CSE 2331 - Problem Set 2
Due beginning of lecture on September 13th

Problem numbers are from the third edition 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. 3.1-1

2. Let $f(n)$ and $g(n)$ be asymptotically positive functions. Prove or disprove each of the following conjectures:

   (a) $f(n) = \Omega(g(n))$ implies $g(n) = \Omega(f(n))$.

   (b) $f(n) + g(n) = O(\min(f(n), g(n))$.

   (c) $f(n) = O(g(n))$ implies $2^{f(n)} = O(2^{g(n)})$.

   (d) $f(n) = \Omega(\sqrt{f(n)})$.

   (e) $f(n) = \Theta(f(2n))$.

3. 4.3-6

4. 4.4-1

5. Give the asymptotic running time of the following algorithms in Θ notation. Justify your solution.

(a)
```
function func1(n)
    s = 0
    for i = n to n^2 do
        for j = i to n^2 do
            s = s + j - i
        endfor
    endfor
    return(s)
```

(b)
```
function func2(n)
    s = 0
    for i = 1 to n^2 do
        j = i^2
        while j > 10 do
            j = floor(j/5)
            s = s + j - i
        endwhile
    endfor
    return(s)
```