

Unit #7: Sequence and Series

Date: _____

Topic: Tests for Convergence Checkpoint B

Objective: SWBAT determine whether a series converges or diverges by using known series, the divergence, integral, ratio, comparison, and alternate series tests.

Warm Up #8:

For what integer $k, k > 1$, will both $\sum_{n=1}^{\infty} \frac{(-1)^{kn}}{n}$ and $\sum_{n=1}^{\infty} \left(\frac{k}{4}\right)^n$ converge?

(A) 6

(B) 5

(C) 4

(D) 3

(E) 2

Checkpoint B: Which Test Should I Use?

Directions: For each of the following determine whether the series is converging or diverging using a known series or the divergence, integral, ratio, comparison, or alternating series test.

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

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

$$3) \sum_{n=1}^{\infty} \frac{n^2}{5^n}$$

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

$$5) \sum_{n=3}^{\infty} \frac{3}{\sqrt{n^2-4}}$$

$$6) \sum_{n=1}^{\infty} \frac{(-1)^n (4^n)}{n!}$$

$$7) \sum_{n=1}^{\infty} \frac{n^3}{(n+1)^2}$$

$$8) \sum_{n=1}^{\infty} \frac{(\sin n)^2}{n(n+1)}$$

$$9) \sum_{n=1}^{\infty} \frac{\sqrt{k+3}}{k\sqrt{k+2}}$$

$$10) \sum_{n=1}^{\infty} \frac{n+3}{n^2\sqrt{n}}$$

$$11) \sum_{n=1}^{\infty} \frac{5\sqrt{n}}{\sqrt{n^3}}$$

$$12) \sum_{n=1}^{\infty} \frac{1}{3^n + n}$$

$$13) \sum_{n=5}^{\infty} \frac{1000}{n(\ln n)^2}$$

$$14) \sum_{n=1}^{\infty} \frac{1}{n^3 + n + 7}$$

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

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

Answer Key

1) Diverges

2) Converges

3) Converges

4) Diverges

5) Diverges

6) Absolute Convergence

7) Diverges

8) Converges

9) Diverges

10) Converges

11) Diverges

12) Converges

13) Converges

14) Converges

15) Conditional Convergence

16) Diverges

