

	1	2	3	4-6	7	Totals (not an average)
Implementing Mathematical Practices						
Connecting Representations						
Justification						
Communication and Notation						

For every justification problem on this quiz, indicate the name of the convergence/divergence test used.

1. The alternating series $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{2n+2}$ converges to S.
- a) If the sum of the first six terms of the series is used to approximate S, what is the alternating series error bound?
- b) Determine whether the alternating series is absolutely or conditionally convergent. Justify your answer.

- Test used: _____
2. What are all the values for x for which $\sum_{n=0}^{\infty} \left(\frac{x}{2+x}\right)^n$ converges?

3. Consider the series $\sum_{n=2}^{\infty} \frac{1}{n^p \ln(n)}$ where $p \geq 0$.

a) Show that the series converges for $p > 1$. Identify the name of the test used.

Test used: _____

b) Use the **Integral Test** to determine whether the series converges or diverges for $p = 1$.

4. Use the **Root Test** to determine whether the series converges or diverges.

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

5. Use the **Limit Comparison Test** to determine whether the series converges or diverges.

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

6. For what values of p will BOTH of the following series converge?

$$\sum_{n=1}^{\infty} \frac{1}{n^{(2p)}} \quad \text{and} \quad \sum_{n=1}^{\infty} \left(\frac{p}{2}\right)^n$$

7. Determine whether each series converges or diverges. Justify your answer for each.

a) $\sum_{n=1}^{\infty} \frac{8^n}{n!}$

b) $\sum_{n=1}^{\infty} \frac{n!}{n^{100}}$

Converge or Diverge? _____

Test used: _____

Converge or Diverge? _____

Test used: _____

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

d) $\sum_{n=1}^{\infty} \frac{-8}{(-3)^n}$

Converge or Diverge? _____

Test used: _____

Converge or Diverge? _____

Test used: _____