

SELECT THE BEST RESPONSE AND RECORD IT ON YOUR SCAN TRON ANSWER SHEET.

1. Find the fourth term of the sequence $\left\{ \frac{(-1)^n(2^n + 1)}{n!} \right\}$, $n = 1, 2, 3, \dots$

- a. $\frac{17}{24}$
 b. $\frac{17}{4}$
 c. $\frac{17}{4}$
 d. None of these
 e. $\frac{9}{24}$

2. Find the sum: $\sum_{n=0}^{\infty} 2 \left(\frac{1}{2} \right)^n = 2 - 1 + \frac{1}{2} - \frac{1}{4} + \dots$

- a. 4
 b. -1
 c. 0
 d. $\frac{4}{3}$
 e. None of these

3. Determine the convergence or divergence of the series using the

Integral Test: $\sum_{n=1}^{\infty} \frac{1}{n^2} \cos \left[\frac{8}{n} \right]$.

- a. Diverges by the Integral Test.
 b. The Integral Test is inconclusive.
 c. Converges by the Integral Test.
 d. The Integral Test does not apply.
 e. None of these

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4.

Investigate the series $\sum_{n=1}^{\infty} \frac{\sqrt{n}}{4n^3 - 6n^2 + 5}$ for convergence or divergence.

- a. Converges by Root Test
- b. None of these
- c. Converges by Limit Comparison Test
- d. Converges by n th-Term Test for Divergence
- e. Diverges by n th-Term Test for Divergence

5.

Determine whether the series, $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{\ln(n+1)}$, is convergent or divergent. If convergent, classify the series as absolutely convergent or conditionally convergent.

- a. Conditionally convergent
- b. Divergent
- c. None of these
- d. Absolutely convergent

6.

Investigate $\sum_{n=1}^{\infty} \left[\frac{n+1}{n} \right]^n$ for convergence or divergence.

- a. Converges by Ratio Test
- b. Diverges by n th-Term Test for Divergence
- c. Diverges by Root Test
- d. Converges by Root Test
- e. None of these

7. Find the third term of the Taylor polynomial centered at 0 for

$$f(x) = e^{-x^2}.$$

- a. $\frac{x^6}{12}$
- b. None of these
- c. $\frac{x^2}{2}$
- d. $\frac{-x^6}{6}$
- e. $\frac{x^4}{2}$

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8. Find the interval of convergence of the power series:

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

- a. None of these
 b. (2, 4)
 c. [2, 4]
 d. (-1, 1]
 e. (-1, 1)

- 9.

Find a power series, centered at 2, for the function $f(x) = \frac{1}{3x-2}$.

- a. $\sum_{n=0}^{\infty} \frac{3^n (x-2)^n}{4^{n+1}}$
 b. $\sum_{n=0}^{\infty} \frac{(-1)^n 3^n (x-2)^n}{4^{n+1}}$
 c. $\sum_{n=0}^{\infty} \frac{3^n (x-2)^n}{2^{n+1}}$
 d. $\sum_{n=0}^{\infty} \frac{(3x)^n}{2^{n+1}}$
 e. None of these

10. Find the Maclaurin Series for
- $f(x) = \ln(x+1)$
- .

- a. $x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \dots$
 b. None of these
 c. $x - \frac{x^2}{2!} + \frac{x^3}{3!} - \frac{x^4}{4!} + \dots$
 d. $x + \frac{x^2}{2} + \frac{x^3}{3} + \frac{x^4}{4} + \dots$
 e. $x - x^2 + x^3 - x^4 + \dots$