CSE 332: Data Structures and Parallelism

Mathematical Formulas

Gauss' Summation

$$\sum_{i=0}^{n} i = \frac{n(n+1)}{2}.$$

Infinite Geometric Series

$$\sum_{i=0}^{\infty} x^i = \frac{1}{1-x}, \text{ where } -1 < x < 1.$$

Finite Geometric Series

$$\sum_{i=0}^{n} x^i = \left(\frac{1}{1-x}\right) - \left(\frac{x^{n+1}}{1-x}\right) = \frac{1-x^{n+1}}{1-x}$$

Logs

$x^{log_x n} = n$

$a^{log_b c} = c^{log_b a}$

$log_b a = \frac{log_d a}{log_d b}$

Summations

$$\sum_{i=0}^{n} i = \frac{n(n+1)}{2}$$

$$\sum_{i=0}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$$

$$\sum_{i=0}^{n} i^3 = \frac{n^2(n+1)^2}{4}$$