CSE 680 - Problem Set 1
Due lecture on October 12th

Problem numbers are from the second edition or the third of "Introduction to algorithms". If unsure about which problem to solve, ask. Collaboration is permitted; looking for solutions from external sources (books, the web, etc.) is prohibited.

1. 1.2-3, 2.1-1, 2.1-3, 3.1-1, 3.1-4, 3-4 except 3-4 h.

2. Give the asymptotic complexity (Θ) of each of the following functions in simplest terms and then order the functions by asymptotic dominance. That is, produce a permutation $f_1(n), f_2(n), \ldots$ such that $f_i = O(f_{i+1})$. Note if any two functions are asymptotically equivalent, i.e. if $f_i = \Theta(f_{i+1})$.

   (a) $f_a(n) = \log_3(6n+7)\log_2(5n^{0.3}+21)$
   (b) $f_b(n) = \sum_{i=1}^{n^2}\left(\frac{3}{4}\right)^i$
   (c) $f_c(n) = 2\log_4(4n+17)$
   (d) $f_d(n) = \sum_{j=1}^{2n}(4j+1)$
   (e) $f_e(n) = 6^{13}$
   (f) $f_f(n) = 5n^{0.6} + 3n^{0.7}$
   (g) $f_g(n) = 6\log_5(n^5+3n^3) + 3n^{0.2}$
   (h) $f_h(n) = \sqrt{3n^2+2n+74}$
   (i) $f_i(n) = 5\log_2(3n^2+n+8)$
   (j) $f_j(n) = \sqrt{2\log_2(n)+3+7n}$
   (k) $f_k(n) = 2n\log_3(2n^3+17n+1)$
   (l) $f_l(n) = 2\log_3(n) + \sqrt{2n} + 3n$