

M11

a) $S \rightarrow aSa | ab$

ϵ nincs ✓ $a^n a b a^n$
 ldnc nincs ✓

CNF:
 $A \rightarrow BC$
 $A \rightarrow a$
 $(S \rightarrow \epsilon \dots)$

$X_a \rightarrow a$
 $X_b \rightarrow b$
 $S \rightarrow X_a X_b | X_a Y$
 $Y \rightarrow S X_a$

b) $S \rightarrow aSa | bSa | \epsilon$ $\{ wa^n | i=|w|, w \in \{a,b\}^* \}$

ϵ -mentesítésk:

$S' \rightarrow S | \epsilon$

$S \rightarrow aSa | aSa | bSa | ba$

ldnc:

$S' \rightarrow \epsilon | aSa | aSa | bSa | ba$

$S \rightarrow aSa | aSa | bSa | ba$

CNF:

$S' \rightarrow \epsilon | X_a Y_1 | X_a X_a | X_b Y_1 | X_b X_a$

$Y_1 \rightarrow S X_a$

$S \rightarrow X_a Y_1 | X_a X_a | X_b Y_1 | X_b X_a$

$X_a \rightarrow a \quad X_b \rightarrow b$

c) $S \rightarrow aA | bBc | aCb | Dc$

$A \rightarrow aAb | ab \rightsquigarrow a^n b^n$

$B \rightarrow Bc | c \rightsquigarrow c^+$

$C \rightarrow aC | a \rightsquigarrow a^+$

$D \rightarrow ADc | bc \rightsquigarrow b^n c^n$

nincs ϵ , ldnc $L(G) = \{ a^i b^j c^k | i \geq 2, j \geq 2 \}$

CNF:
 $S \rightarrow X_a Y_1 | X_a Y_4$ $\left. \begin{matrix} a^n b^j c^k \\ i \geq 2, j \geq 2 \end{matrix} \right\}$

$Y_1 \rightarrow A Y_2 \quad A \rightarrow X_a Y_7 | X_a X_b$

$Y_2 \rightarrow X_b Y_3 \quad Y_7 \rightarrow A X_b$

$Y_3 \rightarrow B X_c \quad B \rightarrow B X_c | c$

$Y_4 \rightarrow C Y_5 \quad C \rightarrow X_a C | a$

$Y_5 \rightarrow X_b Y_6 \quad D \rightarrow X_b Y_8 | X_b X_c$

$Y_6 \rightarrow D X_c \quad Y_8 \rightarrow B X_c$

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$$E \rightarrow E + E \mid E * E \mid a$$

