Kacper Kalinowski 16.03.2021

1.

a) 2 · 1 · 2 · 1

8

b) Obliczą potęgę b za a czyli b^a

4.

$T(n) = 6T(\frac{n}{2}) + n^2$

$a = 6$
$b = 2$ $f(n) = n^2$

$\log_2 6 > 2 \Rightarrow g(n) = n^{\log_2 6} > f(n)$

$T(n) = \Theta(n^{\log_2 6})$

9

```
function alg (T)
    if (T == null)
        return 0
    sunalewa = alg (T.left)
    sumaprawa = alg (T.right)
    if (T.key mod 3 == 0)
        sunalewa = alg (T.left)
        sumaprawa = alg (T.right)
    return T.key
```

```
function alg (T)
    return suma (T) / iloczyn (T)
```

```
function iloczyn (T)
    if (T == null) then
        return 1
    lewo = iloczyn (T.left)
    prawo = iloczyn (T.prawo)
```

```
function suma (T)
    if (T == null) then
        return 0
    lewo = suma (T.left)
    prawo = suma (T.right)
```

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2.

```
function g(n)
    if (n>=0) then
        if n ==0
            then return 1
        else if n ==1
        then return 2
            else
            return (g(n-1) + g(n-2) + 3*pow(n,3))
    else
        return niepoprawidłowe dane
```

3.

```
function g(n)
    for i:=0 to n do
        if i==0
            then tab[i]=1
        else if ==1
            then tab[i]=2
        else
            tab[i] = tab[i-1]+tab[i-2]+3*pow(i,3)

    return tab[n]
```

4.

```
fundion roznica (S, Q)
    suma := 0
    suma2 := 0
    ilosc := 0
    ilosc2 := 0

    while not (Stack_Empty(S)) do
        suma := suma + POP(S)
        ilosc := ilosc + 1

    while not (Queue_Empty(Q)) do
        suma2 := suma2 + Dequeue(Q)
        ilosc2 := ilosc2 + 1

    if (ilosc > 0 and ilosc2 > 0) then
        return (suma/ilosc) - (suma2/ilosc2)
```

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5.

```
function kwadrat (n, T[1..n, 1..n])
    min = T[2,1]
    max = T[2,1]
    for i:=2 to n do
        for j:=1 to i-1 do
            if min > T[i,j] then
                min = T[i,j]
            else if max < T[i,j] then
                max = T[i,j]
    return max * max - min * min
```

6.

a) iloczyn parzystych par w tablicy

b) n^2

c) $O(n^2)$

8.

```
function alg(L)
    if (L == null) then
        return null
    x = L.head
    y = L1.head
    while (x != null) do
        temp = floor(x.key)
        y.key = x.key + temp
        x = x.next
        y = y.next
    return L1
```

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9.

```
Function iloczyn (T)
    if (T == null) then
        return 1
    lewo = iloczyn (T.left)
    prawo = iloczyn (T.right)
    if (T.key % 3 == 0 ) then
        return T.key * lewo * prawo
    return lewo * prawo

function suma (T)
    if (T == null)
        return 0
    lewo = suma (T.left)
    prawo = suma (T.right)
    if (T.key % 3 == 0 ) then
        return T.key + lewo + prawo
    return lewo + prawo

function alg (T)
    return suma (T) / iloczyn (T)
```

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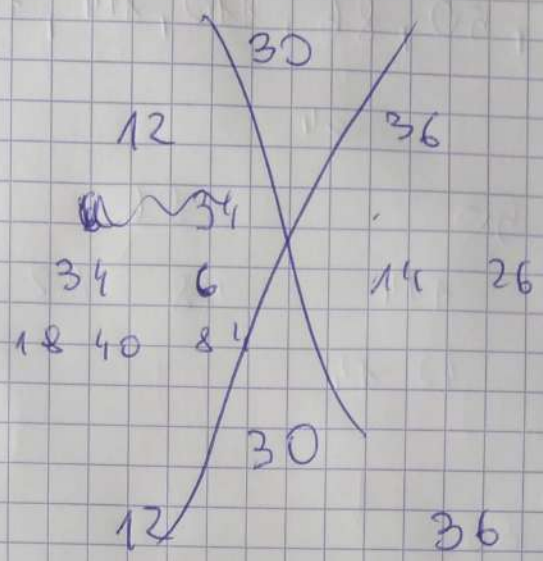
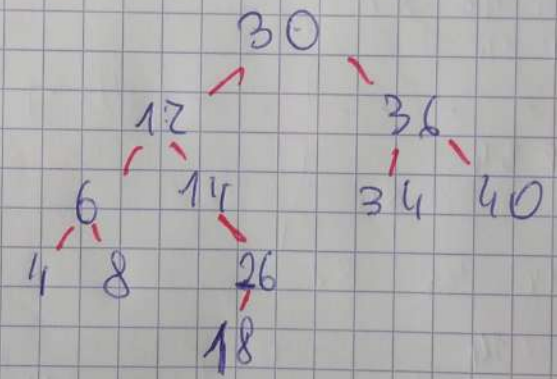
10

