

Introduction To Algorithms
CS430

Spring 2013
HomeWork 3
Due 10th February

1. **Problem 1:** Solve the recurrence

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

$$T(i) = 1; i = 1 \dots 10$$

(10 pts)

2. **Problem 2:** Use the recursion tree method to solve

$$T(n) = T(n - c) + T(c) + f(n)$$

when c is a constant integer and

(i) $f(n) = \log n$ and

(ii) $f(n) = n$. (20 pts)

3. **Problem 3:** Show how to multiply two complex numbers $a + bi$ and $c + di$. Use 3 multiplications only. Professor B uses divide and conquer to multiply n complex numbers $a_1, a_2 \dots a_n$. (The obvious method of dividing into two sequences of size $n/2$). What is the complexity of this method? (20 pts)