Math202
Jan/2/2008

Test 4–Version A

Name:
Hamed Al-Sulami

Instructions. (20 points) Solve each of the following problems.

(1pts) **1.** The series $\sum_{n=0}^{\infty} \frac{2^n + 3^n}{5^n + 2}$ is

(a) Converges by Comparison Test
(b) Diverges by Comparison Test
(c) Converges by Ratio Test
(d) Converges by Integral Test

(1pts) **2.** The series $\sum_{n=0}^{\infty} \frac{\ln n}{n^3}$ is

(a) Diverges by Integral Test
(b) Diverges by Comparison Test
(c) Converges by Ratio Test
(d) Converges by Comparison Test

(1pts) **3.** The series $\sum_{n=0}^{\infty} \frac{n+2}{3n-1}$ is

(a) Converges by Comparison Test
(b) Converges by Integral Test
(c) Diverges by Divergence Test
(d) Diverges by Ratio Test

(1pts) **4.** The series $\sum_{n=0}^{\infty} \frac{n2^n}{3^n}$ is

(a) Diverges by Comparison Test
(b) Converges by Ratio Test
(c) Diverges by Comparison Test
(d) Converges by Integral Test

(1pts) **5.** The sequence $\left\{ \left(\frac{1}{n}\right)^{1/\ln n} \right\}_{n=1}^{\infty}$ is

(a) Divergent
(b) Convergent to -1
(c) Convergent to 1
(d) Convergent to e

(1pts) **6.** The sum of the series $\sum_{n=1}^{\infty} \left(\frac{1}{\sqrt{n}} - \frac{1}{\sqrt{n+1}} \right)$ is

(a) 0
(b) 1
(c) -1
(d) $\sqrt{2}$

(1pts) **7.** The series $\sum_{n=0}^{\infty} \frac{\sqrt{n}}{\ln n}$ is

(a) Converges by Integral Test
(b) Converges by Comparison Test
(c) Diverges by Comparison Test
(d) Converges by Ratio Test

(1pts) **8.** $\lim_{n\to\infty} \tanh n =$

(a) 0
(b) $\pi/2$
(c) DNE
(d) 1

(1pts) **9.** The Taylor series for $f(x) = \ln x$ at $a = 2$ is

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

(b) $1 + \sum_{n=0}^{\infty} \frac{(-1)^{n+1} (x-2)^{n+1}}{(n+1)2^{n+1}}$

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

(d) $\ln 2 + \sum_{n=0}^{\infty} \frac{(-1)^{n+1} (x-2)^{n+1}}{(n+1)2^{n+1}}$

(1pts) **10.** The series $\sum_{n=0}^{\infty} \frac{\sin n}{3^n}$ is

(a) Diverges

(b) Absolutely Convergent

(c) Conditionally Convergent

(d) Conditionally Divergent

(1pts) **11.** The radius of convergence of the power series $\sum_{n=0}^{\infty} \frac{(-1)^n (x-3)^n}{n+1}$ is

(a) $R = 3$

(b) $R = \infty$

(c) $R = 1$

(d) $R = 4$

(1pts) **12.** The sequence $\left\{ \frac{n}{n+1} \right\}_{n=1}^{\infty}$ is

(a) Not monotone

(b) Divergent

(c) Bounded

(d) Not bounded

(1pts) **13.** The series $\sum_{n=1}^{\infty} \frac{10}{n(n+1)}$ is

(a) Convergent to 10

(b) Convergent to -10

(c) Convergent to 0

(d) Divergent

(1pts) **14.** The series $\sum_{n=0}^{\infty} \frac{n2^n}{3^n}$ is

(a) Converges by Integral Test

(b) Converges by Root Test

(c) Diverges by Root Test

(d) Diverges by Comparison Test

(1pts) **15.** The sequence $\{-1, 0, 1, -1, 0, 1, -1, 0, 1, \ldots\}$ is

(a) Divergent

(b) Convergent to -1

(c) Convergent to 0

(d) Convergent to 1

(1pts) **16.** The sequence $\left\{ \frac{(-1)^n n}{n+1} \right\}_{n=1}^{\infty}$ is

(a) Divergent

(b) Convergent to -1

(c) Convergent to 1

(d) Convergent to 0

(1pts) **17.** The interval of convergence of the power series $\sum_{n=0}^{\infty} \frac{(-1)^n (x-3)^n}{n+1}$ is

(a) $[2, 4]$

(b) $(2, 4]$

(c) $(2, 4)$

(d) $[2, 4)$

(1^{pts}) **18.** The sequence $\left\{\dfrac{n}{n+1}\right\}_{n=1}^{\infty}$ is

(a) Decreasing
(b) Increasing
(c) Not monotone
(d) Not bounded

(1^{pts}) **19.** The sum of the series $\displaystyle\sum_{n=0}^{\infty}\frac{\cos(n\pi)}{3^n}$ is

(a) $\dfrac{-1}{3}$
(b) $\dfrac{3}{4}$
(c) $\dfrac{-3}{4}$
(d) $\dfrac{1}{3}$

(1^{pts}) **20.** The power series for $f(x)=\sin^2 x$ is

(a) $\displaystyle\sum_{n=0}^{\infty}\frac{(-1)^{n+1}2^{2n-1}x^{2n}}{(2n)!}$
(b) $1+\displaystyle\sum_{n=0}^{\infty}\frac{(-1)^{n}2^{2n-1}x^{2n+1}}{(2n+1)!}$
(c) $\displaystyle\sum_{n=1}^{\infty}\frac{(-1)^{n+1}2^{2n-1}x^{2n}}{(2n)!}$
(d) $1+\displaystyle\sum_{n=1}^{\infty}\frac{(-1)^{n}2^{2n-1}x^{2n+1}}{(2n+1)!}$