R-1.1 Graph the functions $12n$, $6n \log n$, n^2, n^3, and 2^n using logarithmic scale for the x- and y-axes; that is, if the function value *f(n)* is *y*, plot this as a point with *x*-coordinate at $\log n$ and *y*-coordinate at $\log y$.

R-1.2 Algorithm A uses $10n \log n$ operations, while algorithm B uses n^2 operations. Determine the value n_0 such that A is better than B for $n \geq n_0$.

R-1.6 Order the following list of functions by the big-O notation.

$n \log n$	$\log \log n$	$1/n$	$4n^{3/2}$
$5n$	$2n \log^2 n$	2^n	4^n
n^3	$n^2 \log n$	$4^{\log n}$	$\sqrt{n}$

R-1.10 Give a big-O characterization, in terms of *n*, of the running time of the Loop1 method below:

Algorithm Loop1(n)
s ← 0
for *i* ← 1 **to** *n* **do**
    s ← *s* + *i*

R-1.14 Perform a similar analysis for method Loop5 below:

Algorithm Loop5(n)
s ← 0
for *i* ← 1 **to** n^2 **do**
    for *j* ← 1 **to** i **do**
        s ← *s* + *i*

Prove:

$$\log_b x^a = a \log_b x$$