

GRAMÁTICAS DE FORMA

Luís Romão

Gramáticas de Forma

Partindo de uma seleção criteriosa nas respectivas obras de dois artistas muralistas, o brasileiro Athos Bulcão (1918-2008) e a portuguesa Maria Keil (1914-2012), este trabalho busca estabelecer o formalismo dos recortes supracitados e baseado nessas gramáticas, compor uma nova gramática híbrida que misture elementos de ambos os artistas, a fim de realizar uma nova composição (derivação) a ser aplicada, a título de exemplo, em uma parede externa da FA.Ulisboa

Textos de apoio:

- Ice-ray: a note on the generation of Chinese lattice designs_ **Stiny**
- An introduction to structure and structure grammars_ **Woodbury e McKelvey**

Obras selecionadas:

Athos Bulcão_ **Parte do mural em residência de Brasília** (2,4 x 1,2m)

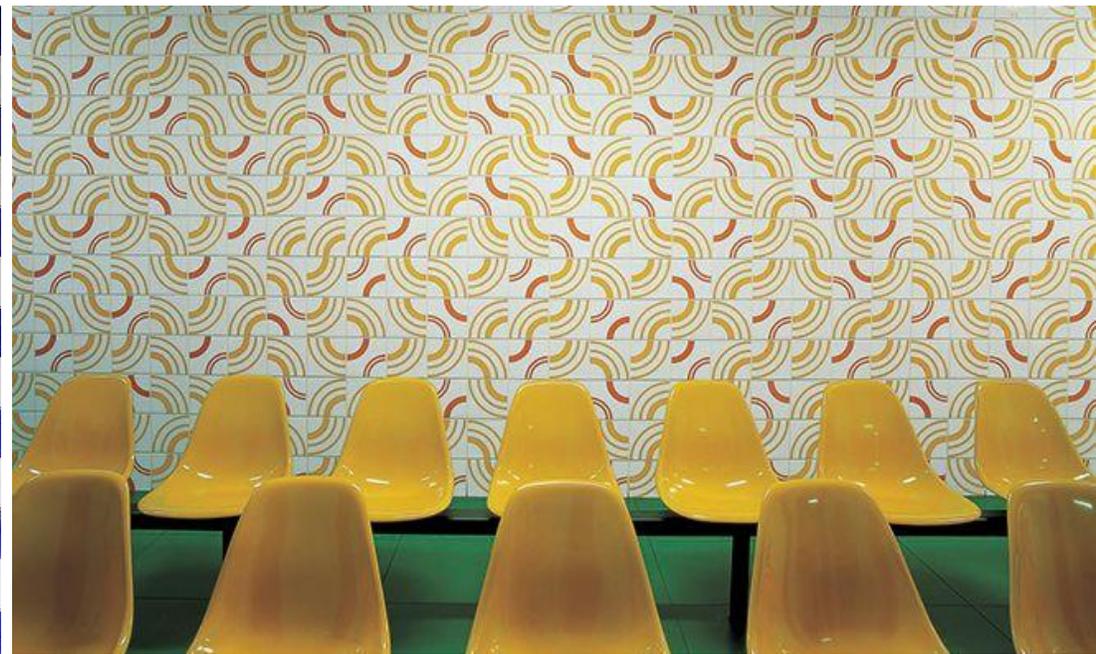
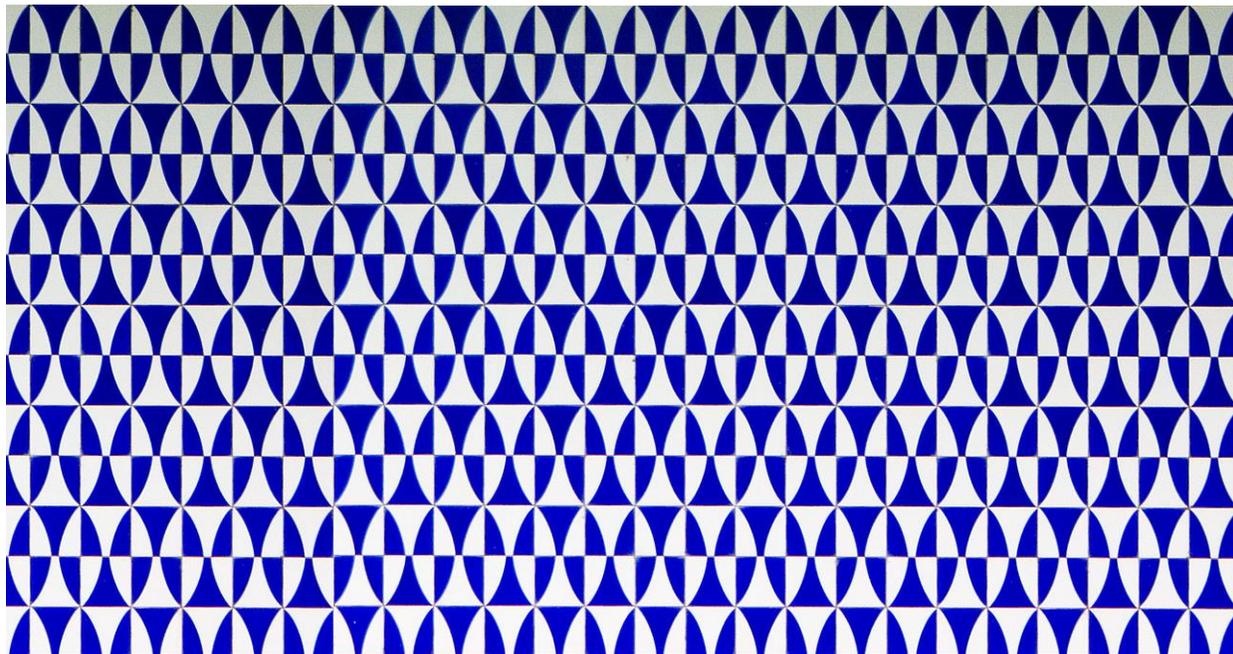
Maria Keil_ **Trecho do mural da estação de Pícoas/Lisboa** (2,4 x 1,2m)

ATHOS BULCÃO (AB)

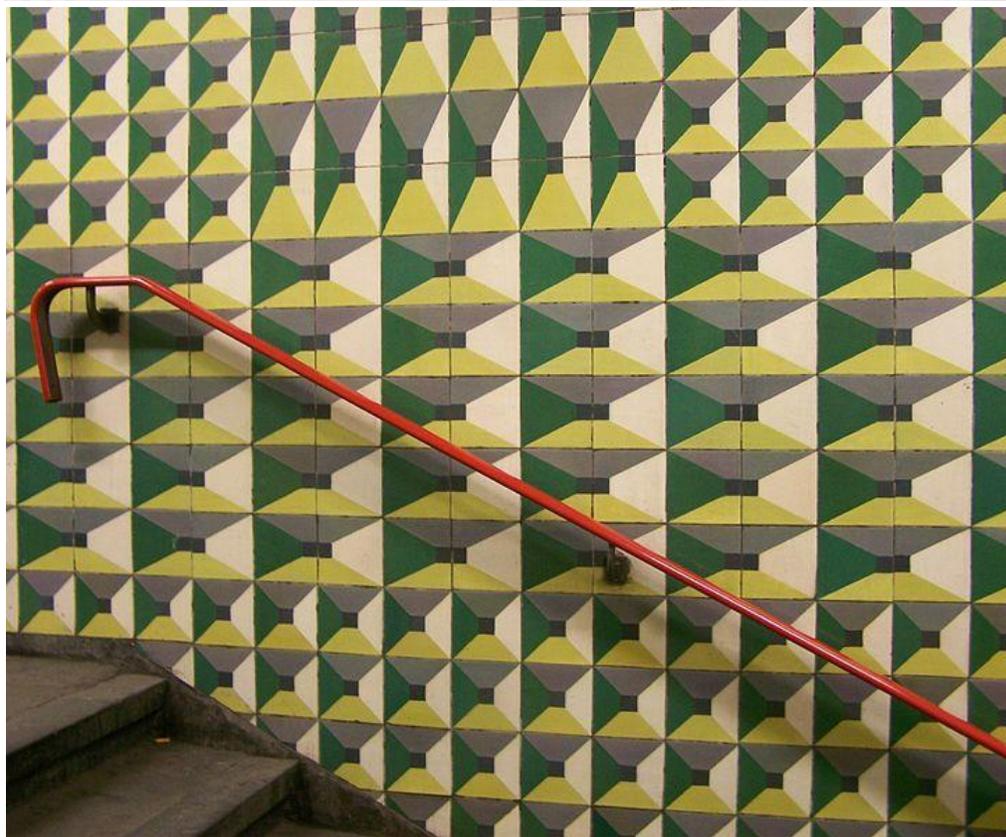


MARIA KEIL (MK)





Athos Bulcão diversidade da obra



Maria Keil diversidade da obra

MARIA KEIL (MK)

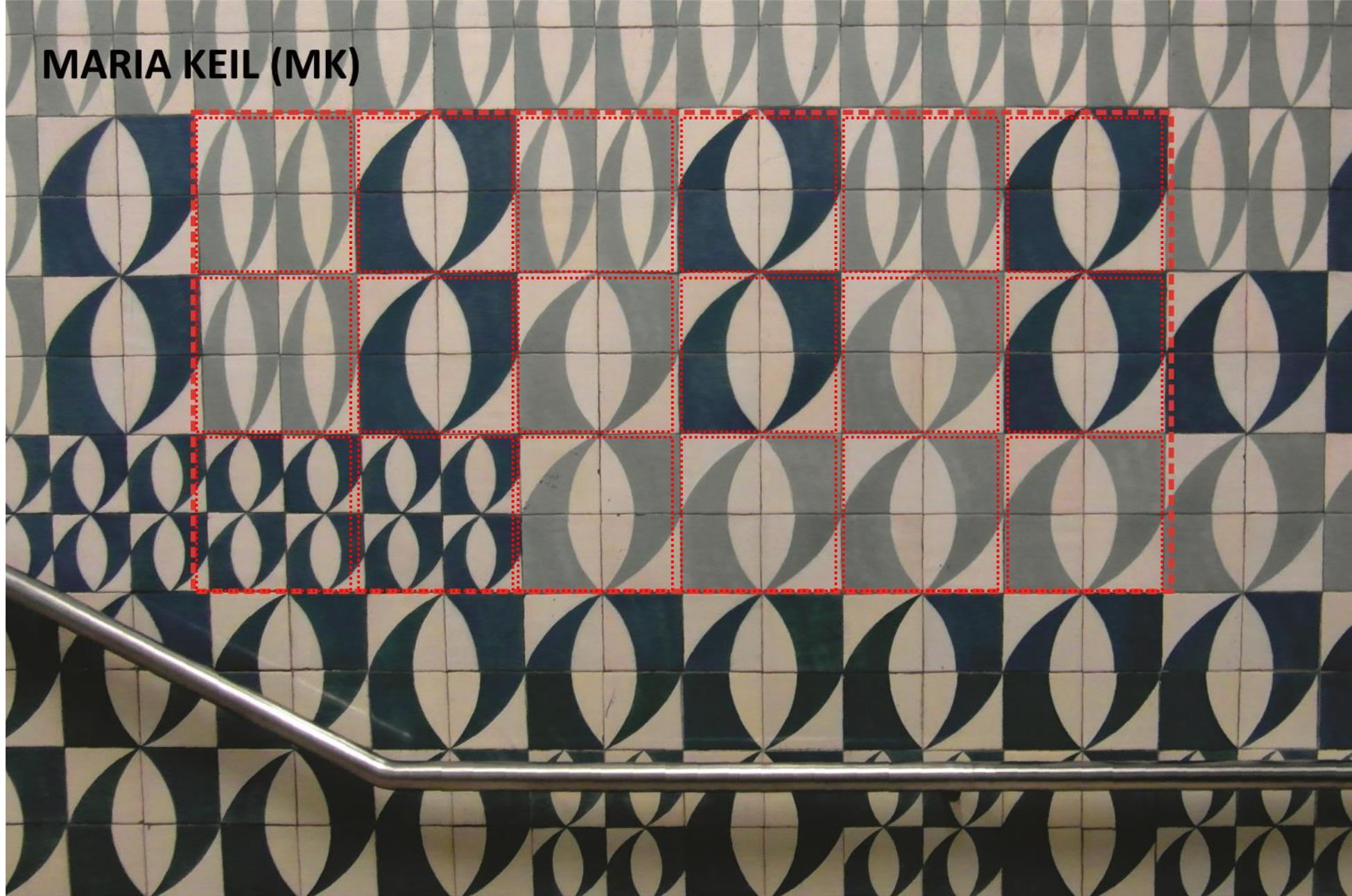
Seleção
2,4 m x 1,2 m



MARIA KEIL (MK)

Seleção
2,4 m x 1,2 m

Divisão em 18 quadrados
de 40 cm

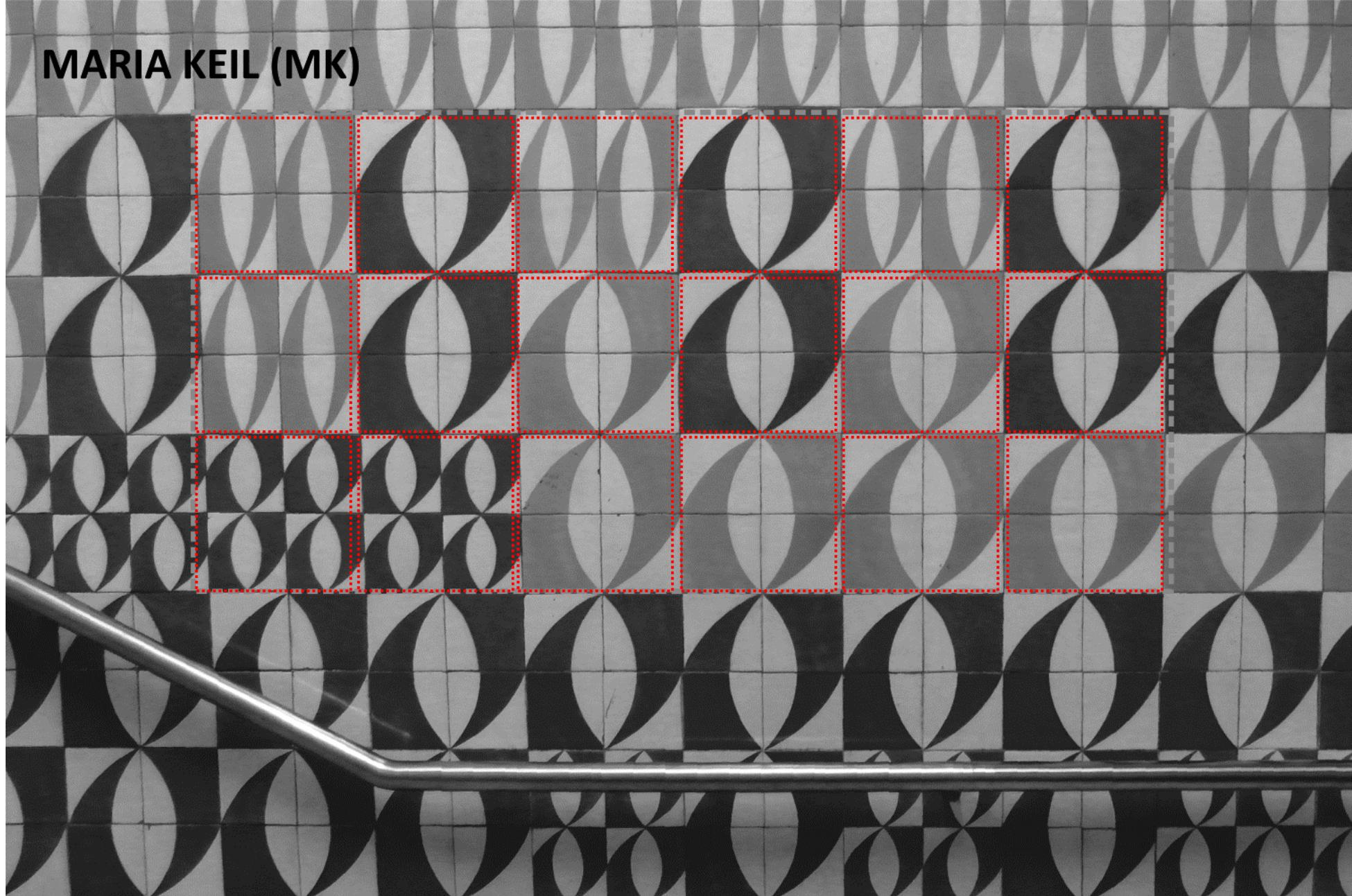


MARIA KEIL (MK)

Seleção
2,4 m x 1,2 m

Divisão em 18 quadrados
de 40 cm

As cores foram desconsideradas



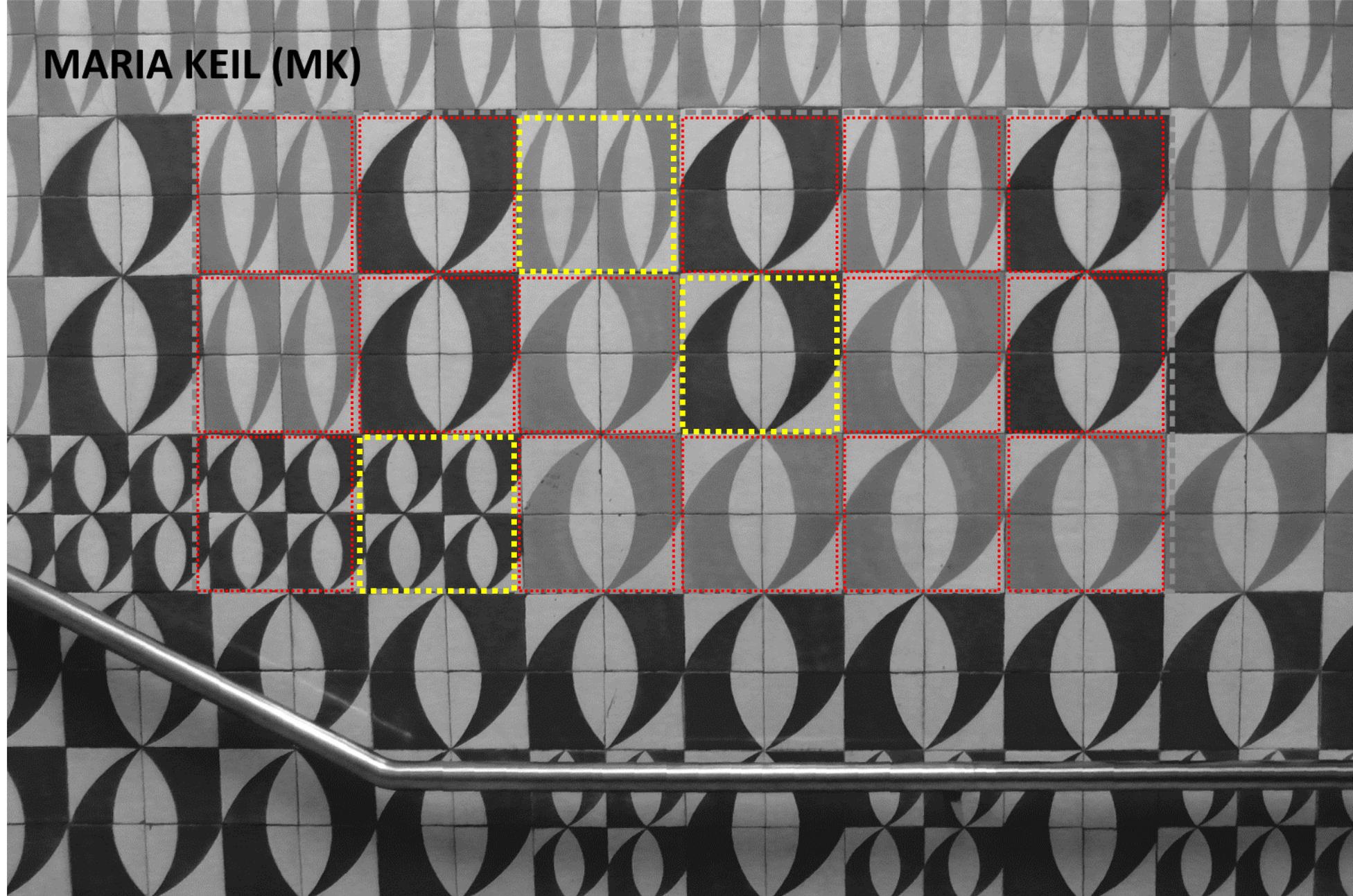
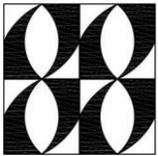
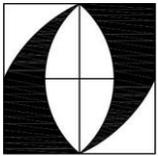
MARIA KEIL (MK)

Seleção
2,4 m x 1,2 m

Divisão em 18 quadrados
de 40 cm

As cores foram desconsideradas

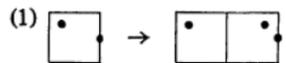
Contendo 3 variações do
mesmo tipo



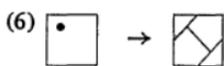
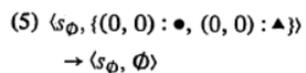
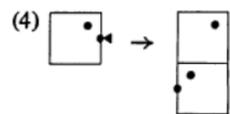
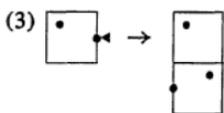
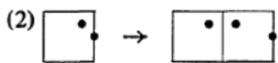
Modelo de apoio:
Ice-ray: a note on the generation of Chinese
lattice designs_ **Stiny**

S: —

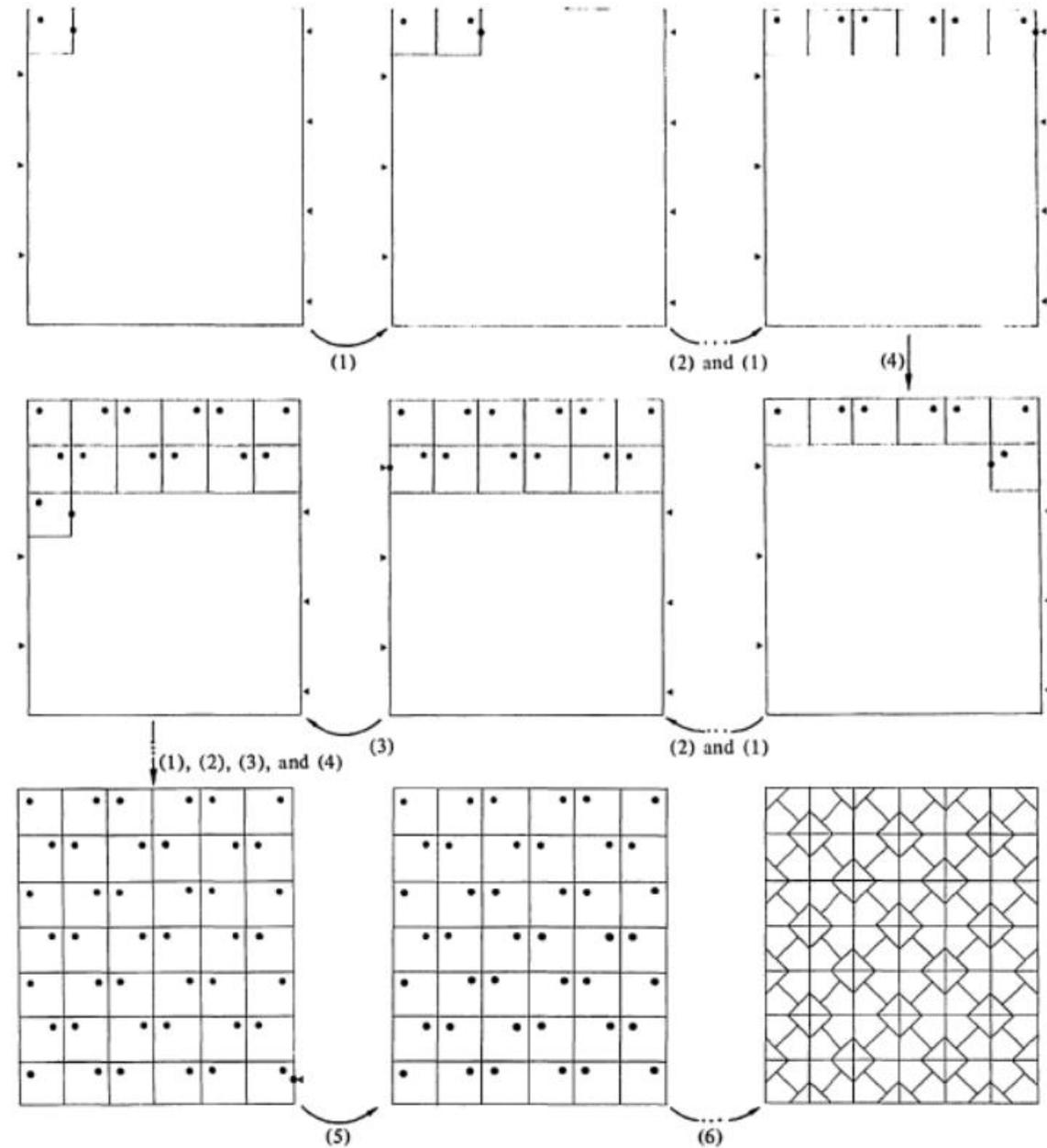
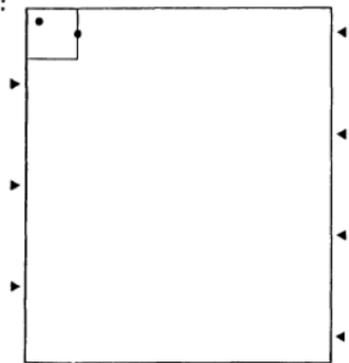
R:



L: $\{(0, 0) : \bullet\}, \{(0, 0) : \blacktriangle\}$

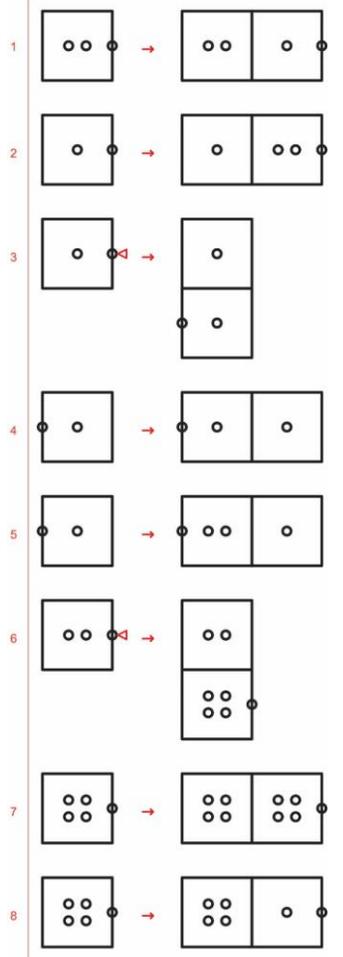


I:



L: $\{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \bullet\}$

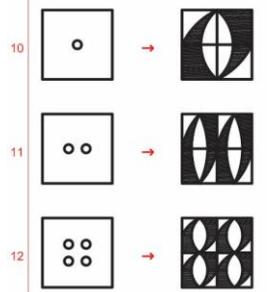
R: A \rightarrow B

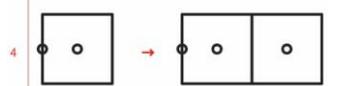
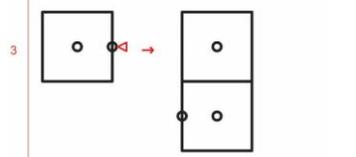
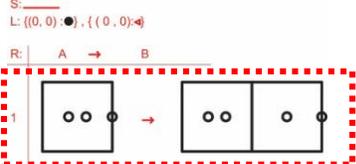


Forma inicial

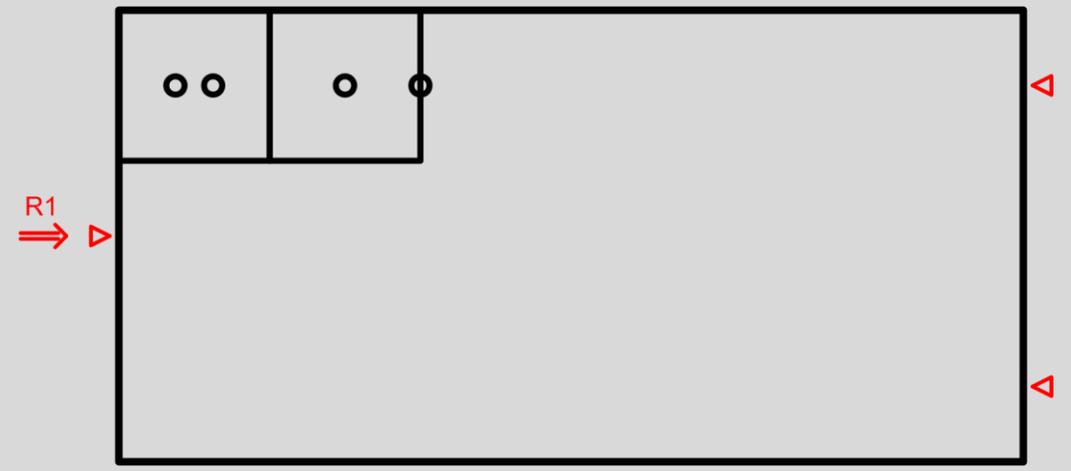
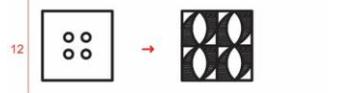


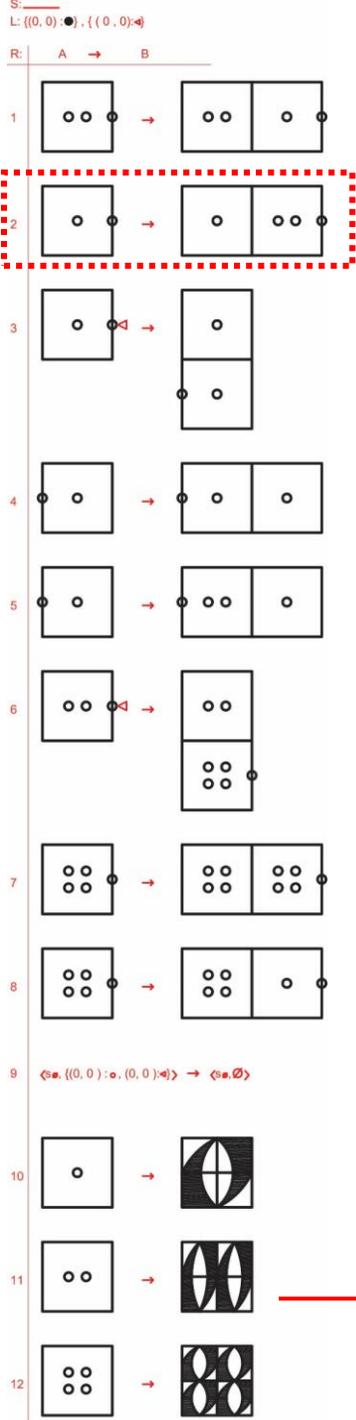
9 $\langle \bullet, \{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \bullet\} \rangle \rightarrow \langle \bullet, \emptyset \rangle$



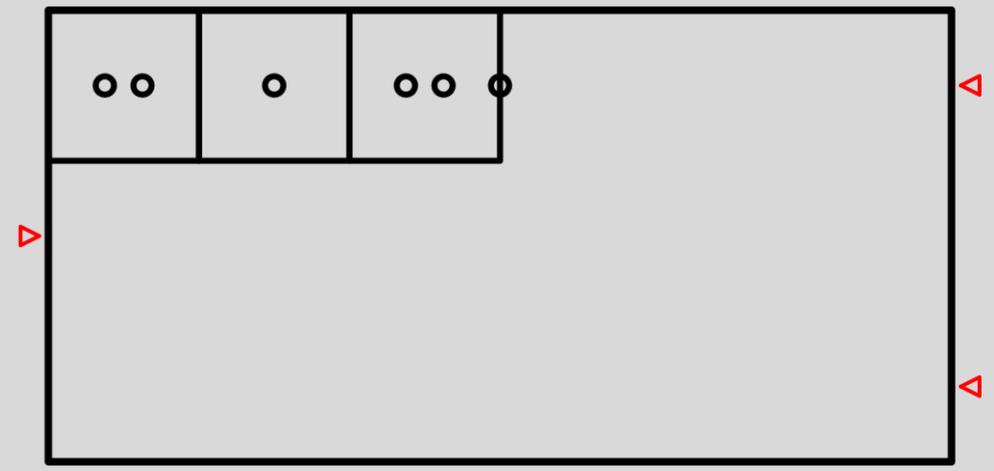


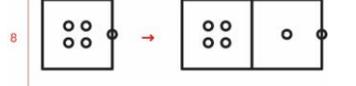
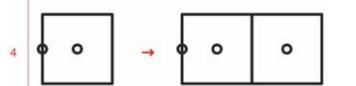
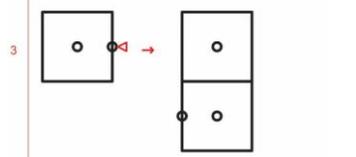
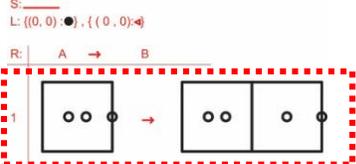
$\langle \bullet, \{(0,0): \bullet, \{(0,0): \blacktriangleleft\} \rangle \rightarrow \langle \bullet, \emptyset \rangle$



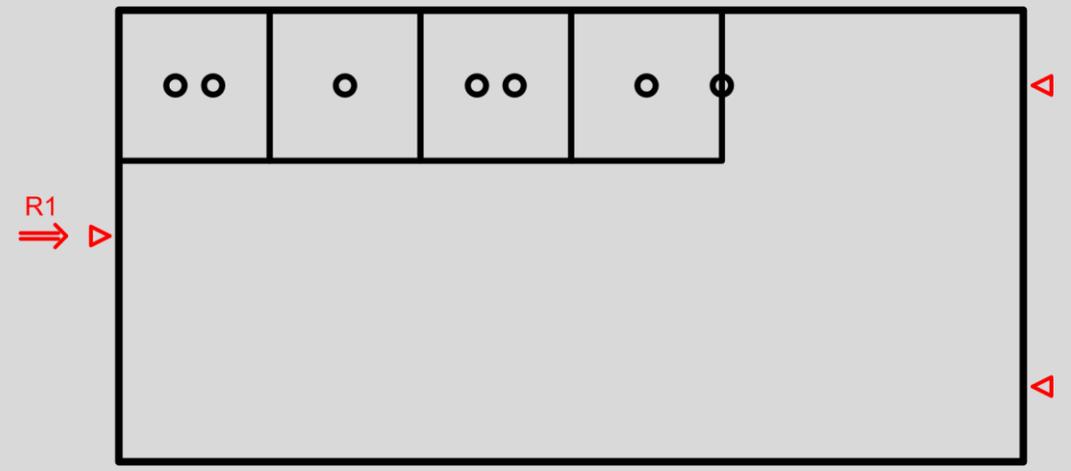


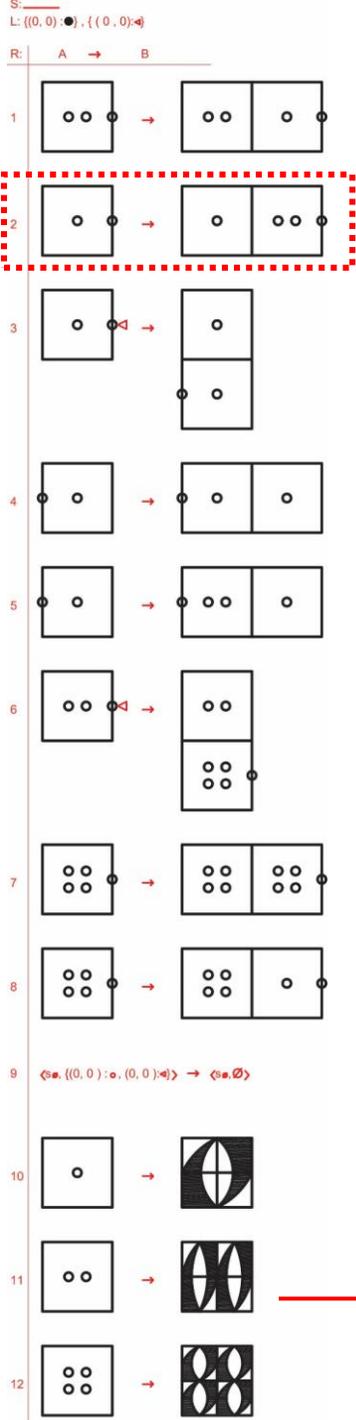
R2



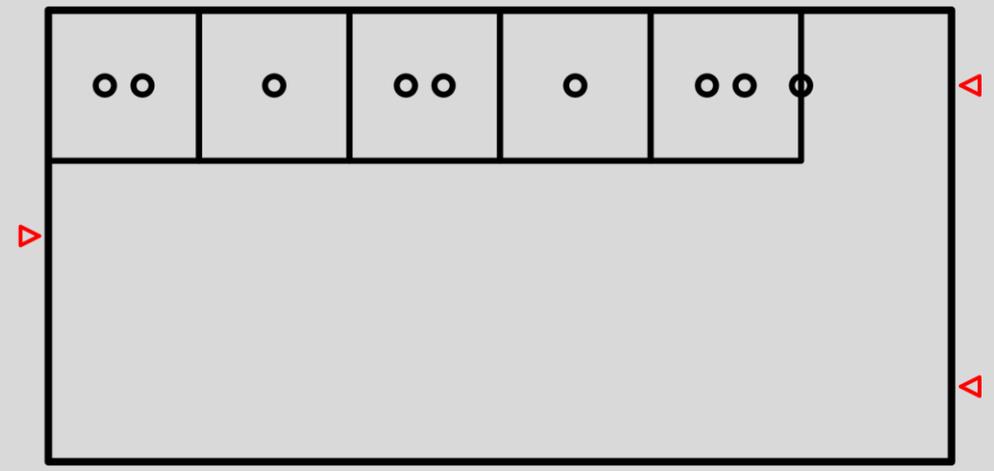


9 $\langle \bullet, \{(0,0): \bullet, (0,0): \bullet \} \rangle \rightarrow \langle \bullet, \emptyset \rangle$



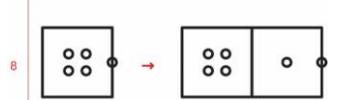
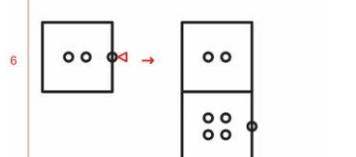
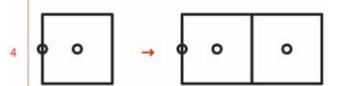
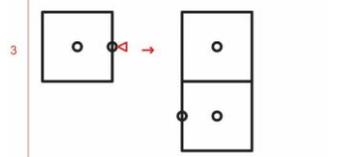
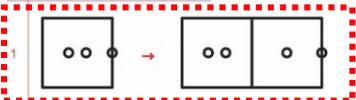


R2

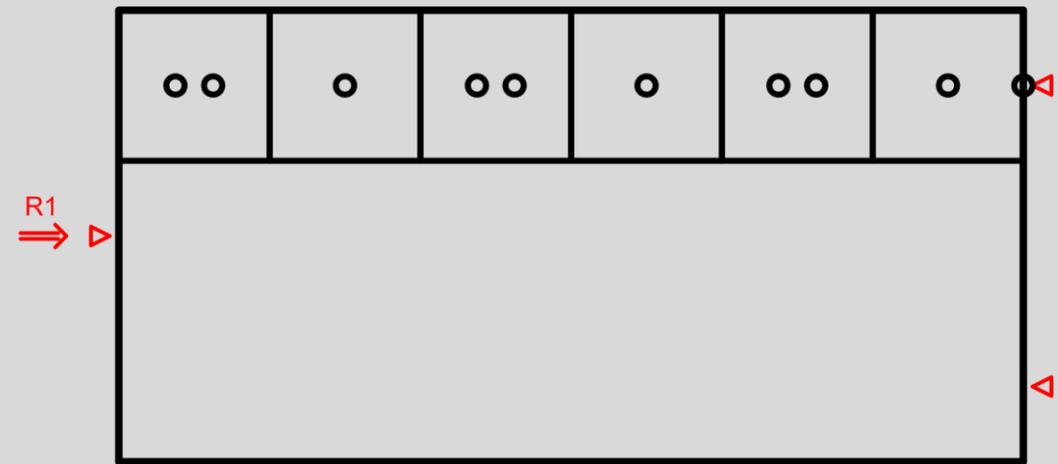
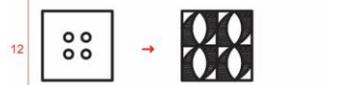


L: $\{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \bullet\}$

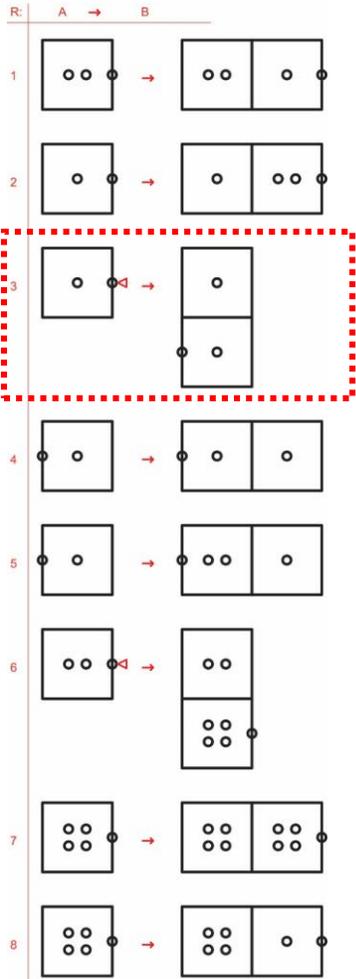
R: A \rightarrow B



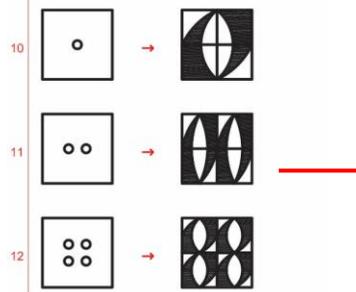
9 $\langle \bullet, \{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \bullet\} \rangle \rightarrow \langle \bullet, \emptyset \rangle$



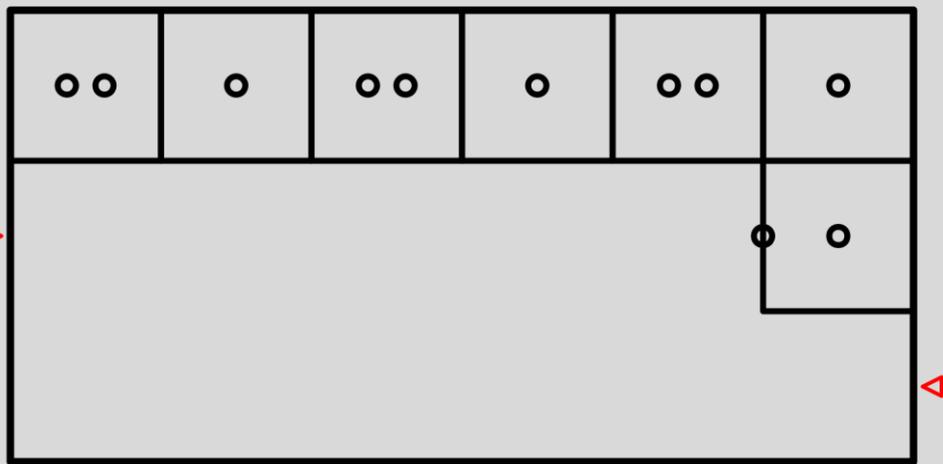
L: $\{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \bullet\}$

