Math 252: Quiz 7 **29 October, 2026**

Name: _____ **/ 25**

30 minutes maximum. No aids (book, calculator, etc.) are permitted. Show all work and use proper notation for full credit. Answers should be in reasonably-simplified form. 25 points possible.

1. For each of the following series, determine whether the series converges or diverges. Answers without justification will receive no credit.

   (a) (5 points) $\displaystyle\sum_{n=3}^{\infty} \frac{1}{2\sqrt{n}+5}$

   (b) (5 points) $\displaystyle\sum_{n=1}^{\infty} \sin^2(n) \left(\frac{1}{3}\right)^n$

2. For each of the following series, determine whether the series converges absolutely, converges conditionally, or diverges. Answers without justification will receive no credit.

(a) (5 points) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{e^{1/n}}$

(b) (5 points) $\displaystyle\sum_{n=3}^{\infty} \frac{(-1)^{n-1}}{2\sqrt{n}+5}$

(c) (5 points) $\displaystyle\sum_{n=10}^{\infty} \frac{(-1)^{n+1}}{n^2 \ln(n)}$

BONUS (2 points) Does the series $\sum_{n=1}^{\infty} \left(\frac{1}{n} - \cos\left(\frac{1}{n}\right) \right)$ converge or diverge? Answers without justification will receive no credit.