$$\downarrow \quad \downarrow \quad \downarrow$$

$$E \rightarrow E \hat{x} \mid E \hat{y} \mid a$$

$$x \rightarrow \hat{+} E$$

$$y \rightarrow \hat{*} E$$

$$\hat{+} \rightarrow +$$

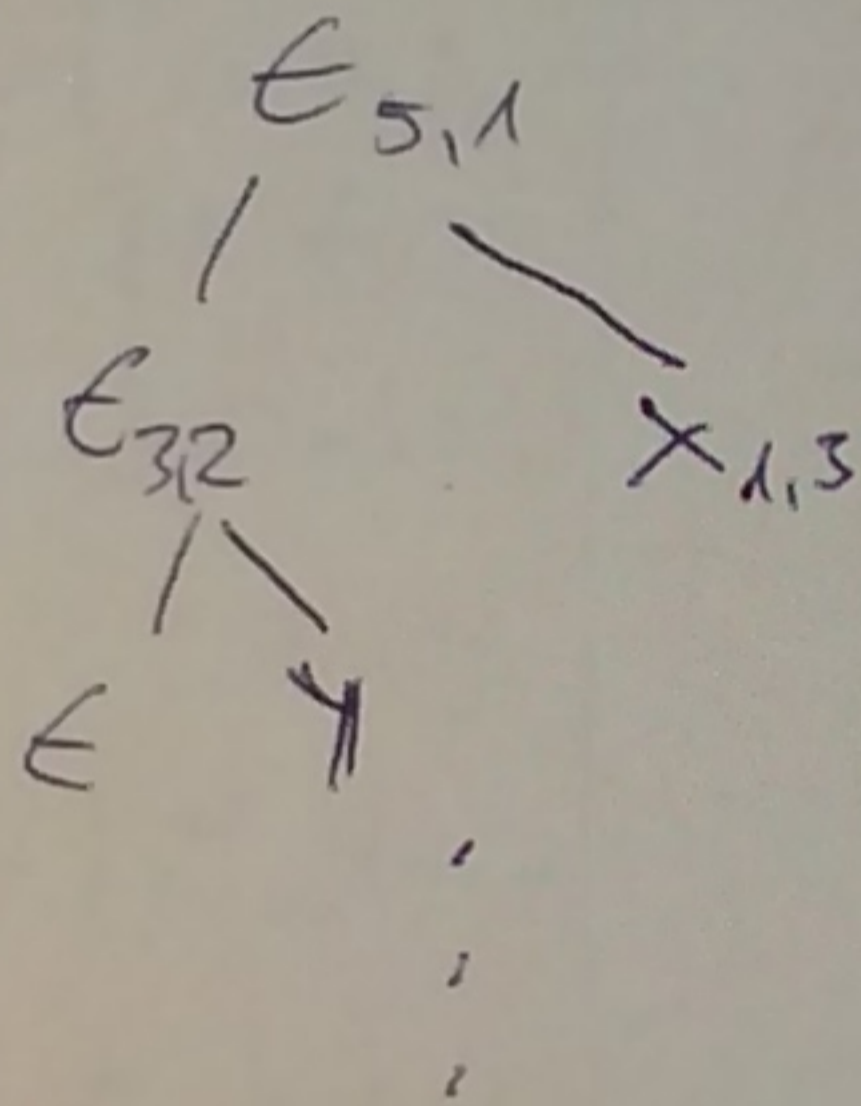
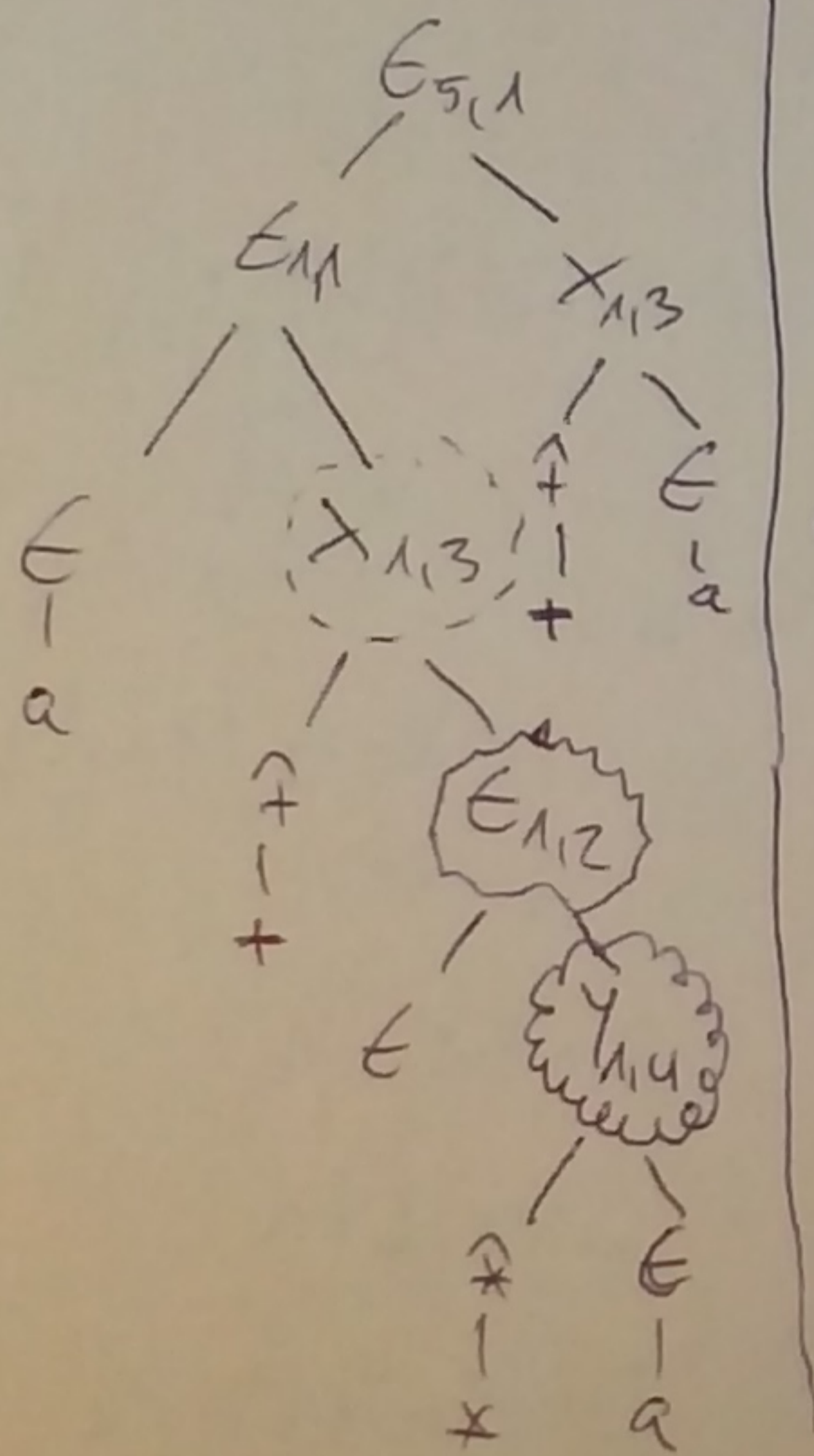
$$\hat{*} \rightarrow *$$

