CSCI 305, Homework # 3

YOUR NAME HERE

Due date: Tuesday, May 8, midnight.

- Find $\Theta(T(n))$ for each case.
- For problem 1, find the solution three ways:
  - The master theorem
  - The substitution method
  - Iterate, cancel, and solve the summation to find an exact solution.
- For all other problems, use just the master theorem.
- When using the master theorem, be explicit about $n^{\log_b a}$, and about which case of the master theorem applies, about making sure the special condition applies in case 3 of the master theorem, and about proving f's correct asymptotic relationship to $n^{\log_b a}$.

1. Solve this one three different ways: master theorem, substitution method, and the iterate/cancel/summation method.

$$T(n) = 2T(n/2) + n^4$$

2. Solve this one using the master theorem.

$$T(n) = 16T(n/4) + n^2$$

3. Solve this one using the master theorem.

$$T(n) = 2T(n/4) + \sqrt{n}$$

4. Solve this one using the master theorem.

$$T(n) = 4T(n/3) + n \lg n$$

5. Solve this one using the master theorem.

$$T(n) = 4T(n/2) + n^2\sqrt{n}$$