1.

1. √𝑛 >> √4𝑛 = 2√𝑛
2. n >> 4n
3. n2 >> (4n)2 = 16 n2
4. n3 >> (4n)3 = 64 n3
5. 2n >> 24n = 16n

2.

ln2n < 5log(n+100)10 < < 0.001n4+3n3+1 < 3n < 22n <(n-2)!

3.

a. finding difference between the largest and smallest value in an array

b. Traverse through the array (exhaustive search), compare and replace minval with smaller number, or maxval with bigger number. Return the difference between maxval and minval.

c. n times

d. Time complexity: O(n)

4.

S(n) = S(n-1) + n3 S(1) = 1

S(n-1) = S(n-2) + (n-1)3

S(n) = [S(n-2) + (n-1)3] +n3

S(n) = S(1) + 23 + 33 + … + (n-1)3 +n3

S(n) = 1 + 23 + 33 + … + (n-1)3 +n3 =

O(n4)