b)

7	$\epsilon_{1,1}$	$\epsilon_{3,2}$	$\epsilon_{5,1}$			
6		$x_{1,3}$				
5	$\epsilon_{1,1}$	$\epsilon_{3,2}$	$\epsilon_{5,1}$			
4		$x_{1,3}$		$x_{1,4}$		
3	$\epsilon_{1,1}$		$\epsilon_{1,2}$		$\epsilon_{1,1}$	
2		$x_{1,3}$		$x_{1,4}$		$x_{1,3}$
1	ϵ	$\hat{+}$	ϵ	$*$	ϵ	$\hat{+}$
	a	+	a	*	a	+

$x_{1,3}$: A 3 szabály miatt került be a $\hat{+}$ az első sorban van

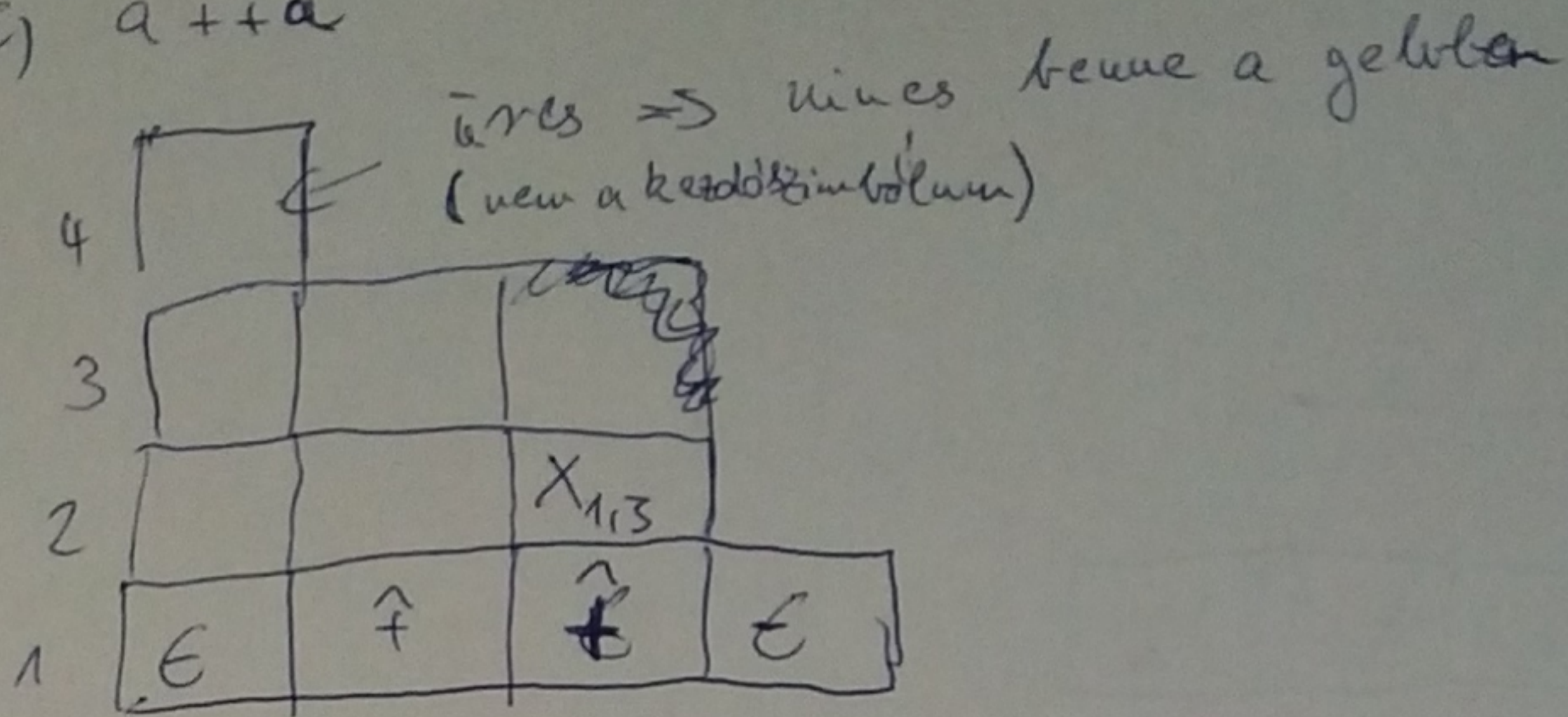
b) Levezetések



$$(a+(a*a))+a$$

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c) $a++a$



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$S \rightarrow aSa \mid bSb \mid aa \mid bb$

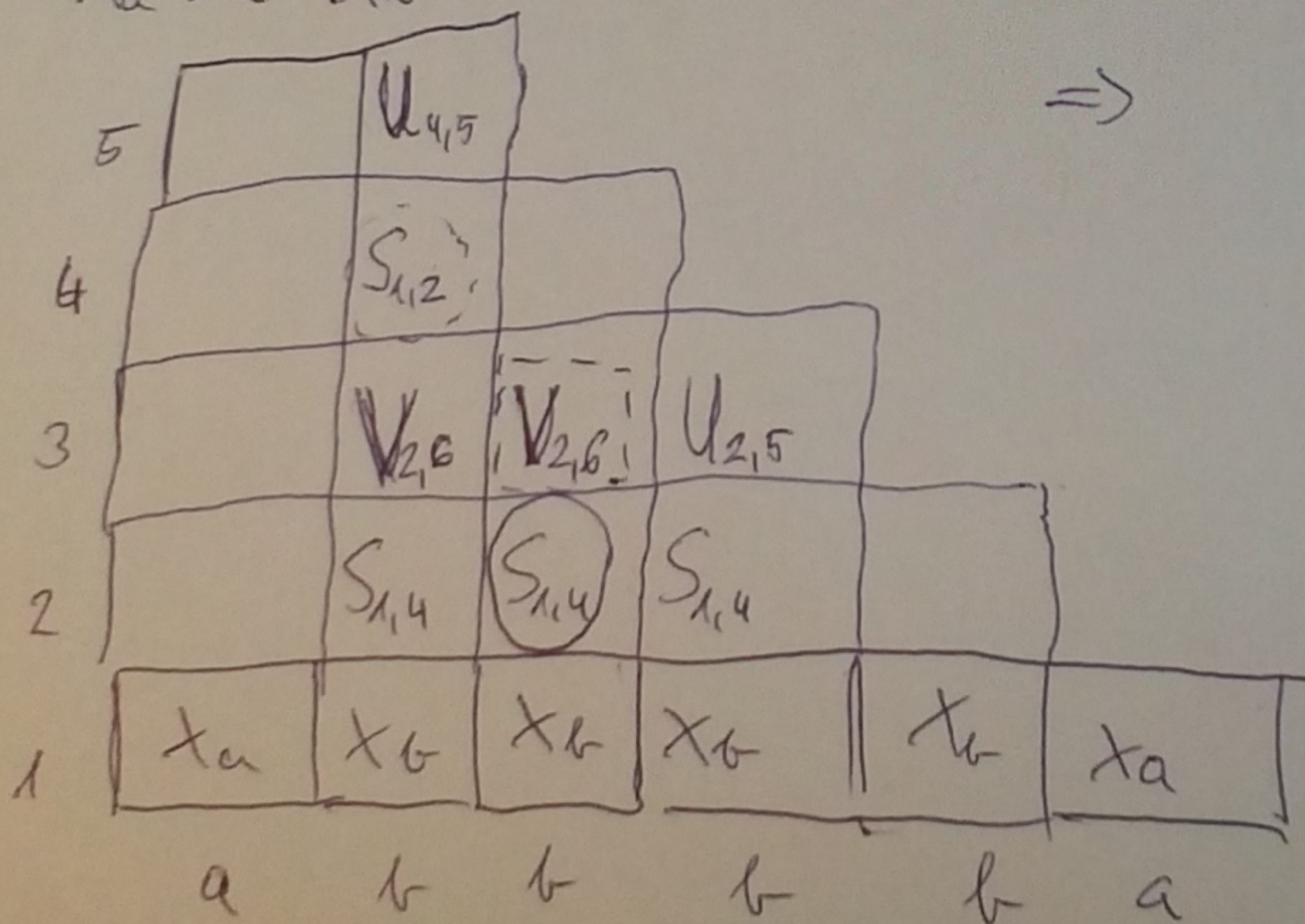
CNF.

