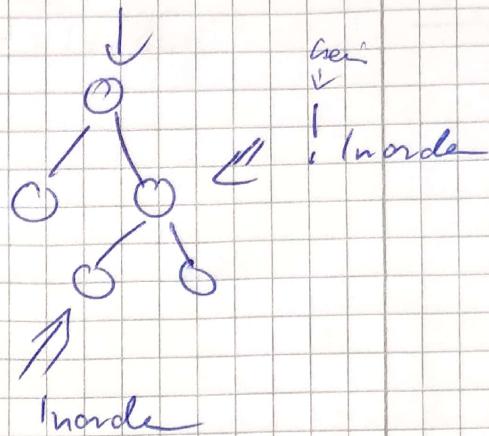
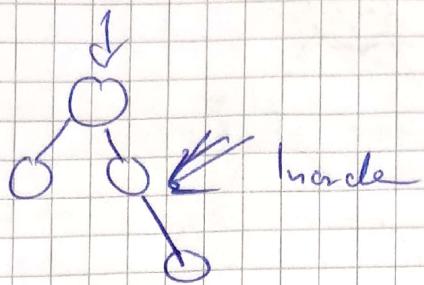
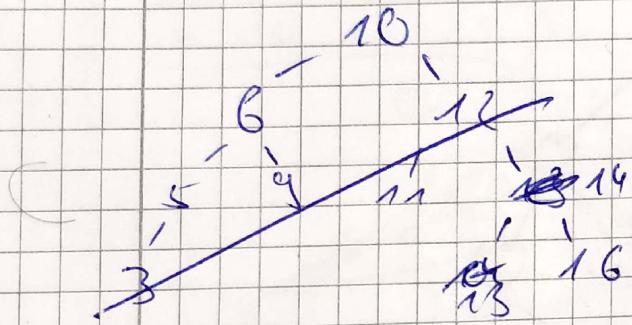