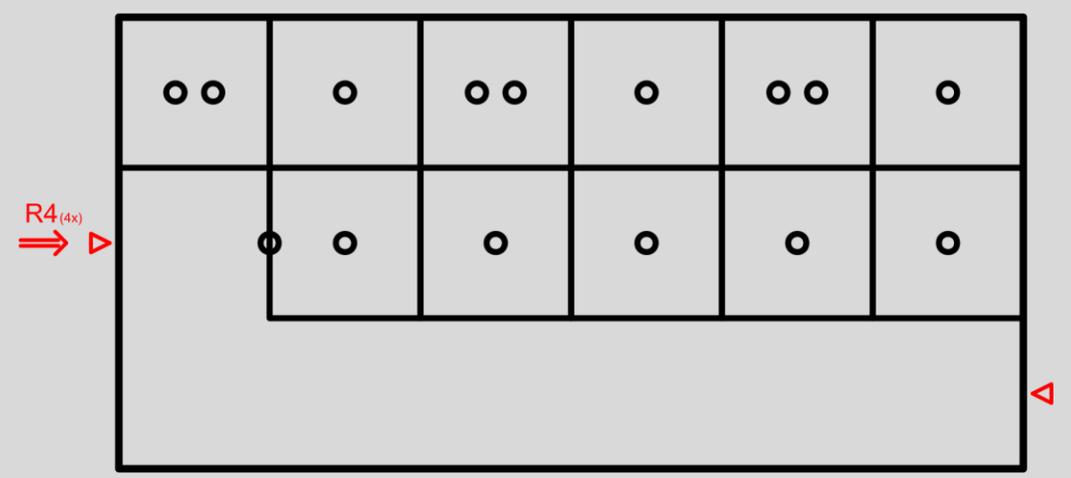
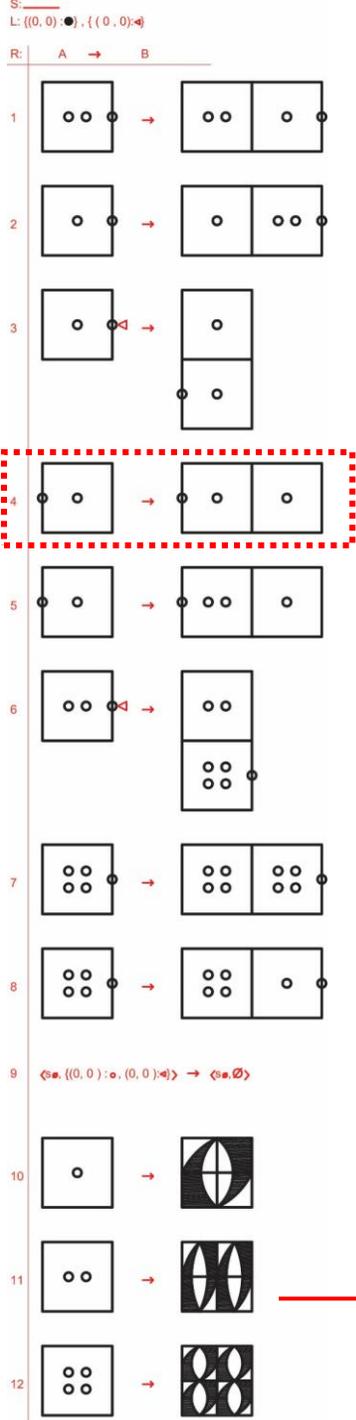


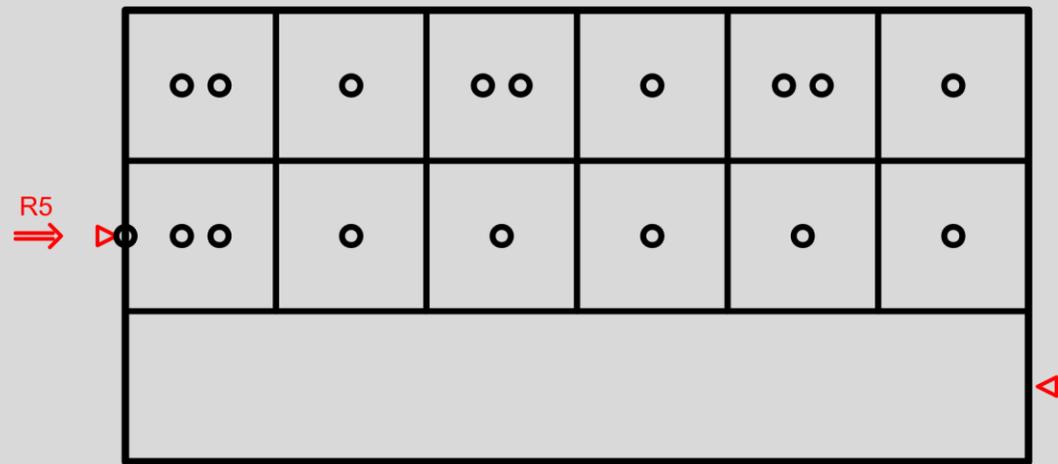
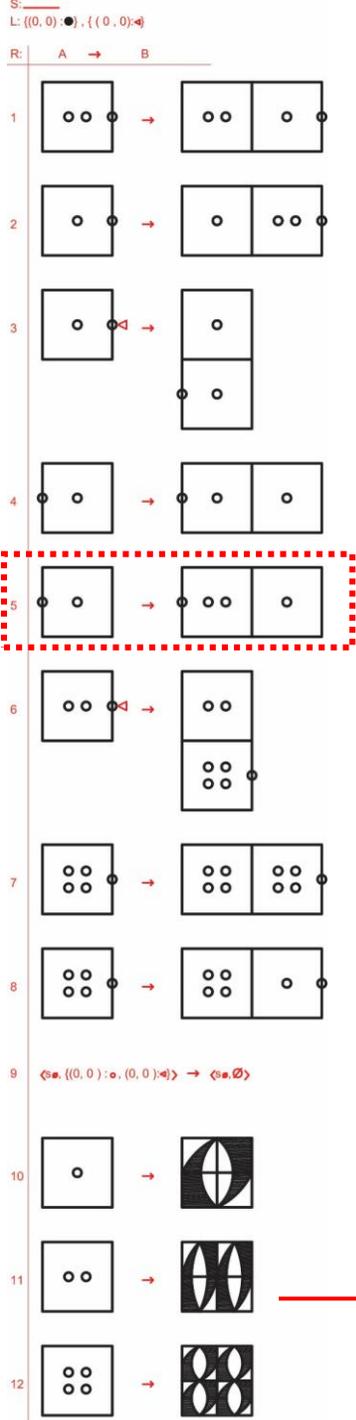
9 $\langle \bullet, \{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \bullet\} \rangle \rightarrow \langle \bullet, \emptyset \rangle$



R3 \Rightarrow

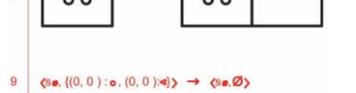
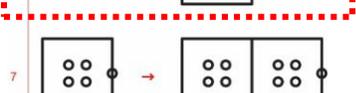
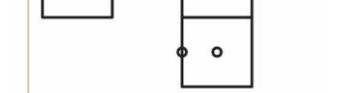




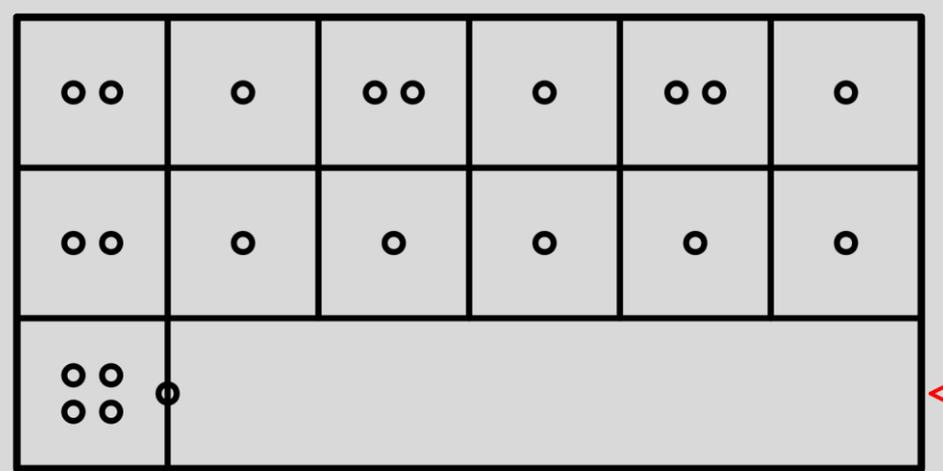


L: $\{(0,0):\bullet\}, \{(0,0):\blacktriangleleft\}$

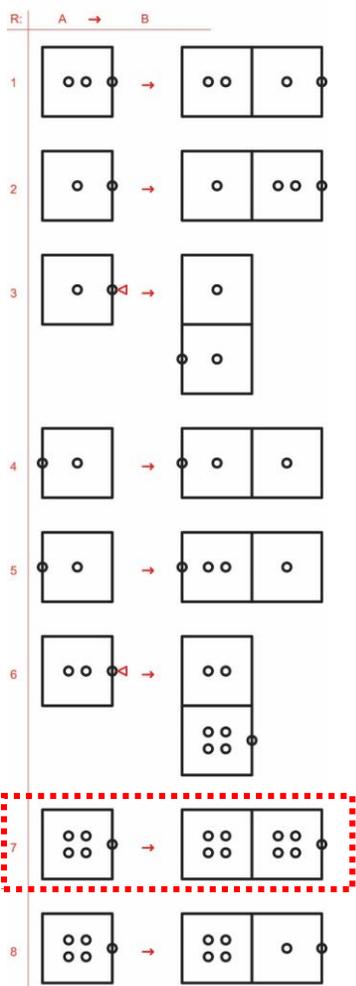
R: A \rightarrow B



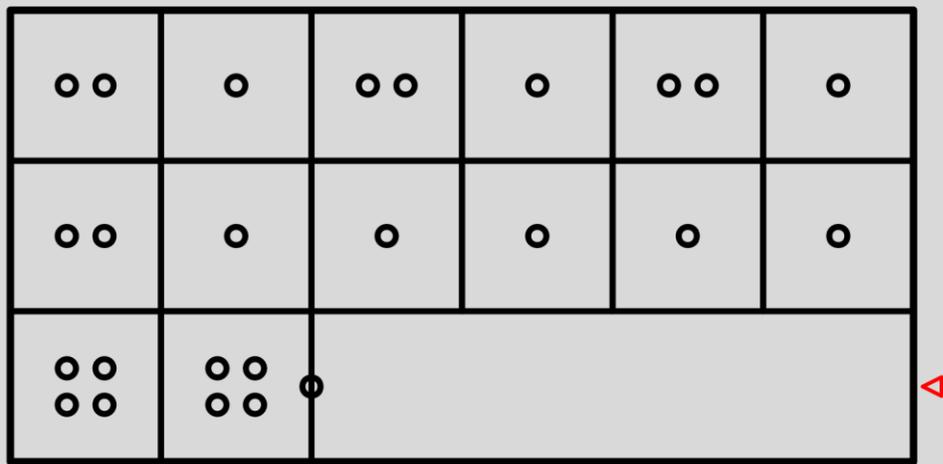
R6 \Rightarrow



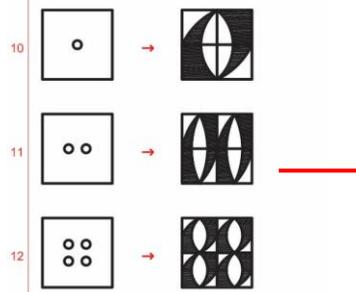
L: $\{(0,0) \rightarrow \bullet, (0,0) \rightarrow \blacktriangleleft\}$



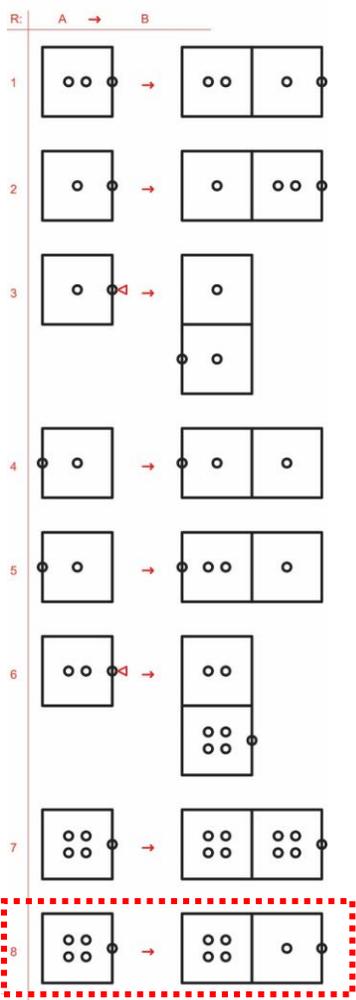
R7 \Rightarrow



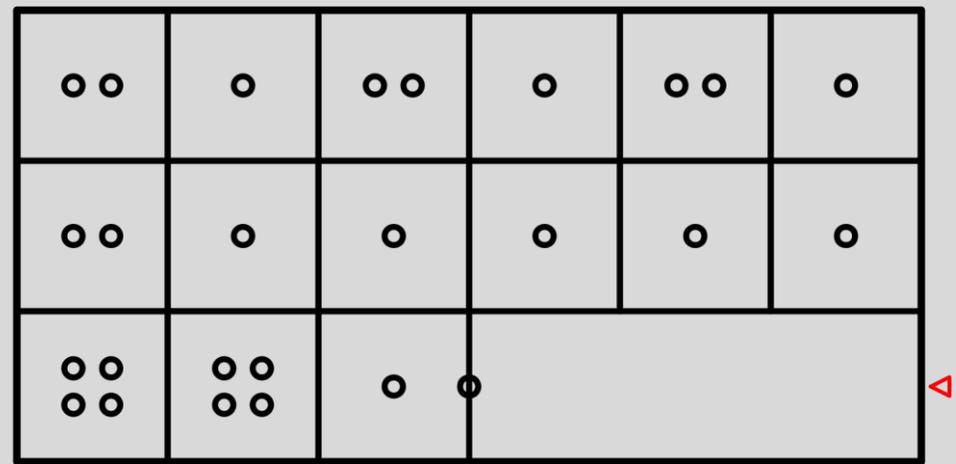
9 $\langle \bullet, \{(0,0) \rightarrow \bullet, (0,0) \rightarrow \blacktriangleleft\} \rangle \rightarrow \langle \bullet, \emptyset \rangle$



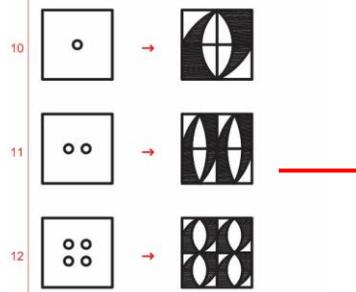
L: $\{(0,0):\bullet\}, \{(0,0):\blacktriangleleft\}$

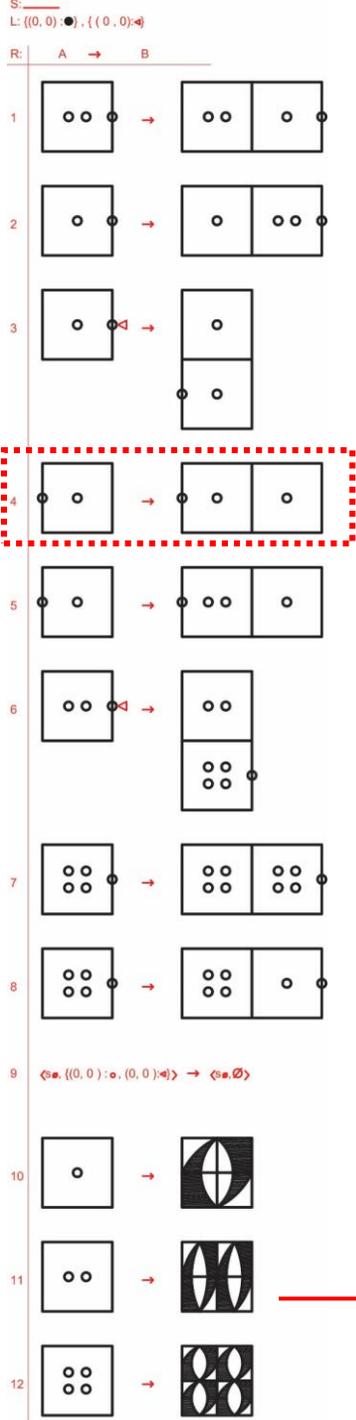


R8

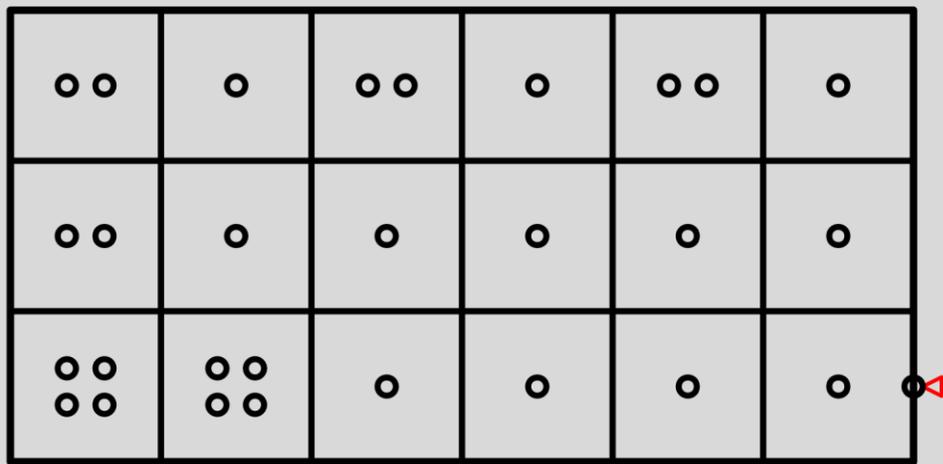


9 $\langle \bullet, \{(0,0):\bullet, (0,0):\blacktriangleleft\} \rangle \rightarrow \langle \bullet, \emptyset \rangle$

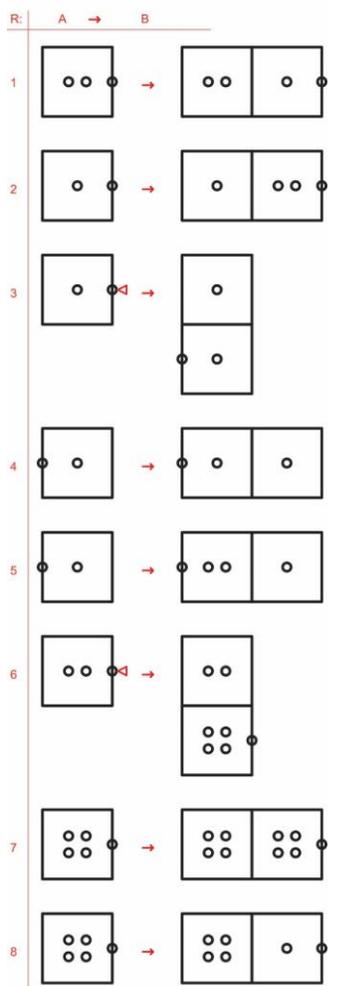




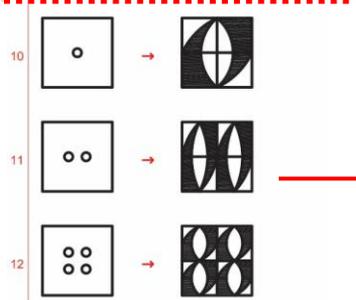
$R4_{(3x)}$



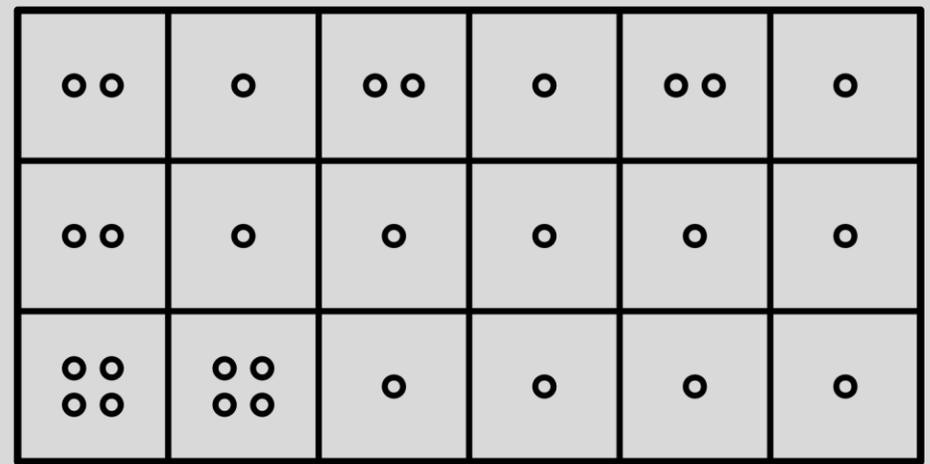
L: $\{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \bullet\}$



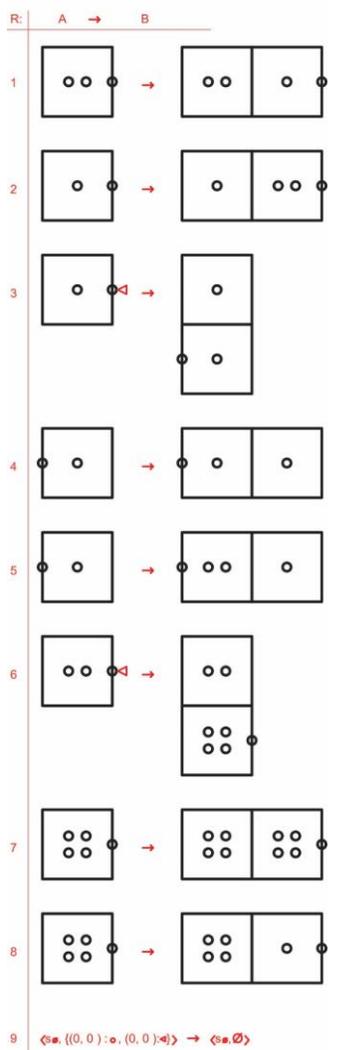
9 $\langle \bullet, \{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \bullet\} \rangle \rightarrow \langle \bullet, \emptyset \rangle$



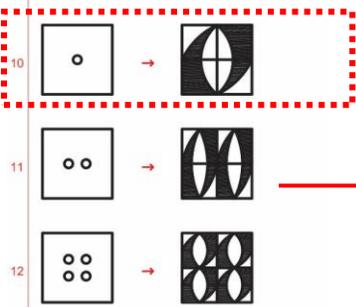
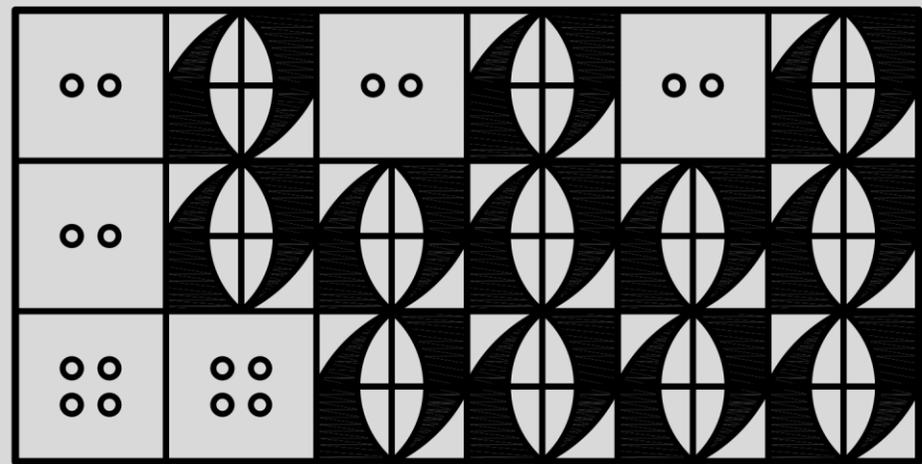
R9



R: $\{(0,0):\bullet\}, \{(0,0):\blacktriangleleft\}$

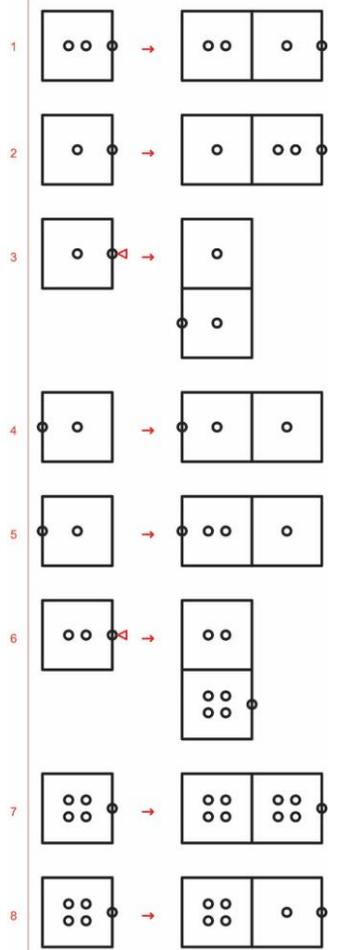


R10

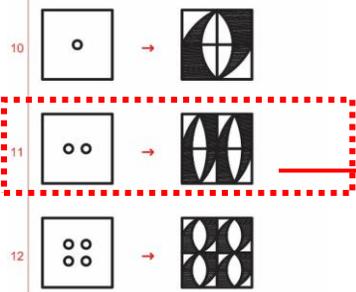



L: $\{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \blacktriangleleft\}$

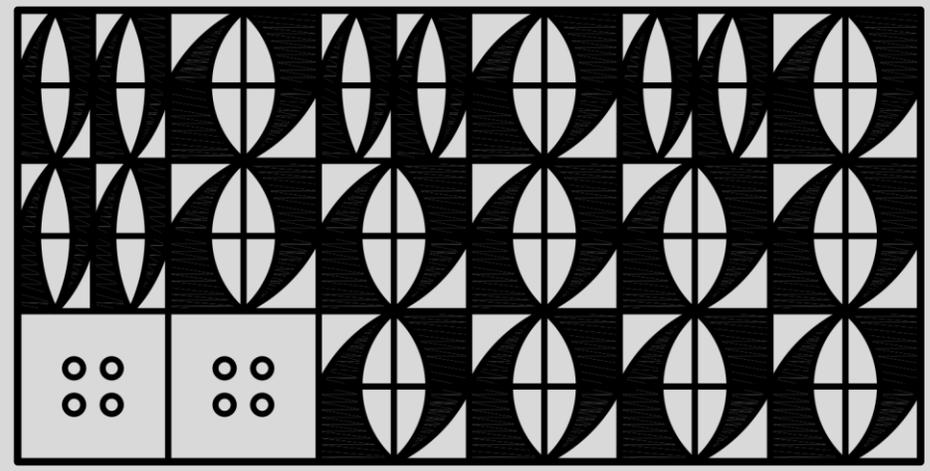
R: A \rightarrow B



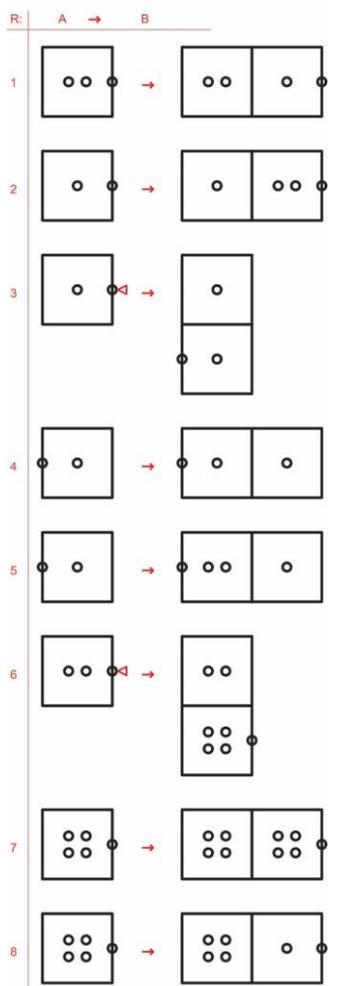
9 $\langle \bullet, \{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \blacktriangleleft\} \rangle \rightarrow \langle \bullet, \emptyset \rangle$



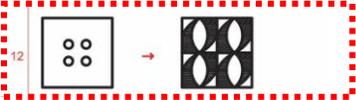
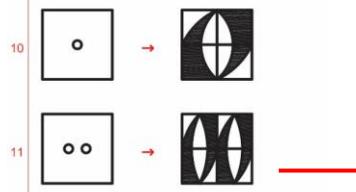
R11 \Rightarrow



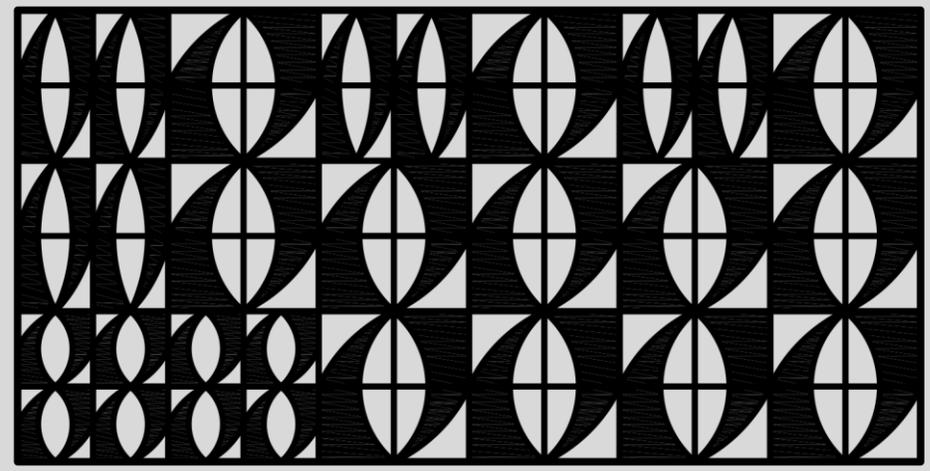
L: $\{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \blacktriangleleft\}$



9 $\langle \bullet, \{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \blacktriangleleft\} \rangle \rightarrow \langle \bullet, \emptyset \rangle$



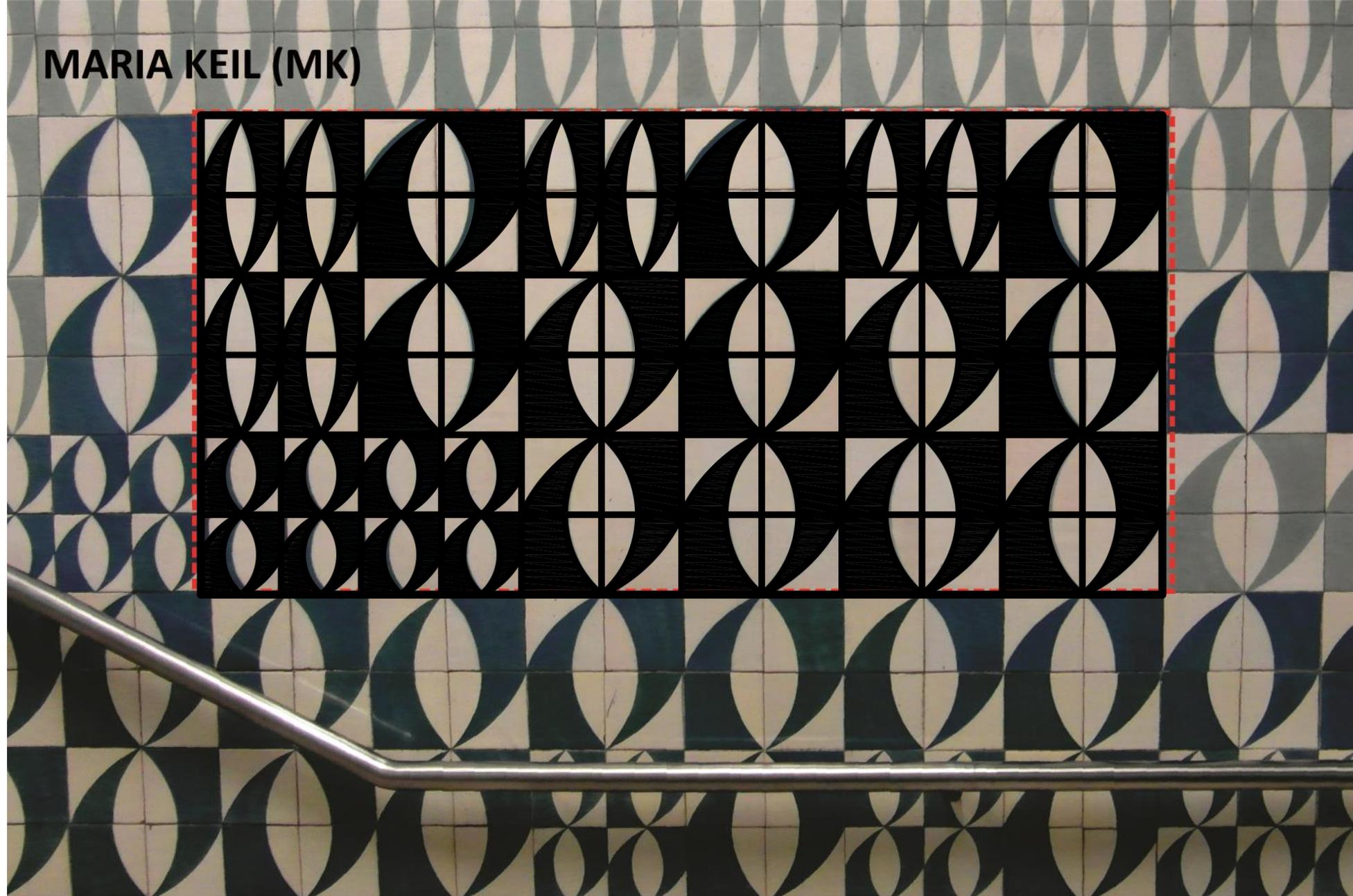
R12
⇒



MARIA KEIL (MK)



MARIA KEIL (MK)



MARIA KEIL (MK)



ATHOS BULCÃO (AB)

Seleção
2,4 m x 1,2 m



ATHOS BULCÃO (AB)

Seleção
2,4 m x 1,2 m

Divisão em 18 quadrados
de 40 cm

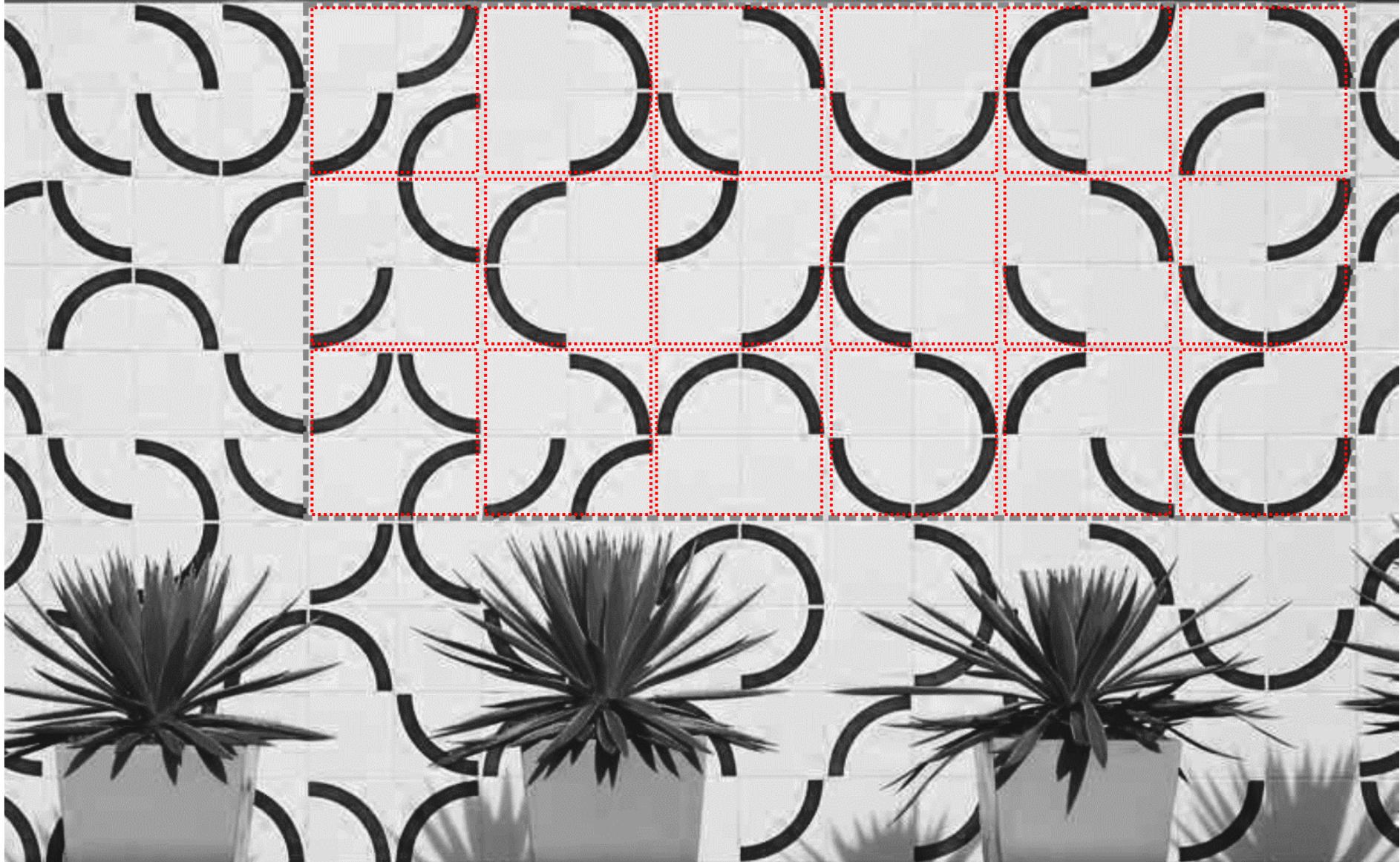


ATHOS BULCÃO (AB)

Seleção
2,4 m x 1,2 m

Divisão em 18 quadrados
de 40 cm

As cores foram desconsideradas



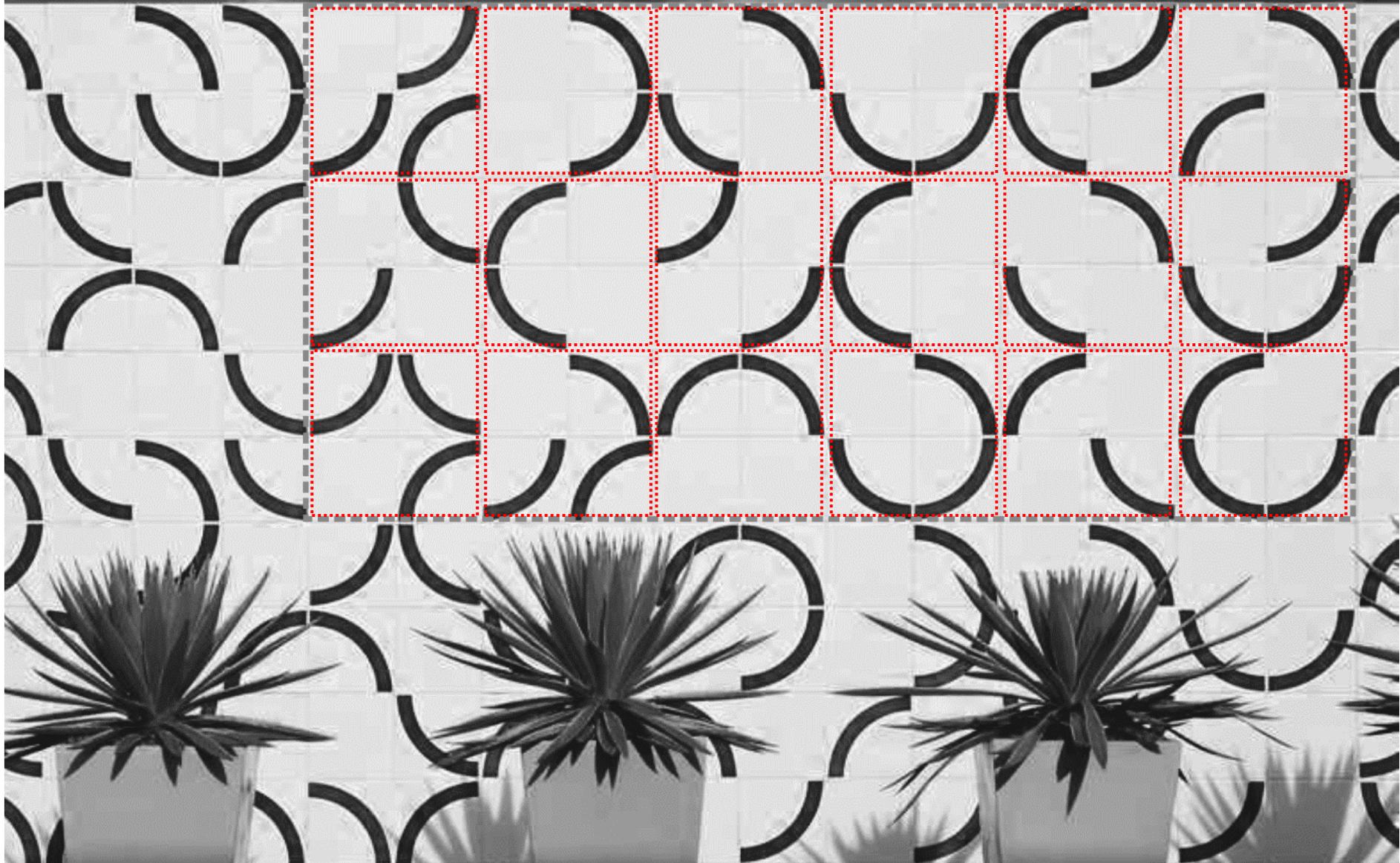
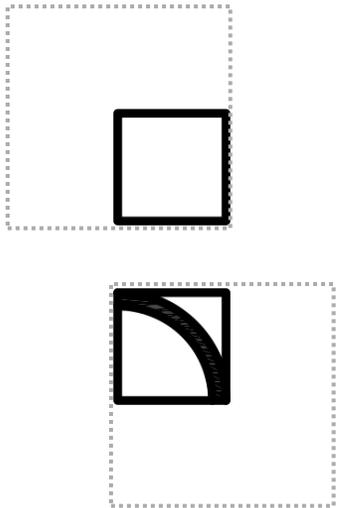
ATHOS BULCÃO (AB)

