Quiz 1: Asymptotic Notation

CS 14 - Data Structures

April 3, 2013

Don't panic! Everyone gets full credit on quizes just for taking them. But remember, test questions will look exactly like these questions. If you do not do well on these quizes, you will not do well on the tests. No calculators.

Questions:

1. (3 pt) What does $f = \Omega(g)$ mean? Give an exact definition.

2. (1pt) Give an *upper bound* on the function: $f(x) = 3x^3 + 4x^2 + x^2 \log^4 x$

3. (1pt each) Simplify the following:
   (a) $\Theta(n^2 + n \log n) + \Theta(n^3)$

   (b) $\Omega(3.45n + 1n) * \Omega(\log n)$

   (c) $O(n(1 + \log n) + n^{3.2} + \log 2^n)$

4. (1pt each) Circle the bigger function; if they are the same, circle "equal."

   (a) $O(n^{42})$ or $O(42^n)$ or equal

   (b) $\Theta(5 * 10^{30})$ or $\Theta(\log n)$ or equal

   (c) $\Omega(\log_2 n)$ or $\Omega(\log_3 n)$ or equal