Use the nth-term test for divergence to show that the series is divergent, or state that the test is inconclusive.

$$\sum_{n=1}^{\infty} \ln \frac{1}{n}$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The series diverges because $\lim_{n\to\infty} \ln \frac{1}{n} = \infty$ and fails to exist.
- B. The series diverges because $\lim_{n\to\infty} \ln \frac{1}{n} = -\infty$ and fails to exist.
- C. The series diverges because $\lim_{n\to\infty} \ln \frac{1}{n}$ exists and is equal to $\square$.
- D. The test is inconclusive because $\lim_{n\to\infty} \ln \frac{1}{n} = \square$.