

CSE 4310 – Worksheet1

Mathematical Foundations

1. (10 pts) Find the solution to the following expression: $\log_4 x + \log_4(x - 12) = 3$

2. (20 pts) Find limit of the following functions using L'Hopital's rule

1. $\lim_{n \rightarrow \infty} \frac{e^x + 2/x}{e^x + 5/x}$

2. $\lim_{n \rightarrow \infty} \frac{n!}{\sqrt{2\pi n} (n/e)^n}$

3. $\lim_{n \rightarrow \infty} \frac{2^x + 3x}{3^x + 2x}$

4. $\lim_{n \rightarrow \infty} \frac{n^2}{n \log_2 n}$

3. (20 pts) Find summation for the following functions :

1. $T(n) = \sum_{i=0}^3 5 + \sqrt{4^i}$

2. $T(n) = \sum_{i=1}^{100} 4 + 3i$

3. $T(n) = \sum_{i=0}^{n-1} \sum_{j=0}^{i-1} 1$

4. $T(n) = \sum_{i=0}^{n-1} i(i+1)$