1] a) $3^n > 2^n \Rightarrow$ True

$O(2^n)$: 2^n'dan ve yukarı

b) $4n\lg n \simeq n\lg n \in \Omega(n\lg n)$ True

c) $n^2 < n^3 \Rightarrow$ False

$\Theta(n^2)$ olmalı

d) $n^9 > n^3 \Rightarrow$ False

$\Theta(n^9)$ olmalı

2] $T(n) = 3T(n-6)$ $\quad T(1) = 4$

$= 3\left(3T(n-12)\right) = 3^2 T(n-12)$

$= 3^2\left(3T(n-18)\right) = 3^3 T(n-36)$

$= 3^i T(n-i6)$

$= 3^{\frac{n-1}{6}} \cdot 4 \in \Theta(3^n)$

$T(n-6) = 3T(n-12)$

$T(n-12) = 3T(n-18)$

$n - i6 = 1 \Rightarrow i = \frac{n-1}{6}$

(*) kovalari bir dizi için aldik

```
Sirala(A[0---2n])

for i←0 to n-1 do    // Dizinin yarisina kadar

    for j←i to 2n-2-i do

        swap A[j] and A[j+1]
```

$$\sum_{i=0}^{n-1} \sum_{j=i}^{2n-2-i} 1 = \sum_{i=0}^{n-1} 2n-2-i-i+1 = \sum_{i=0}^{n-1} 2n-1-2i$$

$$= (2n-1) \sum_{i=0}^{n-1} 1 - 2 \sum_{i=0}^{n-1} i = (2n-1)(n) - 2\frac{(n-1)(n)}{2} = n^2 \in \Theta(n^2)$$

7 8,1

8 7,2

3 6,4

5 5,5

1 4,7

4 3,8

2 2,9

6 1,10

10 9,3

9 10,6