Name: _____ Quiz 9

Math F252X-901, Calculus II Fall 2024

Thirty minutes maximum. No aids (book, notes, calculator, phone, etc.) are permitted. Show all work and use proper notation for full credit. Answers should be in reasonably simplified form.

1. Determine whether the following series converge or diverge. Justify your answers.

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

   (b) $\displaystyle\sum_{k=10}^{\infty} \frac{5}{k^2 - 25}$

2. Determine whether the following series converge absolutely, converge conditionally, or diverge. Justify your answers.

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

   - $\displaystyle\sum_{k=4}^{\infty} \left(-\frac{1}{k}\right)^{k}$

BONUS Does the series $\displaystyle\sum_{n=1}^{\infty} \left(\frac{1}{n} - \cos\left(\frac{1}{n}\right)\right)$ converge or diverge. Justify your answer.