1.

a) $2 \cdot 2 \cdot 2 \cdot 1$

8

b) Oblicza potęgę b za b^a

2. 4.

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

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

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

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

3.

~~function alg (T)~~
~~if (T == null)~~
~~return 0~~
~~suma lewa = alg (T.left)~~
~~suma prawa = alg (T.right)~~
~~if (T.key mod 3 == 0)~~
~~suma lewa = alg (T.left)~~
~~suma prawa = alg (T.right)~~
~~return T.key~~

function   function iloczyn(T)   function suma(T)
alg (T)   if (T==null) then   if (T==null) then
return suma (T) / iloczyn(T)   return 1   return 0

                lewo = iloczyn(T.left)   lewo = suma (T.left)
                prawo = iloczyn(T.right)   prawo = suma (T.right)

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 nieprawidłowe dane
```

3.
```
function g(n)
    for i:=0 t> 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]
```

7.
```
function 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)
        ilosc 2 = ilosc 2 +1

    if (ilosc >0 and ilosc2 >0) then
        return (suma */ilosc) - (suma2/ibsc2)
```

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 +1

6.

a)   iloczyn parzystych par w tablicy

b) n^2

c) $O(n^2)$

8.

a) 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

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

    return  suma (T) / iloczyn (T)
```
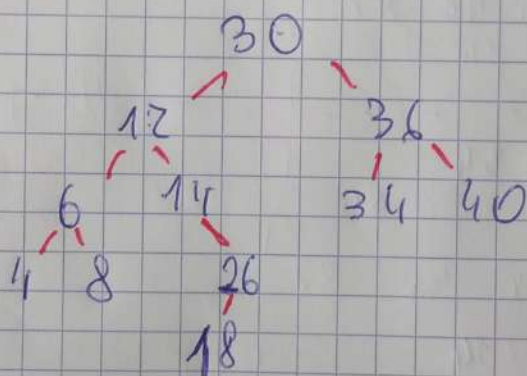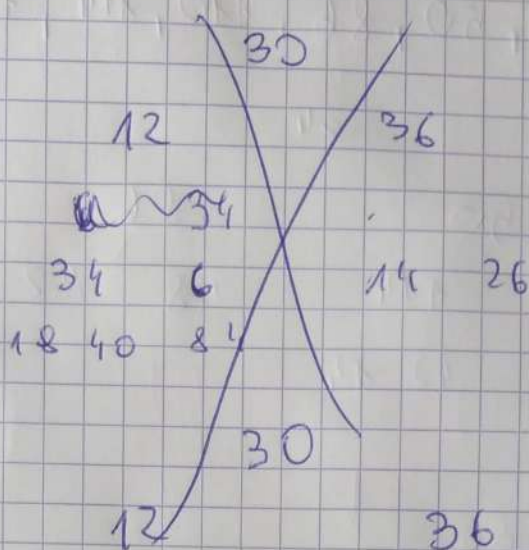
10

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

30

12   36

34

34   6   14   26

18 40   8 4

30

12   36

30

12   36

36

12   34   40

6   14

4   8   26

18

Kasper Kalinowski   484966   16.03.2021
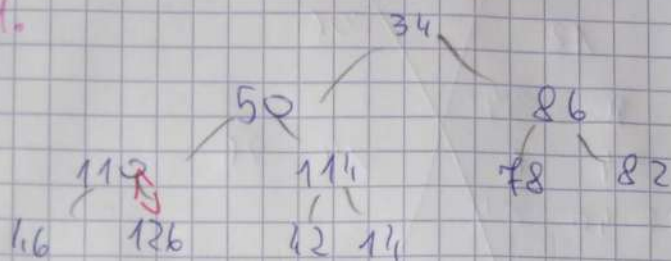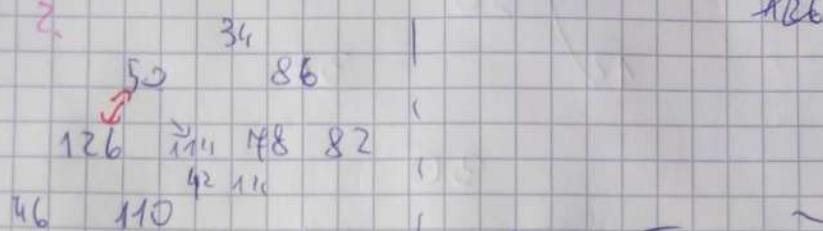
10.
b)   B = [34, 50, 86, 110, 114, 78, 82, 46, 126, 42, 14]

1.
```
                34
         50           86
      110      114   78  82
   46   126   42  14
                               126
2.
         34
      50      86
   126  114 78 82
      42 110
46   110
3.         34
   126        86
  50   114 78 82
46  110  42 14

7.
4.                 34                          126
  126         86              114           86
110    114   78 82        110    42     78  82
46  50   42 14           46 50   34 14

5.        126
     34         86
  110  114   78 82
46 50    42 14
6.          126
    114         86
  110   34    78 82
   46 50  42 14
```
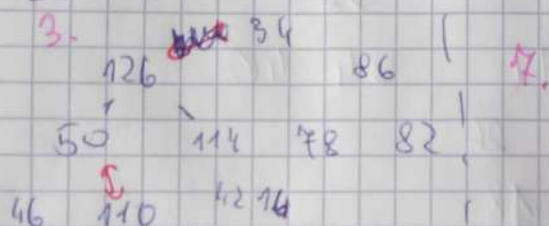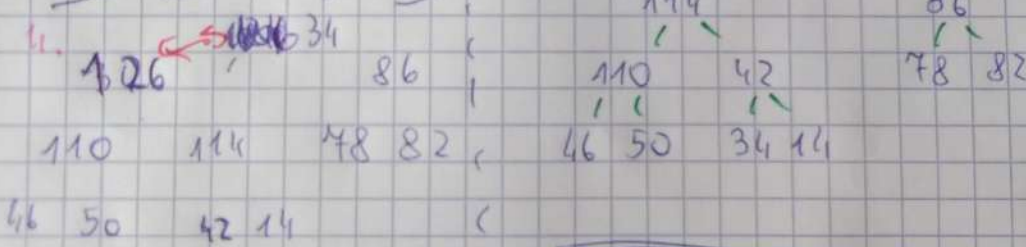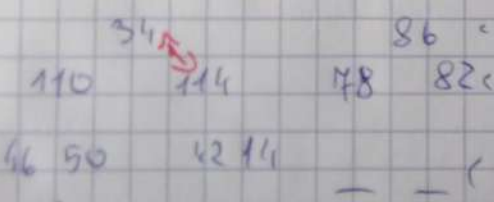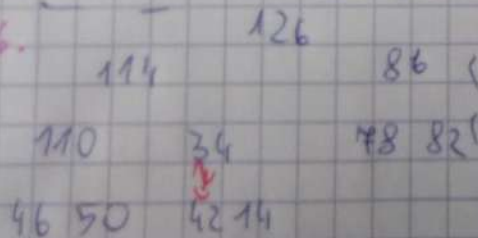
Oświadczam, że w trakcie
pisania kolokwium nie korzystałem
z pomocy osób trzecich oraz notatek
                    Kasper Kalinowski
                    16.03.2021