1.1

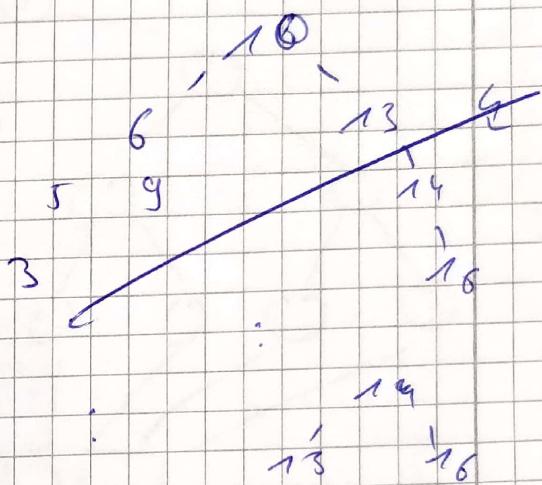


Wenn ein Knoten zwei Nachfolger hat kann er nie
ein Inorder-Nachfolger sein! ▷

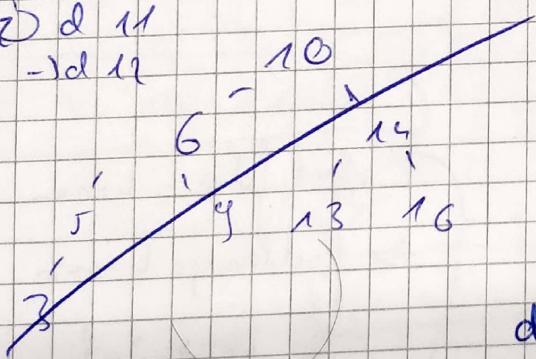
⑩. 1.2



⑩. d 11
-> d 11



⑩. d 11
-> d 11



d. 1 → d: 4

→ 2, 3, 4 ⇒ 2, 3, 4 ⇒ 2

d. 4 → d: 1

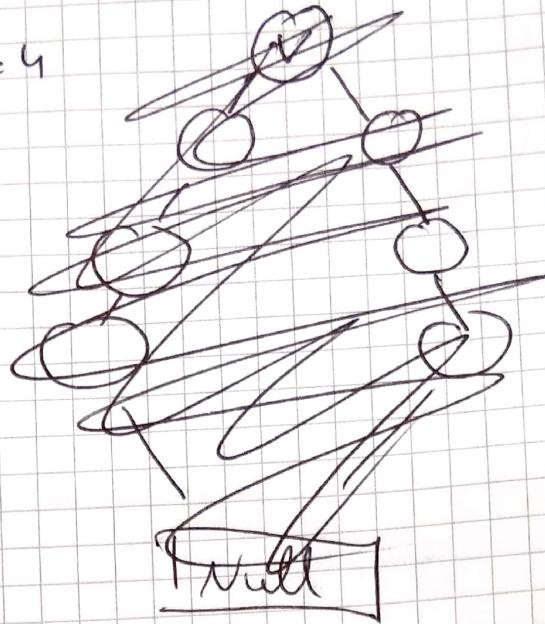
1, 2 ⇒ 3

⇒ nicht kommutativ

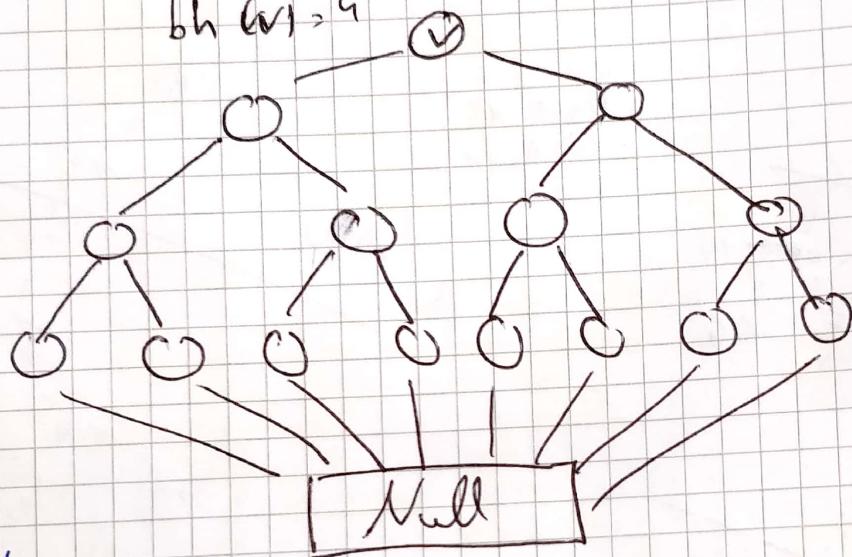
10ex 8

2.11

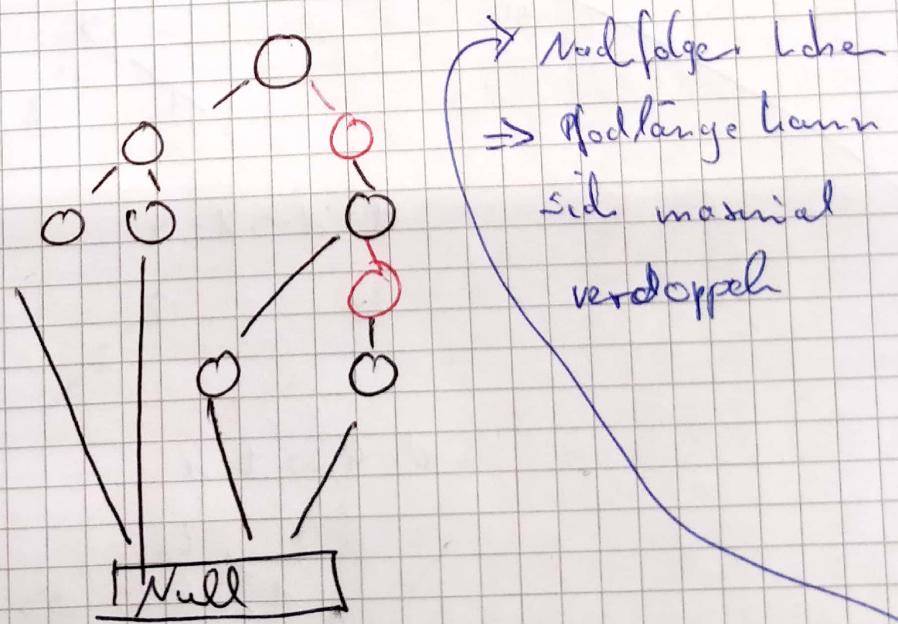
$$bh(v) = 4$$



$$bh(v) = 4$$



2.11



~~Unter~~ ~~z.B.~~ ohne die Regel der Schwarzen Höhe zu verletzen kann man nur rote Knoten hinzufügen. Aber jede rote Knoten muss einen schwarzen

