BC Calculus Name_____Pd.____

Geometric Series Infinite Series Day 2

Calculate the first eight terms of the sequence of the partial sums, correct to four decimal places. Does it appear that the series is convergent or divergent?

1. $\sum_{n=1}^{\infty} \frac{1}{n^3}$

2. $\sum_{n=1}^{\infty} \frac{n}{1+\sqrt{n}}$

Determine whether the geometric series is convergent or divergent. If it is convergent, find its sum.

3. $\sum_{n=1}^{\infty} 6(0.9)^{n-1}$

4. $\sum_{n=1}^{\infty} \frac{10^n}{(-9)^{n-1}}$

5. $\sum_{n=1}^{\infty} \frac{(-3)^{n-1}}{4^n}$

6. $\sum_{n=0}^{\infty} \frac{1}{\left(\sqrt{2}\right)^n}$

Answers:

1. converges 2. diverges 3. 60 4. diverges 5. $\frac{1}{7}$ 6. $\frac{\sqrt{2}}{\sqrt{2}-1}$

Geometric Series

Infinite Series Day 2

7. $\sum_{n=0}^{\infty} \frac{\pi^n}{3^{n+1}}$

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

9. $\sum_{n=1}^{\infty} e^{-n}$

10. $\sum_{n=1}^{\infty} e^{3-2n}$

11. Find the value of c such that

$\sum_{n=0}^{\infty} e^{nc} = 10$

Review

R1. If g(x)=-2|x+3|, what is the value $\lim_{x \to -3^-} g'(x)$?

A. −6 B. −2 C. 2
D. 6 E. nonexistent

R2. What is $\lim_{\Delta x \to 0} \frac{\sin\left(\frac{\pi}{3} + \Delta x\right) - \sin\left(\frac{\pi}{3}\right)}{\Delta x}$

A. $-\frac{1}{2}$ B. 0 C. $\frac{1}{2}$
D. $\frac{\sqrt{3}}{2}$ E. nonexistent

R3. If f(x) is an antiderivative of xe^{-x^2} and f(0)=1, then f(1)=

A. $\frac{1}{e}$ B. $\frac{1}{2e} - \frac{3}{2}$ C. $\frac{1}{2e} - \frac{1}{2}$
D. $-\frac{1}{2e} + \frac{3}{2}$ E. $-\frac{1}{2e} + \frac{1}{2}$

R4. If $g(x) = 3\tan^2(2x)$, then $g'\left(\frac{\pi}{8}\right)$ is

A. 6 B. $6\sqrt{2}$ C. 12
D. $12\sqrt{2}$ E. 24

Answers:

7 Diverges 8 $\frac{3e}{3-e}$ 9 $\frac{1}{e-1}$ 10 $\frac{e^3}{e^2-1}$ 11 $c = \ln\left(\frac{9}{10}\right)$ R1 C R2 C R3 D R4 E