1. [2] Please indicate True or False.
   
   (a) True / False: If \( a_n \to 0 \) as \( n \to \infty \), the series \( \sum a_n \) converges.
   
   (b) True / False: If \( a_n \to 0 \) as \( n \to \infty \), the series \( \sum a_n \) neither converges nor diverges.
   
   (c) True / False: If \( \sum |a_n| \) converges, then \( \sum a_n \) converges absolutely.
   
   (d) True / False: If \( \sum |a_n| \) diverges, then \( \sum a_n \) diverges absolutely.

2. [4] Use the Limit Comparison Test to show the following series converges or diverges.

\[
\sum_{n=4}^{\infty} \frac{\sqrt{n^3 + 7n}}{n^2 + 7n}
\]

3. [4] Use the Integral Test to show the following series converges or diverges. Be sure to verify the hypotheses.

\[
\sum_{n=2}^{\infty} \frac{1}{n \sqrt{\ln n}}
\]