Seleção
2,4 m x 1,2 m

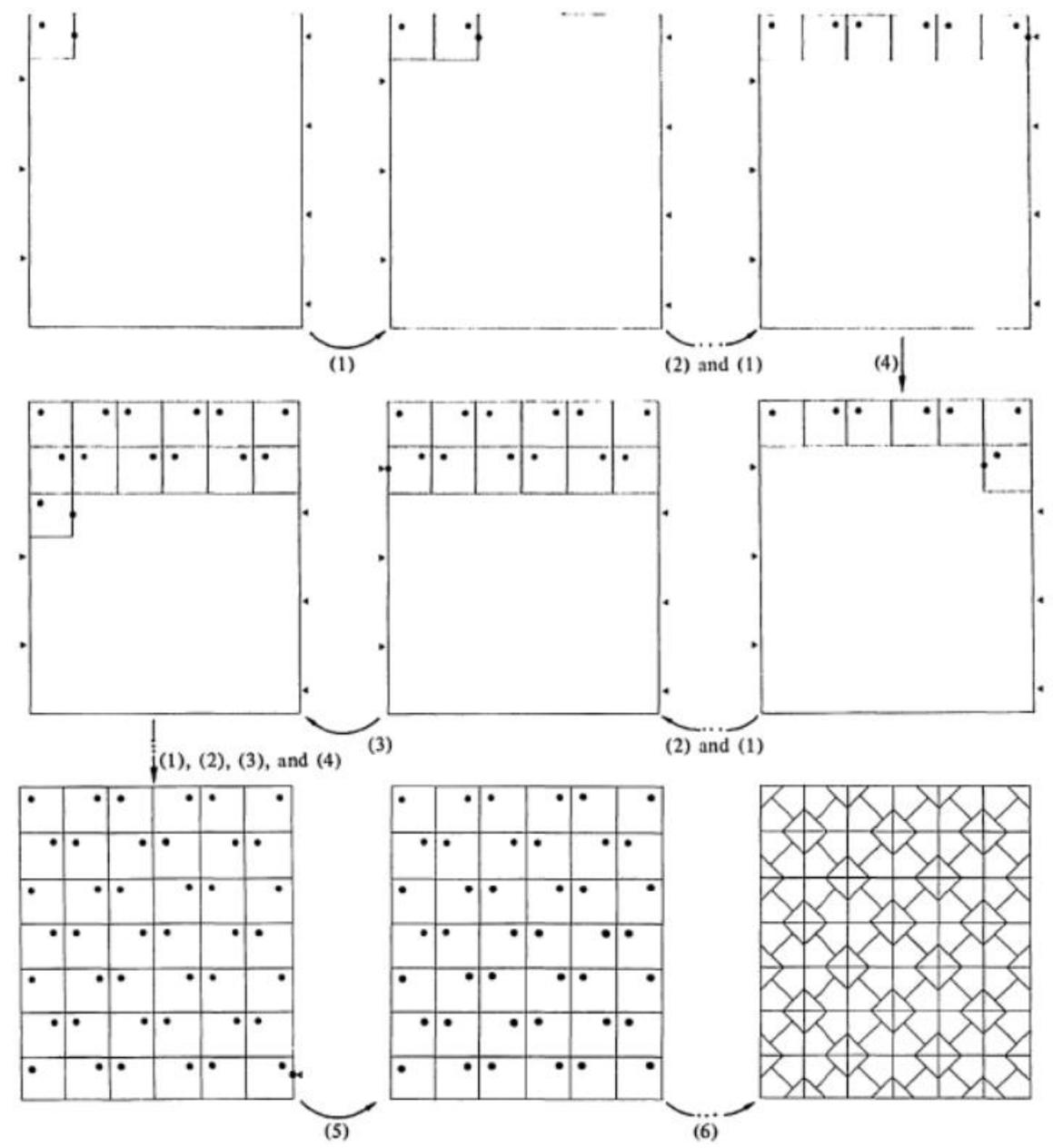
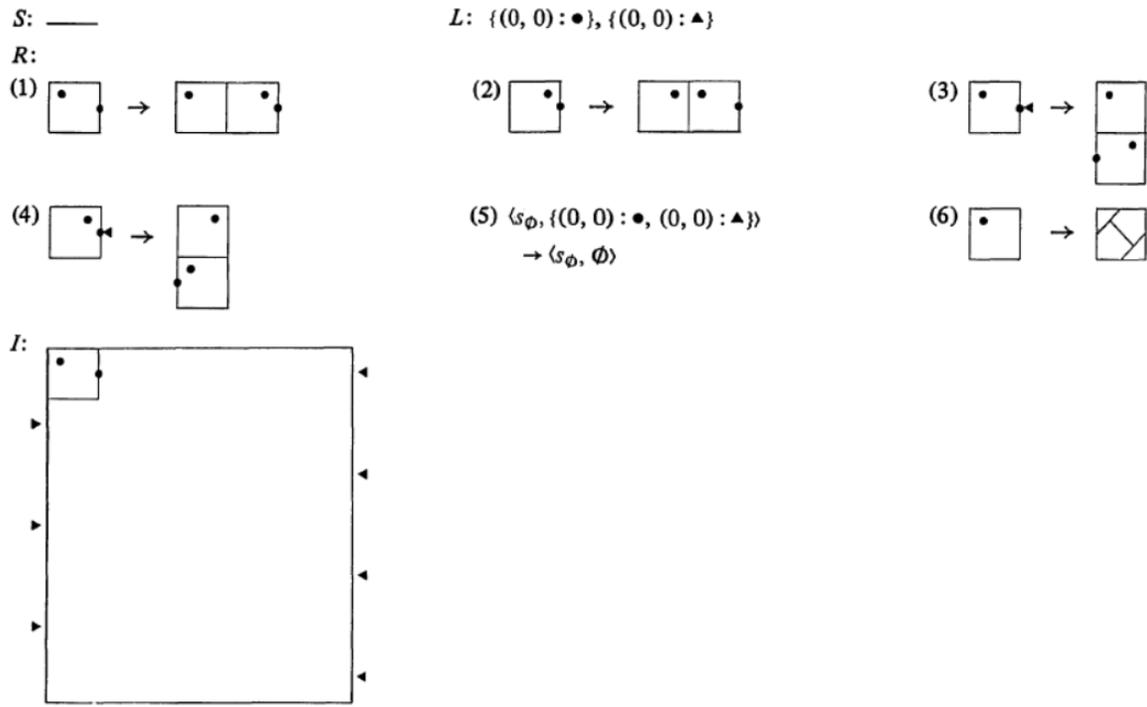
Divisão em 18 quadrados
de 40 cm

As cores foram desconsideradas

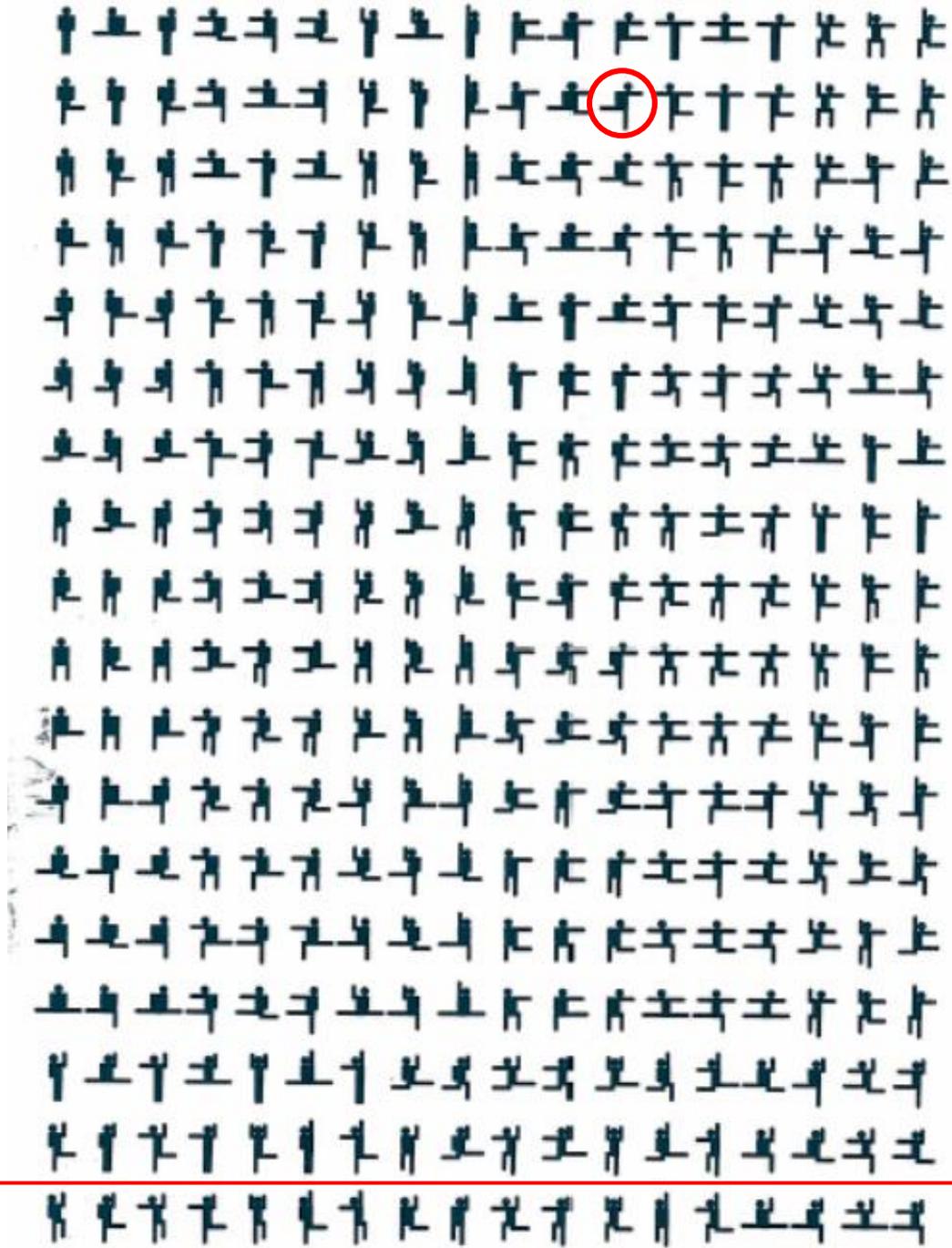
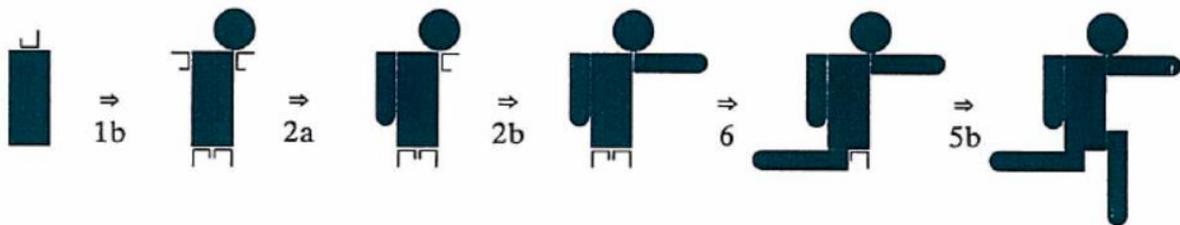
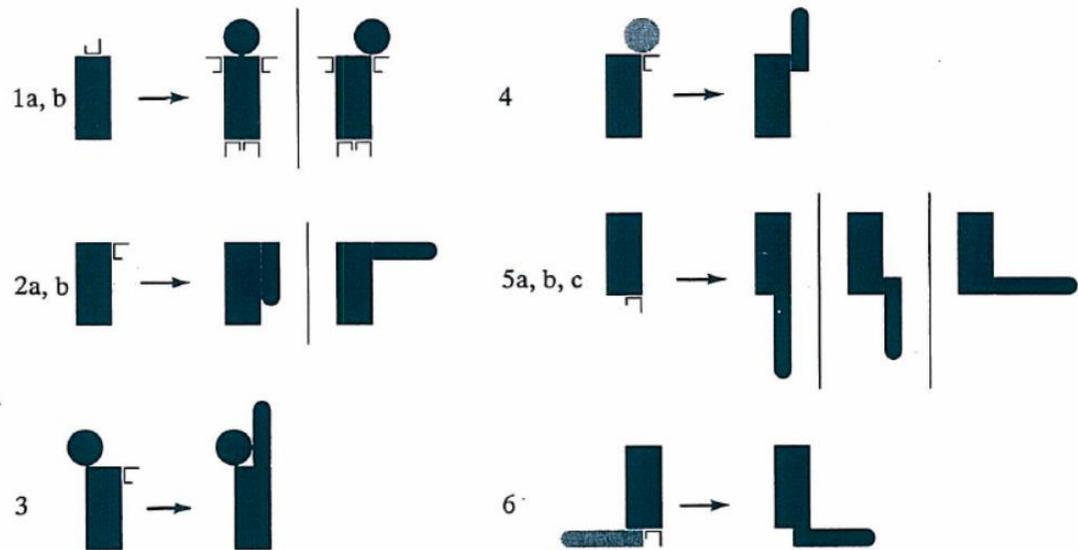
**Contendo 18 variações, sendo
estas compostas por apenas
dois tipos**



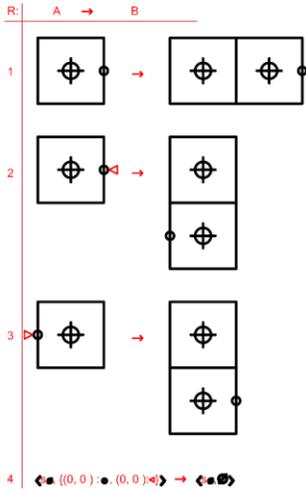
Modelo de apoio para a primeira fase da decomposição:
Ice-ray: a note on the generation of Chinese lattice designs_**Stiny**



Modelo de apoio para a última fase da decomposição:
 An introduction to structure and structure grammars
 _Woodbury e McKelvey



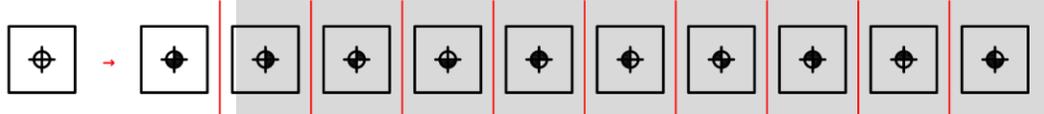
S: _____
L: {(0,0) •}, {(0,0) ◀}



Forma inicial



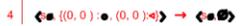
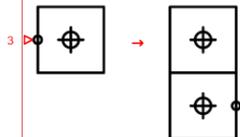
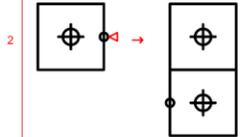
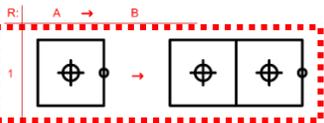
5a, b, c, d, e, f, g, h, i, j



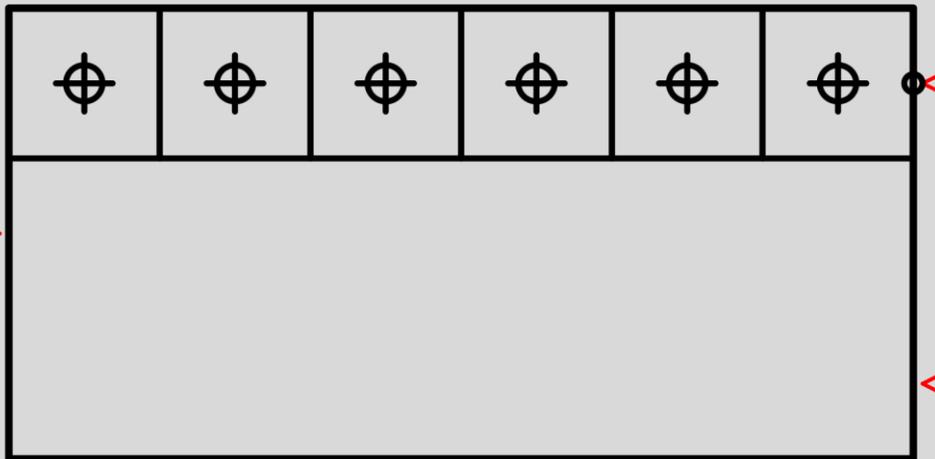
formalismo

AB

S: _____
L: {(0, 0) •}, {(0, 0) ◀}



$R1_{(5x)}$



5a, b, c, d, e, f, g, h, i, j



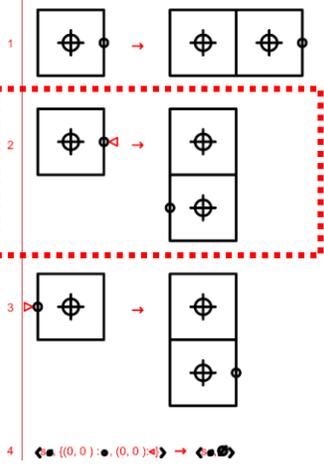
formalismo

AB

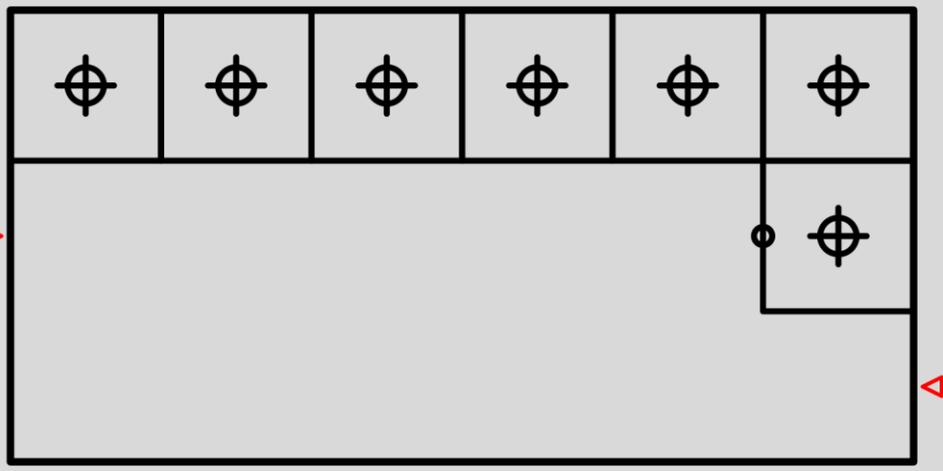
S: _____

L: {(0,0) •, (0,0) ◀}

R: A → B



R2



5a, b, c, d, e, f, g, h, i, j

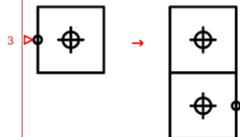
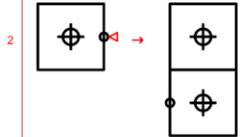
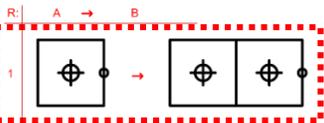


formalismo

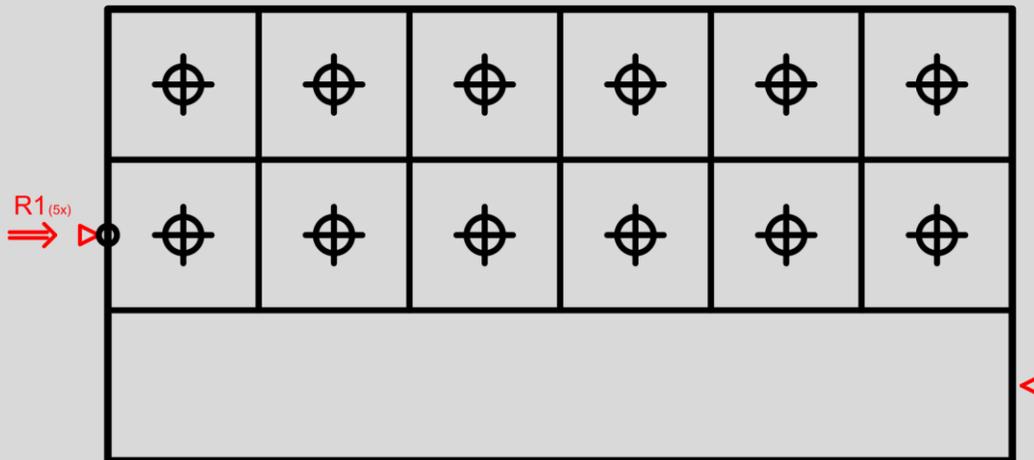
AB

S: _____

L: {(0,0)} •, {(0,0)} ◀



4 ◀ •, {(0,0)} •, {(0,0)} ◀ → ◀ • •



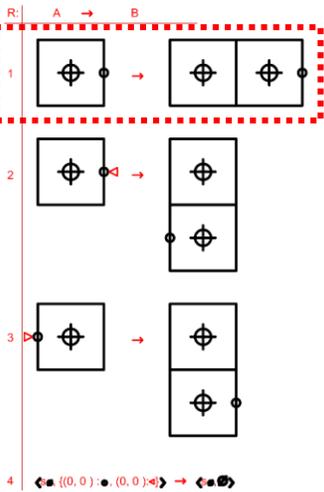
5a, b, c, d, e, f, g, h, i, j



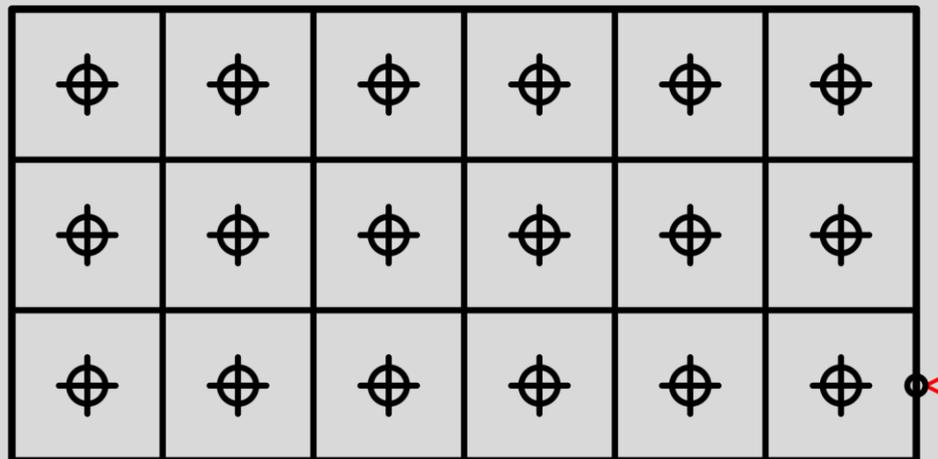
formalismo

AB

S: _____
L: {(0,0) •}, {(0,0) ◀}



$R1_{(5x)}$



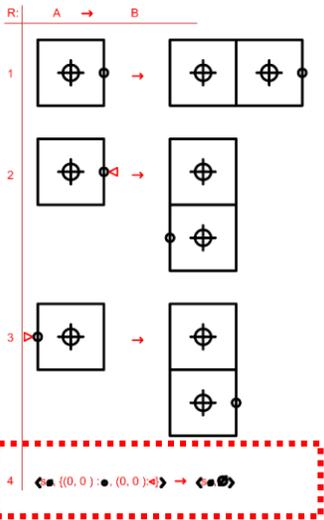
5a, b, c, d, e, f, g, h, i, j



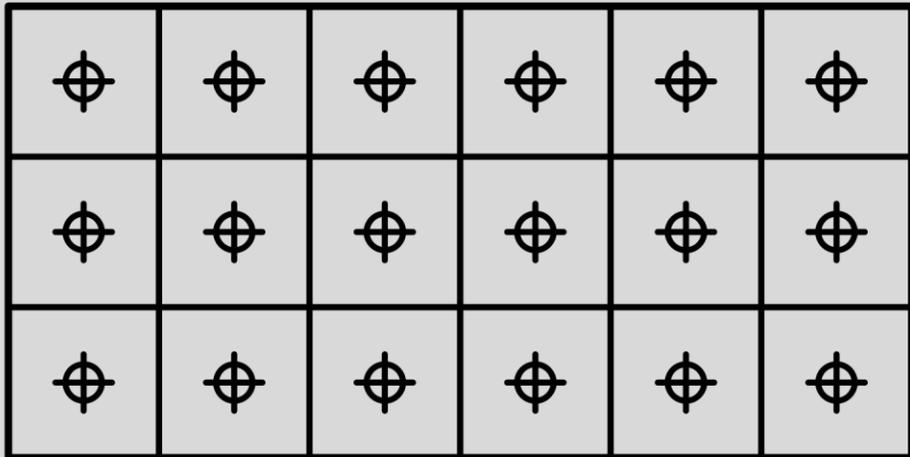
formalismo

AB

S: _____
L: {(0, 0)} •, {(0, 0)} ◀



R4
⇒



5a, b, c, d, e, f, g, h, i, j

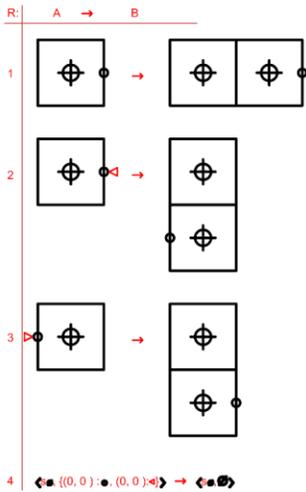


formalismo

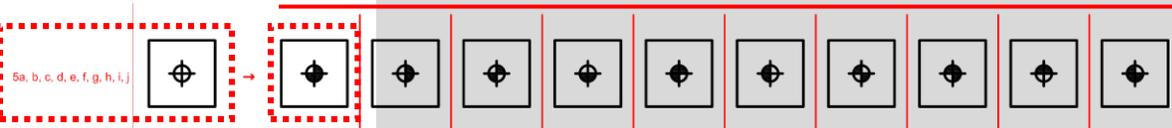
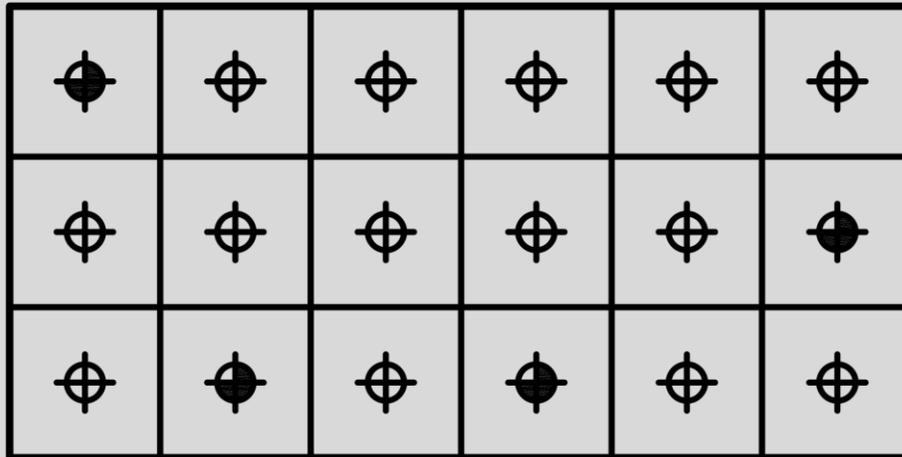
AB

S: _____

L: $\{(0, 0)\}, \{(0, 0)\}$



\Rightarrow R5a_(4x)

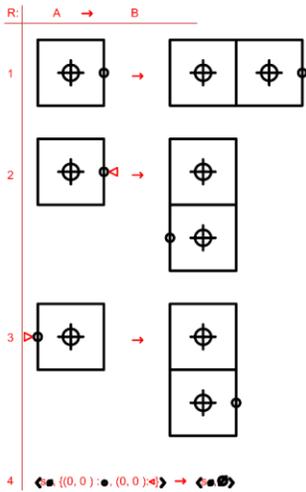


formalismo

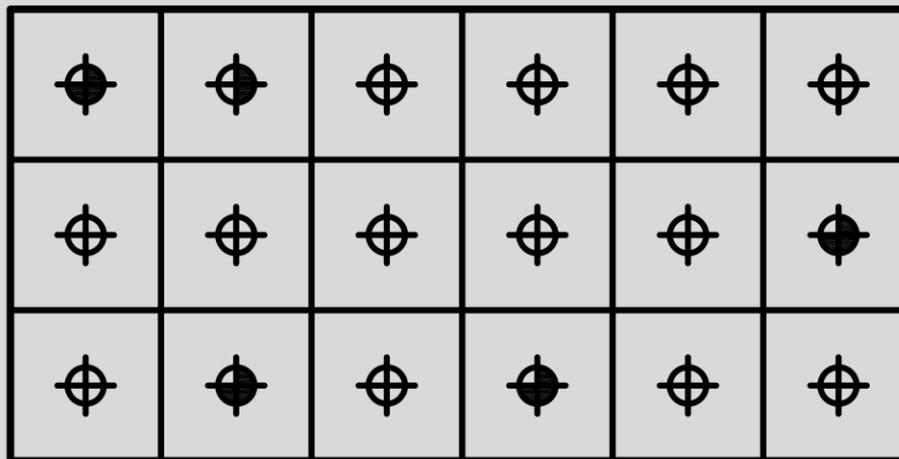
AB

S: _____

L: $\{(0, 0)\}, \{(0, 0)\}$

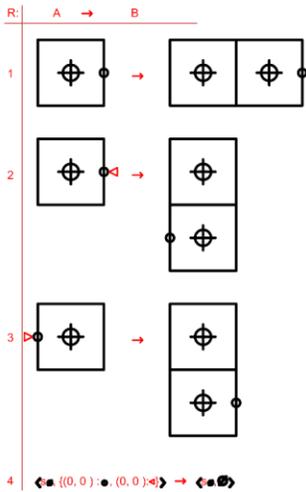


R5b
⇒

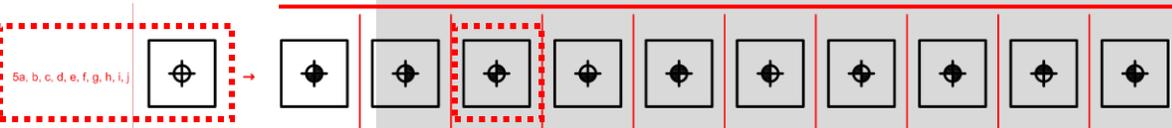
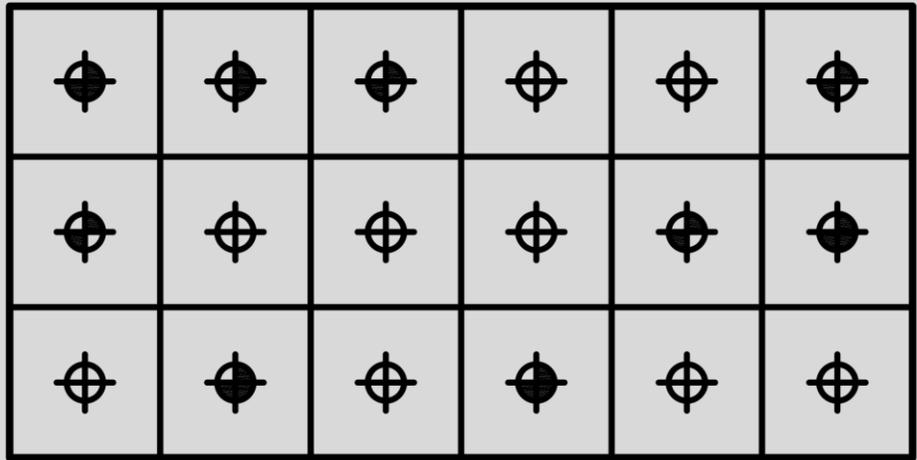


S: _____

L: $\{(0, 0)\}, \{(0, 0)\}$

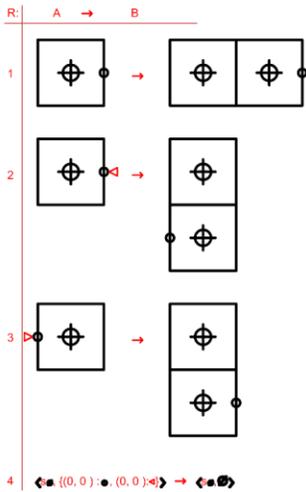


\Rightarrow R5C_(4x)

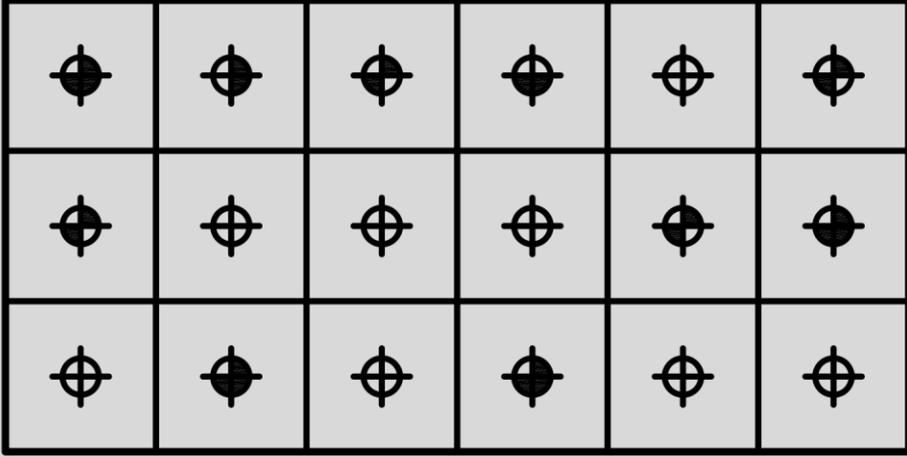


S: _____

L: $\{(0, 0)\}, \{(0, 0)\}$

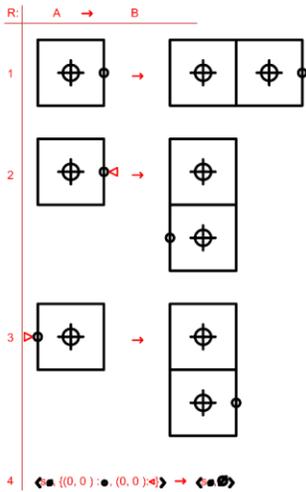


R5d
⇒

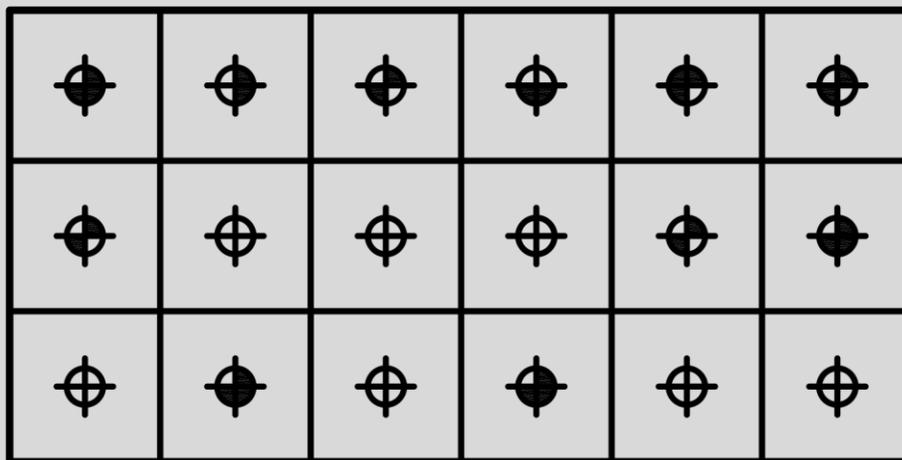


S: _____

L: $\{(0, 0)\}, \{(0, 0)\}$



R5e
⇒

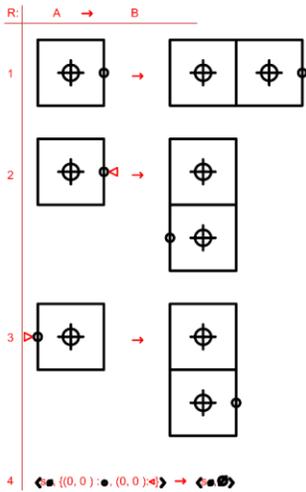


formalismo

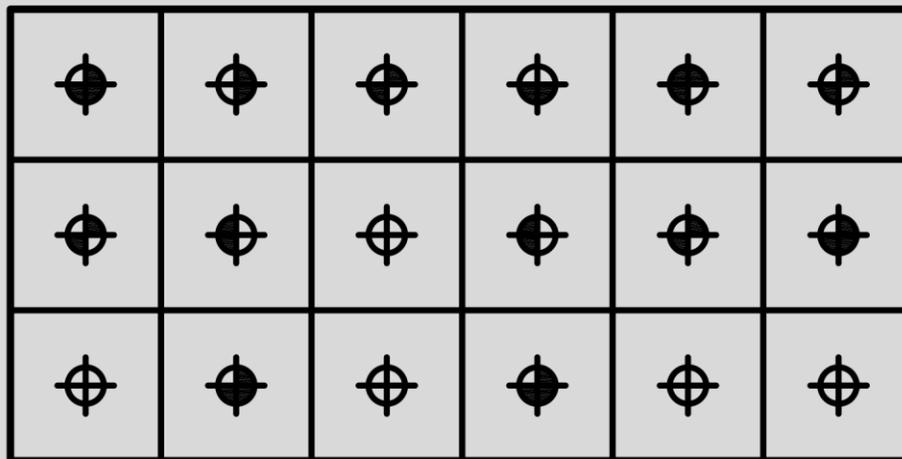
AB

S: _____

L: $\{(0, 0)\}, \{(0, 0)\}$



$R5f_{(2x)}$

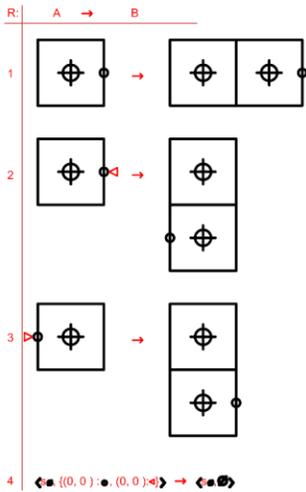


formalismo

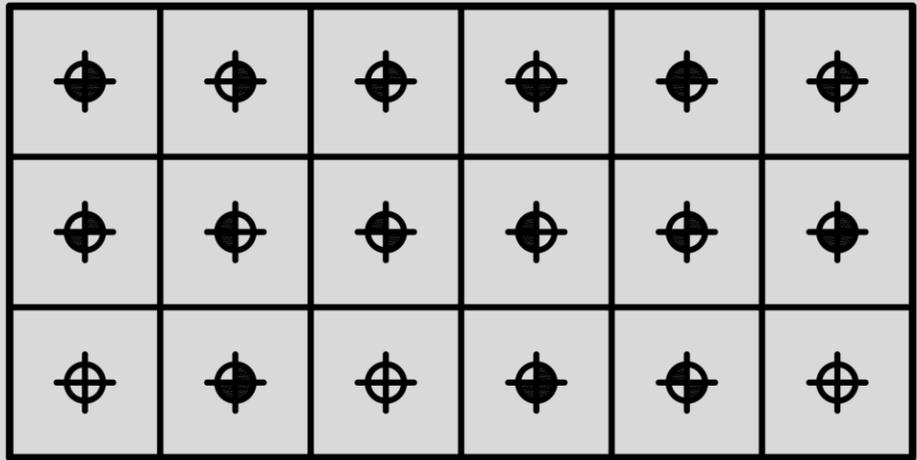
AB

S: _____

L: $\{(0, 0)\}, \{(0, 0)\}$



\Rightarrow $R5g_{(2x)}$

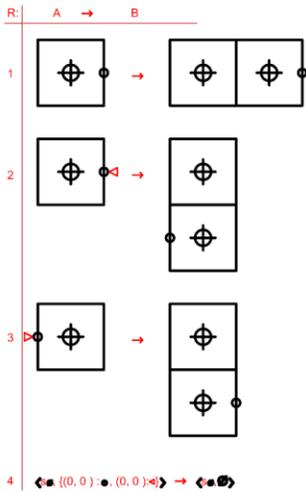


formalismo

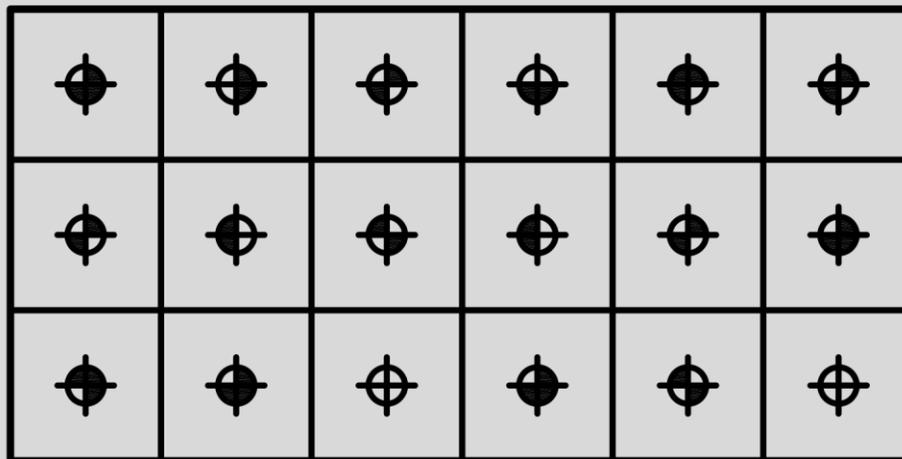
AB

S: _____

L: {(0, 0) •, (0, 0) ◀}

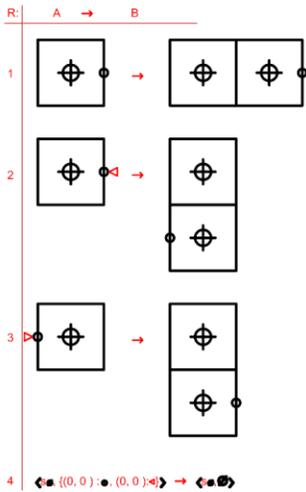


R5h
⇒

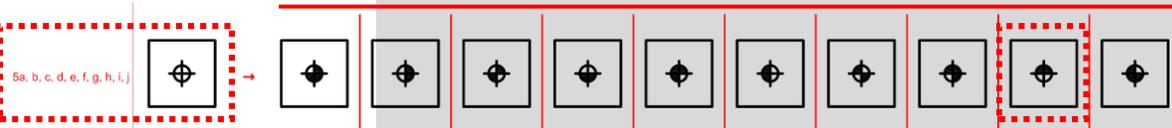
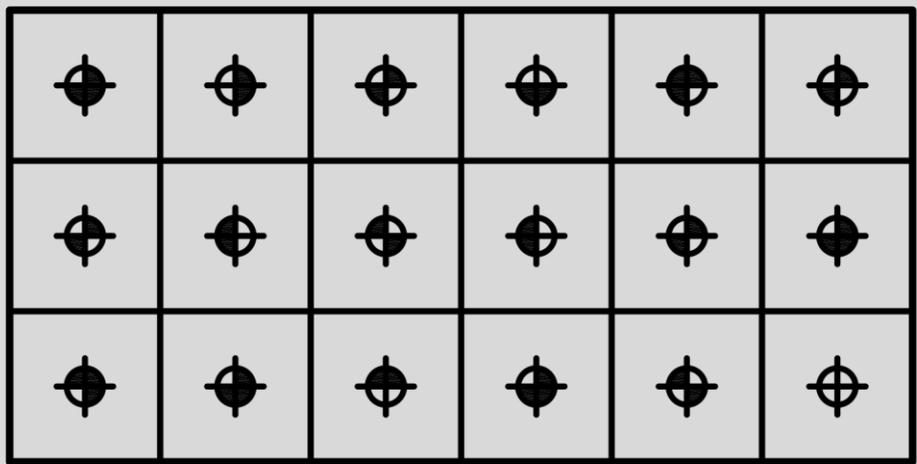


