Math 2602

Finite and Linear Math

Worksheet 8

1. Find a closed form to the following recurrence relation: $a_n = 5a_{n-1} - 6a_{n-2} + n$, $a_0 = 0$, $a_1 = 1$

2. Give an algorithm to decide if n is even. How fast is your algorithm (what is the time complexity of your algorithm)?

3. Give an algorithm that, given a list of integers $a_1, a_2, ..., a_n$, counts the number of even integers in this list. How fast is your algorithms (what is the time complexity)?

- **4.** Which of the following functions are O(1)? O(n)? $O(n^2)$?
 - (a) $\log(n^5)$
 - (b) n^5
 - (c) $n \log(n+5)$
 - (d) $\sin(n)$
 - (e) $\log^{23470}(n)$
 - (f) $\frac{1}{n^2}$
 - (g) $n \log(n^9) + n + 54032$