

July 5, 2016

0.0.1 Asymptotic NotationFact: $f(n) \in o(g(n)) \iff \lim_{n \rightarrow \infty} f(n)/g(n) = 0$ $\omega \iff = \infty$ $\Theta \iff = C \neq \infty, 0$

Use L'Hopital's Rule.

Useful: $a^{\log_b n} = n^{\log_b a}$ $\sum i = \Theta(n^2)$ (arithmetic series) $\sum c^i = \Theta(c^n)$ (geometric series) $\sum 1/i = \Theta(\log n)$ (harmonic series) $\log(n!) = n \log n - \Theta(n)$ (harmonic series) (Stirling formula) $\Theta(\sum \log(n/i)) = \Theta(\sum (\log n - \log i)) = \Theta(n \log n - (n \log n - \Theta(n))) = \Theta(n)$ $T(n) = 2T(n/2) + n^2 = \Theta(N^2)$