S: _____

L: $\{(0, 0)\}, \{(0, 0)\}$



R5i

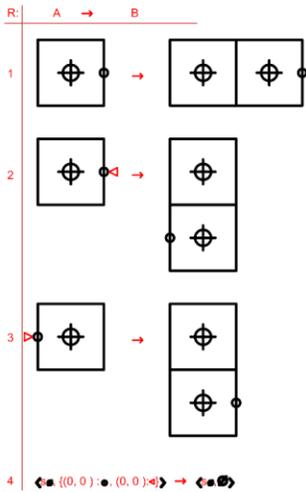


formalismo

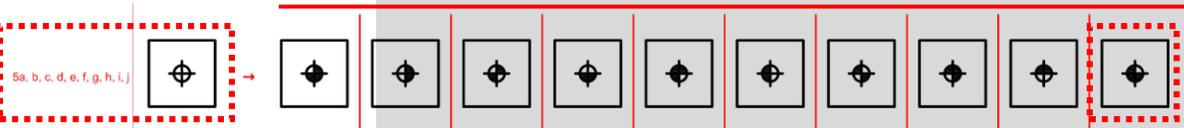
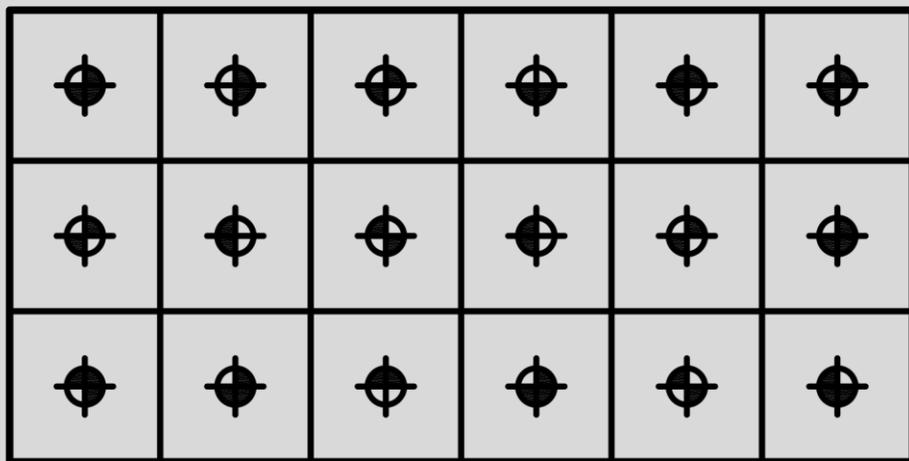
AB

S: _____

L: $\{(0, 0)\}, \{(0, 0)\}$



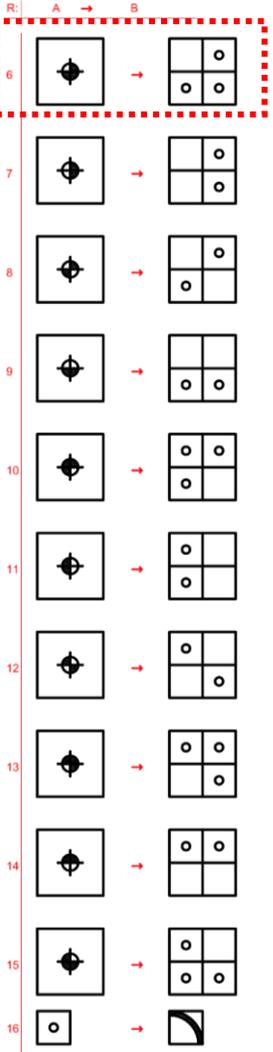
R5j



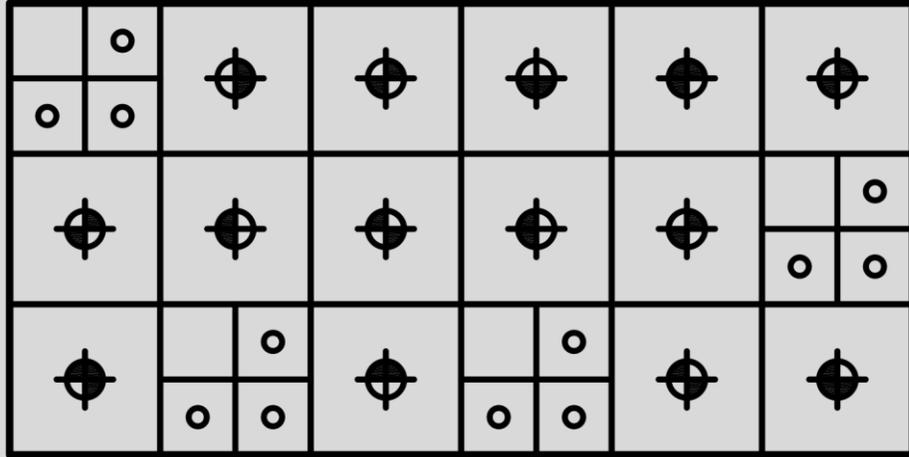
formalismo

AB

S: _____
L: {(0, 0) •}, {(0, 0) ◐}

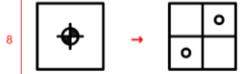
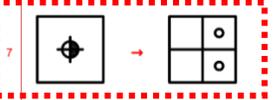
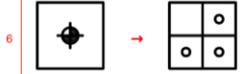


R6 (4x)

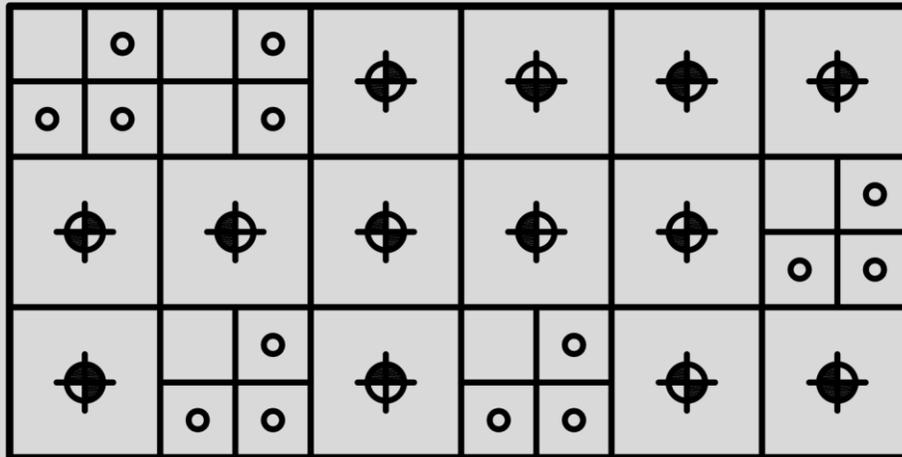


S: $\{ (0,0) \}$, $\{ (0,0) \}$

R: A \rightarrow B

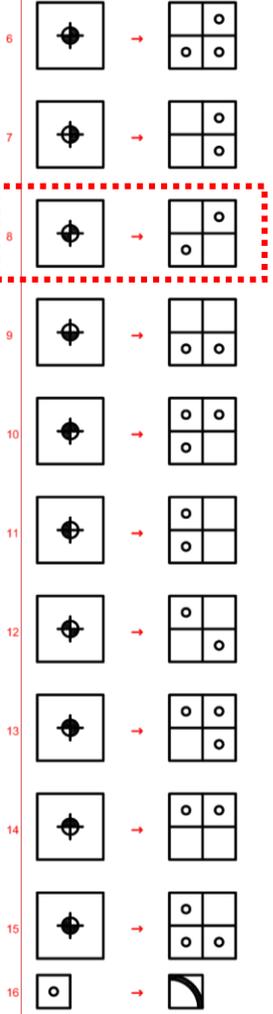


R7 \Rightarrow

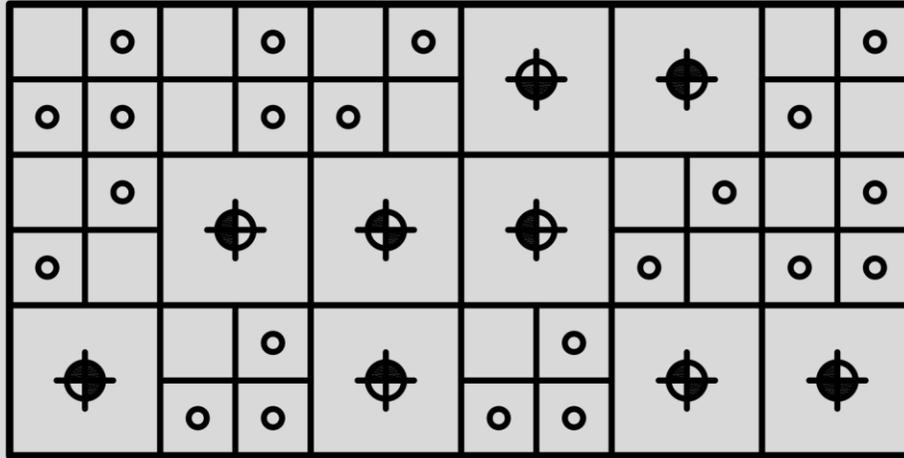


S: $\{ (0, 0) \}$, $\{ (0, 0) \}$

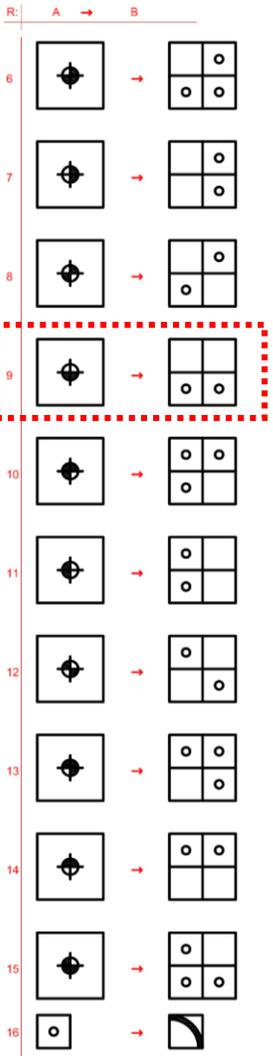
R: A \rightarrow B



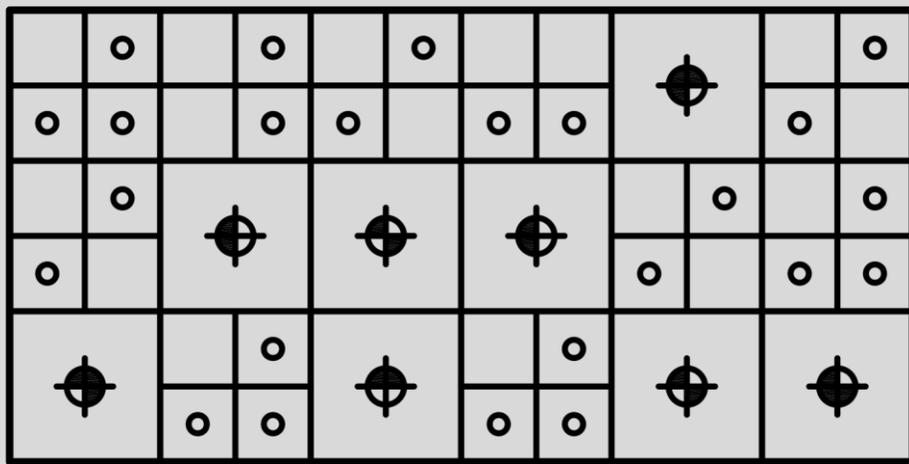
R8 (4x)
 \Rightarrow



S: _____
L: {(0, 0) •}, {(0, 0) ◐}

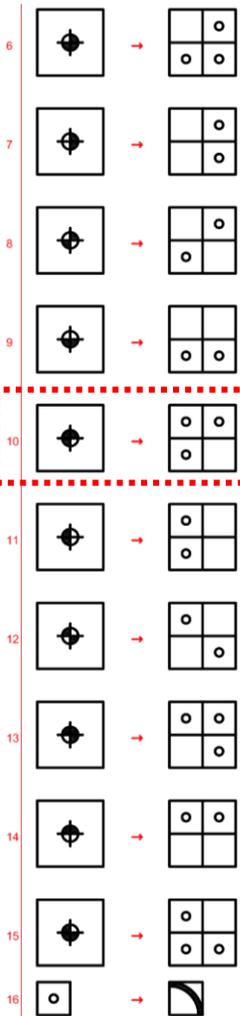


R9
⇒

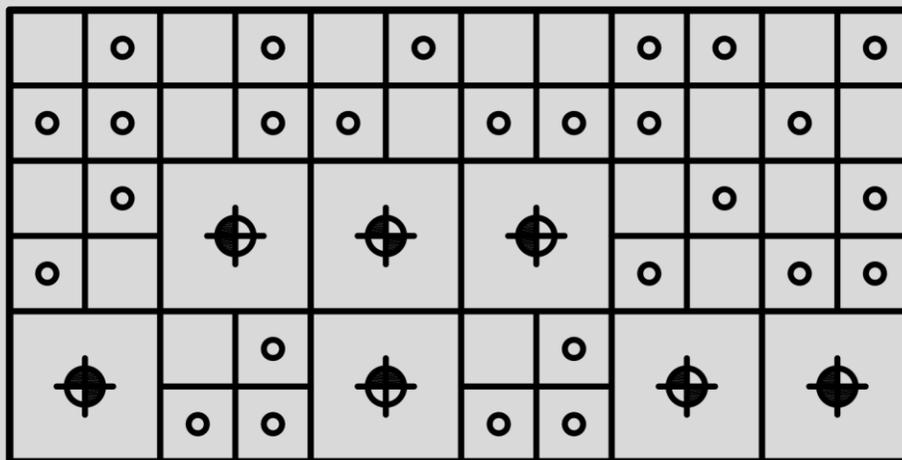


S: _____
L: {(0, 0) •}, {(0, 0) ◀}

R: A → B

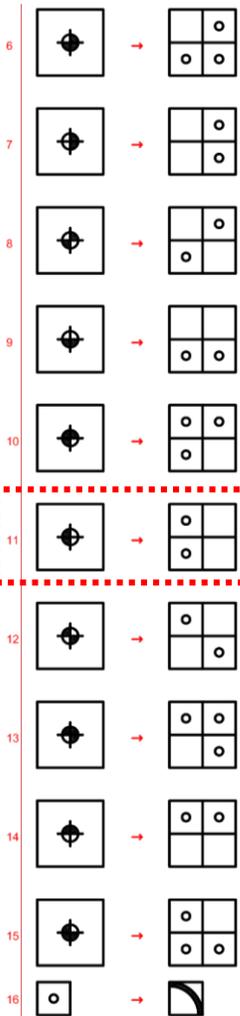


R10
⇒

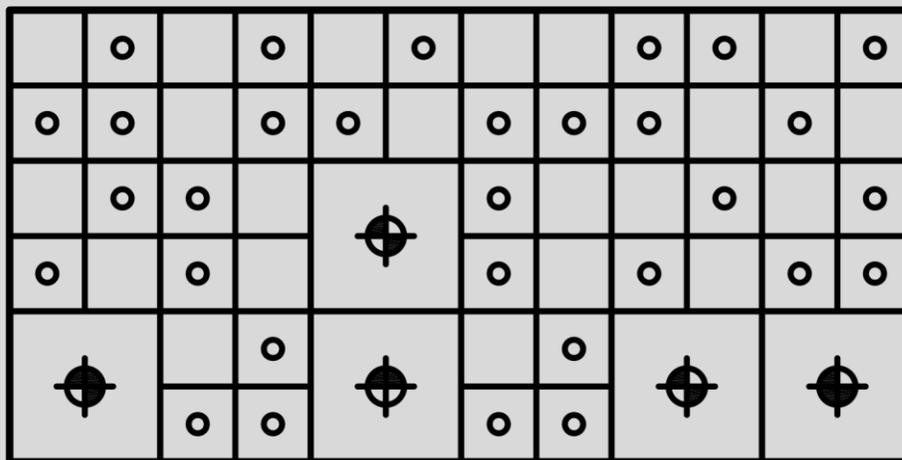


S: _____
L: {(0,0), (0,0)}

R: A → B

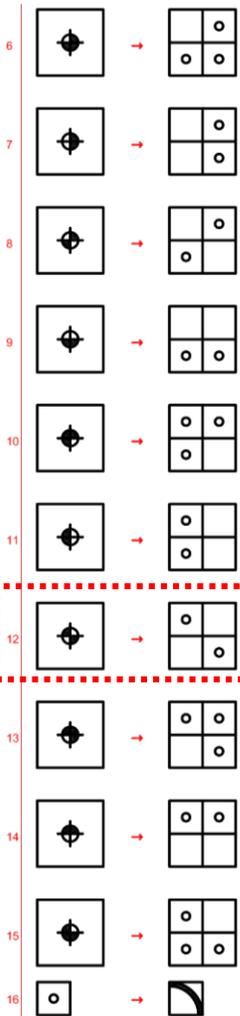


R11_(2x)
⇒

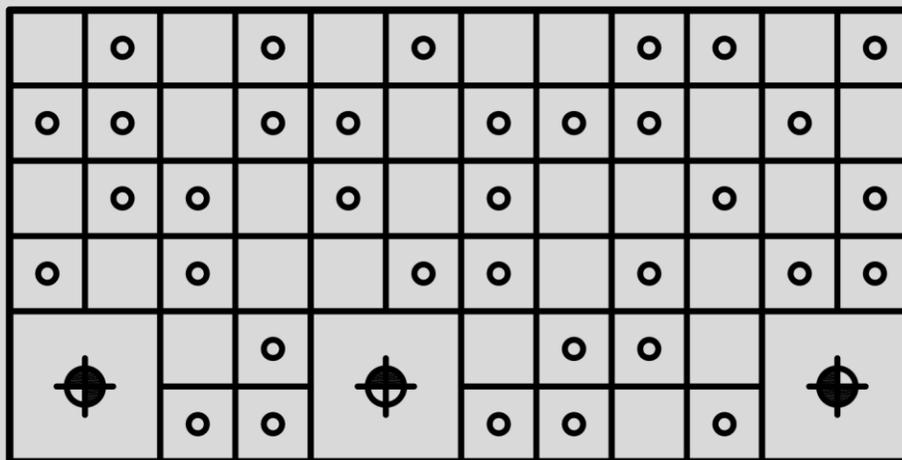


S: L: $\{(0,0), \bullet, \{(0,0)\}$

R: A \rightarrow B



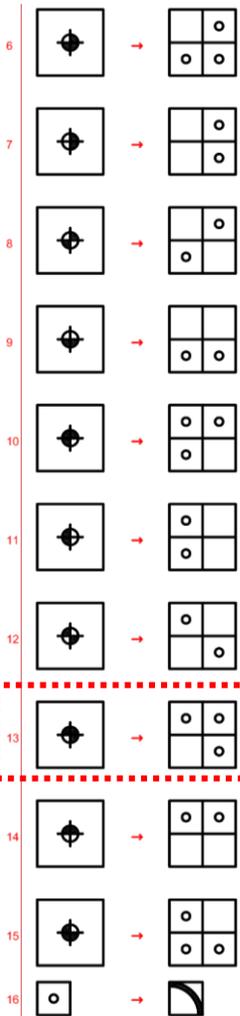
R12_(2x)



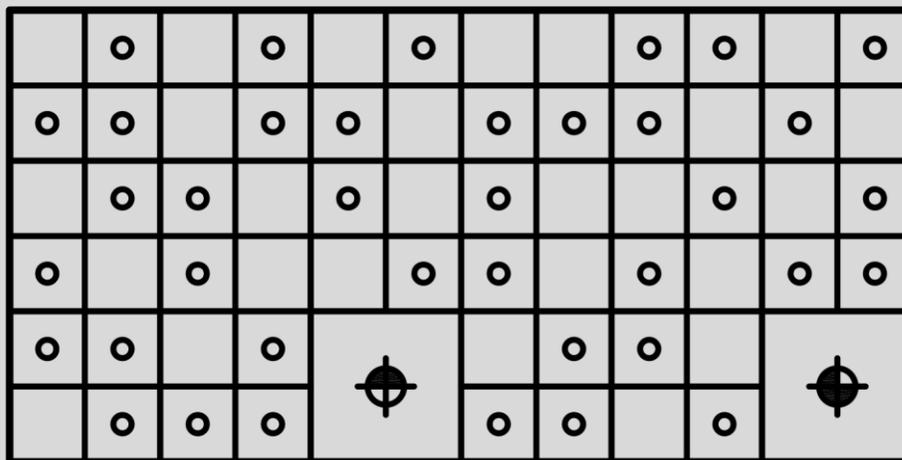
S: _____

L: $\{(0, 0), \bullet, \{(0, 0)\}$

R: A → B

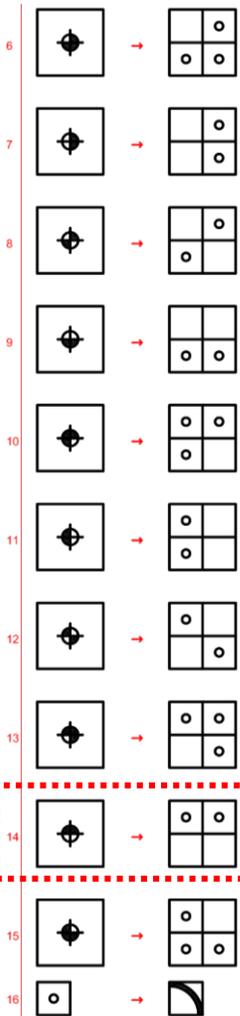


R13
⇒

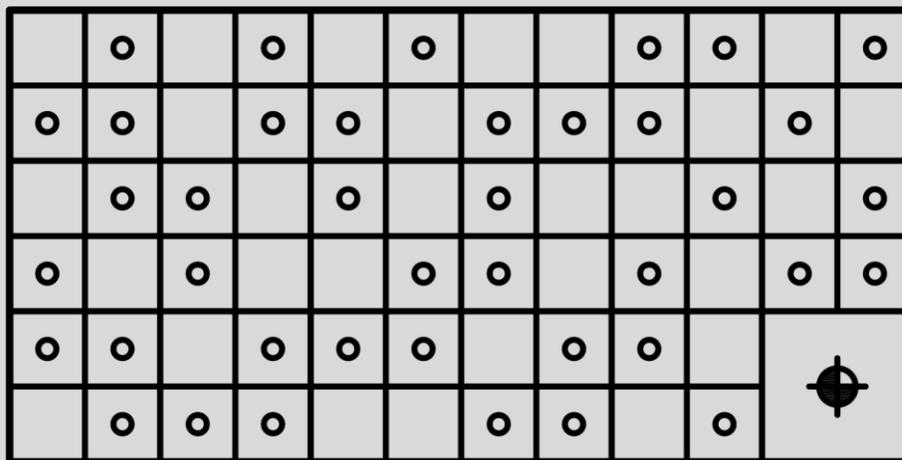


S:  , $\{(0, 0)\}$

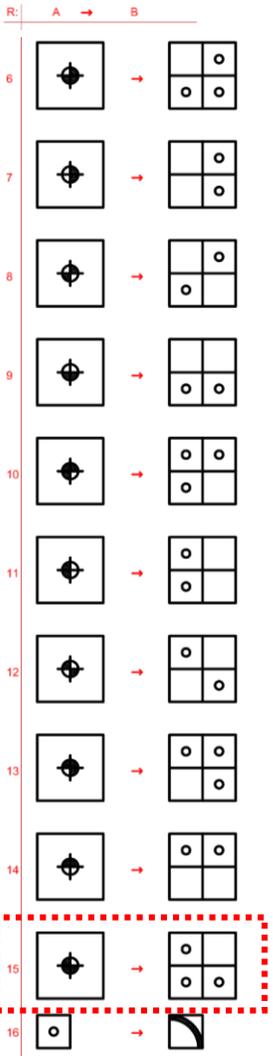
R: A \rightarrow B



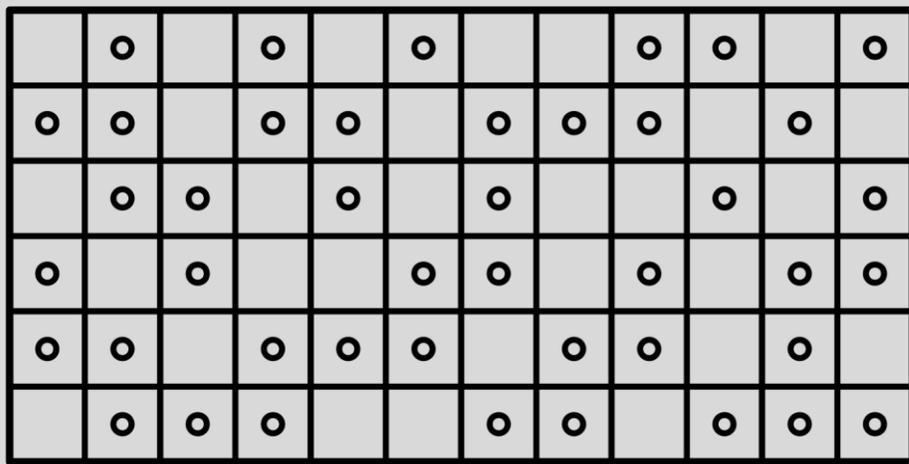
R14 \Rightarrow



S: _____
L: {(0, 0), •}, {(0, 0)} ←

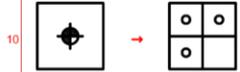


R15
⇒

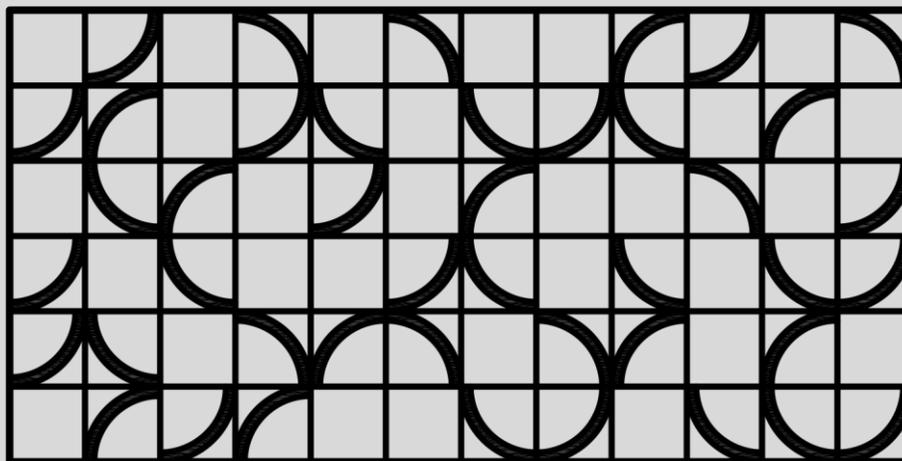


S:  , $\{(0, 0)\}$

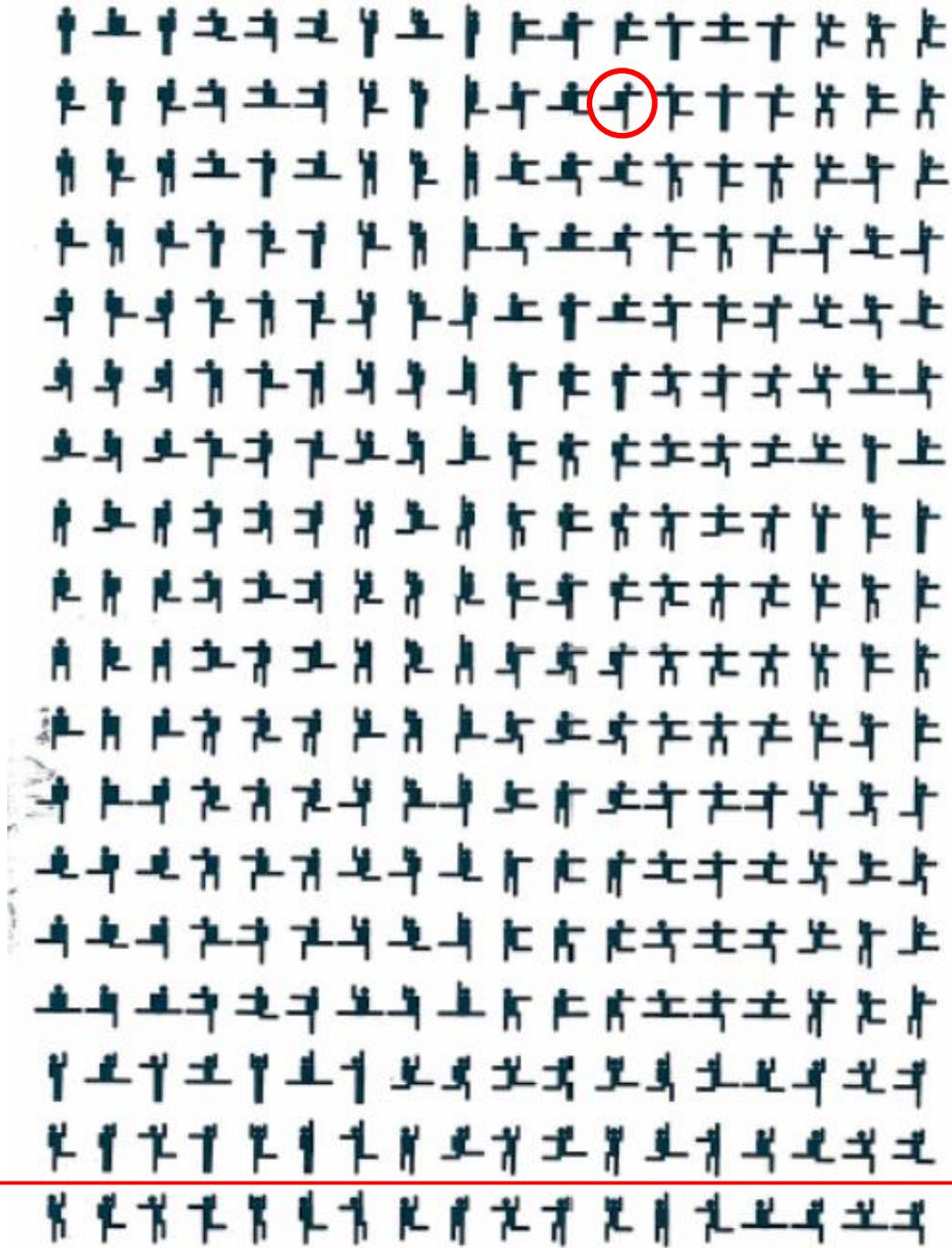
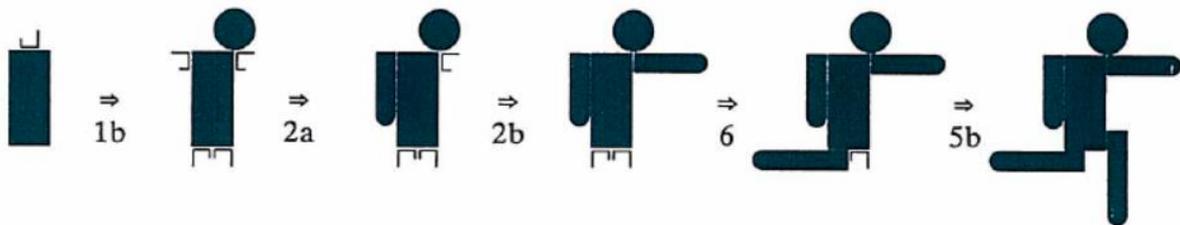
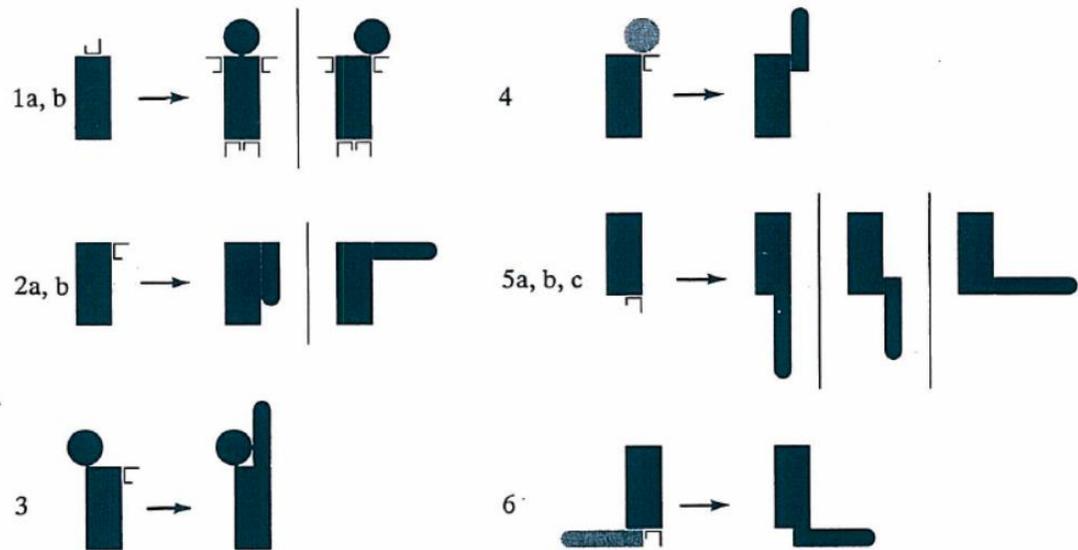
R: A \rightarrow B



R16 \Rightarrow



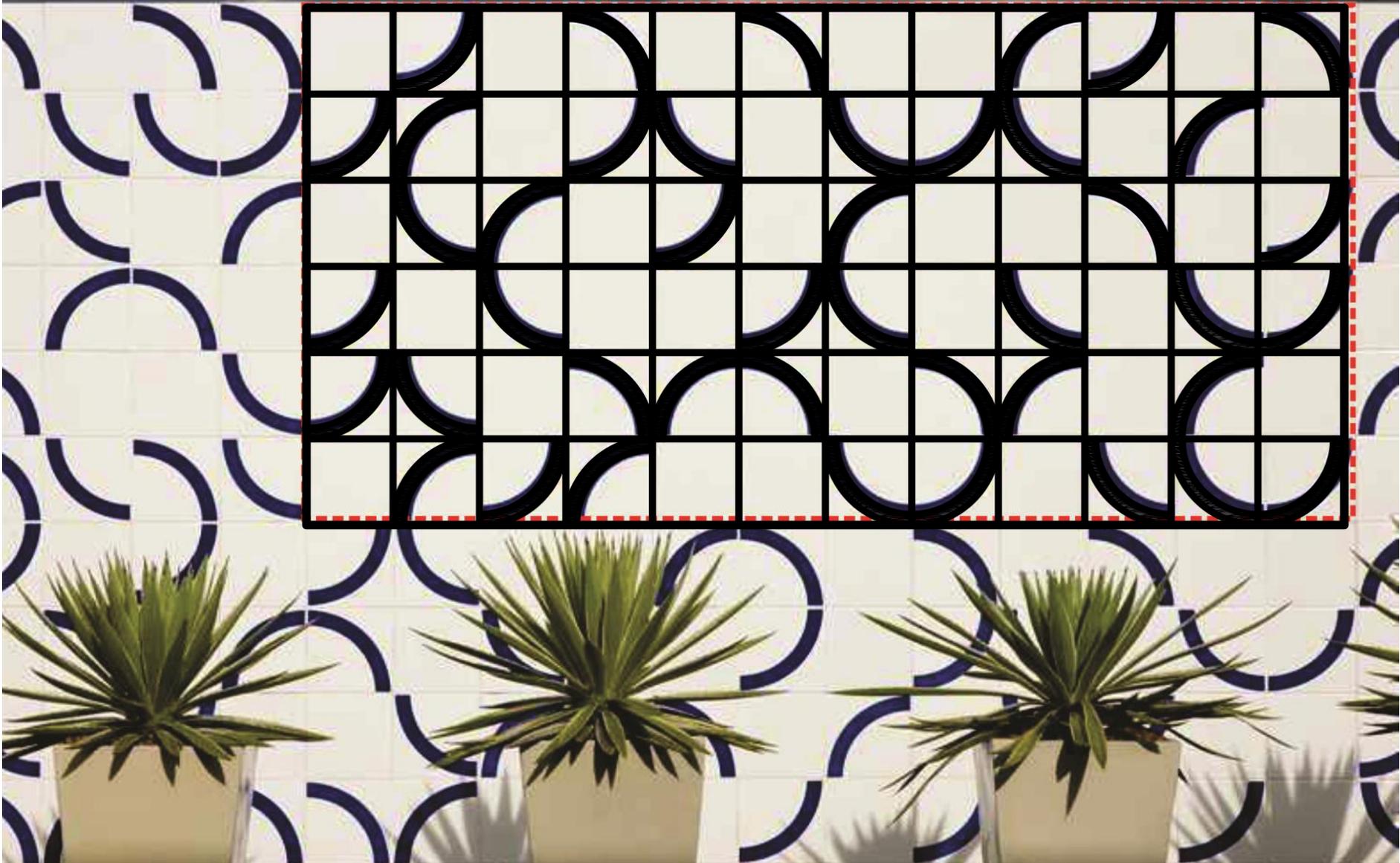
Modelo de apoio para a última fase da decomposição:
 An introduction to structure and structure grammars
 _Woodbury e McKelvey



ATHOS BULCÃO (AB)



ATHOS BULCÃO (AB)



ATHOS BULCÃO (AB)



Local selecionado para aplicação do painel parede ao lado da escadaria de acesso ao bloco 4 e estacionamento;

Características selecionadas:

Athos Bulcão

Trabalhar com o vazio;
Forma simples – Arco;
Aleatoriedade.

Maria Keil

Diferentes escalas;
Distorção da forma.



Características selecionadas:

Athos Bulcão

1 - Trabalhar com o vazio;



2 - Forma simples – Arco;

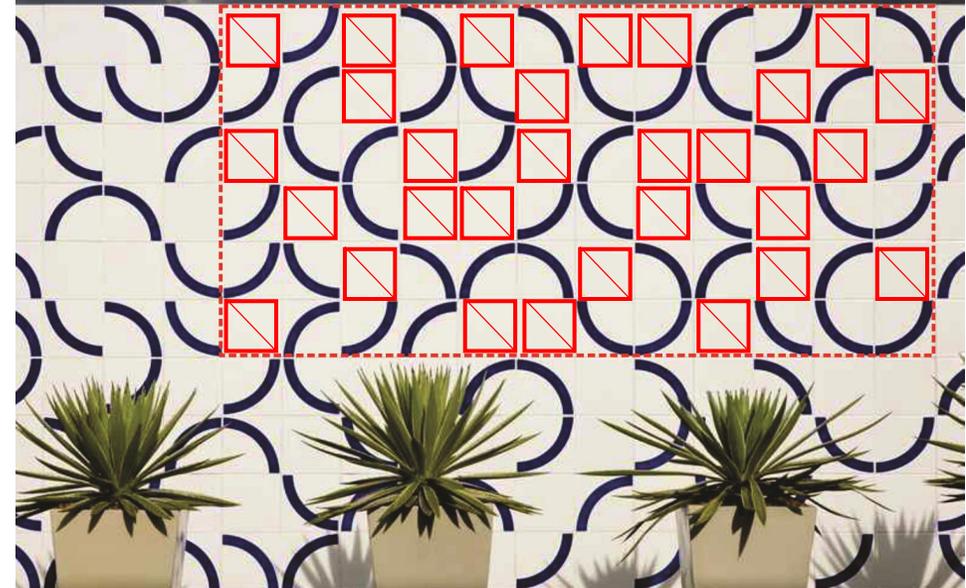
3 - Aleatoriedade.

Maria Keil

4 - Diferentes escalas;

5 - Distorção da forma.

ATHOS BULCÃO (AB)



MARIA KEIL (MK)



Características selecionadas:

Athos Bulcão

1 - Trabalhar com o vazio;

2 - Forma simples – Arco;



3 - Aleatoriedade.

Maria Keil

4 - Diferentes escalas;

5 - Distorção da forma.

ATHOS BULCÃO (AB)



MARIA KEIL (MK)



Características selecionadas:

Athos Bulcão

1 - Trabalhar com o vazio;

2 - Forma simples – Arco;

3 - Aleatoriedade.



Maria Keil

4 - Diferentes escalas;

5 - Distorção da forma.

ATHOS BULCÃO (AB)



MARIA KEIL (MK)



Características selecionadas:

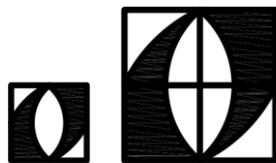
Athos Bulcão

1 - Trabalhar com o vazio;

2 - Forma simples – Arco;

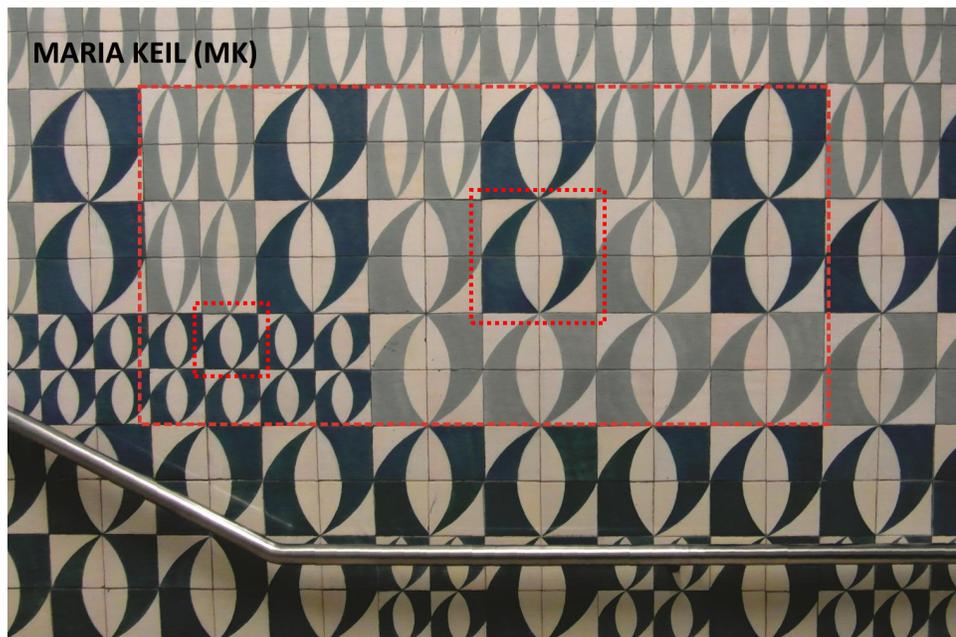
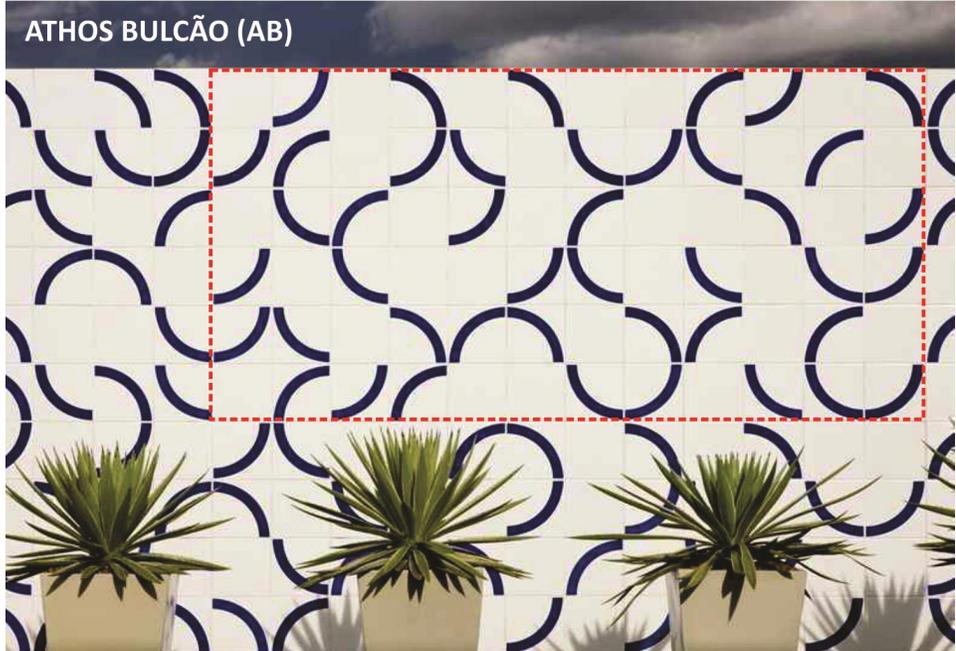
3 - Aleatoriedade.