$S \rightarrow X_a U \mid X_b V \mid X_a X_a \mid X_b X_b$

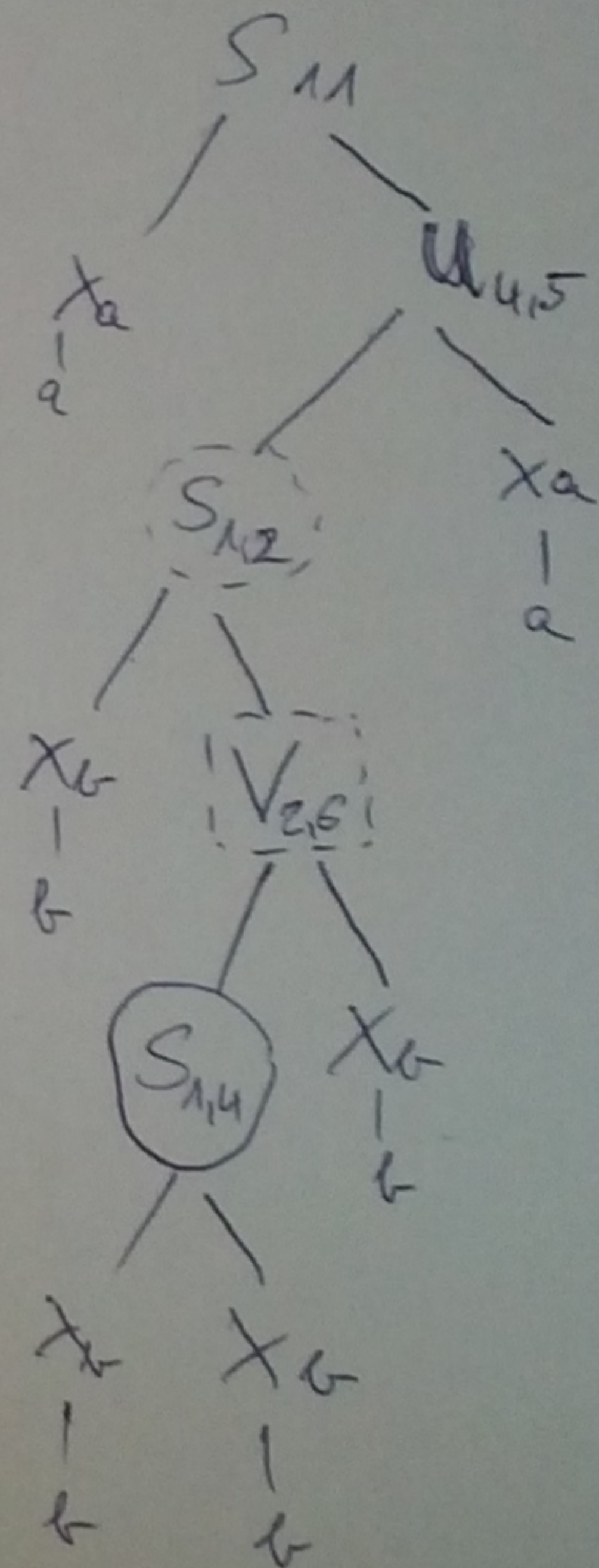
$U \rightarrow SX_a$

$V \rightarrow SX_b$

$X_a \rightarrow a \quad X_b \rightarrow b \quad \square S_{1,1}$



\Rightarrow



← S nem jelent meg → nincs a nyelven

