

Review Problems

March 24, 2017

1. (Fall 2002, Exam 3, #1) Find the interval of convergence of the power series $\sum_{n=1}^{\infty} \frac{(2x-5)^n}{n3^n}$.

2. (Fall 2002, Exam 3, #6) Which of the following series converge?

I. $\sum_{n=0}^{\infty} \frac{3^{2n}}{(\ln n)^n}$

II. $\sum_{n=1}^{\infty} (-1)^n \frac{n+1}{2n-3}$

III. $\sum_{n=1}^{\infty} \frac{4^{2n}(x+2)^{2n}}{(\sqrt{n+1})^{2n}}$ for $\frac{3}{2} < x < \frac{5}{2}$

3. (Fall 2006, Exam 3, #7) Find the interval of convergence of the power series

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

4. (Fall 2007, Exam 3, #5) Is the following series convergent or divergent, and why?

$$\sum_{k=1}^{\infty} \frac{5^k k^k}{(2k-1)^{2k}}$$

5. (Fall 2007, Exam 3, #8) Find the interval of convergence of the series

$$\sum_{n=1}^{\infty} (-1)^n \frac{(x-1)^n}{4n3^n}$$

6. (Fall 2008, Exam 3, #9) For what x does the series $\sum_{k=1}^{\infty} e^{-kx}/k!$ converge?

7. (Fall 2008, Exam 3, #10) Does the series $\sum_{n=0}^{\infty} \frac{(2n+1)^n}{(n+1)^{2n}}$ converge or diverge, and why?

8. (Fall 2008, Exam 3, #11) What is the radius of convergence of the series $\sum_{n=1}^{\infty} 2^n x^n / (n + 1)$?