

AMCS 5461 / Math 5460, Spring 2025, problems for unit on asymptotics

1. Find an asymptotic expression for $\log(n+1) - \log n$.

2. Find an asymptotic expression for $\sum_{j=1}^k \log\left(1 + \frac{j}{n}\right)$. You can assume k is small compared to n , provided you make an explicit assumption about how small you want to assume k is with respect to n .