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Intro to Algorithm Analysis – Assignment 2

1.

1. M(3) = 3
   M(4) = 3
   M(5) = 3
   M(6) = 3
   M(7) = 3
   M(8) = 4

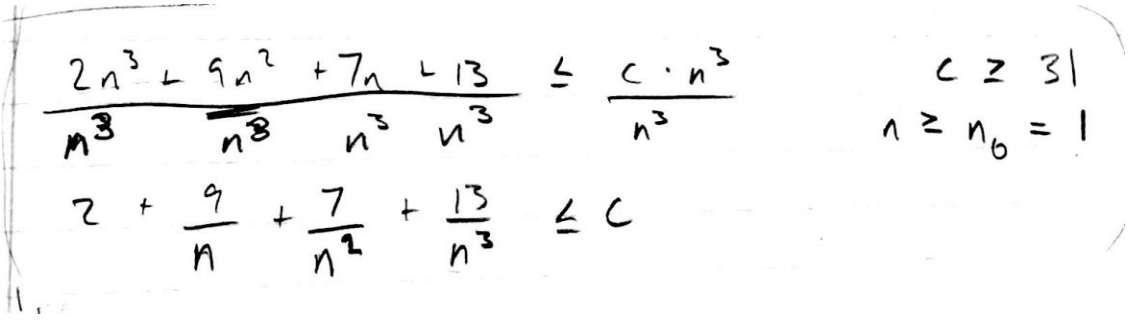
2. M(n) = 1 + M(n-1)

2.

f(n) = 1000000
f(n*ln(n)) = 87,847.5
f($n * \sqrt{n}$) = 10,000
f(n^2) = 1,000
f(n^3) = 100
f(1.1^n) = 144.95
f(2^n) = 19.93
f($n!$) = no solution
f(n^n) = 7.066

3.

1.



2.

$n^4 - n^3 \in O(n^3) \quad n > 1$

$\frac{n^4 - n^3}{n^3} \geq n - 1$

$n > C + 1$ implies $n - 1 > C$ and $f(n) > Cn^3$

$n > 1$, $n > k$, and $n > C + 1$ implies $n > k \wedge f(n) > Cn^3$