Maria Keil



4 - Diferentes escalas;

5 - Distorção da forma.



Características selecionadas:

Athos Bulcão

1 - Trabalhar com o vazio;

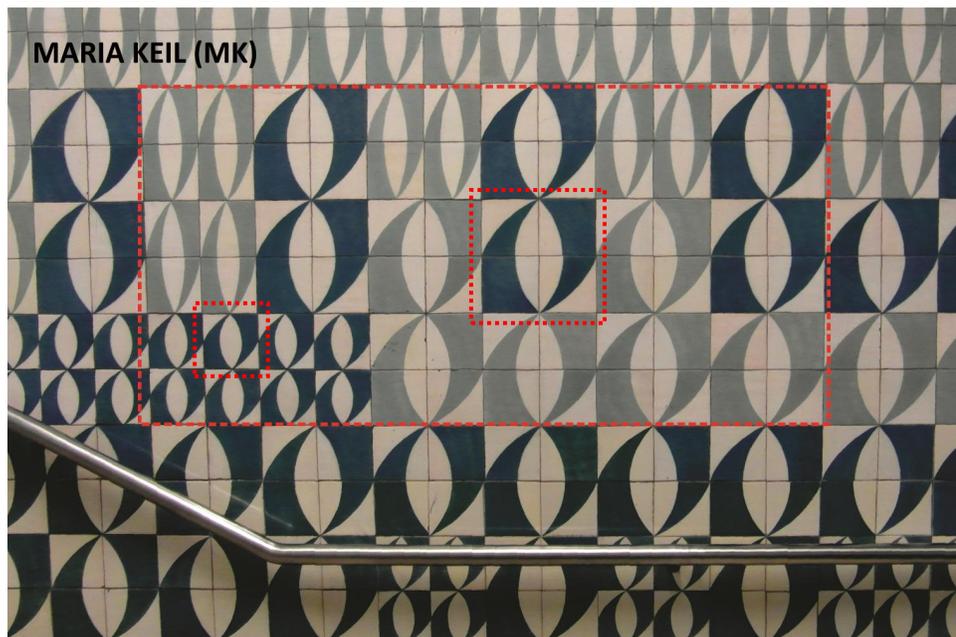
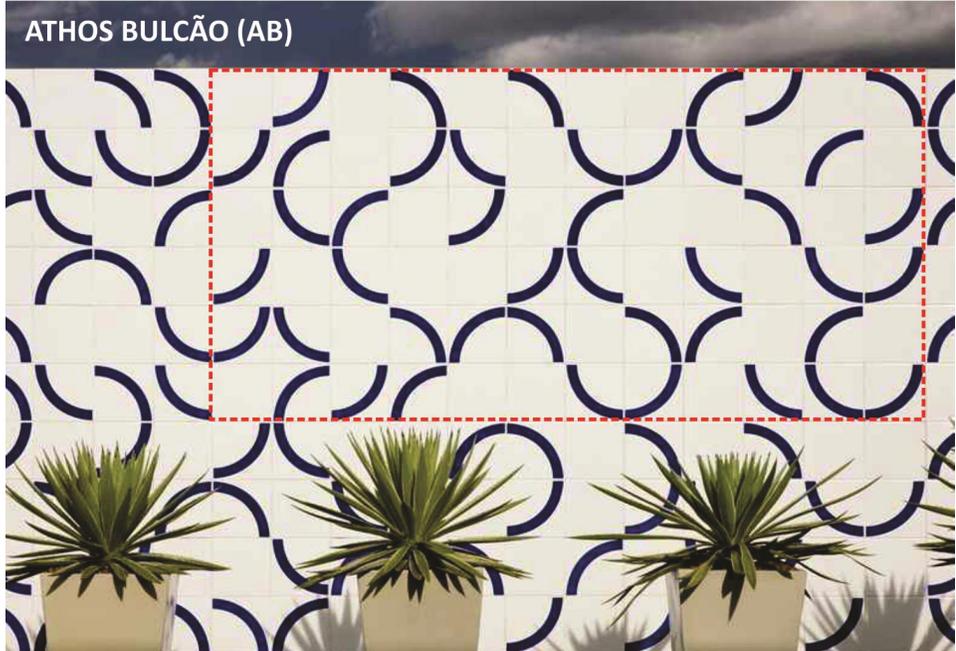
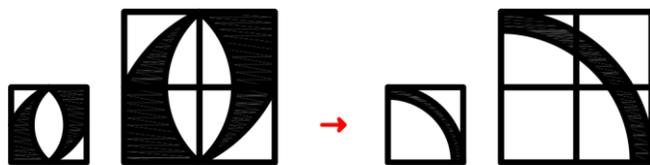
2 - Forma simples – Arco;

3 - Aleatoriedade.

Maria Keil

4 - Diferentes escalas;

5 - Distorção da forma.



Características selecionadas:

Athos Bulcão

1 - Trabalhar com o vazio;

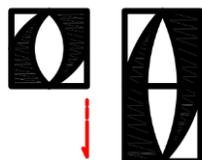
2 - Forma simples – Arco;

3 - Aleatoriedade.

Maria Keil

4 - Diferentes escalas;

5 - Distorção da forma.



ATHOS BULCÃO (AB)



MARIA KEIL (MK)



Características selecionadas:

Athos Bulcão

1 - Trabalhar com o vazio;

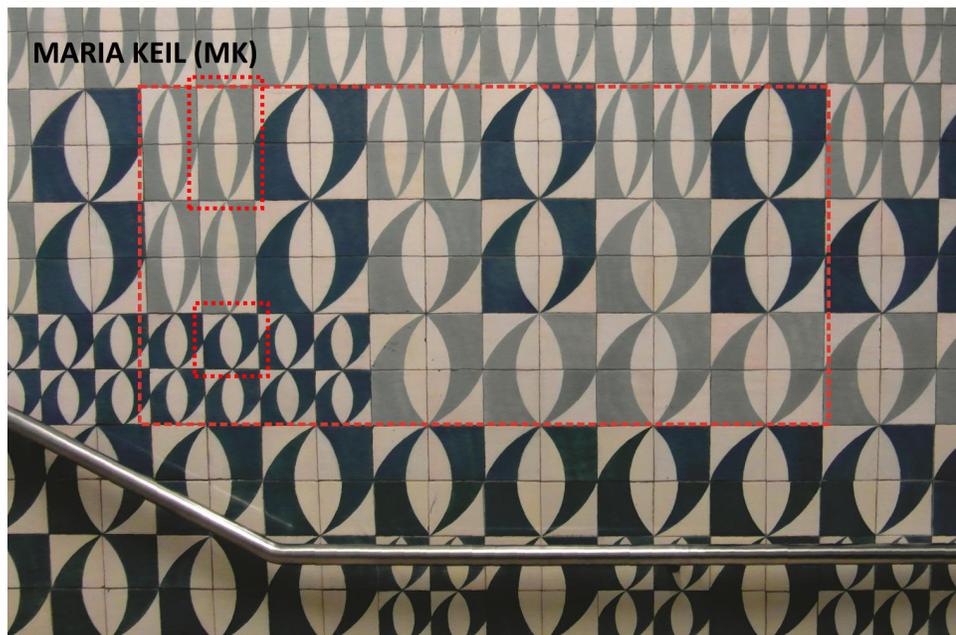
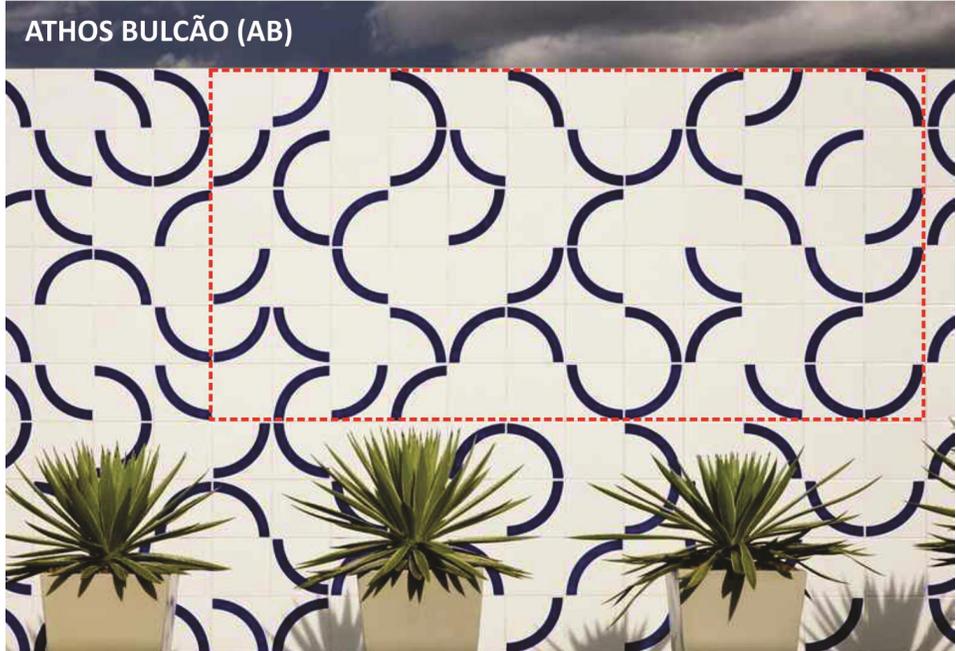
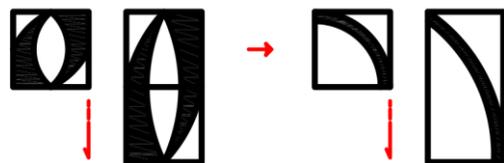
2 - Forma simples – Arco;

3 - Aleatoriedade.

Maria Keil

4 - Diferentes escalas;

5 - Distorção da forma.



Características selecionadas:

Athos Bulcão

1 - Trabalhar com o vazio;



2 - Forma simples – Arco;

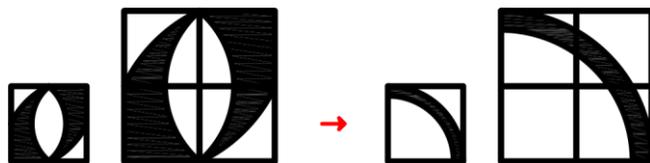


3 - Aleatoriedade.

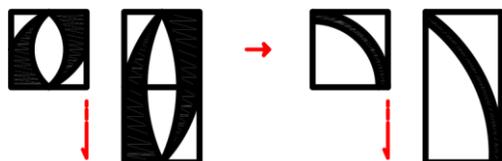


Maria Keil

4 - Diferentes escalas;



5 - Distorção da forma.



ATHOS BULCÃO (AB)

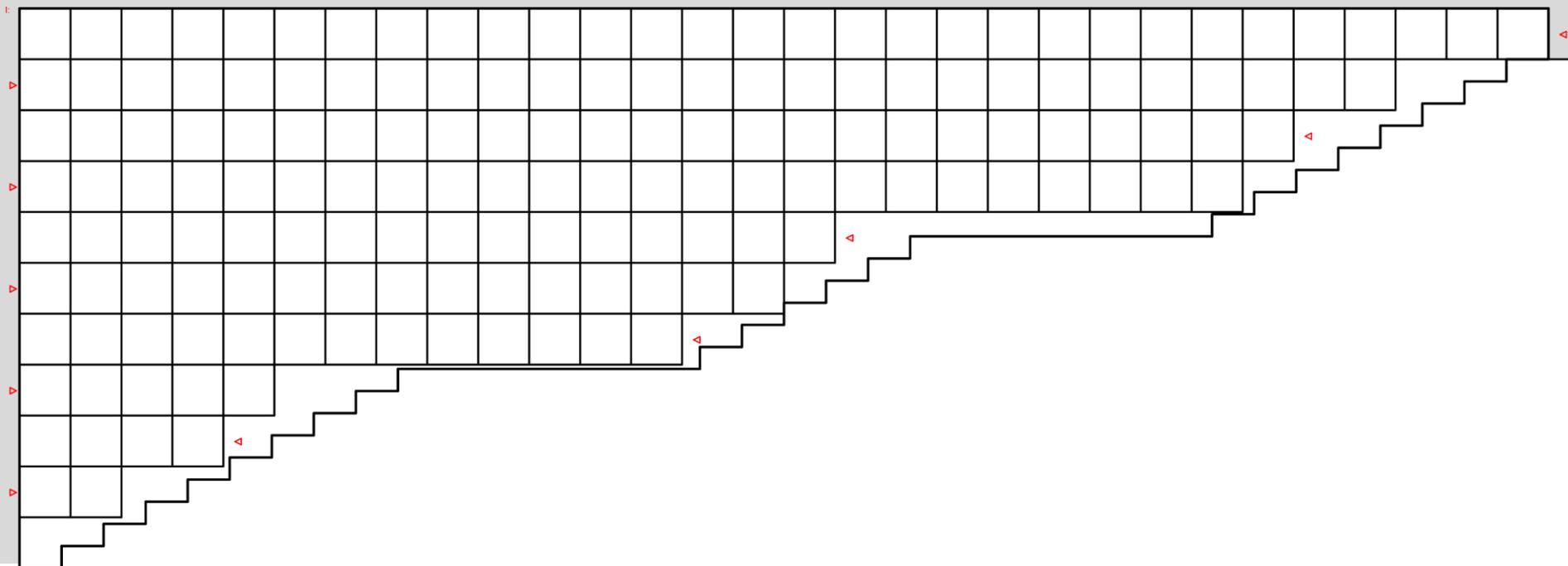
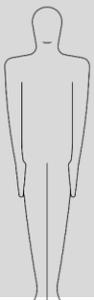


MARIA KEIL (MK)

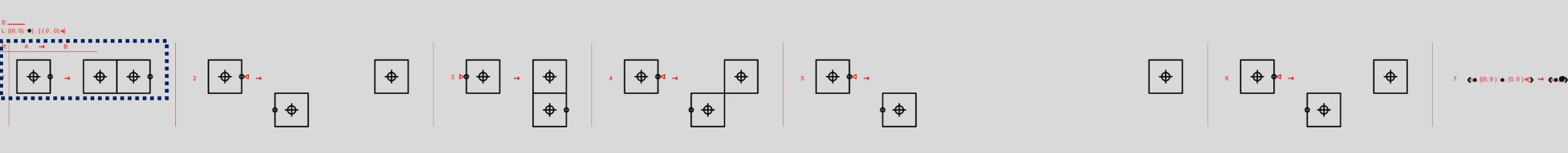


Compreendendo a Forma inicial

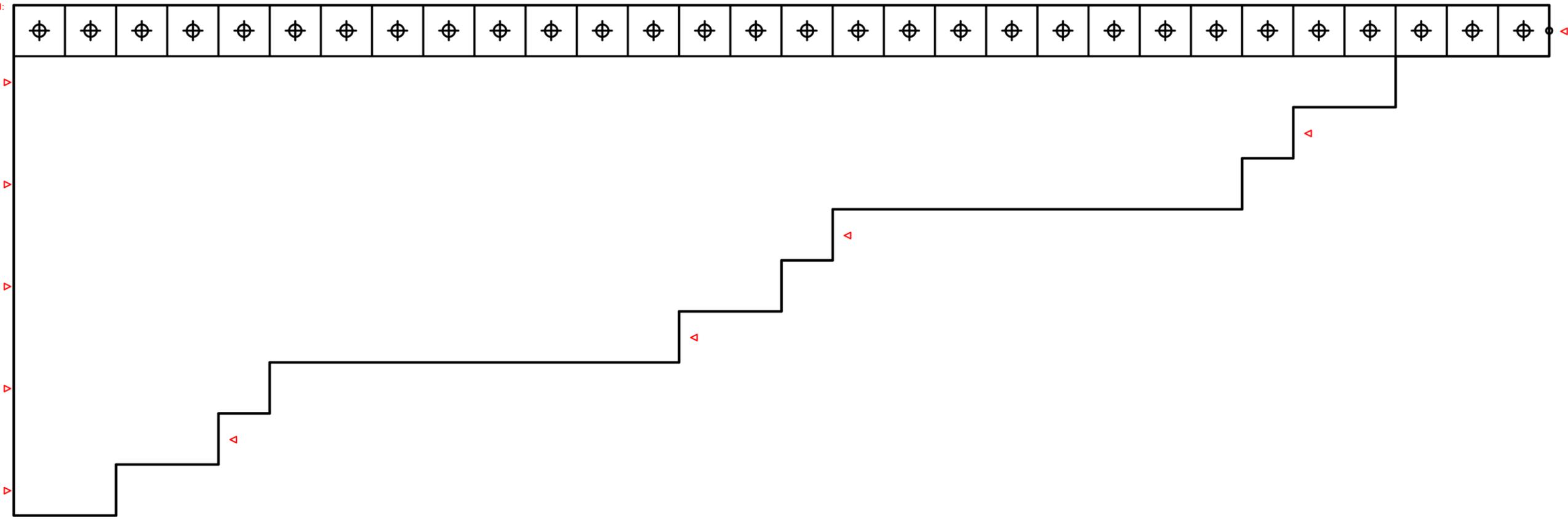




0 .4 .8



R1 (29x)



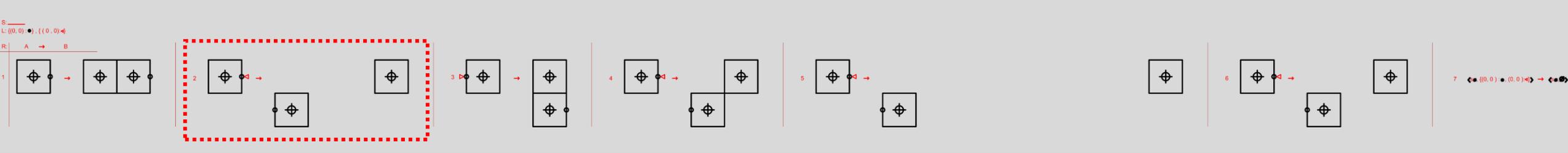
GF

aplicação

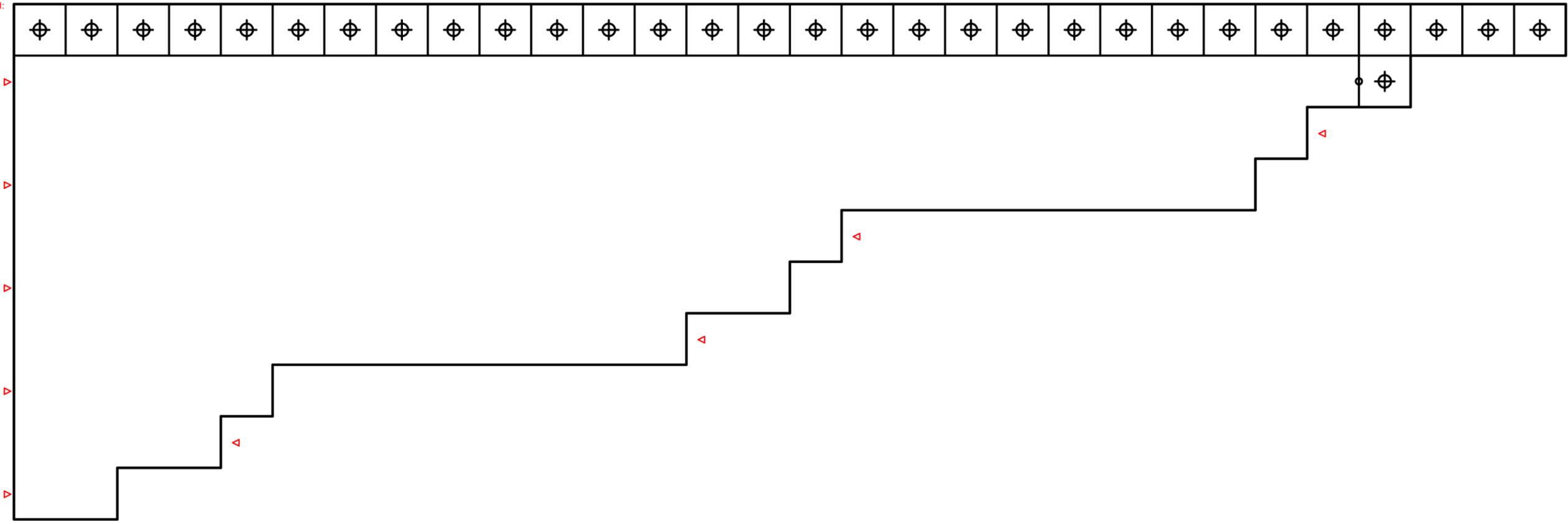
Regra AB

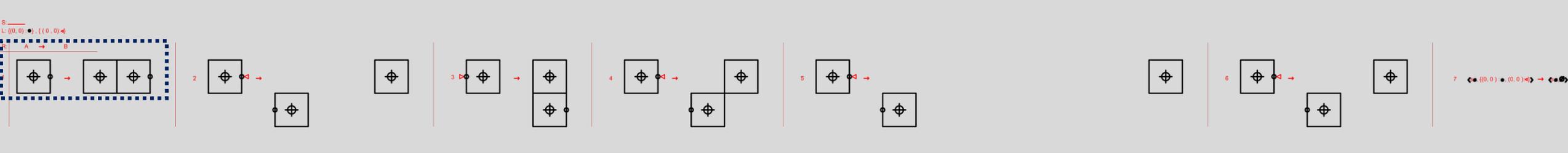
Regra MK

Regra nova

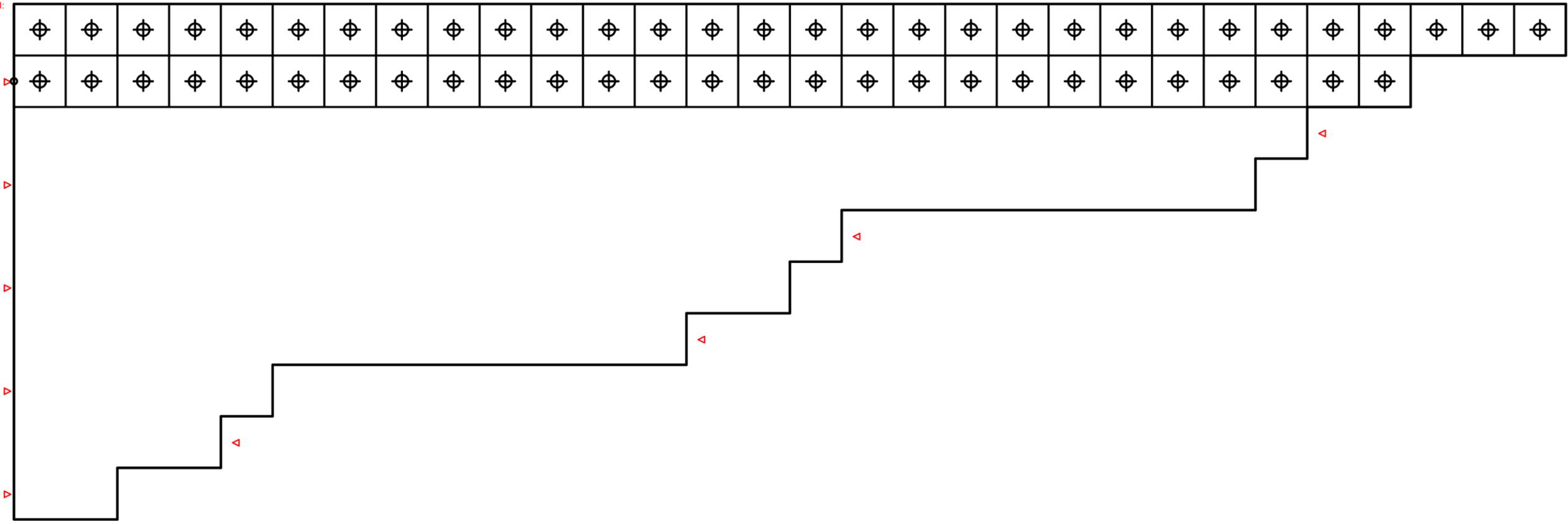


R2
 \Downarrow





R1_(26x)

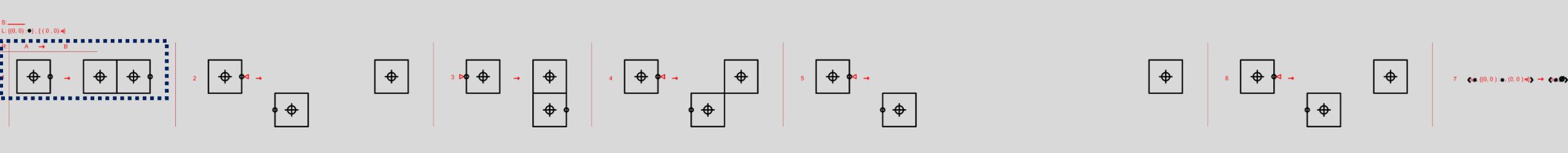


aplicação

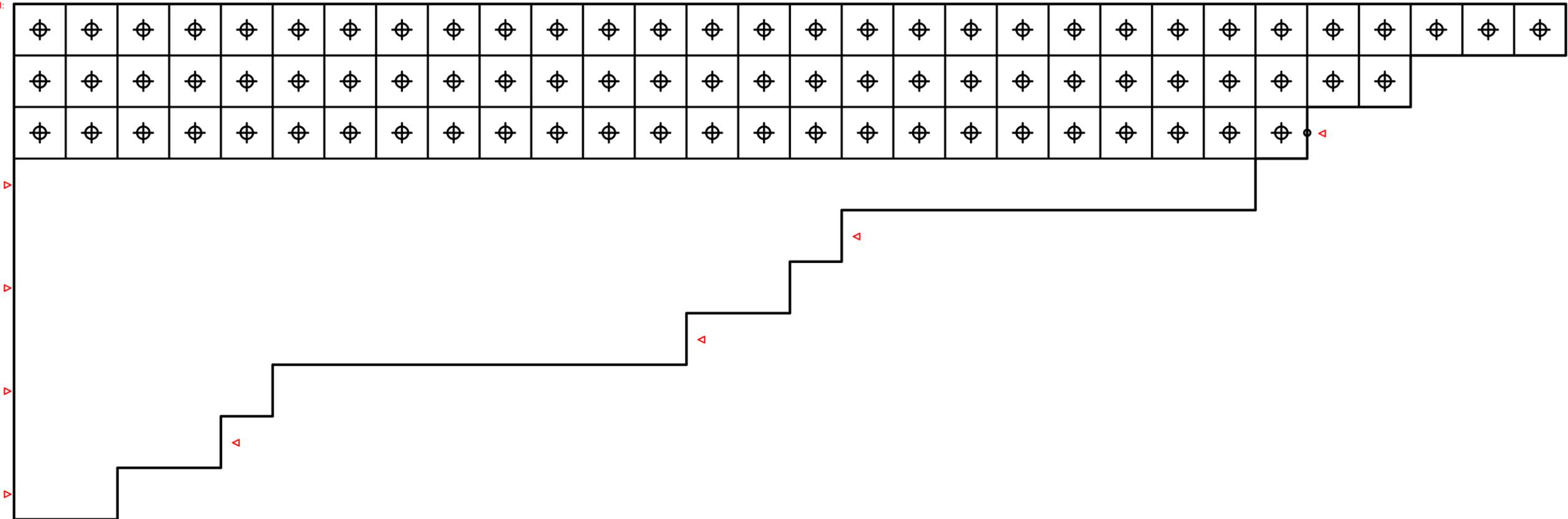
Regra AB

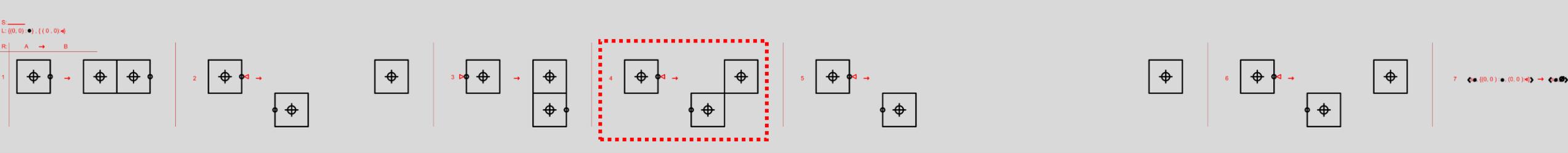
Regra MK

Regra nova

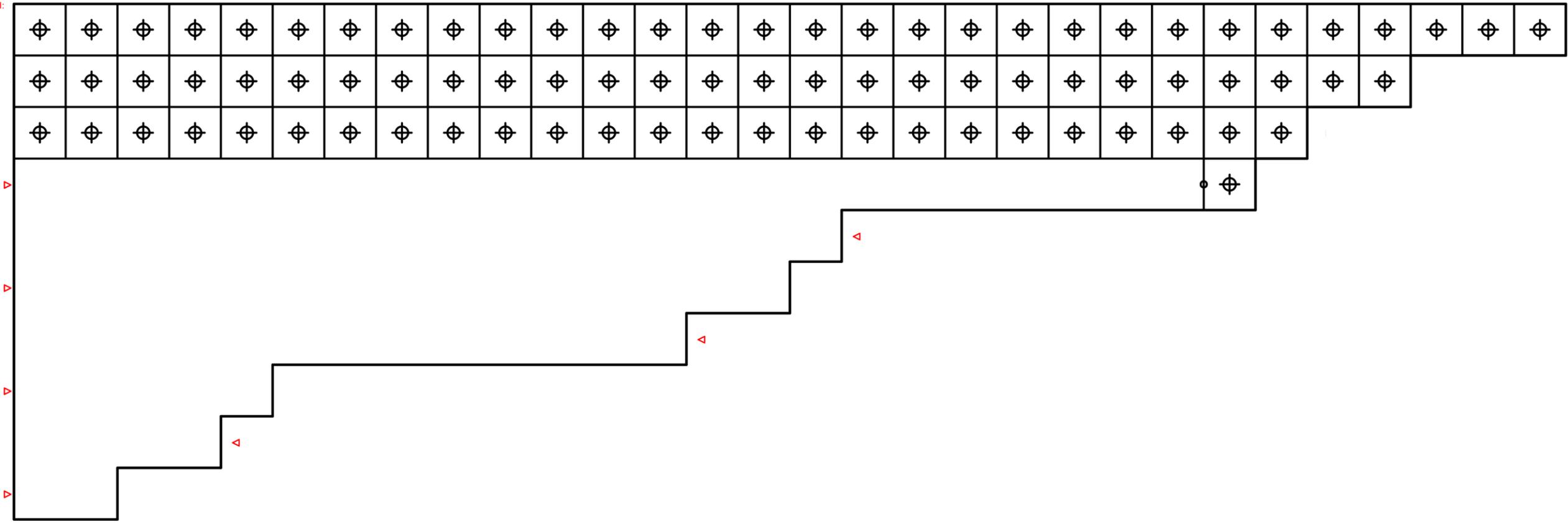


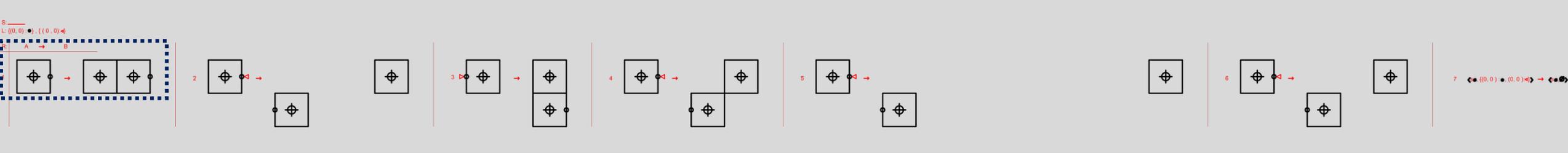
R1_(24x)



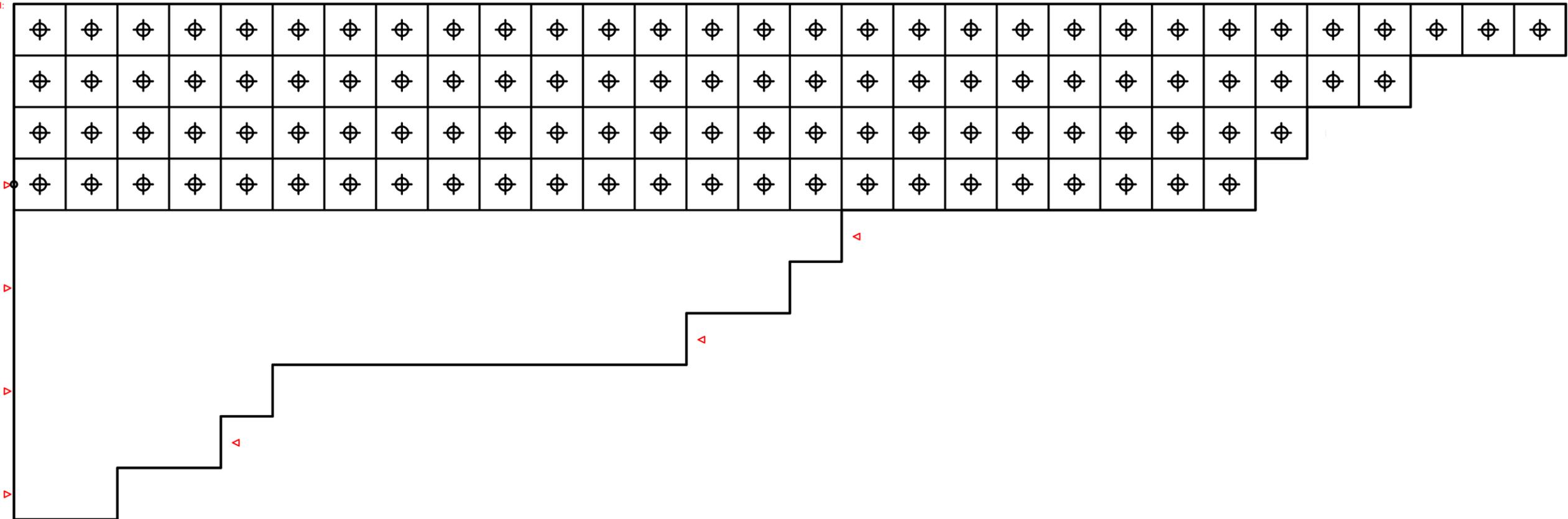


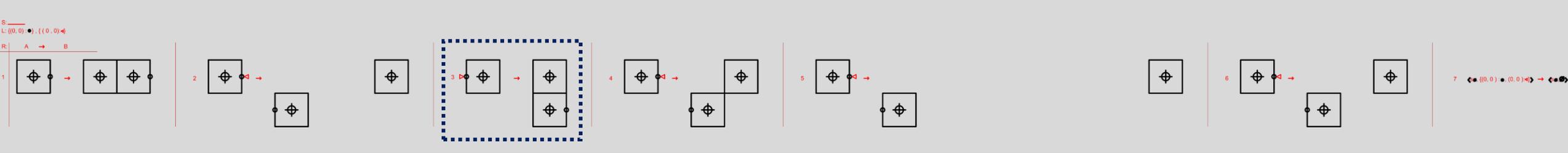
R4



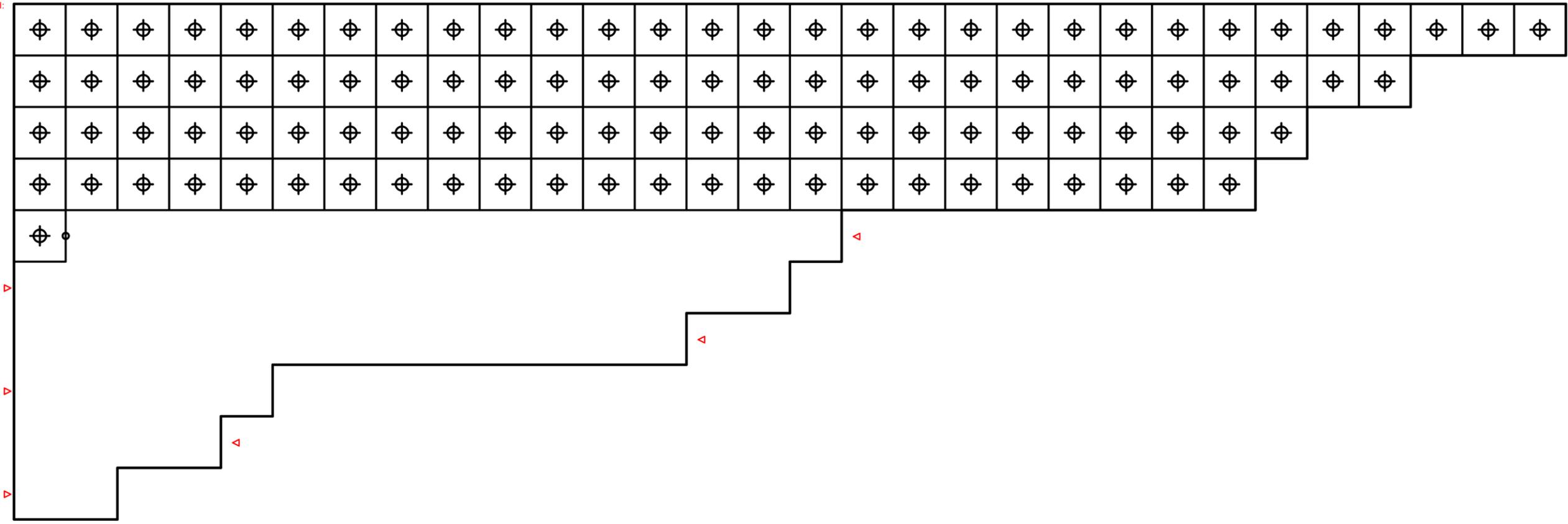


R1 (23x)





R3

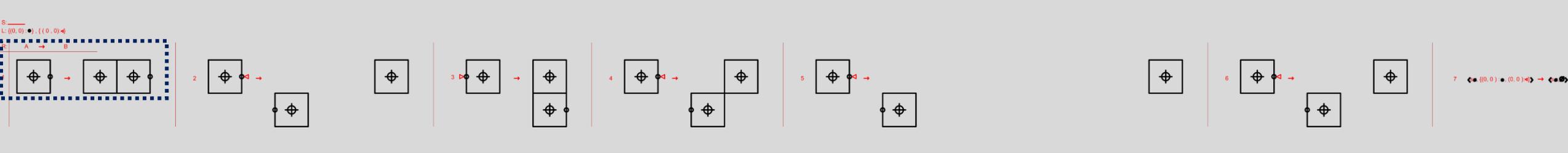


aplicação

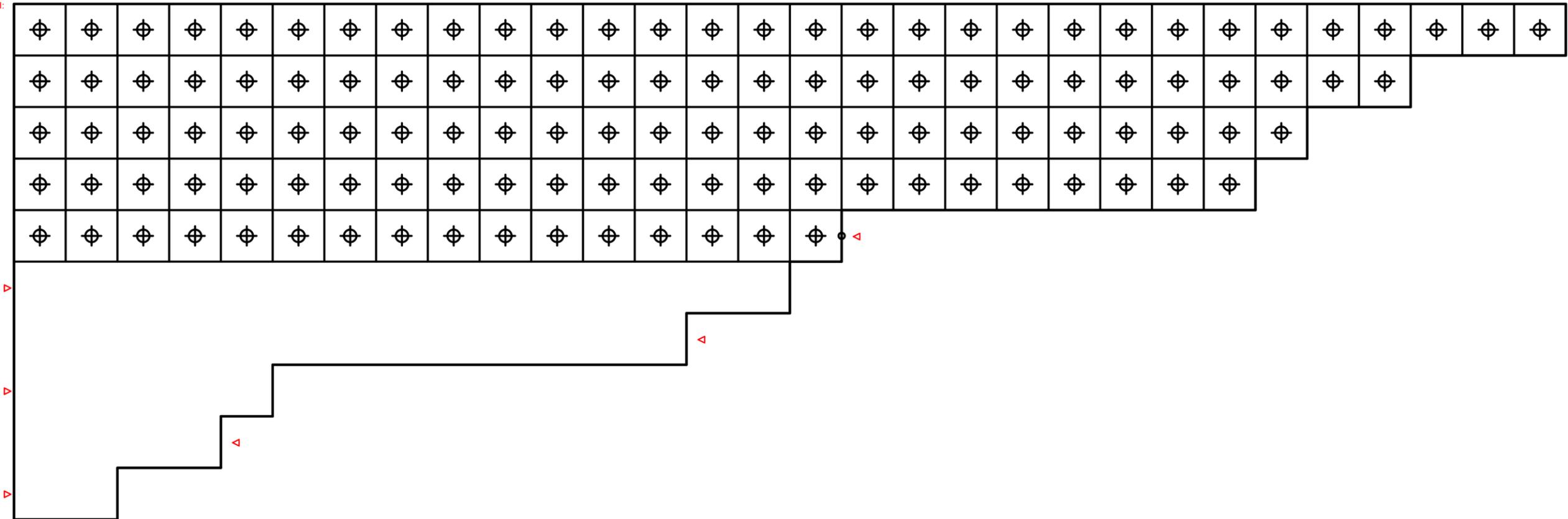
Regra AB

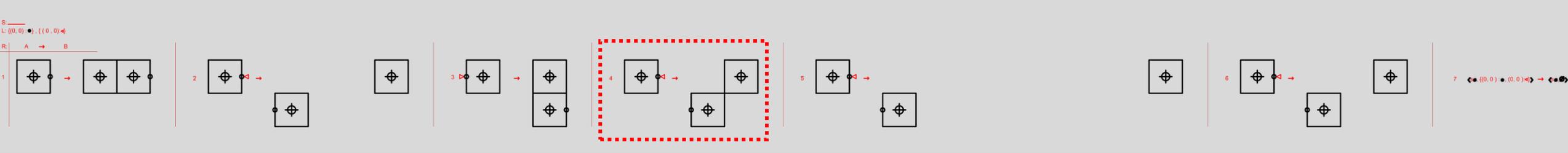
Regra MK

Regra nova

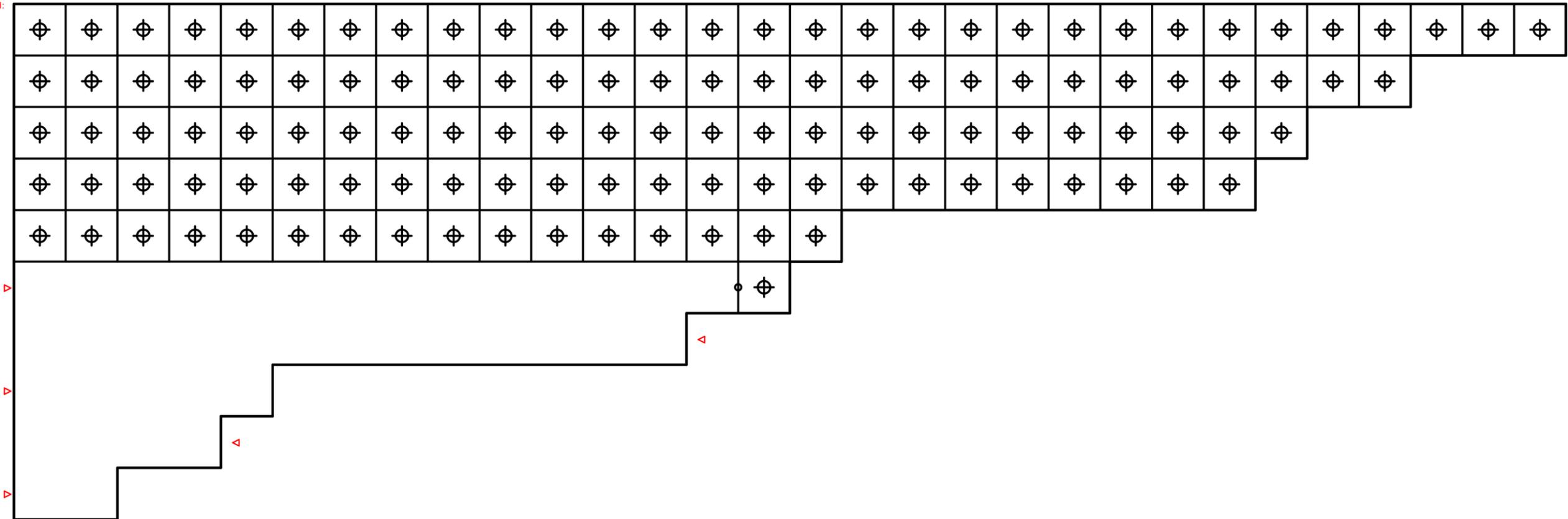


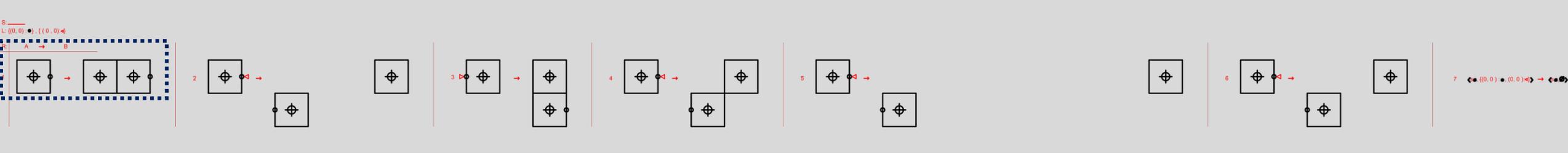
R1 (15x)