AD es 8

F ~~31~~ ~~13~~ + = 5 Min: $\frac{1+7}{2} - 1 = 4$ Max: $\frac{1+7}{2} + 1 = 5$

1. $\boxed{13}$ 2. $\boxed{13 \ 16}$ 3. $\boxed{10 \ 13 \ 16}$

4. $\boxed{10 \ 11 \ 13 \ 16}$ 5. $\boxed{10 \ 11 \ 13 \ 16 \ 24}$ ↙ Voll

⇒ Teilen ↓

$\begin{array}{c} 13 \\ \hline 10 \ 11 \quad 16 \ 24 \end{array}$ $\begin{array}{c} 13 \\ \hline 10 \ 11 \quad 16 \ 24 \end{array}$ $\begin{array}{c} 13 \\ \hline 10 \ 11 \quad 16 \ 24 \end{array}$

~~8.~~ $\begin{array}{c} 13 \\ \hline 10 \ 11 \ 12 \quad 16 \ 24 \end{array}$ ↙

~~9.~~ $\begin{array}{c} 10 \ 13 \\ \hline 11 \ 12 \quad 16 \ 24 \end{array}$

~~10.~~ $\begin{array}{c} 13 \\ \hline 12 \ 11 \ 10 \ 11 \ 12 \quad 16 \ 24 \end{array}$ ↙

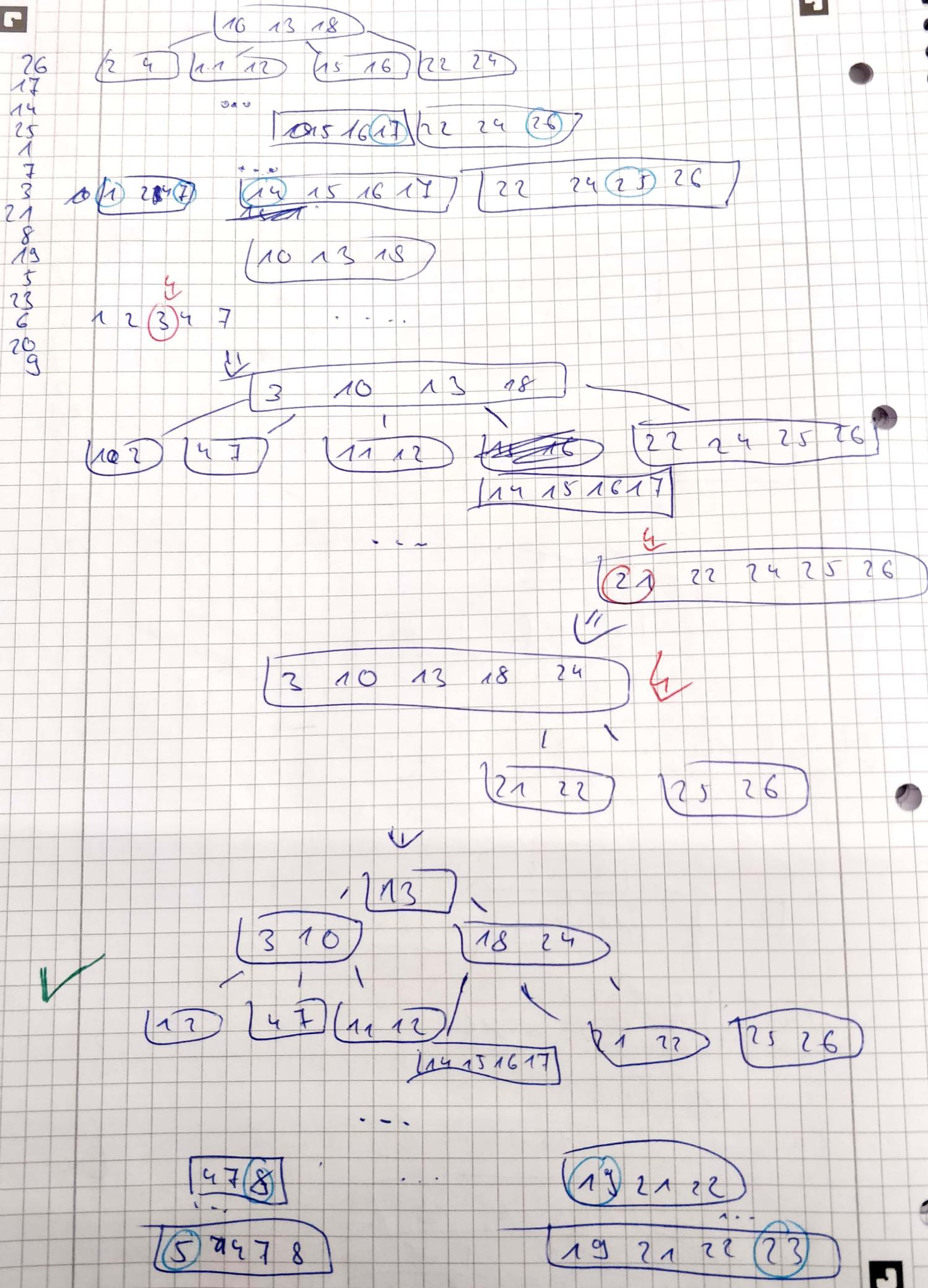
~~11.~~ $\begin{array}{c} 10 \ 13 \\ \hline 11 \ 12 \quad 16 \ 24 \end{array}$

