

CPSC 421/501 Intro to Theory of Computing (Term 1, 2012-13)
Assignment 0

Due: Wednesday September 12th, in class.

Question 1: Exercise 0.5 (3rd edition and 2nd edition).

Question 2: Exercise 0.7 (3rd edition and 2nd edition).

Question 3: Problem 0.11 (3rd edition).

Let $S(n) = 1 + 2 + \cdots + n$ be the sum of the first n natural numbers and let $C(n) = 1^3 + 2^3 + \cdots + n^3$ be the sum of the first n cubes. Prove the following equalities by induction on n , to arrive at the curious conclusion that $C(n) = (S(n))^2$ for every $n \geq 1$.

(a): $S(n) = n(n + 1)/2$.

(b): $C(n) = (n^4 + 2n^3 + n^2)/4 = n^2(n + 1)^2/4$.

Question 4: Problem 0.13 (3rd edition), which is Problem 0.12 (2nd edition).