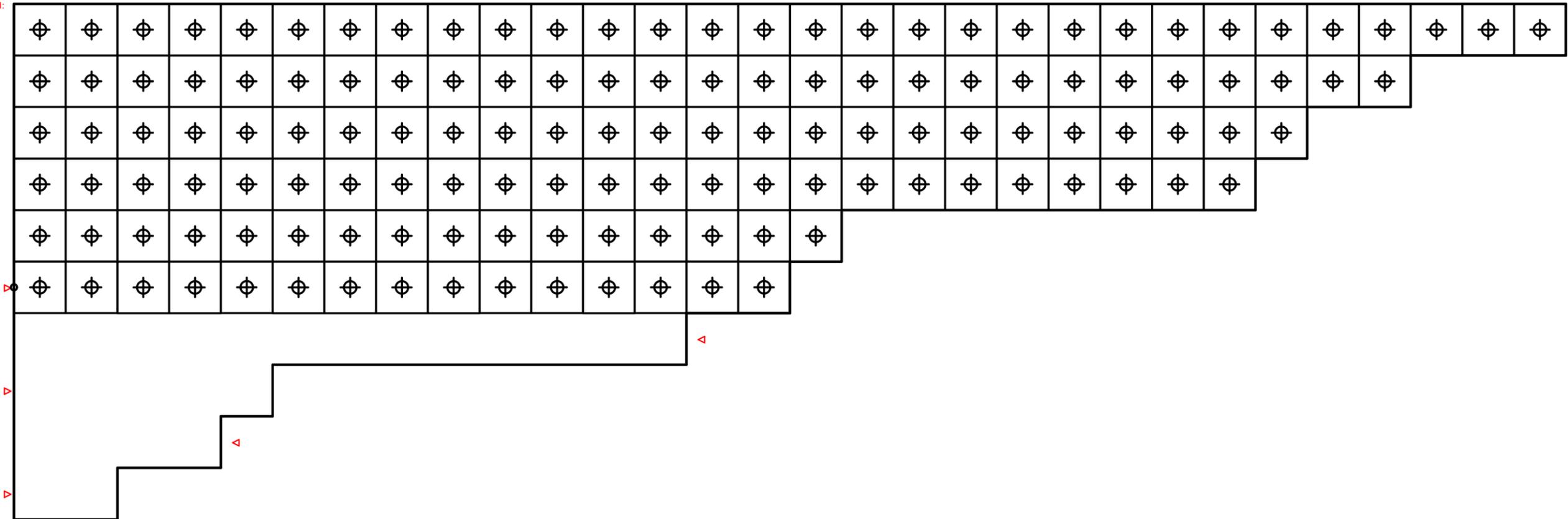


R4





R1_(14x)



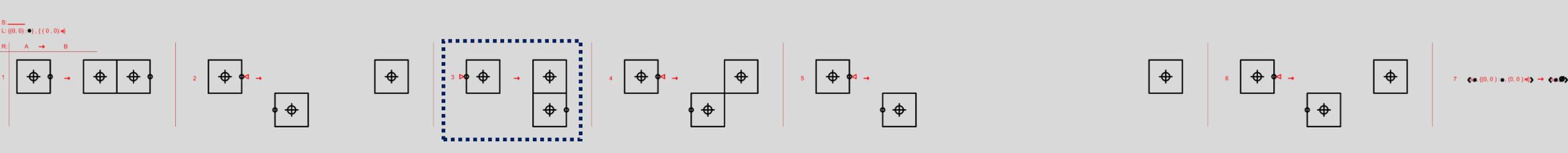
GF

aplicação

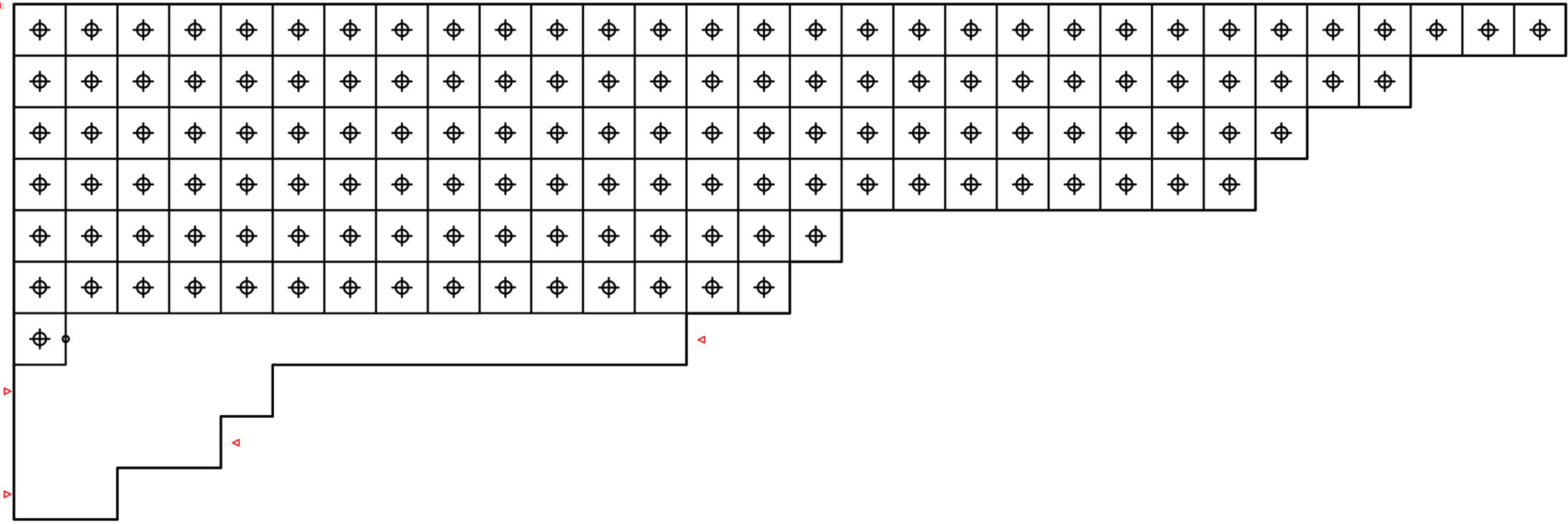
Regra AB

Regra MK

Regra nova



R3

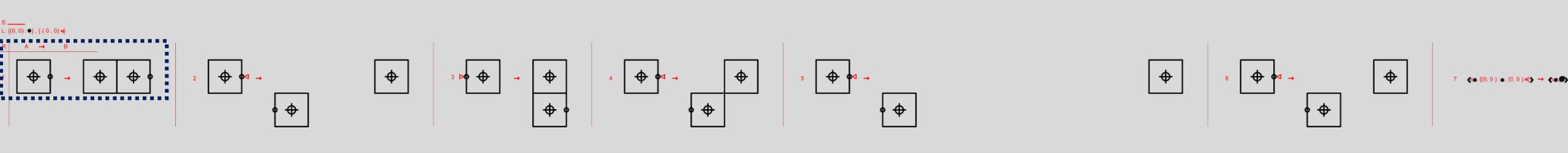


aplicação

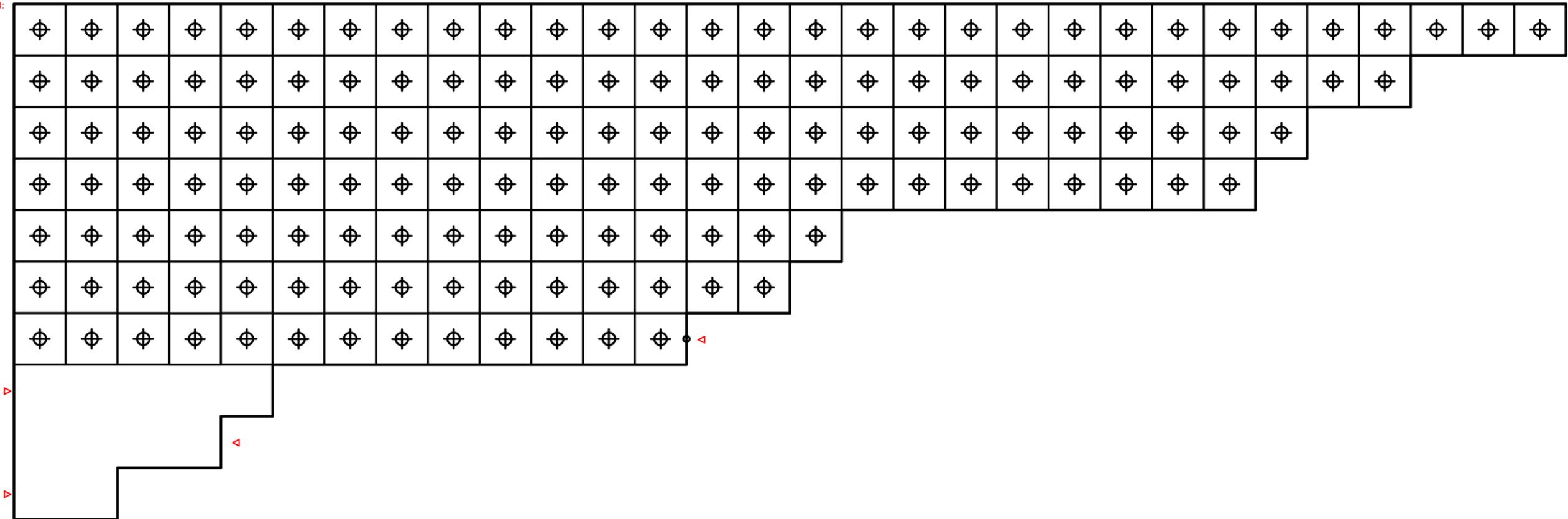
Regra AB

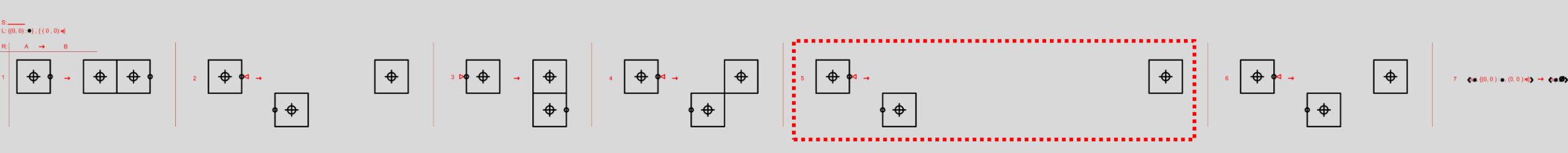
Regra MK

Regra nova

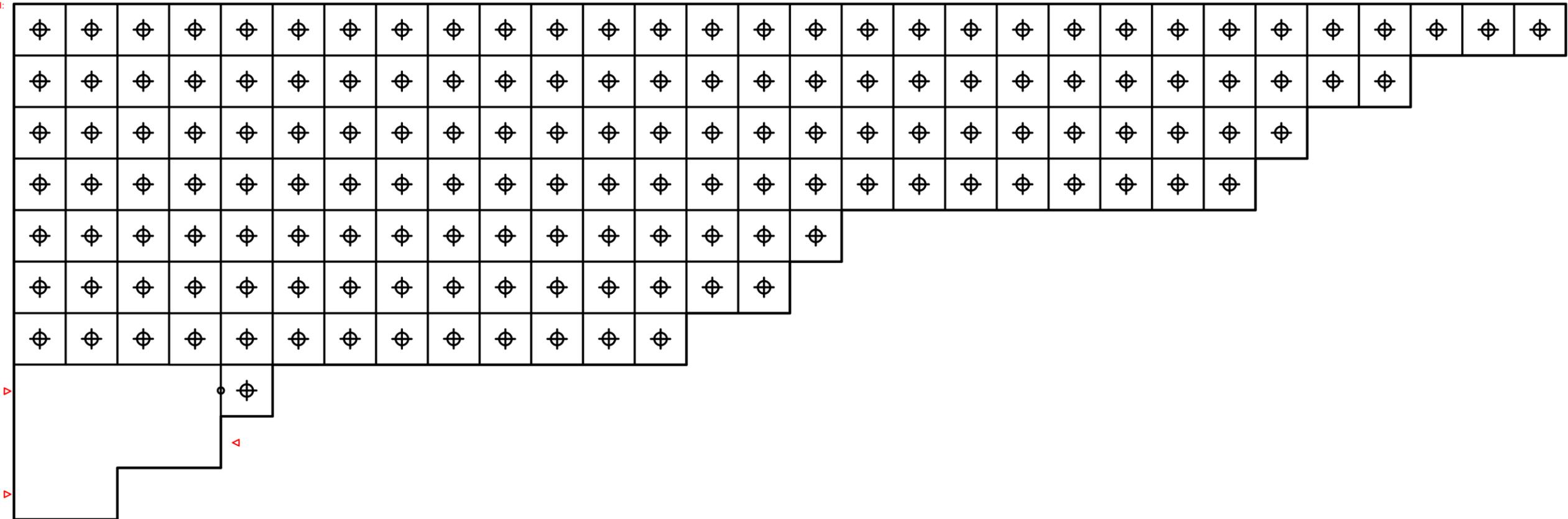


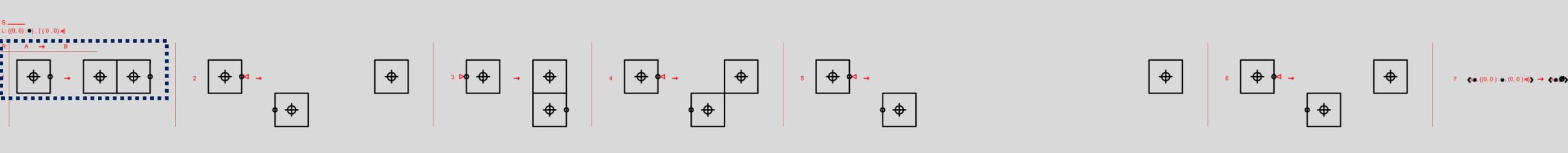
R1_(12x)



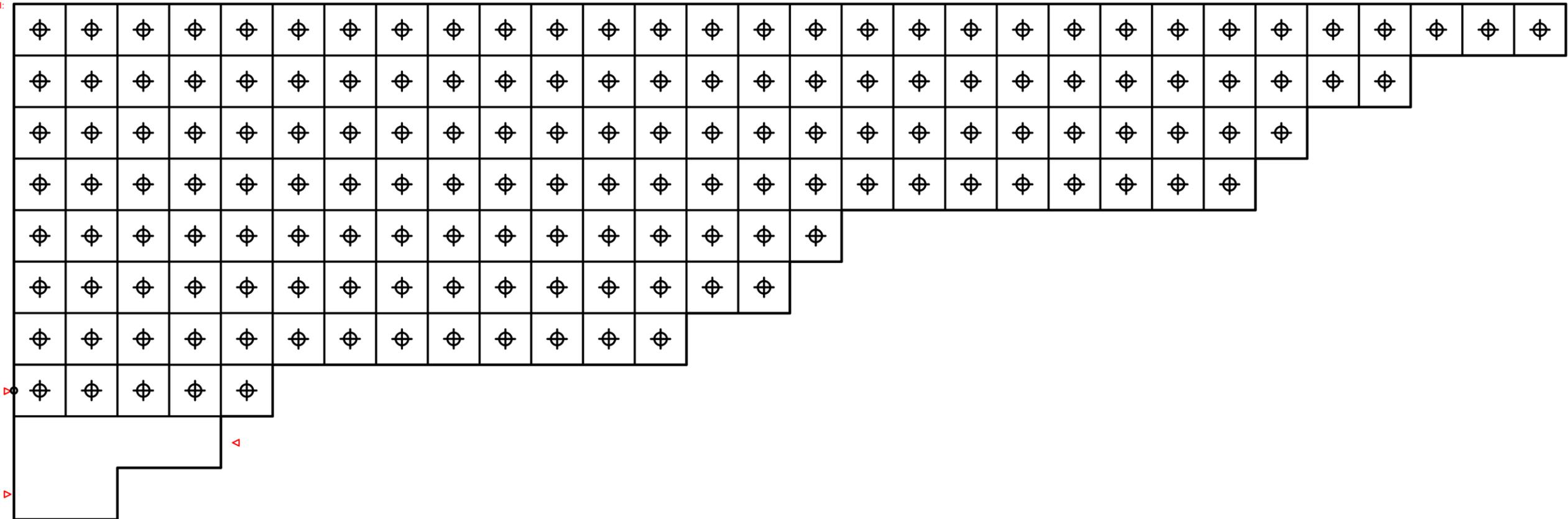


R5





R1_(4x)

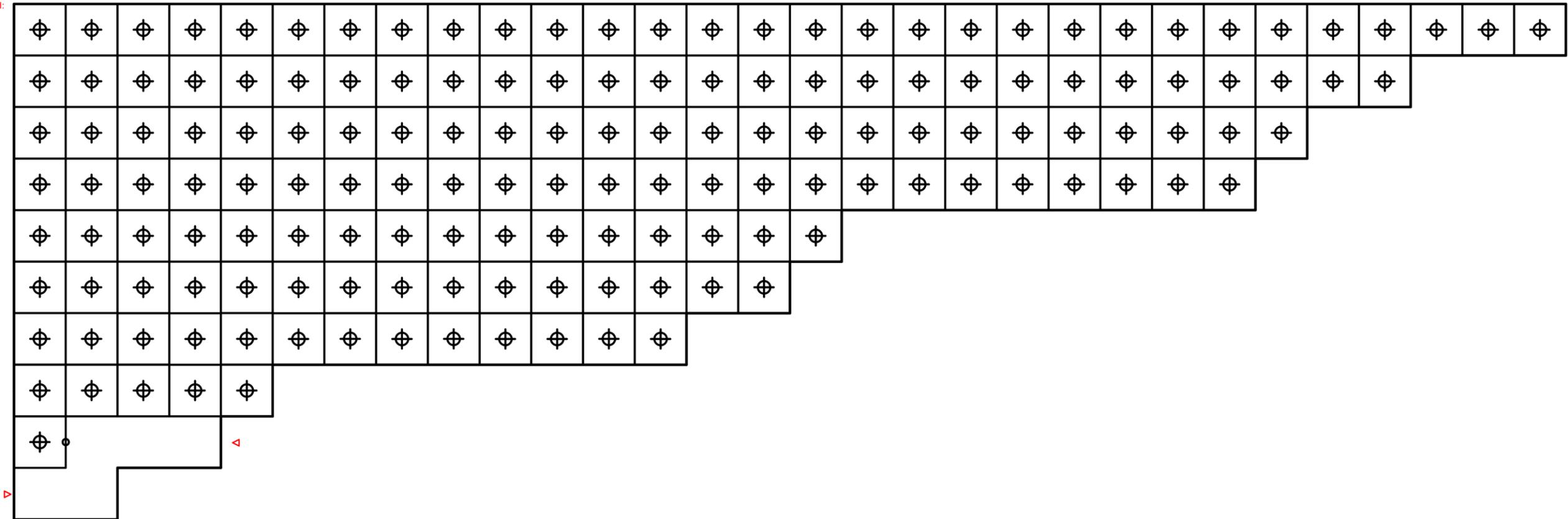
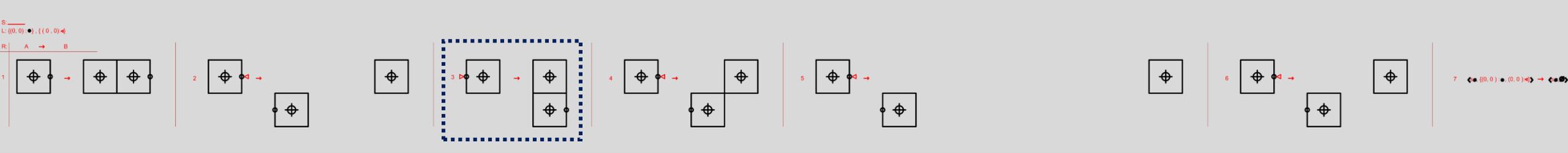


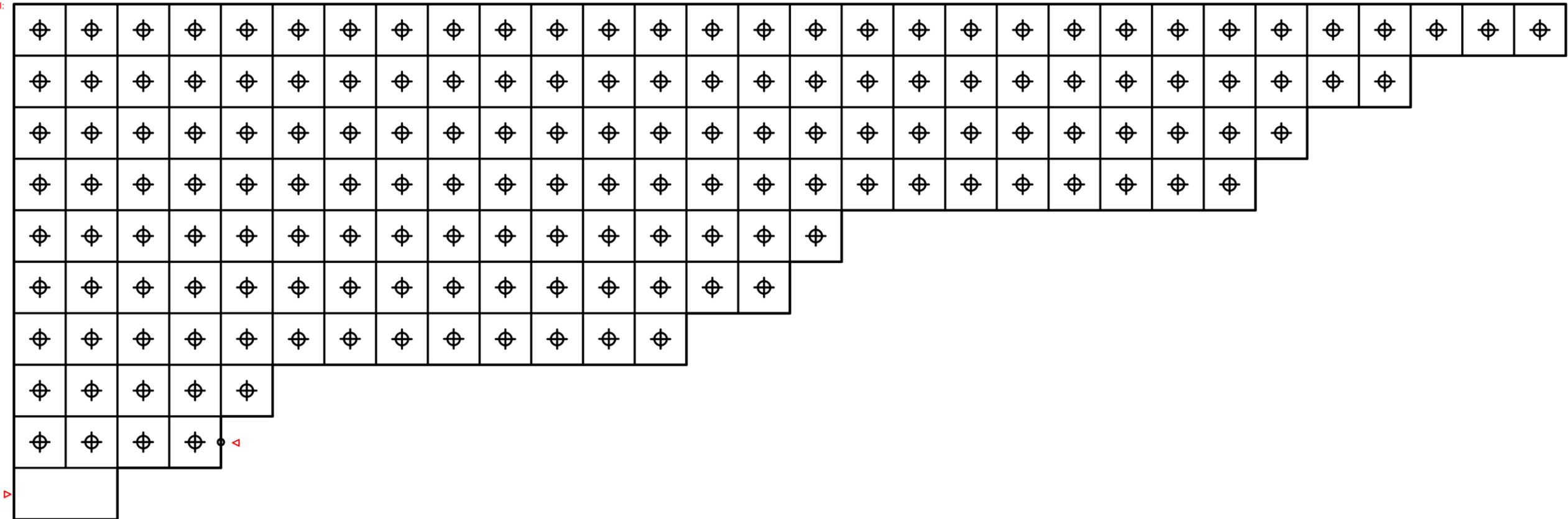
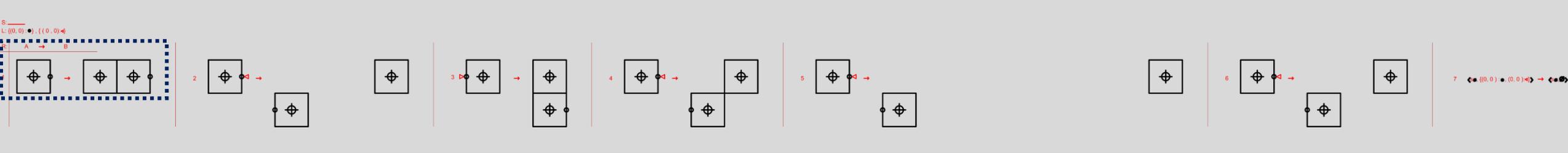
aplicação

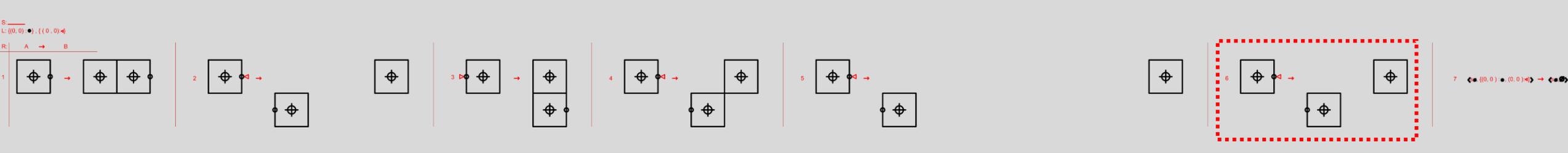
Regra AB

Regra MK

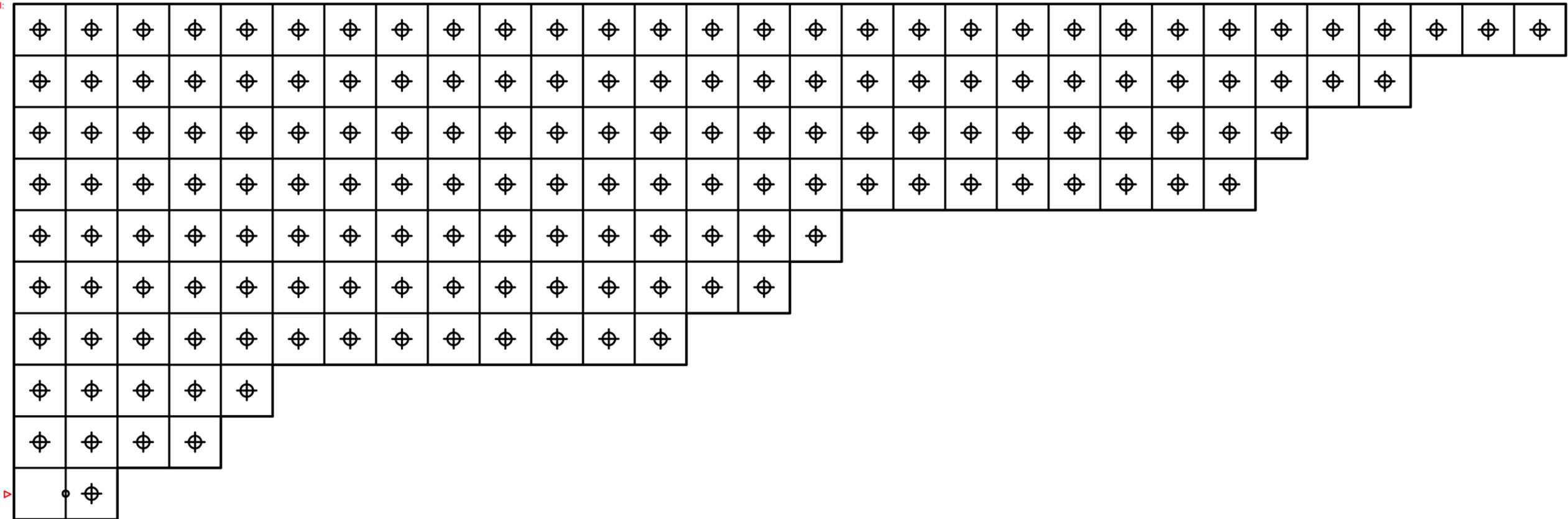
Regra nova

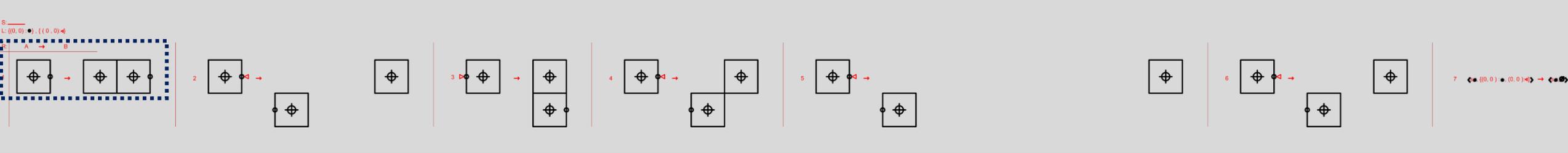




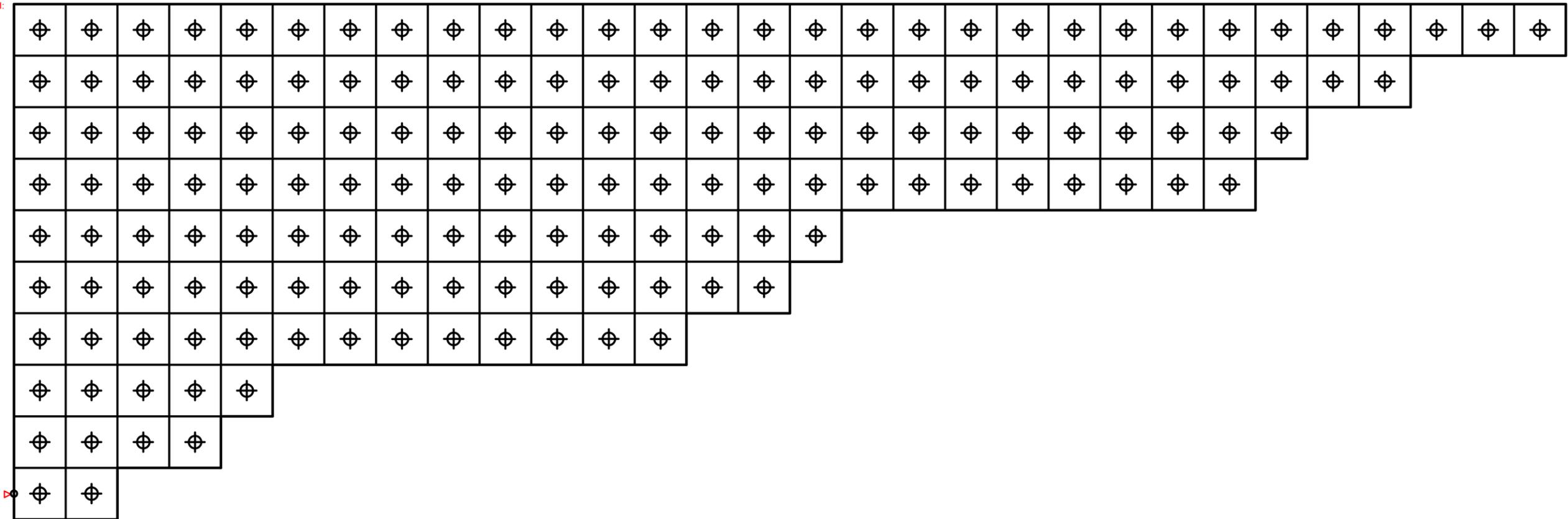


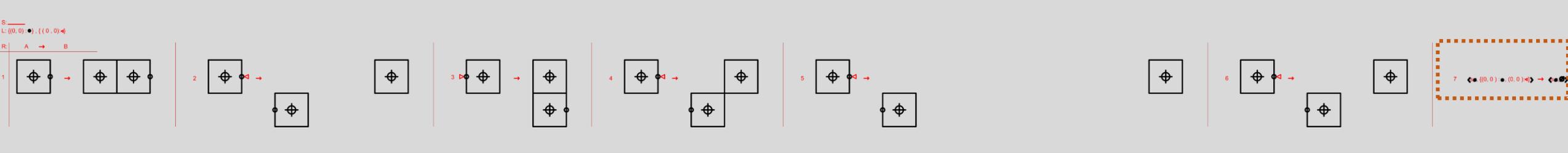
R6



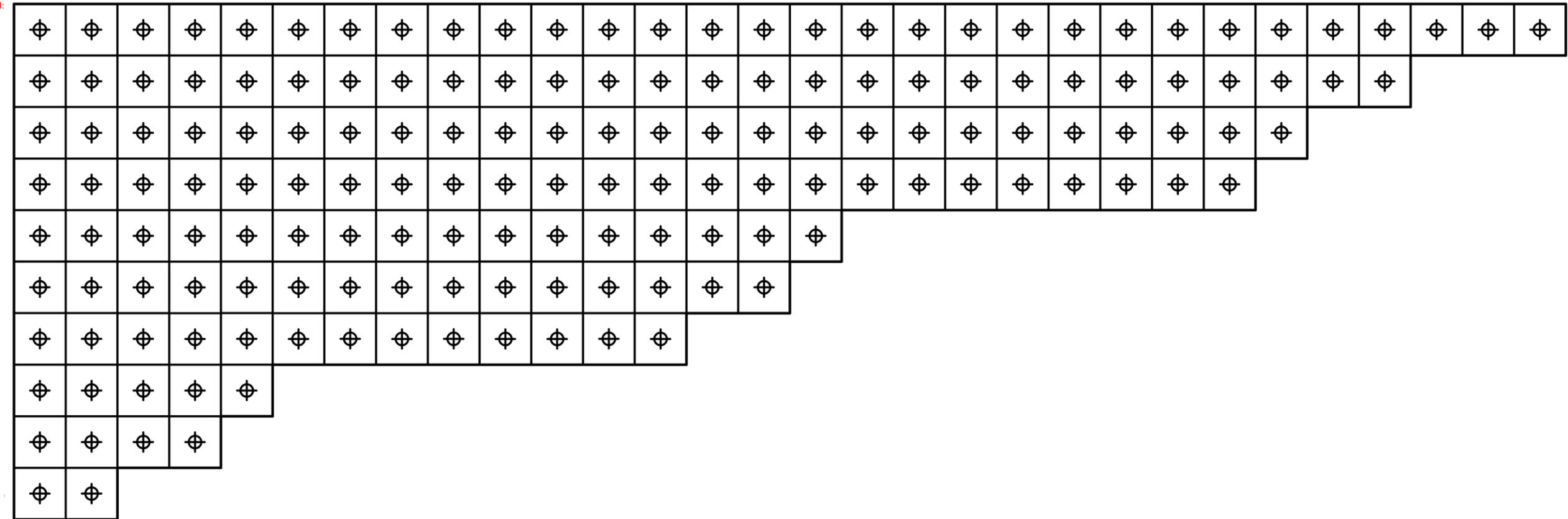


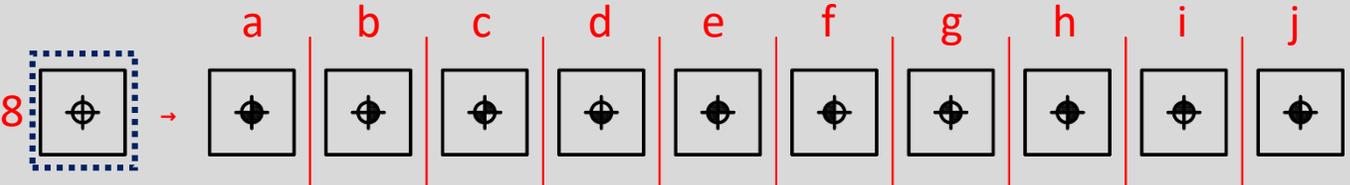
R1
⇓





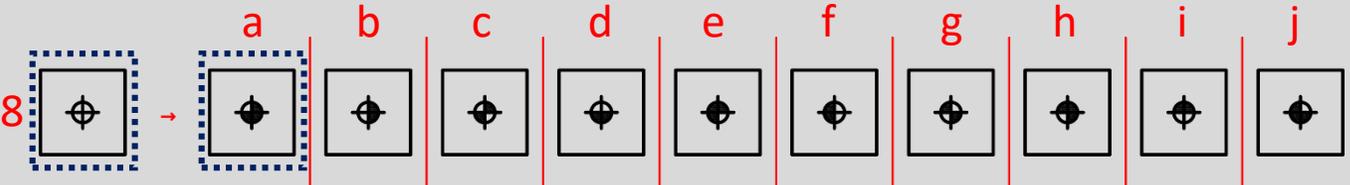
R7



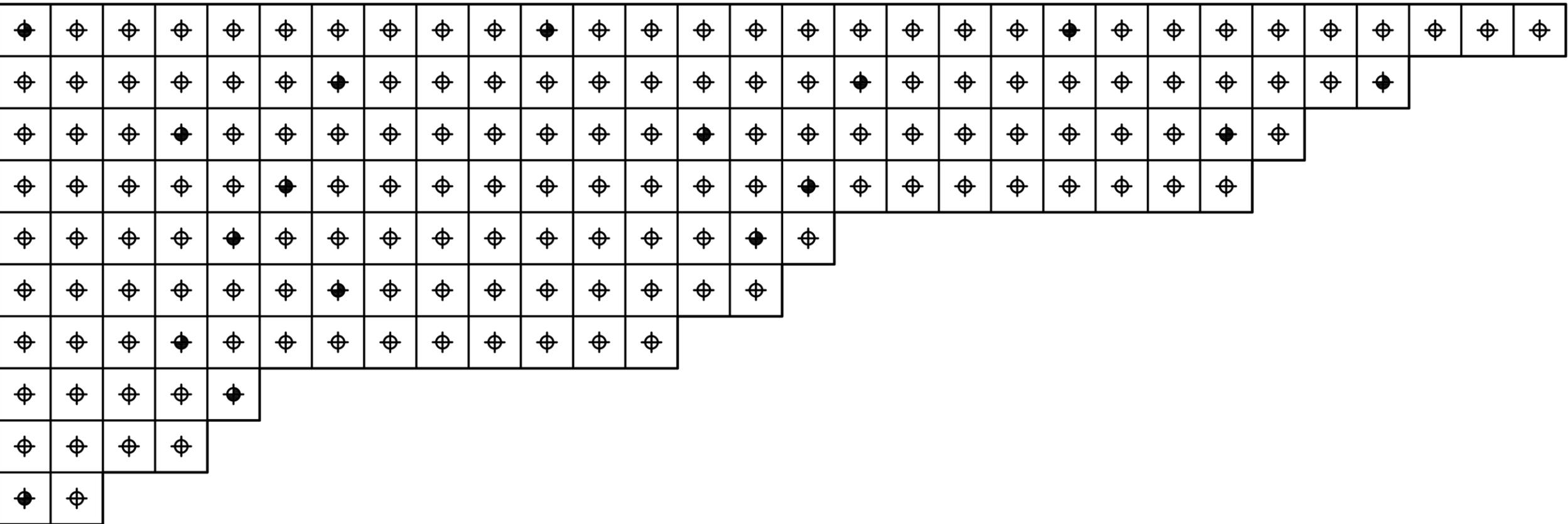


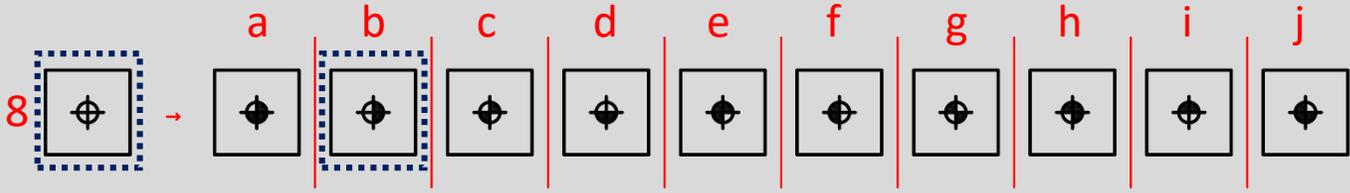
R8

a	b	c	d	e	f	g	h	i	j	a	b	c	d	e	f	g	h	i	j	a	b	c	d	e	f	g	h	i	j
g	f	e	d	c	b	a	j	i	h	g	f	e	d	c	b	a	j	i	h	g	f	e	d	c	b	a			
h	i	j	a	b	c	d	e	f	g	h	i	j	a	b	c	d	e	f	g	h	i	j	a	b					
f	e	d	c	b	a	j	i	h	g	f	e	d	c	b	a	j	i	h	g	f	e	d	c						
g	h	i	j	a	b	c	d	e	f	g	h	i	j	a	b														
g	f	e	d	c	b	a	j	i	h	g	f	e	d	c															
h	i	j	a	b	c	d	e	f	g	h	i	j																	
e	d	c	b	a																									
f	g	h	i																										
a	j																												