a) $A = [30, 12, 36, 34, 6, 14, 26, 18, 40, 8, 4]$





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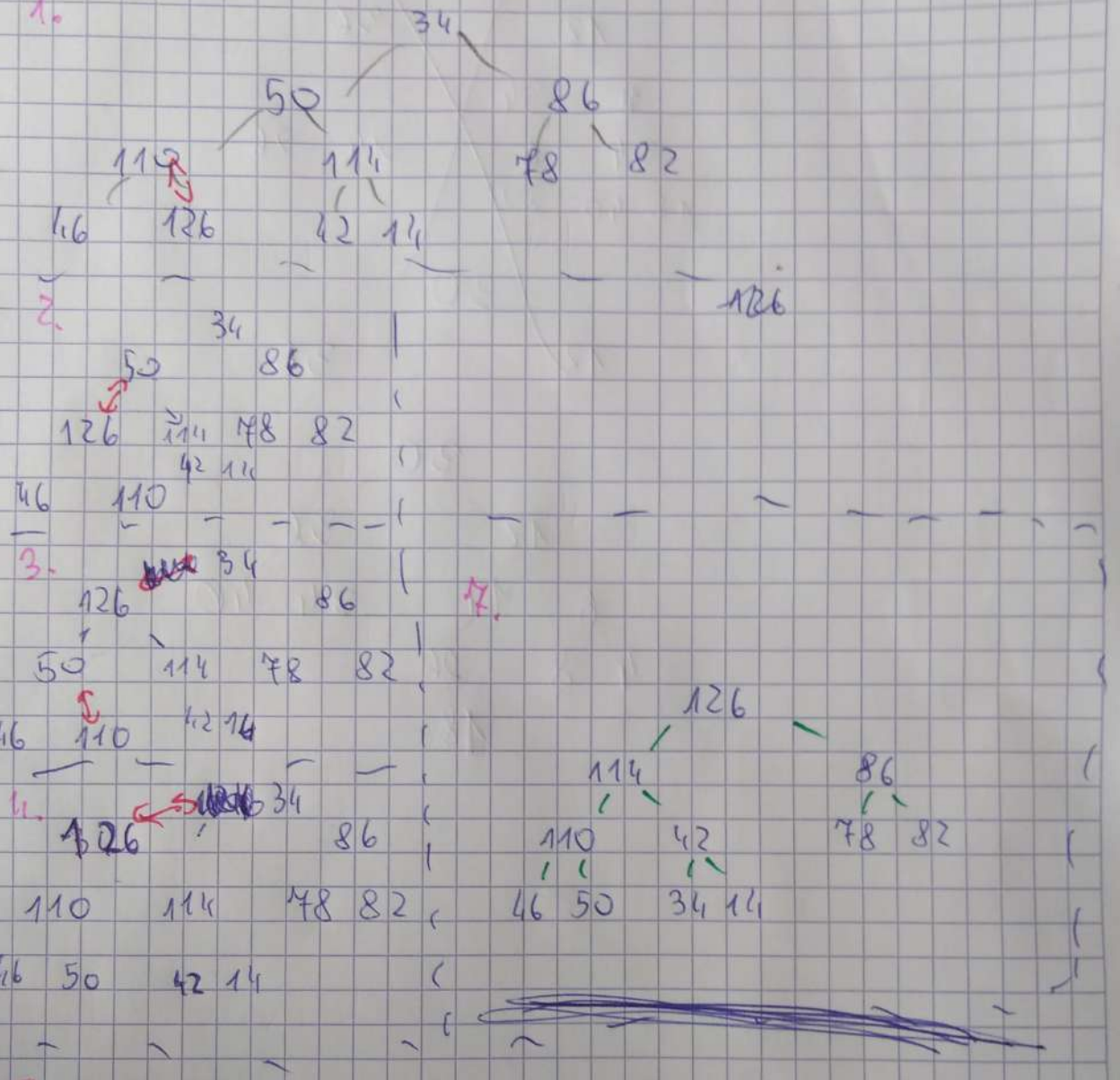
10.

a) $B = [34, 50, 86, 110, 114, 78, 82, 46, 126, 42, 14]$