

Calculus: Inclass Homework 1

March 6th, 2008

1. Determine whether the following limits

$$\lim_{n \rightarrow \infty} (n \ln n - n^2) \quad \text{and} \quad \lim_{n \rightarrow \infty} \frac{(\ln n)^2}{n}$$

exist or not.

2. Let a_n be a sequence with $a_n \neq 0$.

(a) Show that if $\sum_{n=1}^{\infty} a_n$ is convergent, then $\sum_{n=1}^{\infty} 1/a_n$ is divergent.

(b) Show that if $\sum_{n=1}^{\infty} a_n$ is divergent, then $\sum_{n=1}^{\infty} 1/a_n$ can be either convergent or divergent.