

Problem Sheet 3

Evaluate the improper integral $\int_1^\infty \frac{1}{x \ln x} dx$.

Evaluate the following limits:

1. $\lim_{n \rightarrow \infty} (1 + (-1)^n)$

2. $\lim_{n \rightarrow \infty} \frac{\sqrt{n}}{\sqrt{n} + 1}$

3. $\lim_{n \rightarrow \infty} \frac{n}{e^n}$

4. $\lim_{n \rightarrow \infty} \frac{1 + (-1)^n}{n^2}$

5. $\lim_{n \rightarrow \infty} \frac{(n-2)!}{n!}$