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Review #3 Infinite Series Day 11

1. Determine whether the series converges or diverges. If the series converges, find the sum.

a) $\sum_{n=0}^{\infty}\left(\frac{4}{5}\right)^n$ b) $\sum_{n=3}^{\infty}\left(\frac{1}{3}\right)^n$ c) $\sum_{n=0}^{\infty}(.64)^n$

2. Determine whether each harmonic series converges or diverges. If it converges, find its sum.

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

3. Determine whether the series converges or diverges.

a) $\sum_{n=1}^{\infty}\frac{1}{n}$ b) $\sum_{n=1}^{\infty}\frac{1}{n^2}$

c) $\sum_{n=1}^{\infty}\ln\left(\frac{2n+1}{n-3}\right)$ d) $\sum_{n=2}^{\infty}\frac{1}{n\ln n}$

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e) $\sum_{n=3}^{\infty} \frac{1}{n-3}$

f) $\sum_{n=1}^{\infty} \frac{1}{3^n+1}$

g) $\sum_{n=1}^{\infty} \frac{1}{n^2+n+1}$

h) $\sum_{n=1}^{\infty} \frac{n^2}{n^3+1}$

i) $\sum_{n=2}^{\infty} \frac{1}{\sqrt{n^3-1}}$

j) $\sum_{n=1}^{\infty} \frac{n^2-1}{n^4+1}$

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

l) $\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{n}$

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m) $\sum_{n=1}^{\infty}(-1)^n \cdot \frac{2n+3}{4n-1}$

n) $\sum_{n=1}^{\infty}\frac{(-1)^{n-1}}{\sqrt{n}}$

o) $\sum_{n=1}^{\infty}\frac{n^2}{2^n}$

p) $\sum_{n=0}^{\infty}\frac{2^n}{n!}$

q) $\sum_{n=0}^{\infty}\frac{(n+1)!}{n!}$

r) $\sum_{n=1}^{\infty}\frac{n^4}{3^n}$

Determine if each sequence converges absolutely, conditionally, or not at all.

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

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

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

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Review

R1. If f(x) is an antiderivative of $x^2\sqrt{x^3+1}$ and f(2)=0, then f(0)=

a. -6
b. 6
c. $\frac{2}{9}$
d. $-\frac{52}{9}$
e. $\frac{56}{9}$

R2. If $f(x)=5\cos^2(\pi-x)$, then $f'\left(\frac{\pi}{2}\right)$ is

a. 0
b. -5
c. 5
d. -10
e. 10

R3. $g(x)=\int_1^x \frac{3t}{t^3+1}dt$, then g'(2) is

a. 0
b. $-\frac{2}{3}$
c. $\frac{2}{3}$
d. $-\frac{5}{6}$
e. $\frac{5}{6}$

R4. If $\int_k^2 (2x-2)dx=-3$ a possible value for k is

a. -2
b. 0
c. 1
d. 2
e. 3

Answers

1. a. 5 b. $\frac{1}{18}$ c. $\frac{100}{36}$

2. a. Convers to 1 b. Converges to $\frac{3}{2}$

3. a. D b. C c. D d. D e. D f. C g. C h. D i. C
j. C k. D l. C m. D n. C o. C p. C q. D r. C

4. a. Conditionally b. Absolutely c. Absolutely

R1. D R2. A R3. C R4. E