CS 3233 Discrete Mathematical Structures – Fall 04

10/18/04

6. Homework

Due **Wednesday 10/27/04** before class

1. 3.3 (page 254)
   - (3 points) 32
2. **Recurrences**
   For all the recursively defined functions below
   - compute $f(1), f(2), f(3), f(4), f(5)$,
   - find an explicit formula for $f(n)$ (that means, write $f(n) = ...$),
   - Prove the correctness of your formula by induction

   (a) (3 points) $f(0) = 1; f(n) = -f(n-1)$ for $n \geq 1$
   (b) (3 points) $f(0) = 3; f(n) = -2f(n-1)$ for $n \geq 1$
3. **Odd** (3 points)
   Recursively define $a_0 = a_1 = 1$ and $a_n = 2a_{n-1} + a_{n-2}$ for all $n \geq 2$. Show that a_n is odd for all $n \geq 0$.
4. 3.4 (page 271)
   - (2 points) 8 a,b
   - (3 points) 18
   - (2 points) 58 a,b
5. **Recursive algorithms** (4 points)
   Let an array $a[0], ..., a[n-1]$ of integers be given. Give a recursive algorithm (in pseudo code) for ...

   (a) ... finding the sum of the elements in the array.
   (b) ... finding the maximum of the elements in the array.
6. 6.1 (page 409)
   - (3 points) 10
   - (3 points) 28