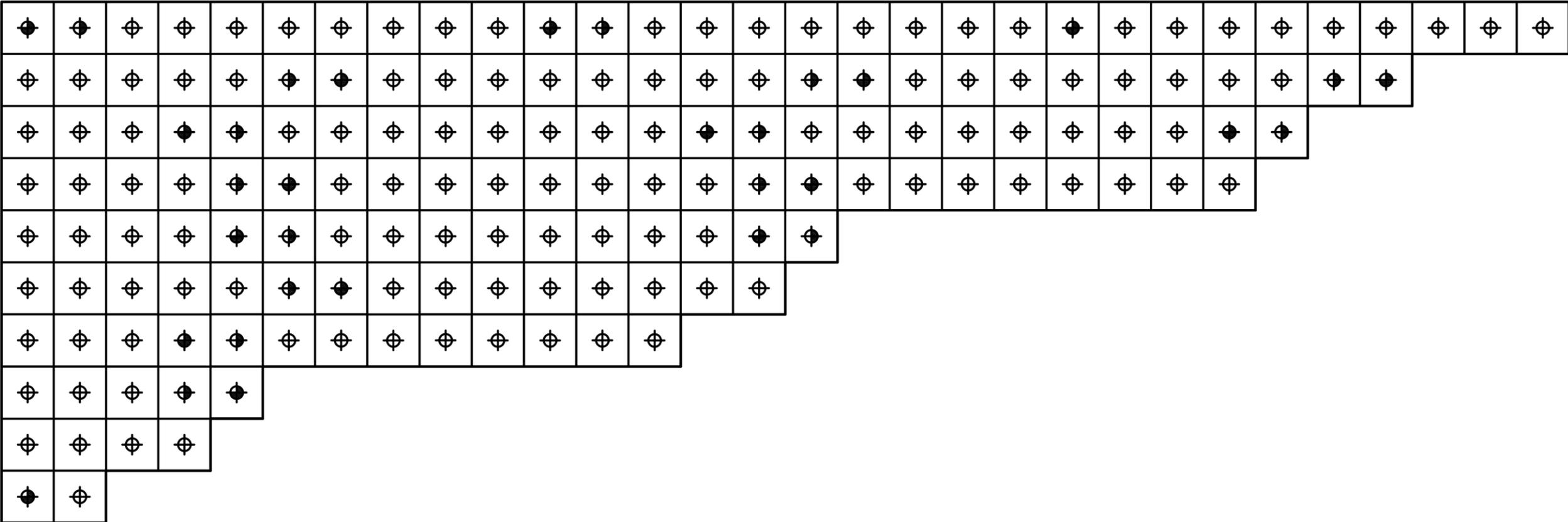


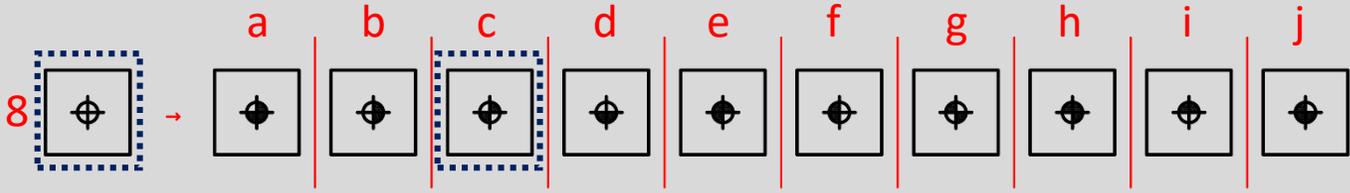
R8a_(17x)



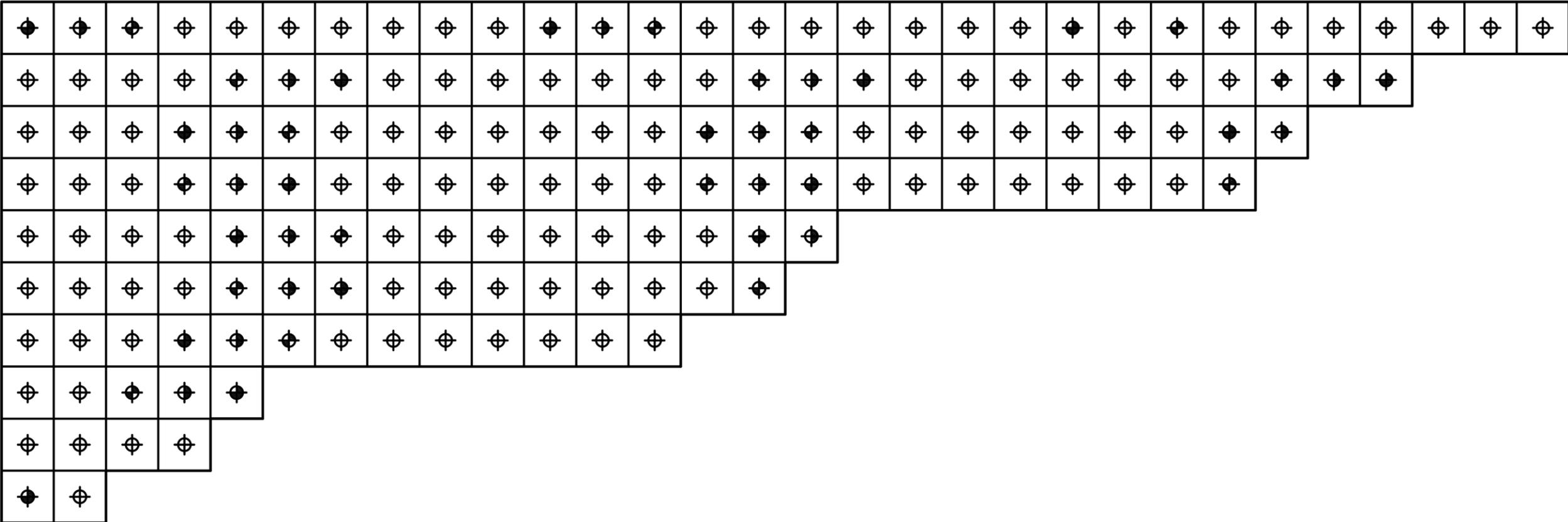


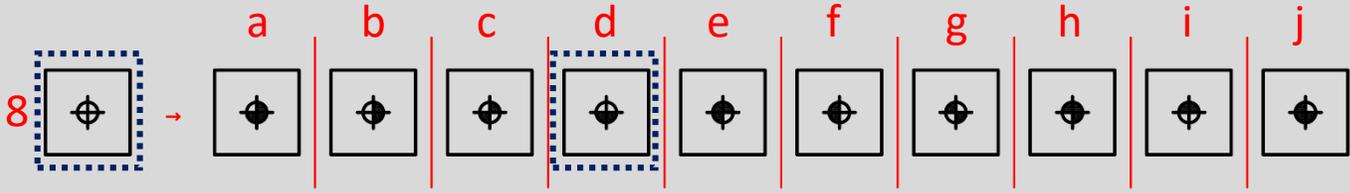
R8b_(15x)



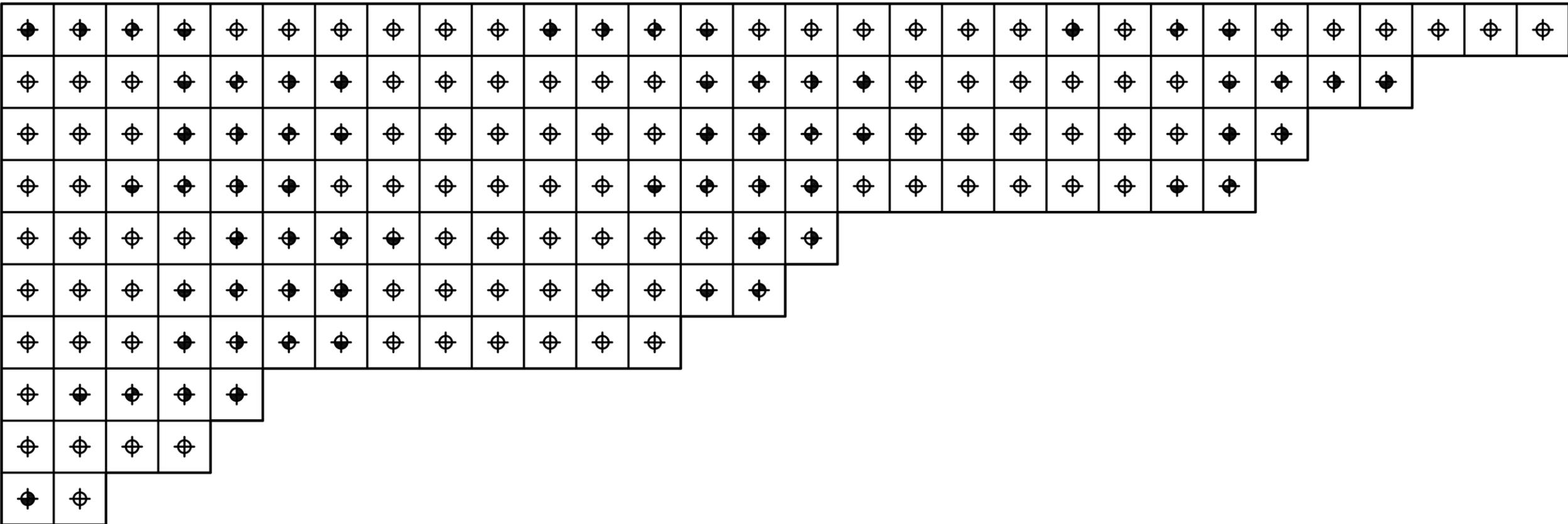


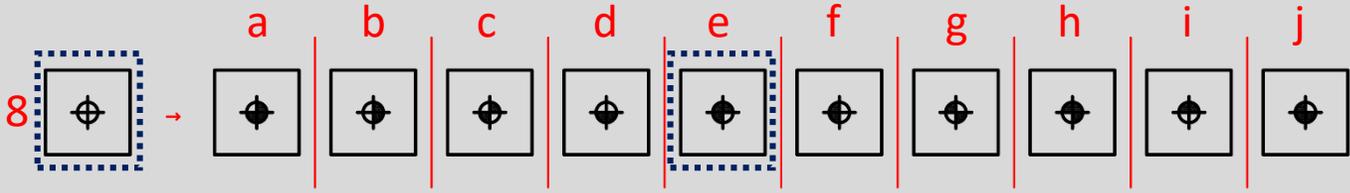
R8C_(16x)



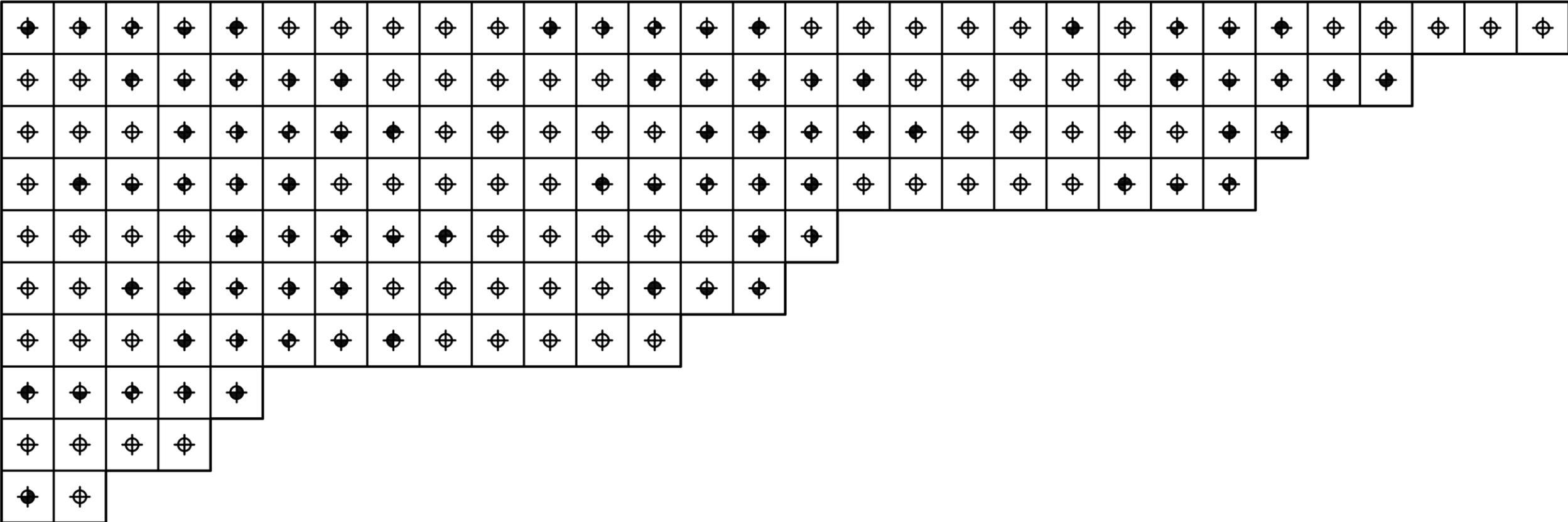


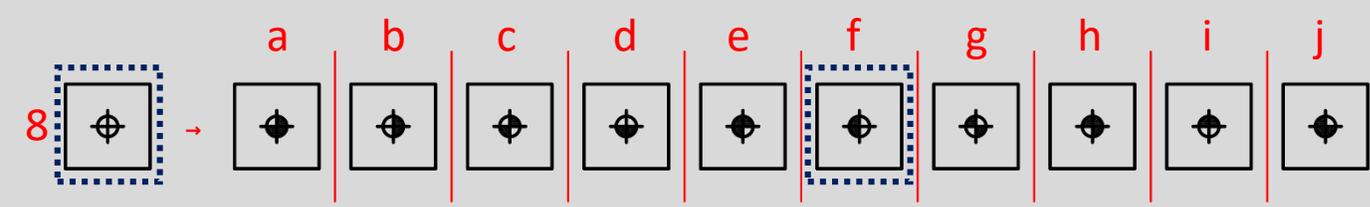
R8d_(16x)



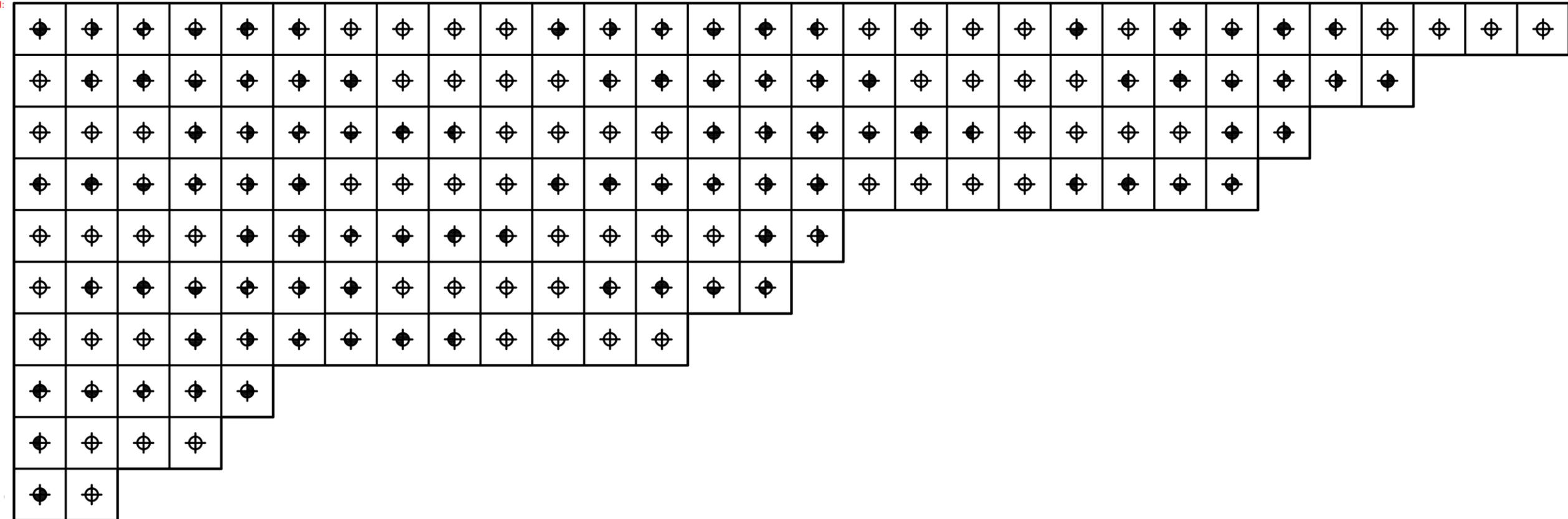


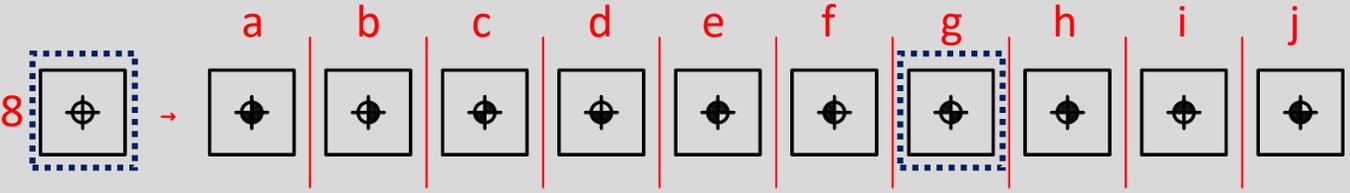
R8e_(16x)



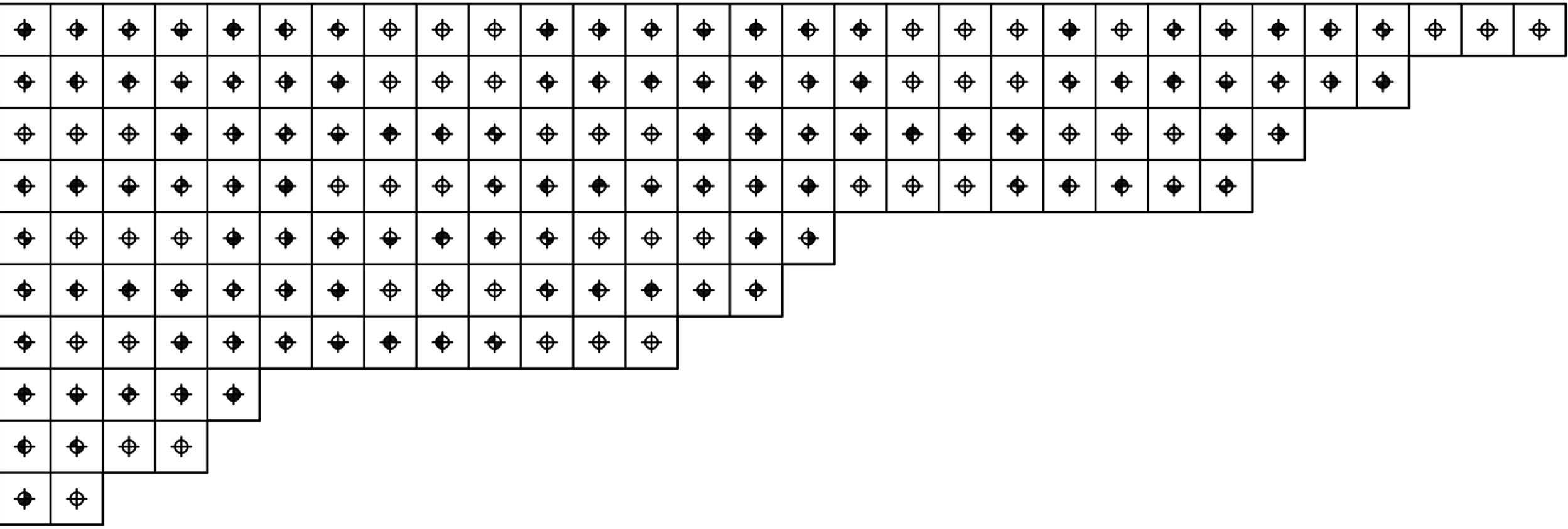


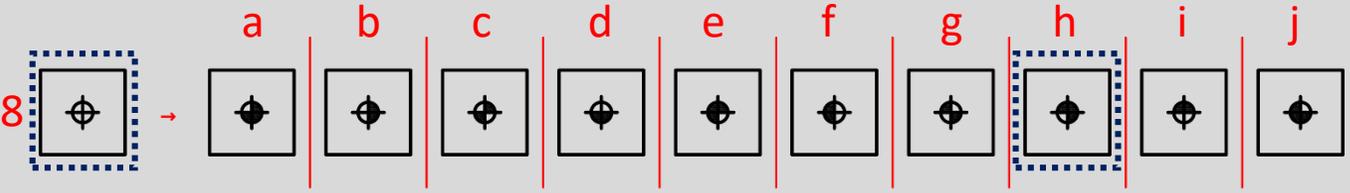
R8f (16x)



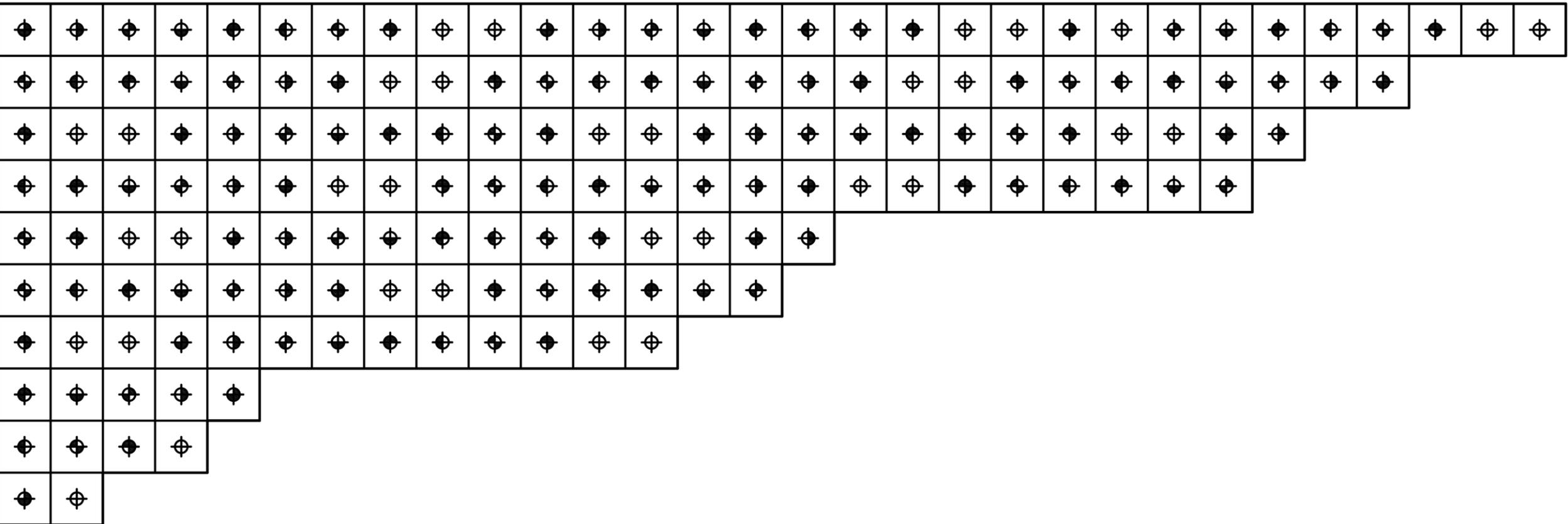


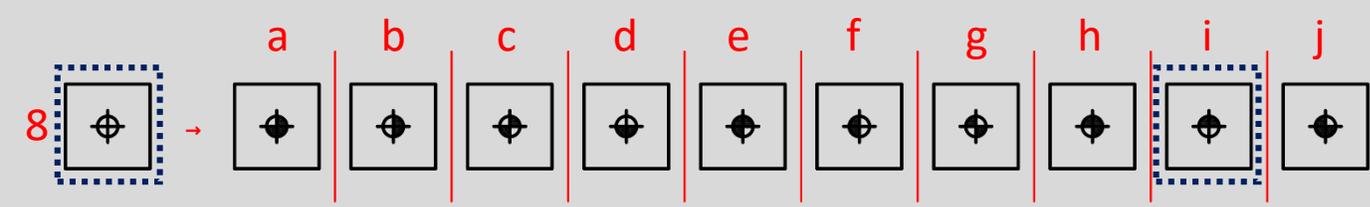
R8g_(16x)
 ↓↓



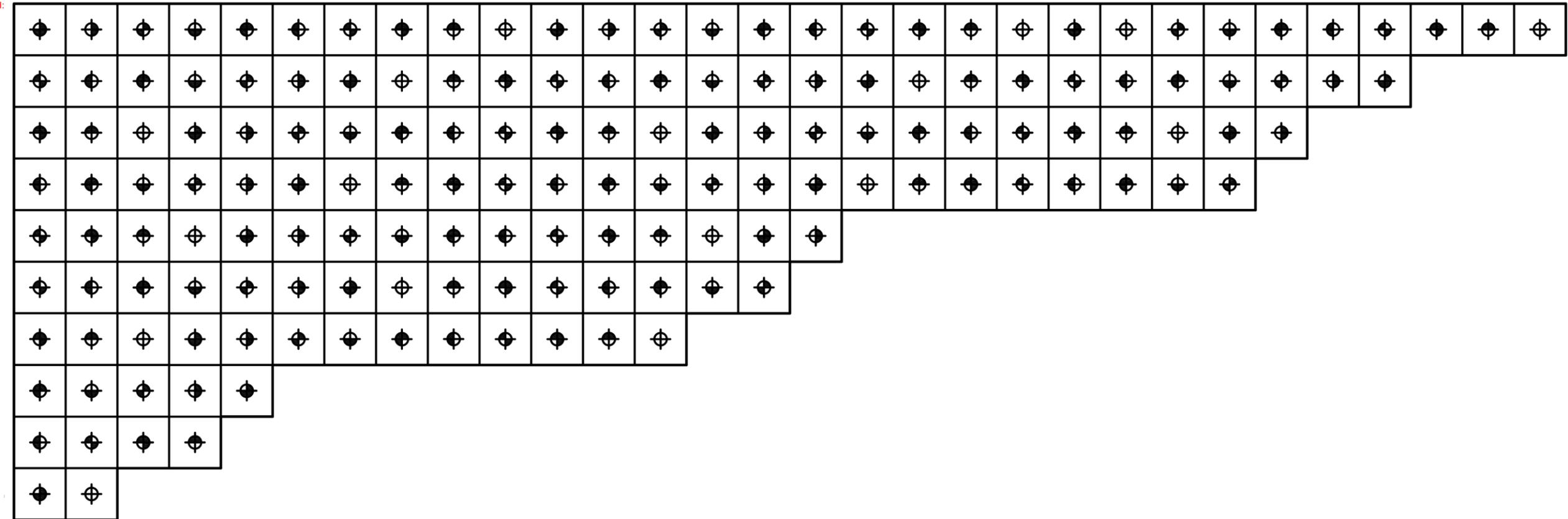


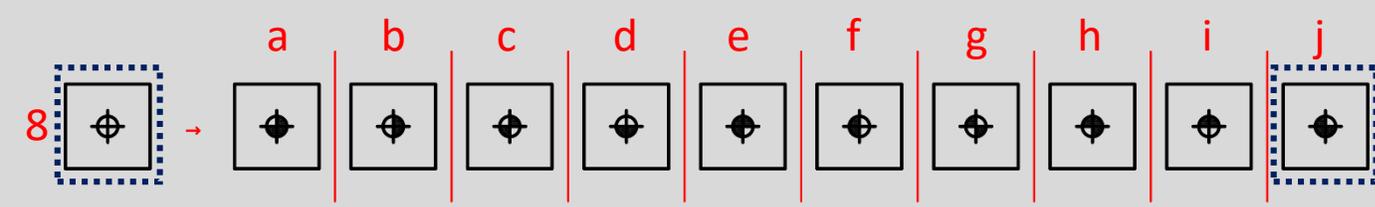
R8h_(16x)
 ↓↓



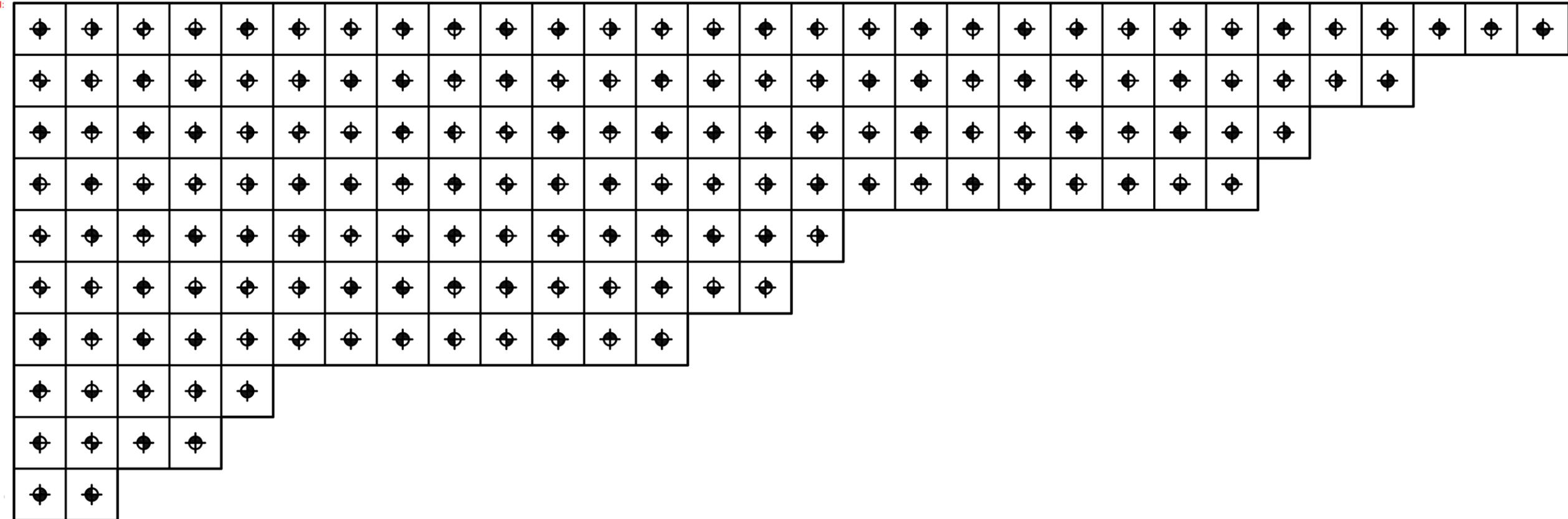


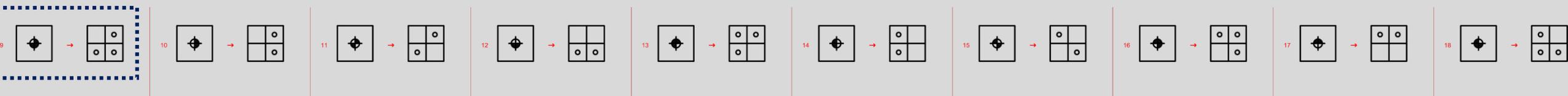
R8i (16x)
 ↓↓



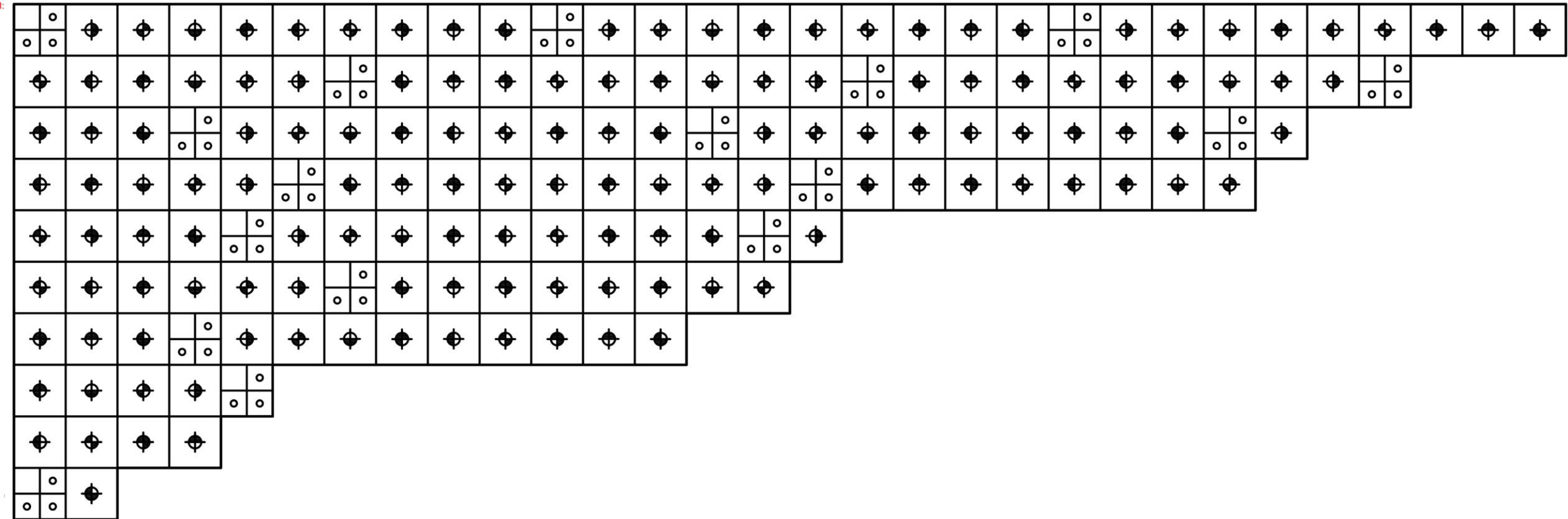


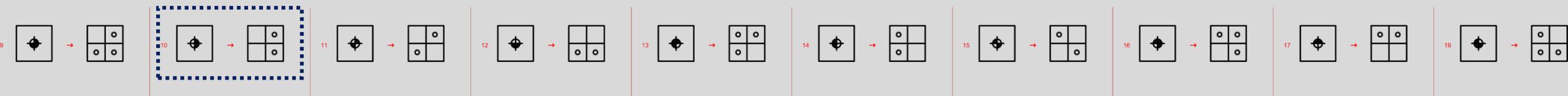
R8j (16x)



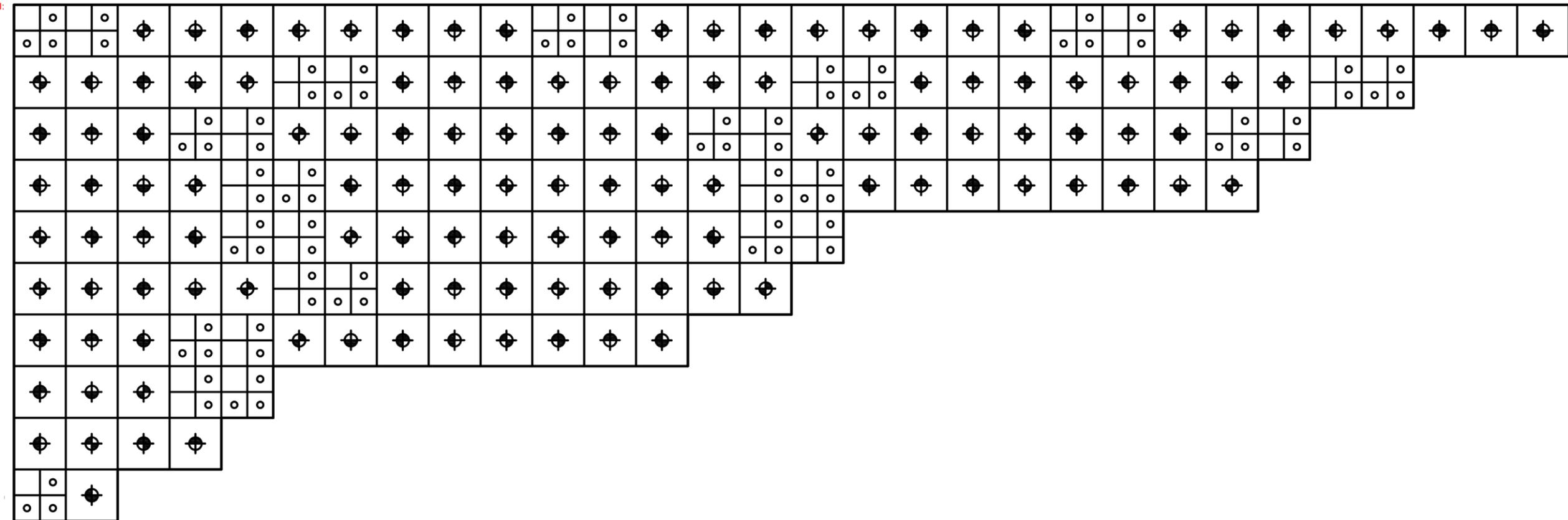


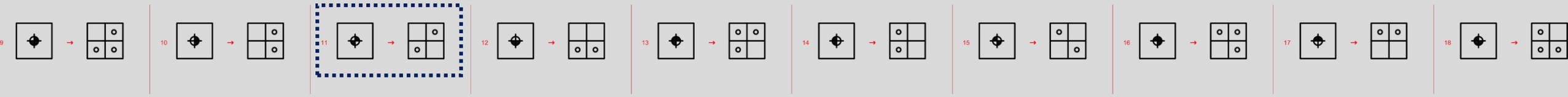
R9 (17x)



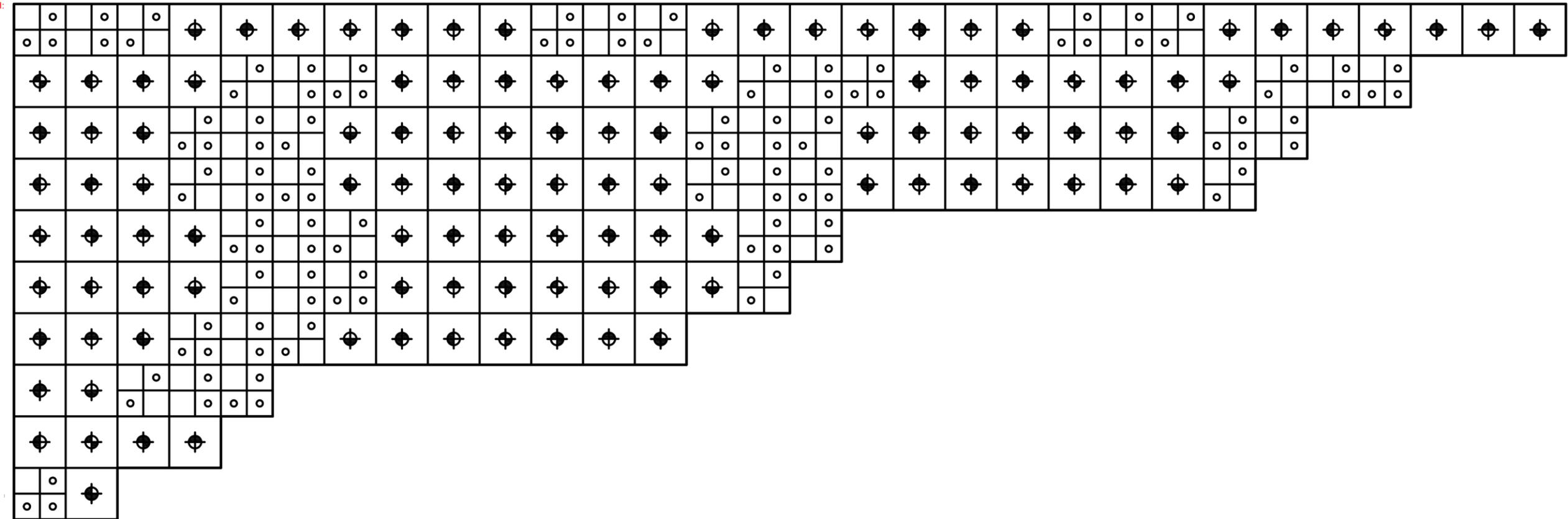


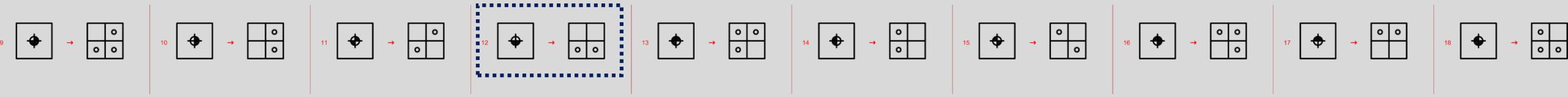
R10_(16x)



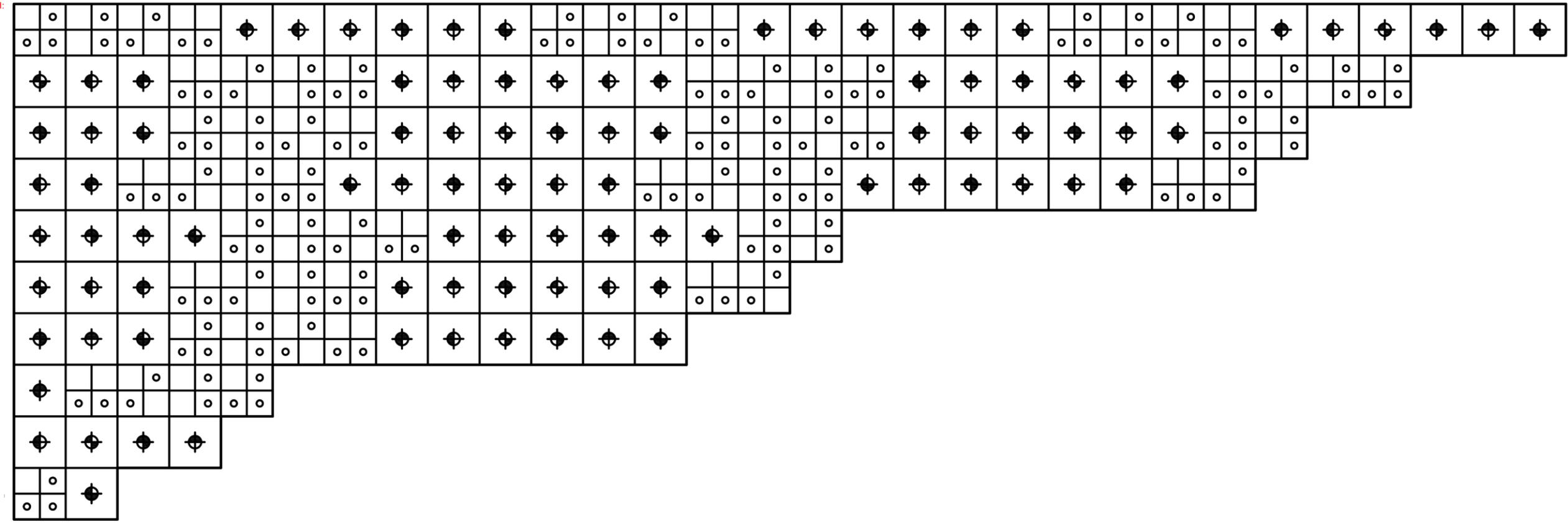


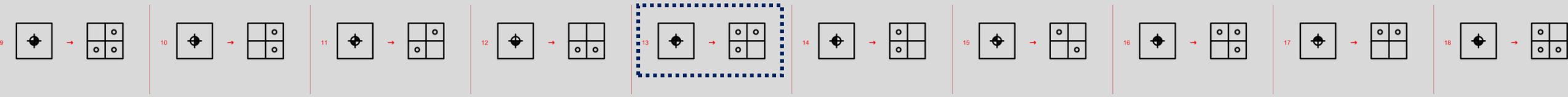
R11 (16x)



