3.-

$$T(n) = 1 + \sum_{i=0}^{n} 1 + 1 + \text{Max}\left[1, 1 + \left(\sum_{i=1}^{n} \sum_{j=1}^{3n} 1\right) + T\left(\frac{n}{2}\right)\right] =$$

$$= 1 + \sum_{i=0}^{n} 1 + 1 + \text{Max}\left[1, 1 + \sum_{i=0}^{n} \left(\sum_{j=1}^{3n} 1\right) + T\left(\frac{n}{2}\right)\right] =$$

$$2 + n + 1 + 3n^2 + T\left(\frac{n}{2}\right) = 3n^2 + n + 3 + T\left(\frac{n}{2}\right)$$

$T(n) = 3n^2 n + 3 + T\left(\frac{n}{2}\right)$ $n = 2^k$

$T(2^k) = 3(2^k)^2 + 2^k + 3 + T(2^{k-1})$

5.- func ~~existe~~ Primo (n: entera) dev prim: boolean

Desde i←2 hasta n Hacer:

si n%i == 0 devolver ~~true~~ false

fDesde

devolver ~~false~~ true

fFunc.

$$T(n) = \sum_{i=0}^{n} (1+1) + 1 = 2n + 1 \quad [O(3n)]$$

6.- func perfecta (n: entera) dev res: boolean

Desde i ← 0 (entera cont:0) hasta n Hacer:

si n%i == 0 entonces cont += i fSi

fDesde

~~si n == contador~~

devolver n == contador

fFunc.

$$T(n) = \sum_{i=0}^{n} 2 + 1 = 2n + 1 \Rightarrow O(n)$$

7.- func f7 (n entero) dev ~~entero~~ contPrim, contPer enteros
contPrim, contPer = 0
desde i=1 hasta n
si Prima(n) entonces contPrim++ fs
si Perfecta(n) entonces contPer++ fs
fdesde
~~ecto~~ devolver contPrim, contPer

$$T(n) = \sum_{i=0}^{n} (4(2n+1)) + 1 = 4n^2 + n + 1 \Rightarrow O(n^2)$$

8.- Python:

```
def reversa(n):
    if(n//10==0):
        return n
    else:
        aux = n%10
        aux = 10*aux
        aux += reversa(n//10)
        return aux
```

$T(n) = 1 + \max[1, 3 + T(n-1)] =$

$= T(n-1) + 4$

$t(n) = x^n$

$x^n = x^{n-1} + 4$

$x^{n-1}(x-1) = 4$

Homogénea:
$x^{n-1}(x-1) = 0$
raíz 1 $\Rightarrow x^{(h)} = A$

Particular
$x^{n-1}(x-1) = 4 \Rightarrow Bn = x^{(p)}$
$x^n = A + Bn = T(n) \Rightarrow O(n)$

9.- def sumatoria(n)
if(n==0): return 0
else: return n+sumatoria(n-1)

$T(n) = 1 + \max(1, 1 + T(n-1)) =$
$= T(n-1) + 2 \quad T(n) = x^n$
$x^n = x^{n-1} + 2$
$x^{n-1}(x-1) = 2$

Homogénea:
$x^n(x-1) = c$
raíz: 1 $\Rightarrow x^{(h)} = A$

Particular
$x^n(x-1) = 2 \Rightarrow x^{(p)} = Bn$
$x = A + Bn = T(n) \Rightarrow O(n)$