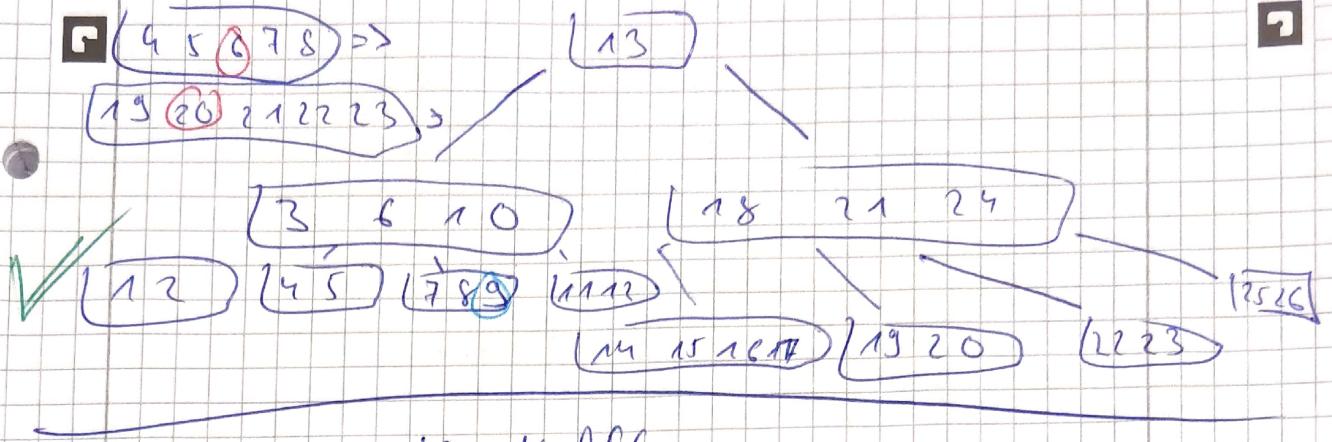
~~12.~~ $\begin{array}{c} 10 \ 13 \\ \hline 11 \ 12 \quad 15 \ 16 \ 24 \end{array}$

~~13.~~ $\begin{array}{c} 10 \ 13 \\ \hline 11 \ 12 \quad 15 \ 16 \ 18 \ 24 \end{array}$ ↳

