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Introduction to Algorithm Analysis

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1. $4000 < n < nlg(n) < (1.1)^n < nln(n) < n^{\lg(n)} < n\sqrt[3]{n} < n\sqrt{n} < n^2 < n^3 < 2^n < 3^n < 2^{n+3} < n! < n^n$

2. Big-O notation: $f(n)\ O\big(g(n)\big)\ iff\ f(n) \leq (c_0 * g(n))\ for\ all\ n \geq k\ where\ C\ and\ K\ are\ positive$

   Big-θ notation: $f(n) = \emptyset * g(n)\ iff\ f(n) \leq \big(c_1 * g(n)\big) for\ all\ n > k\ and\ f(n) \geq c_2 * g(n)\ whenever\ n > k\ where\ c_1 c_2\ k\ are\ positive$

   Since lg(1) = 0, this means k=1, so proof holds so long as n >1.

3.
   a. $\sum_{j=1}^{n}\left(\frac{j^2}{5}+2\right) \in \sum_{i=1}^{n} \emptyset(j^2)$
   b. $\sum_{j=1}^{n}\left(\frac{j^2}{5*4}+3\right) \in \sum_{i=1}^{n} \emptyset(j^2)$
   c. $\sum_{j=1}^{n}\left(\frac{j^1}{5}+2\right) \in \sum_{i=1}^{n} \emptyset(j^1)$