

Instructions: Work the problems below as directed. Show all work. Clearly mark your final answers. Use exact values unless the problem specifically directs you to round. Simplify as much as possible. Partial credit is possible, but solutions without work will not receive full credit.

1. Find the minimum number of terms that would be needed to approximate each series to better than three decimal places accuracy (i.e.  $R < 0.001$ ). If it cannot be approximated, explain why not.

$$\sum_{k=3}^{\infty} \frac{1}{k \ln k \ln(\ln k)}$$

2. Use the ratio or root test to determine the convergence of the series (if possible). Say which test you used. If the test is inconclusive, which test could you try next?

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

- b.  $\sum_{n=2}^{\infty} \frac{(-1)^n}{(\ln n)^n}$

3. Determine the interval of convergence; be sure to check the endpoints!

$$\sum_{n=0}^{\infty} 2 \left( \frac{x}{8} \right)^{3n}$$