~~14.~~ $\begin{array}{c} 10 \ 13 \ 18 \\ \hline 11 \ 12 \quad 15 \ 16 \quad 22 \ 24 \end{array}$

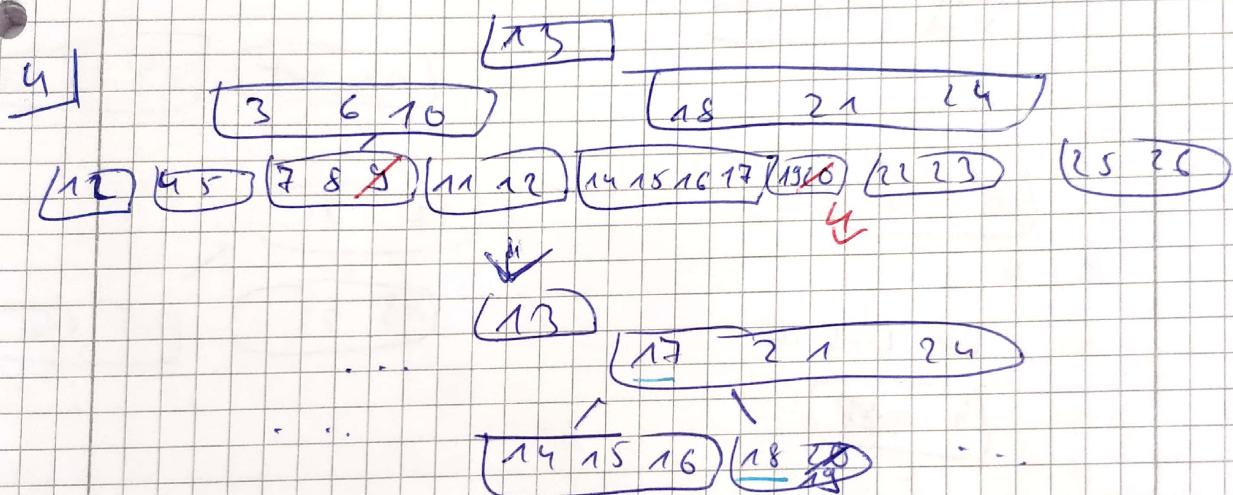
| |
|----|
| 13 |
| 16 |
| 10 |
| 11 |
| 24 |
| 4 |
| 12 |
| 2 |
| 15 |
| 18 |
| 22 |
| 26 |
| 17 |
| 14 |
| 25 |
| 1 |
| 7 |
| 3 |
| 21 |
| 8 |
| 19 |
| 5 |
| 23 |
| 6 |
| 20 |
| 9 |





4 \Rightarrow 10-Na

$$\begin{array}{l} 4 \Rightarrow 6 \\ 18 \Rightarrow 19 \\ 21 \Rightarrow 22 \end{array}$$



$$\boxed{3 \quad 6 \quad 10}$$

10 = 7

$$\boxed{3 \quad 7 \quad 10}$$

$$\boxed{4 \quad 5} \quad \boxed{8} \quad \boxed{11 \quad 12}$$

\Rightarrow Vereinigung

$$\boxed{2 \quad 7}$$

... 45

$$\boxed{2 \quad 5}$$

$$\boxed{8 \quad 10 \quad 11 \quad 11}$$

~~(22 23)~~

y

⇒ Vereinigung

⇒

- (13)

~~(22 23)~~ (3 7)

~~(22 23)~~ (8 10 11 12)

Linksverschiebung

~~(22 23)~~ (17 21)

~~(22 23)~~ (14 15 16)

~~(22 23)~~ (18 20)

~~(22 23)~~ (22 24 25 26)

Linksverschiebung

~~(3 8)~~

~~(4 7)~~ (10 11 12)

~~(17 21)~~

~~(18 21)~~

~~(24 25 26)~~

~~(3 7)~~

10: 4 :

↓ Linksver.

~~(4 10 12)~~

~~(8 10 12)~~

Vereinigung

~~(17 24)~~

~~(18 21)~~

~~(25 26)~~

"

~~(4)~~

~~(8 10 11 12)~~

~~(2 9)~~ (8)

~~(10 11 12)~~

usw...