \frac{n^2+3n}{n^3+n}(x-1)^n$.
(4) $\sum_{n=1}^{+\infty} \frac{(-1)^n (x-2)^n}{2^n \sqrt[7]{n}}$.
(5) $\sum_{n=1}^{+\infty} \frac{(-1)^n x^{5n}}{(2n+1)!}$.
(6) $\sum_{n=1}^{+\infty} \frac{2n^2+n}{n^5+n}(x-2)^n$.
(7) $\sum_{n=1}^{+\infty} n!(x-1)^{2n}$.
(8) $\sum_{n=1}^{+\infty} \frac{(-1)^n x^n}{n+1}$.
(9) $\sum_{n=1}^{+\infty} \frac{(x-3)^{n+3}}{e^n}$.

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29. $\displaystyle\sum_{k=0}^{\infty} \frac{x^k}{k+1}$ **30.** $\displaystyle\sum_{k=0}^{\infty} 3^k x^k$ **31.** $\displaystyle\sum_{k=0}^{\infty} \frac{(-1)^k x^k}{k!}$

32. $\displaystyle\sum_{k=0}^{\infty} \frac{k!}{2^k} x^k$ **33.** $\displaystyle\sum_{k=1}^{\infty} \frac{5^k}{k^2} x^k$ **34.** $\displaystyle\sum_{k=2}^{\infty} \frac{x^k}{\ln k}$

35. $\displaystyle\sum_{k=1}^{\infty} \frac{x^k}{k(k+1)}$ **36.** $\displaystyle\sum_{k=0}^{\infty} \frac{(-2)^k x^{k+1}}{k+1}$

37. $\displaystyle\sum_{k=1}^{\infty} (-1)^{k-1} \frac{x^k}{\sqrt{k}}$ **38.** $\displaystyle\sum_{k=0}^{\infty} \frac{(-1)^k x^{2k}}{(2k)!}$

39. $\displaystyle\sum_{k=0}^{\infty} \frac{3^k}{k!} x^k$ **40.** $\displaystyle\sum_{k=2}^{\infty} (-1)^{k+1} \frac{x^k}{k(\ln k)^2}$

41. $\displaystyle\sum_{k=0}^{\infty} \frac{x^k}{1+k^2}$ **42.** $\displaystyle\sum_{k=0}^{\infty} \frac{(x-3)^k}{2^k}$

43. $\displaystyle\sum_{k=1}^{\infty} (-1)^{k+1} \frac{(x+1)^k}{k}$ **44.** $\displaystyle\sum_{k=0}^{\infty} (-1)^k \frac{(x-4)^k}{(k+1)^2}$

45. $\displaystyle\sum_{k=0}^{\infty} \left(\frac{3}{4}\right)^k (x+5)^k$ **46.** $\displaystyle\sum_{k=1}^{\infty} \frac{(2k+1)!}{k^3} (x-2)^k$

47. $\displaystyle\sum_{k=0}^{\infty} \frac{\pi^k (x-1)^{2k}}{(2k+1)!}$ **48.** $\displaystyle\sum_{k=0}^{\infty} \frac{(2x-3)^k}{4^{2k}}$