Set Probleme 2

I. Determinați intervalele de convergență pentru seriile de funcții următoare:

$$1. \sum_{n=1}^{\infty} e^{nx} \qquad 2. \sum_{n=1}^{\infty} \frac{n}{2^{nx}} \qquad 3. \sum_{n=1}^{\infty} \ln^n \left(1+x^2\right)$$

$$4. \sum_{n=1}^{\infty} \frac{1}{(2n-1)x^n} \qquad 5. \sum_{n=1}^{\infty} \frac{\sqrt{n}}{(x-2)^n} \qquad 6. \sum_{n=1}^{\infty} \frac{2n+1}{(n+1)^5 x^{2n}}$$

R:1.(-∞,0) 2.(0,+∞) 4.(-∞,-1)U(1,∞)

I. Cu testul Weierstrass, demonstrați convergența seriilor de funcții:

$$1. \sum_{n=1}^{\infty} \frac{\sin nx}{n^2} \quad \text{pe } R$$

$$2. \sum_{n=1}^{\infty} \frac{\cos nx}{n\sqrt{n}} \quad \text{pe } R$$

II. Determinați intervalele de convergență pentru seriile de puteri:

$$1. \sum_{n=1}^{\infty} \frac{x^n}{n2^n} \qquad 2. \sum_{n=0}^{\infty} \frac{2^n}{n+1} x^n \qquad 3. \sum_{n=0}^{\infty} \frac{n+1}{\sqrt{1+2n}} x^n$$

$$4. \sum_{n=1}^{\infty} n^n x^n \qquad 5. \sum_{n=1}^{\infty} nx^n \qquad 6. \sum_{n=0}^{\infty} \frac{(-1)^n}{n+1} x^n$$

$$7. \sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{n} x^n \qquad 8. \sum_{n=1}^{\infty} (-1)^n (2n+1)^n x^n \qquad 9. \sum_{n=1}^{\infty} \frac{x^n}{n!}$$

$$10. \sum_{n=1}^{\infty} \frac{x^n}{n^n} \qquad 11. \sum_{n=1}^{\infty} \frac{(x-3)^n}{n \cdot 5^n}$$

$$12. \sum_{n=1}^{\infty} \frac{(-1)^n n}{n^2+1}(x+2)^n \qquad 13. \sum_{n=1}^{\infty} \frac{(-1)^n n^3}{3^n}(x+3)^n$$

$$14. \sum_{n=0}^{\infty} \frac{(n+1)!}{5^n}(x-2)^n \qquad 15. \sum_{n=1}^{\infty} \frac{(-1)^n n!}{n^2}(x-1)^n$$

R:1.[-2,2) 4.x=0 5.(-1,1) 6.(-1,1] 7.(-1,1] 9.R 10.x=0 14.x=2 15.x=1