1. 2n4, c = 2, n0 = 4
2. when c1 = 1, c2 = 2, n0 = 1
3. No, holds only for n0 <= 0 which means that n0 is negative which cannot happen as both constants n0 and c must be positive.
4. O(1), O(lg n), O(n), O(n lg n), O(n2), O(n2 lg n), O(n3), O(2n), O(n!), O(nn)
   1. 1000
   2. 204,095
   3. 1897
   4. 442
   5. 8
5. From n = 7 onward, the first algorithm beats the second algorithm. I got this answer by making a table of values and plugging in values from 1 to 10 to find a transition between the two algorithms.
   1. Answer: Θ(n lg(n))
   2. Answer: Θ()
   3. Answer: Θ()
   4. Answer: Θ(n)