CMPS 201 Analysis of Algorithms Self Assessment Quiz Sep. 18, 2002

Name:
For each question, give the most exact answer you know, and if applicable, give the simplest and best \( O \) (“big O”) expression. Treat all symbols as variables except when directed otherwise.

Take about ten minutes total.

1. \( \sum_{i=0}^{k} i = \)

2. \( \sum_{i=j}^{k} i = \)

3. \( \sum_{1 \leq i \leq n} i^2 = \)

4. \( \log_2 (4r^3) = \)

5. \( \sum_{1 \leq i \leq n} \log i = \) (approx)

(The binomial coefficient \( \binom{n}{3} \) is sometimes written \( _nC_3 \).)

6. \( \binom{n}{3} \) is read in words as:

7. \( \binom{n}{3} = \)

8. \( \binom{n}{k} = \) (use factorials)

9. What is the maximum number of edges in an undirected graph of \( n \) nodes?

10. \( \sum_{i=0}^{k} 2^i = \)

Assume \( a \) and \( k \) are constants in the remaining problems.

11. \( \int_{1}^{n} \frac{a}{x} \, dx = \)

12. \( \int_{0}^{n} ax^k \, dx = (k \geq 0) \)

13. \( \int_{0}^{n} e^{ax} \, dx = \)