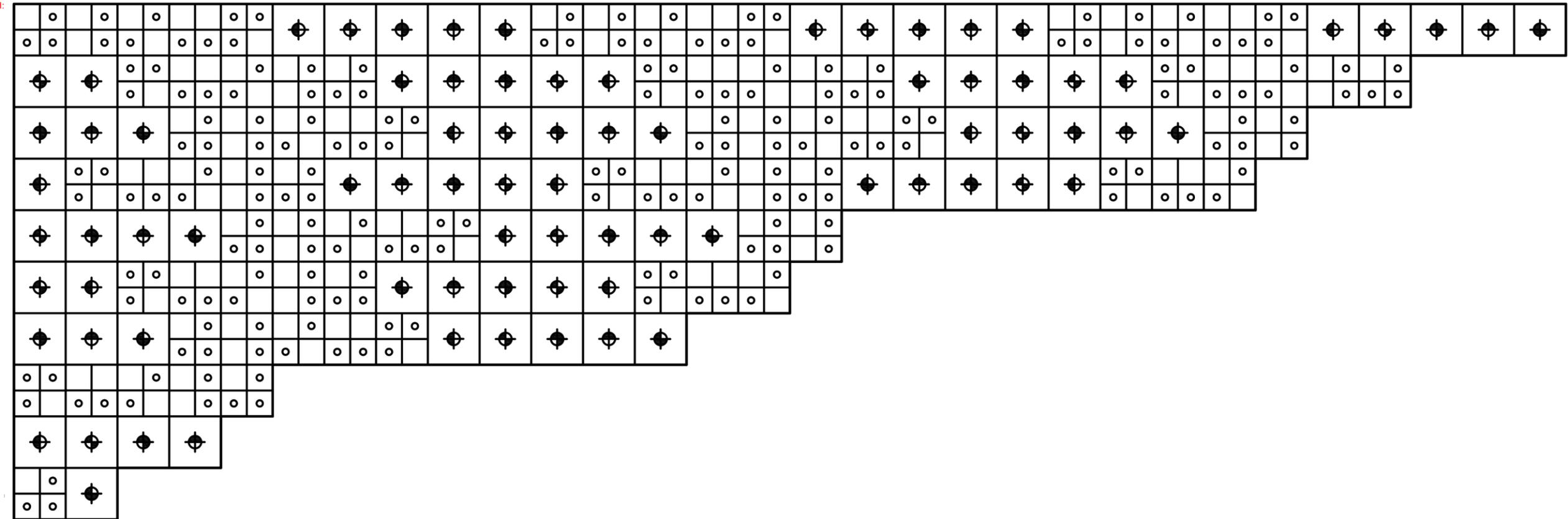


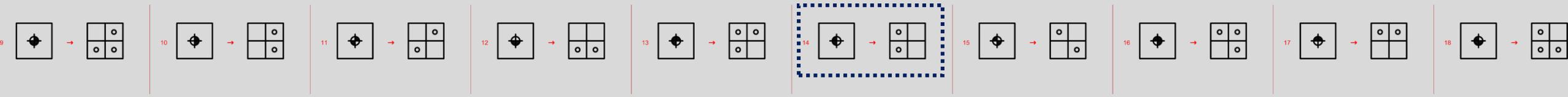
R12_(16x)



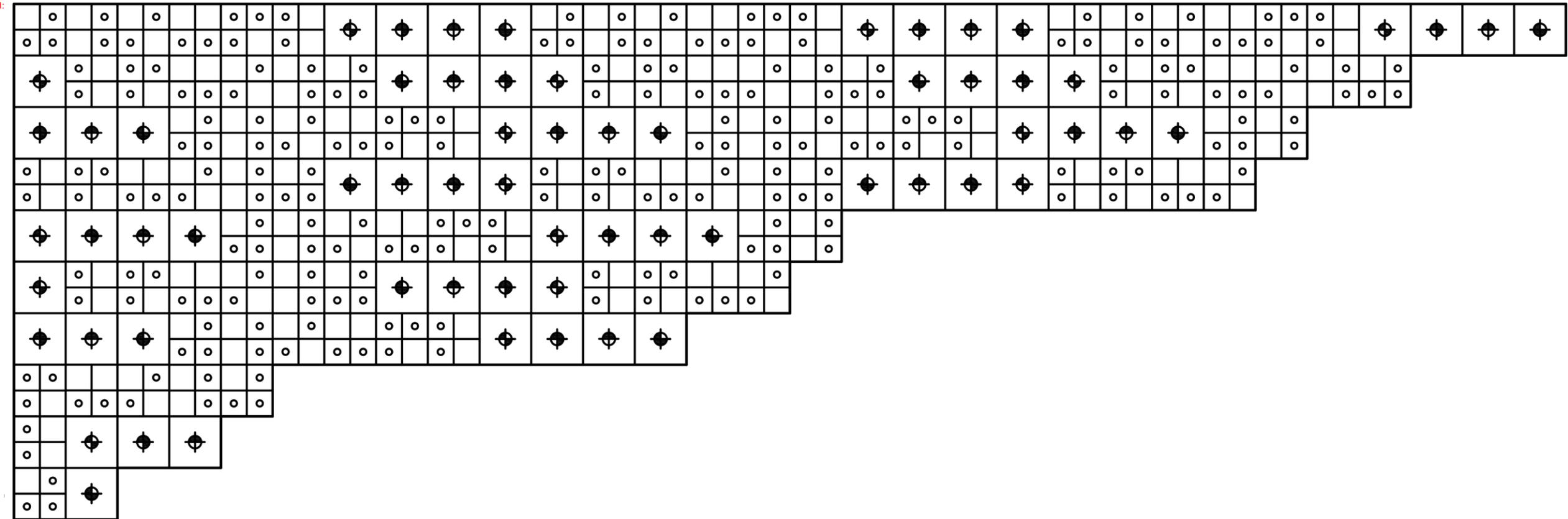


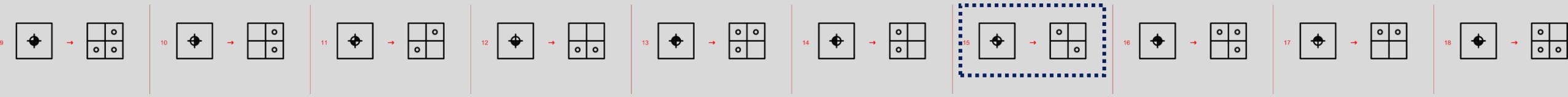
R13_(16x)



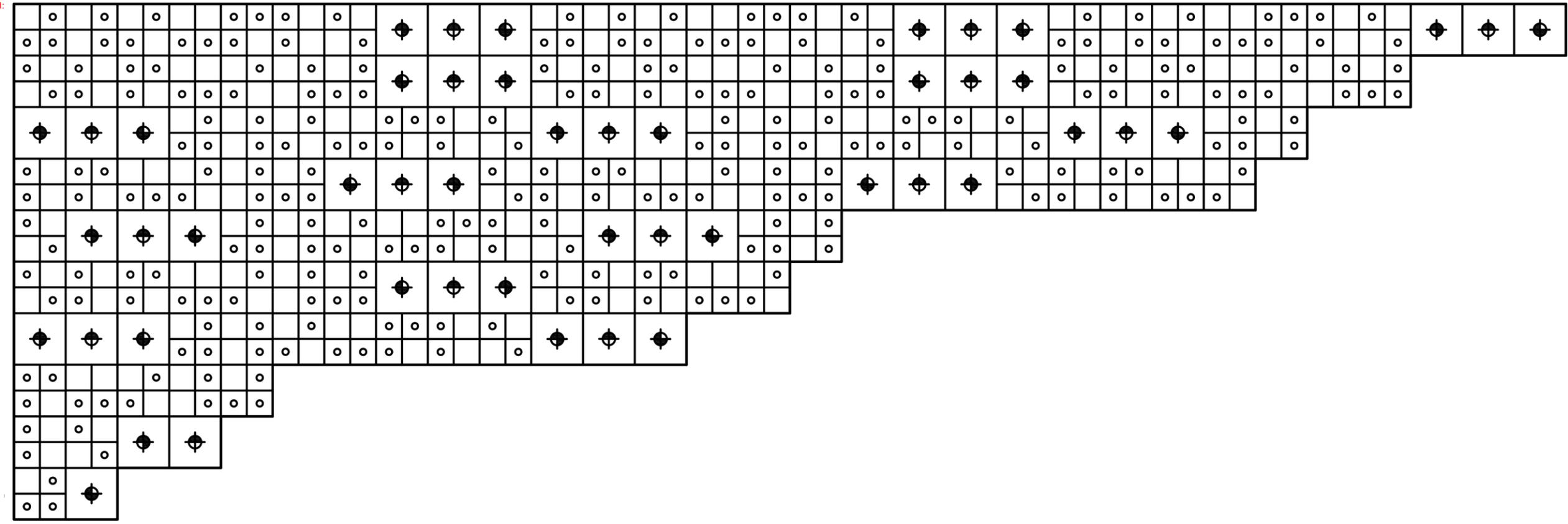


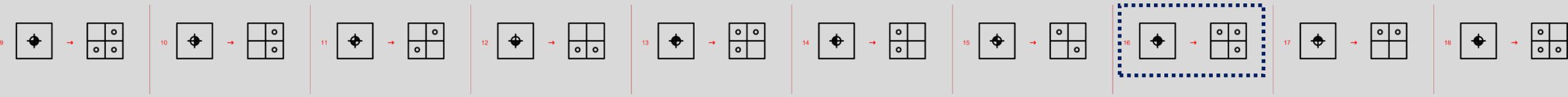
R14_(16x)



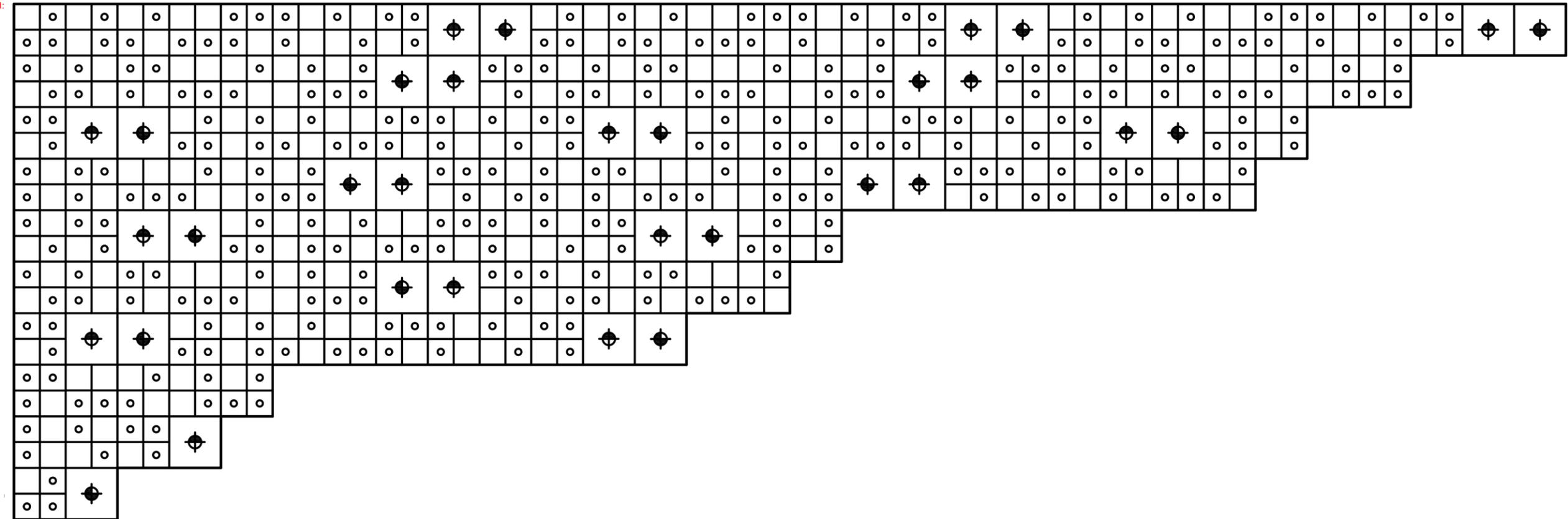


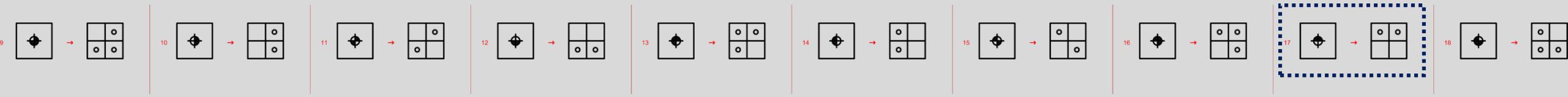
R15_(16x)



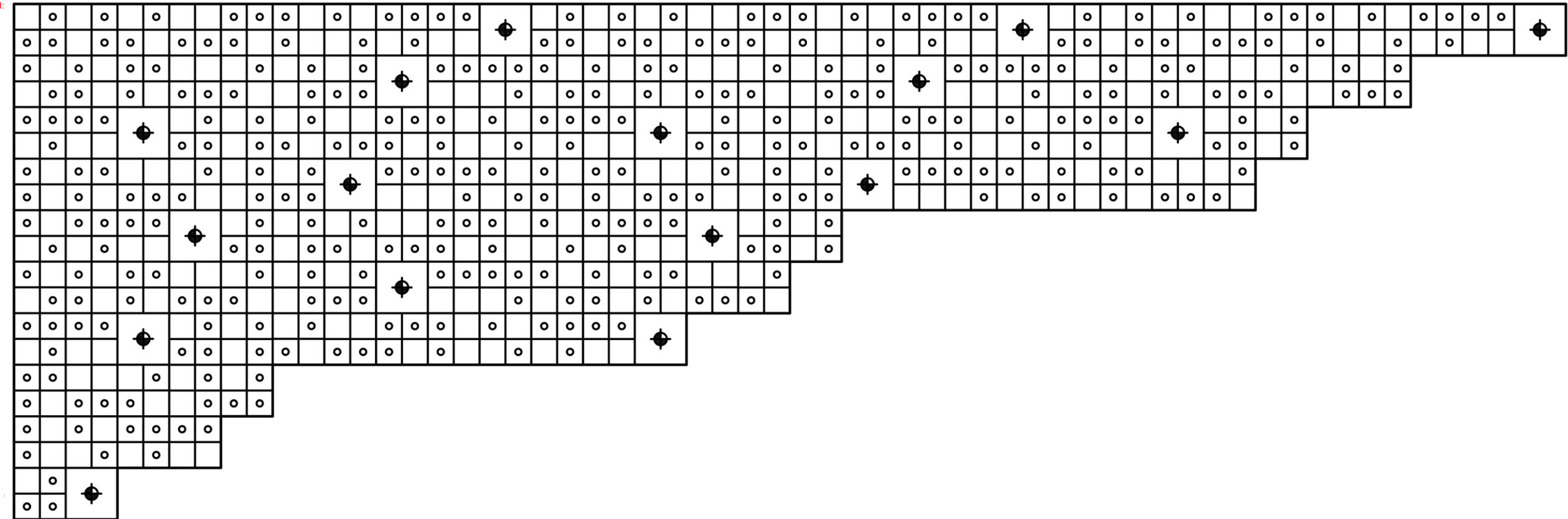


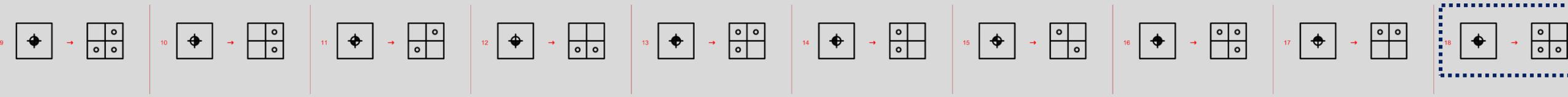
R16_(16x)



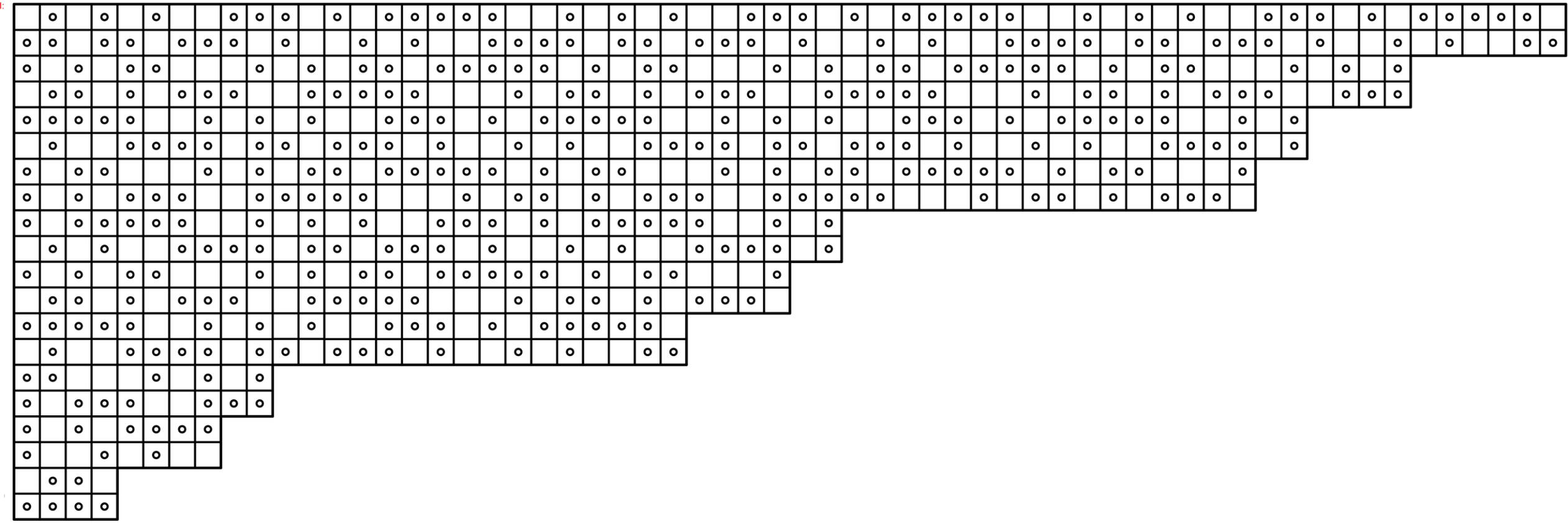


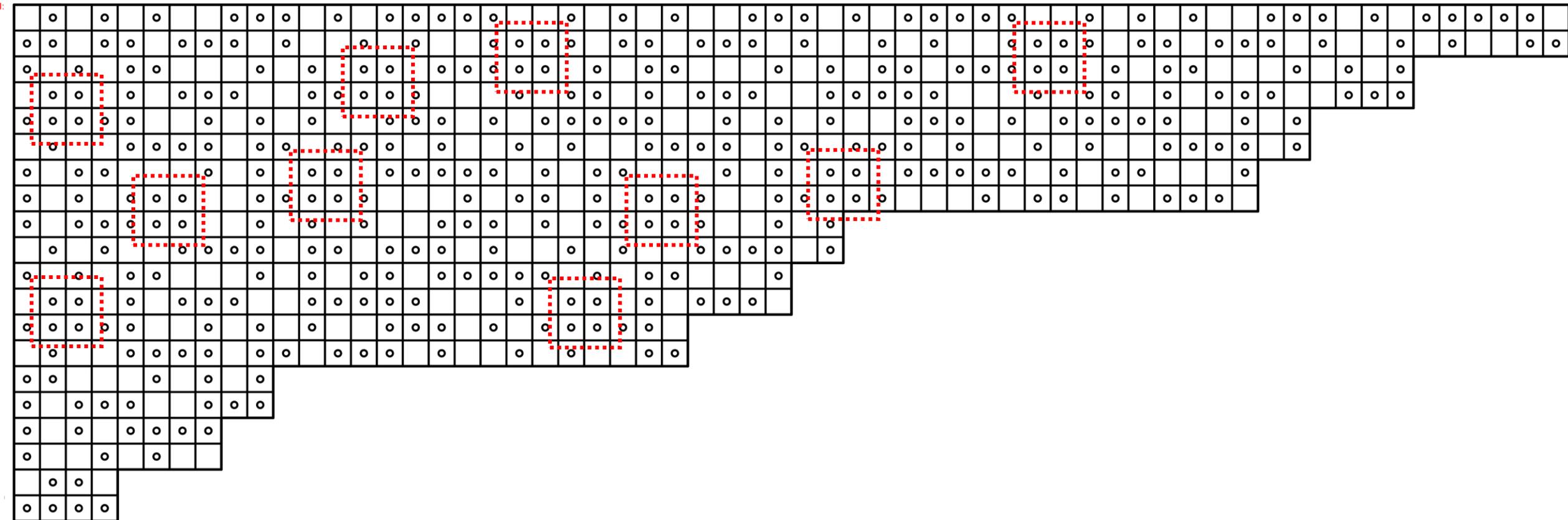
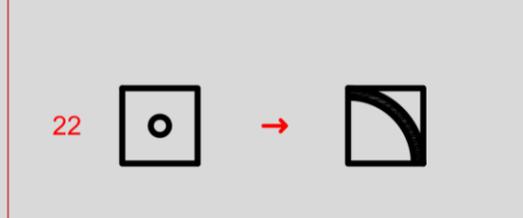
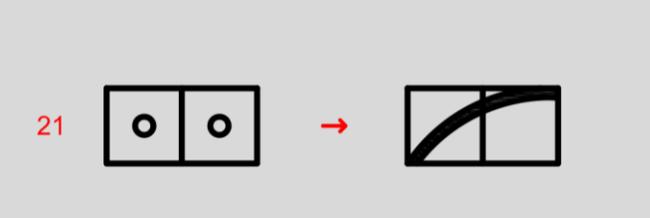
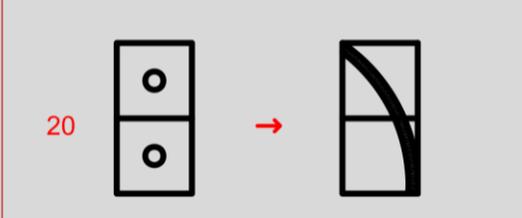
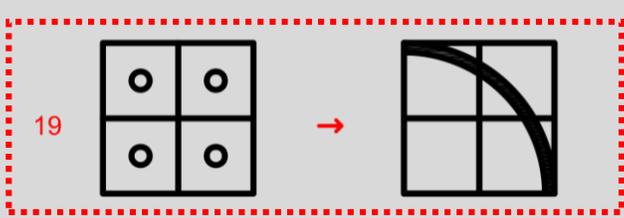
R17_(16x)

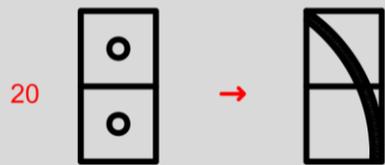
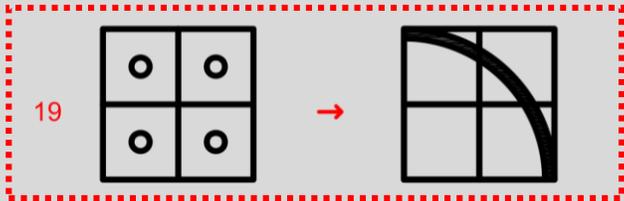




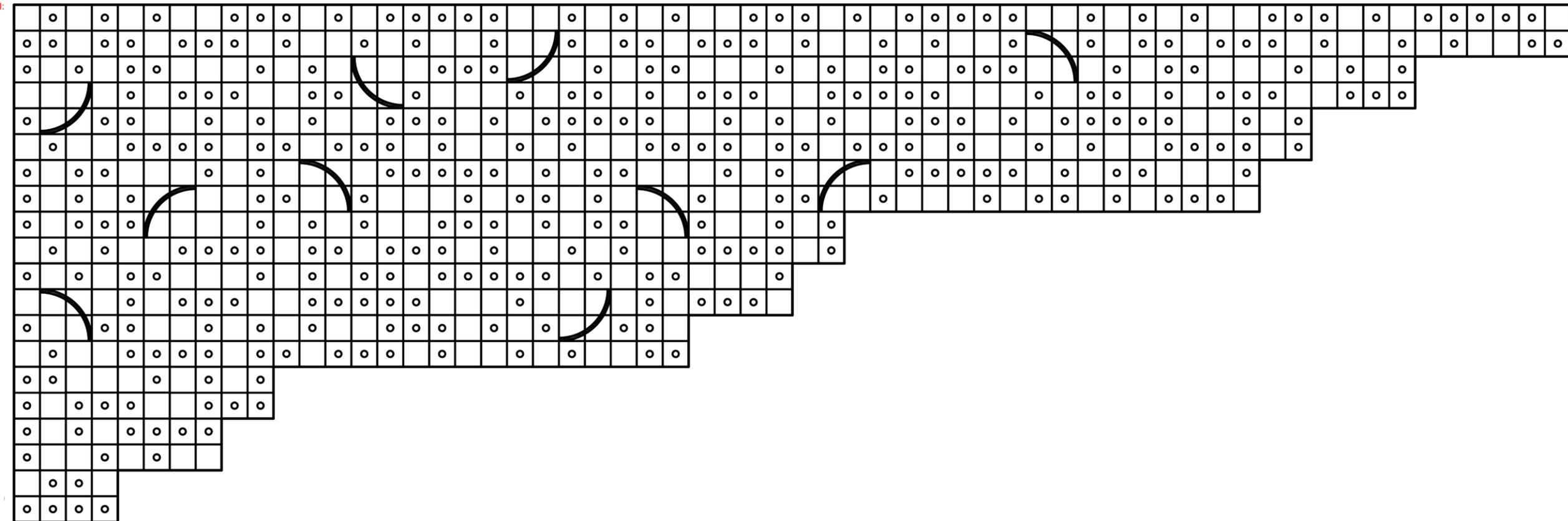
R18_(16x)



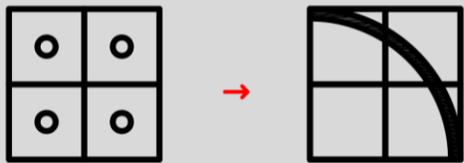




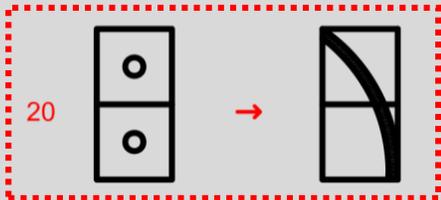
R19_(10x)



19



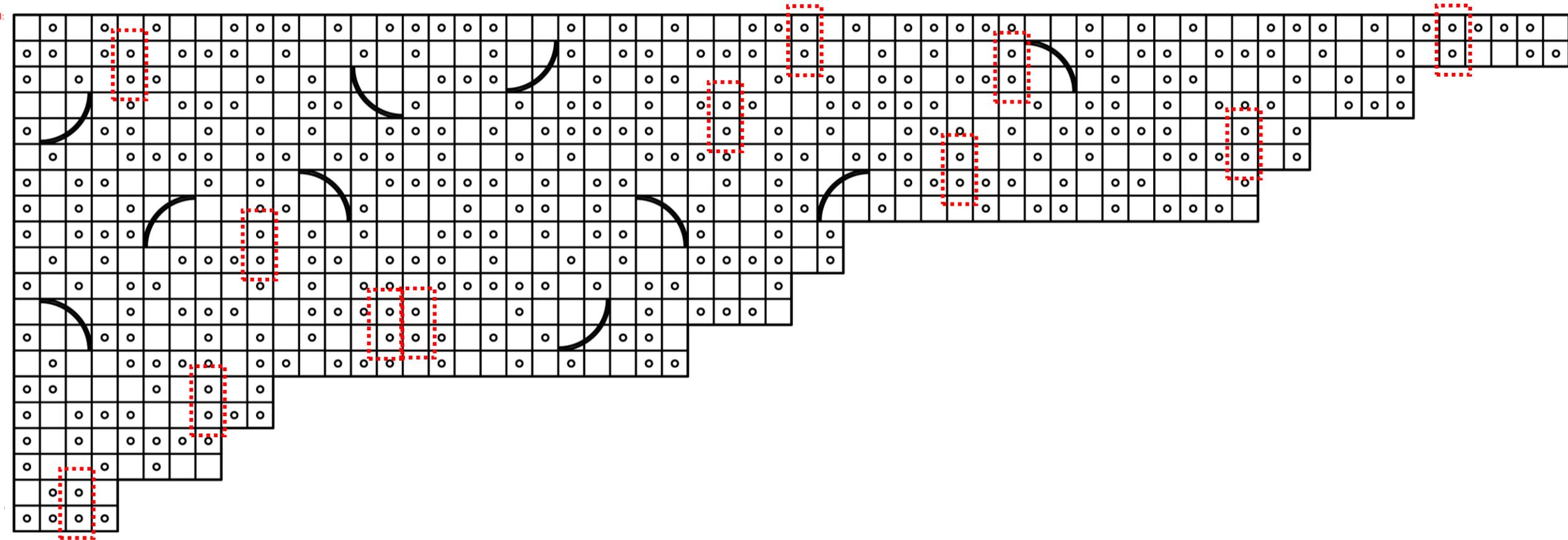
20



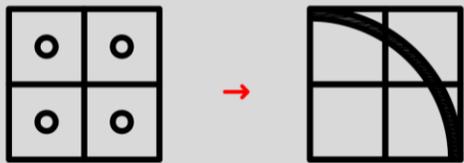
21



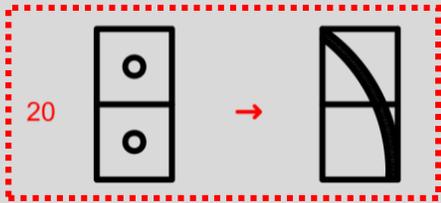
22



19



20



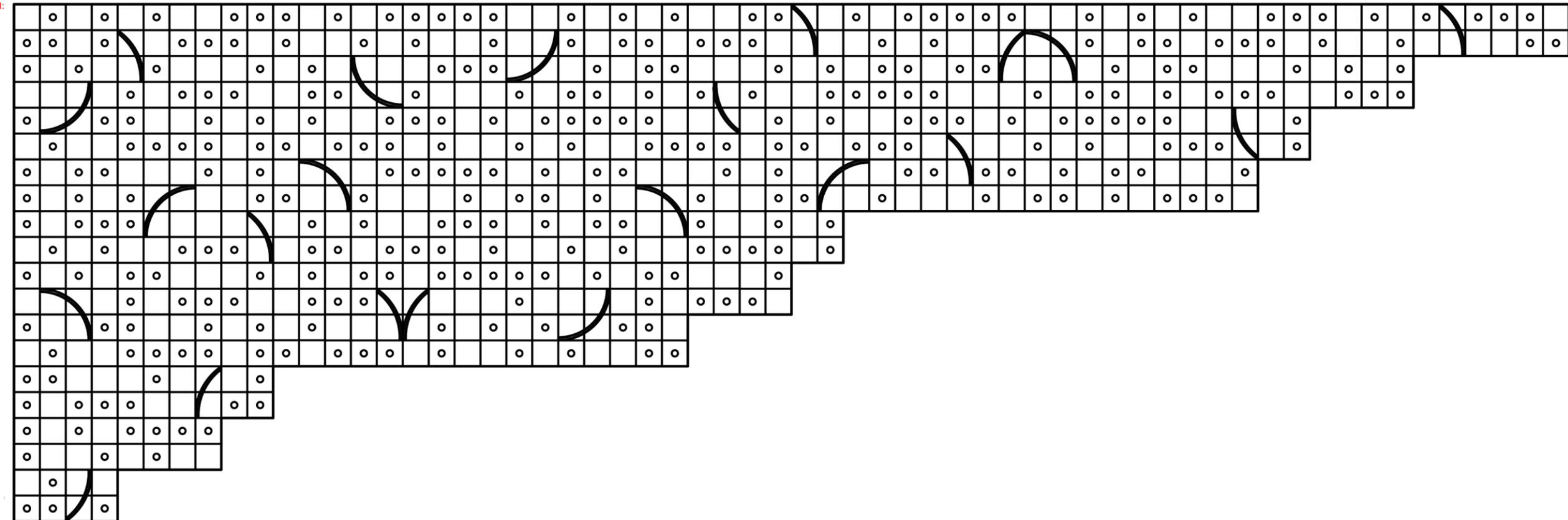
21



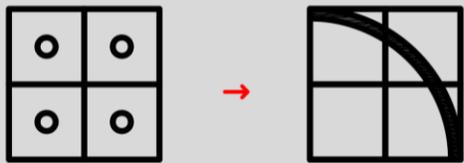
22



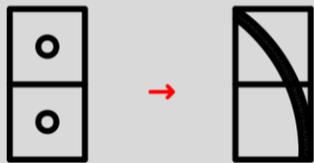
R20_(12x)



19



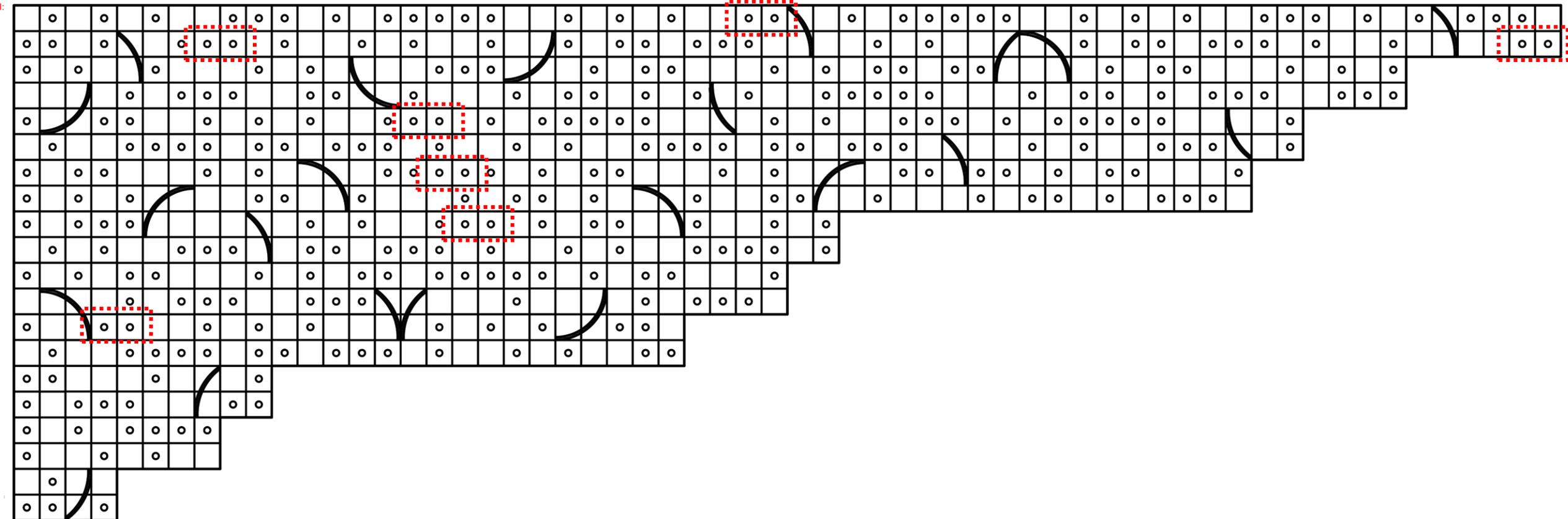
20



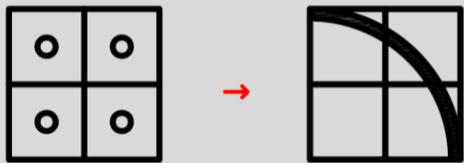
21



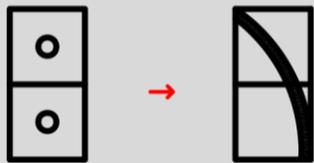
22



19



20



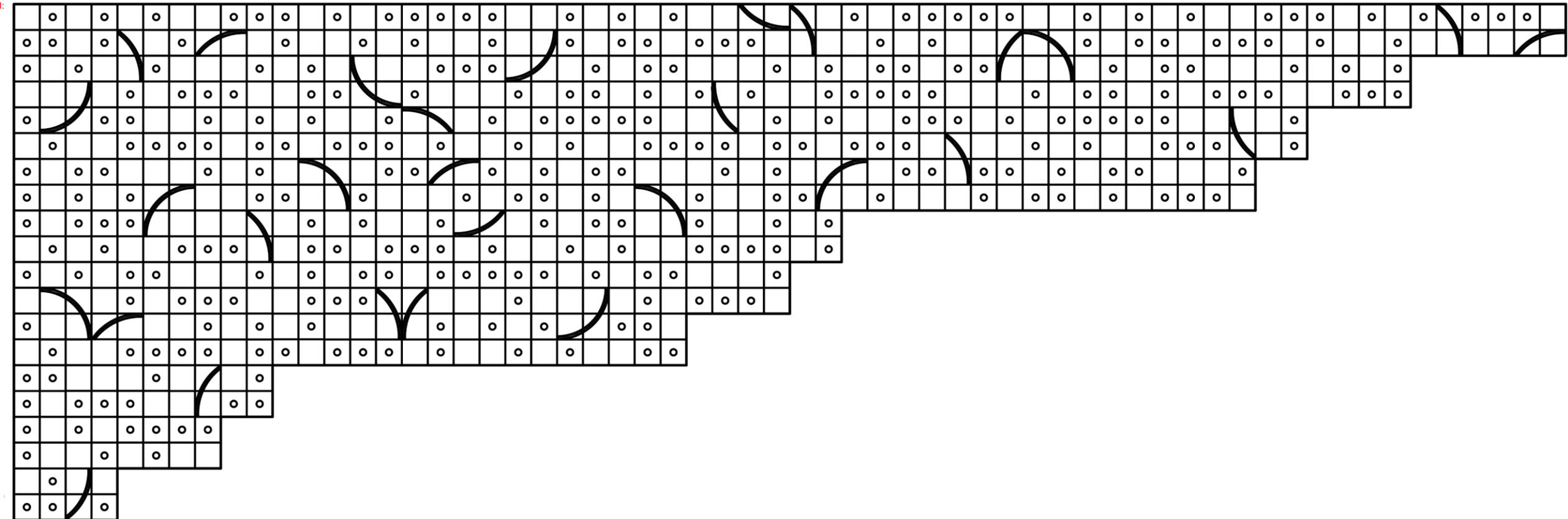
21



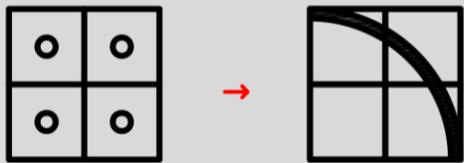
22



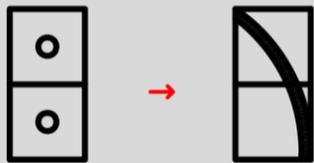
R21_(7x)



19



20



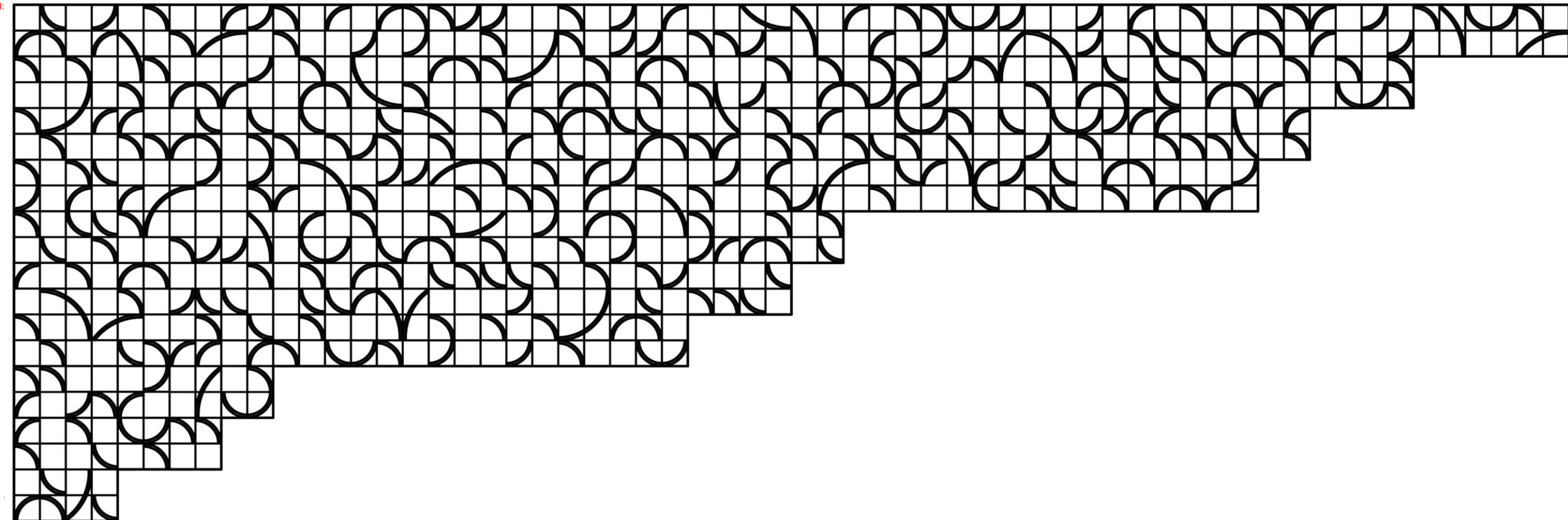
21

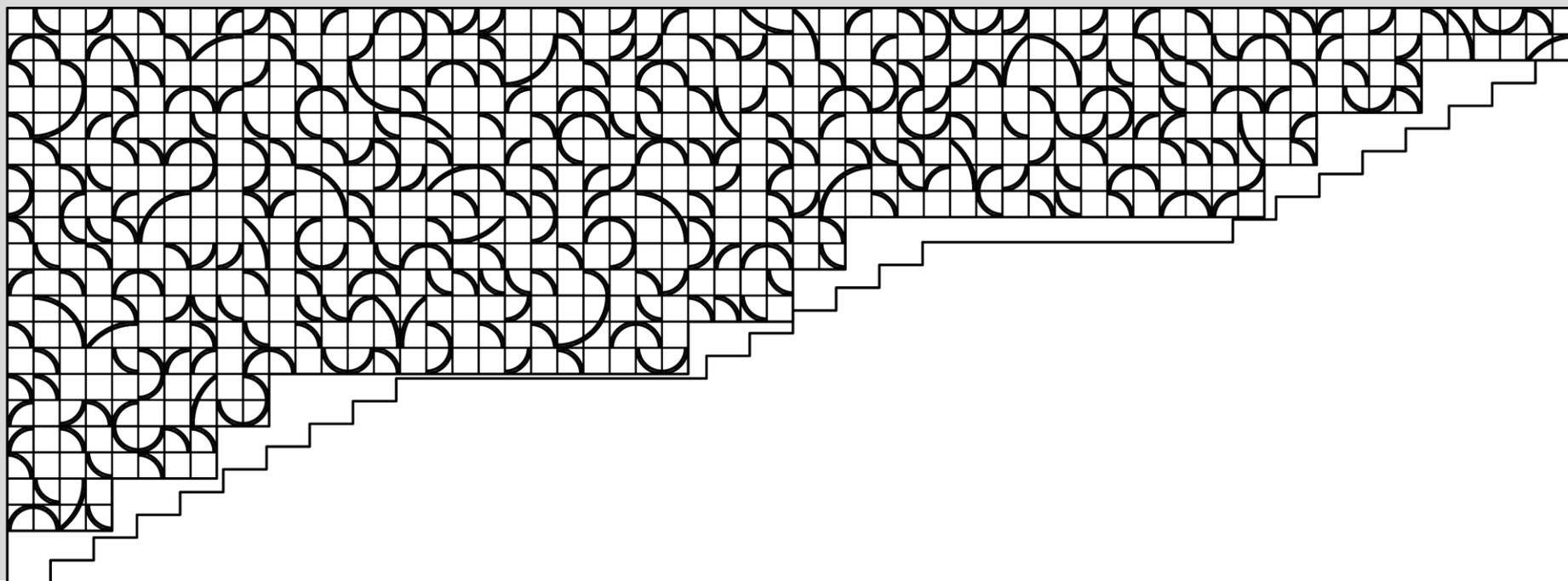


22



R22 (313x)





Quantificação

644 azulejos

313 com arco pequeno

263 azulejos vazios (brancos)

19 com arcos distorcidos (38 peças)

10 com arcos grandes (30 peças)

