



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)

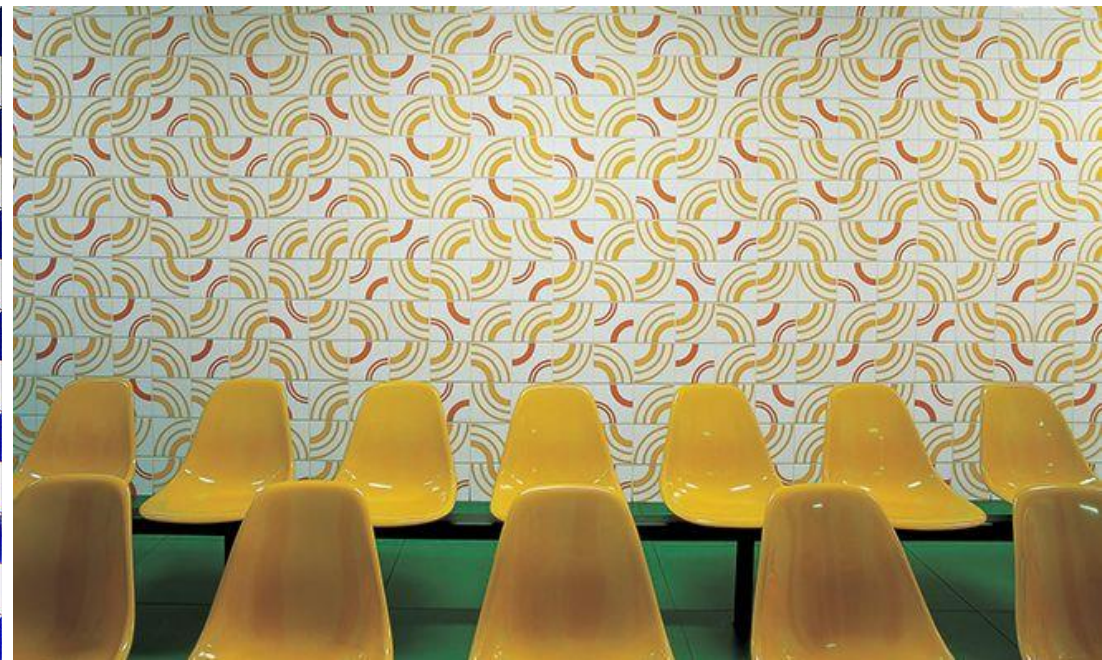
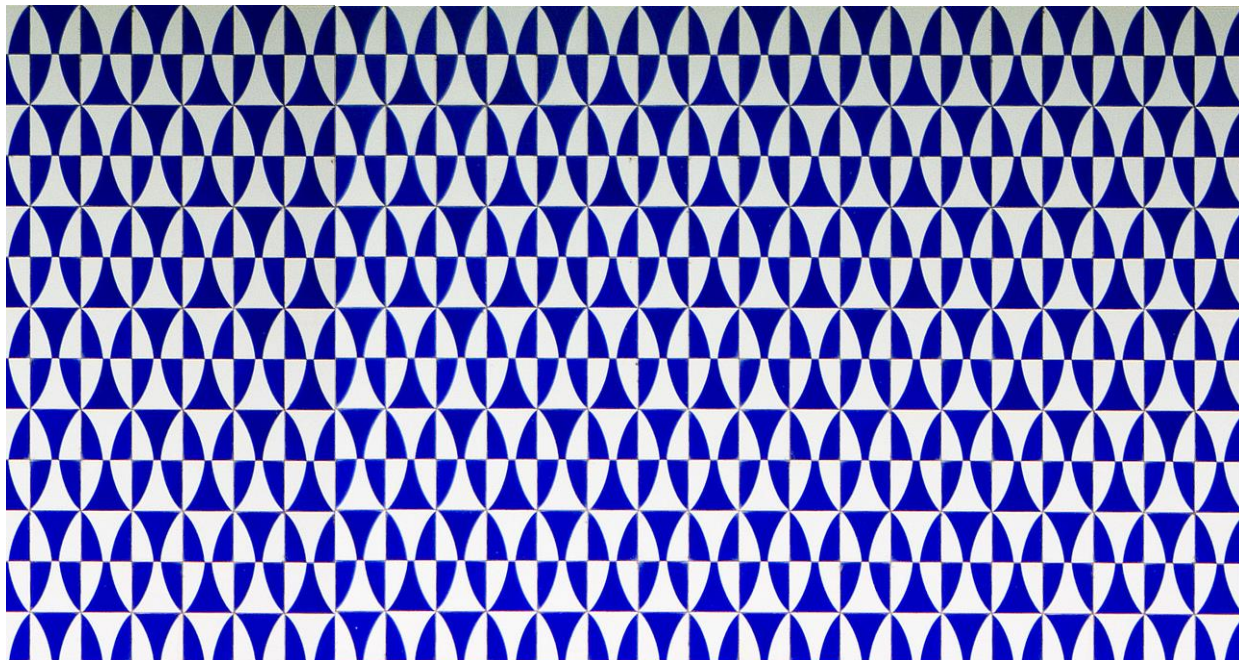
Maria Keil_ **Trecho do mural da estação de Pícoas/Lisboa** (2,4 x 1,2m)

ATHOS BULCÃO (AB)

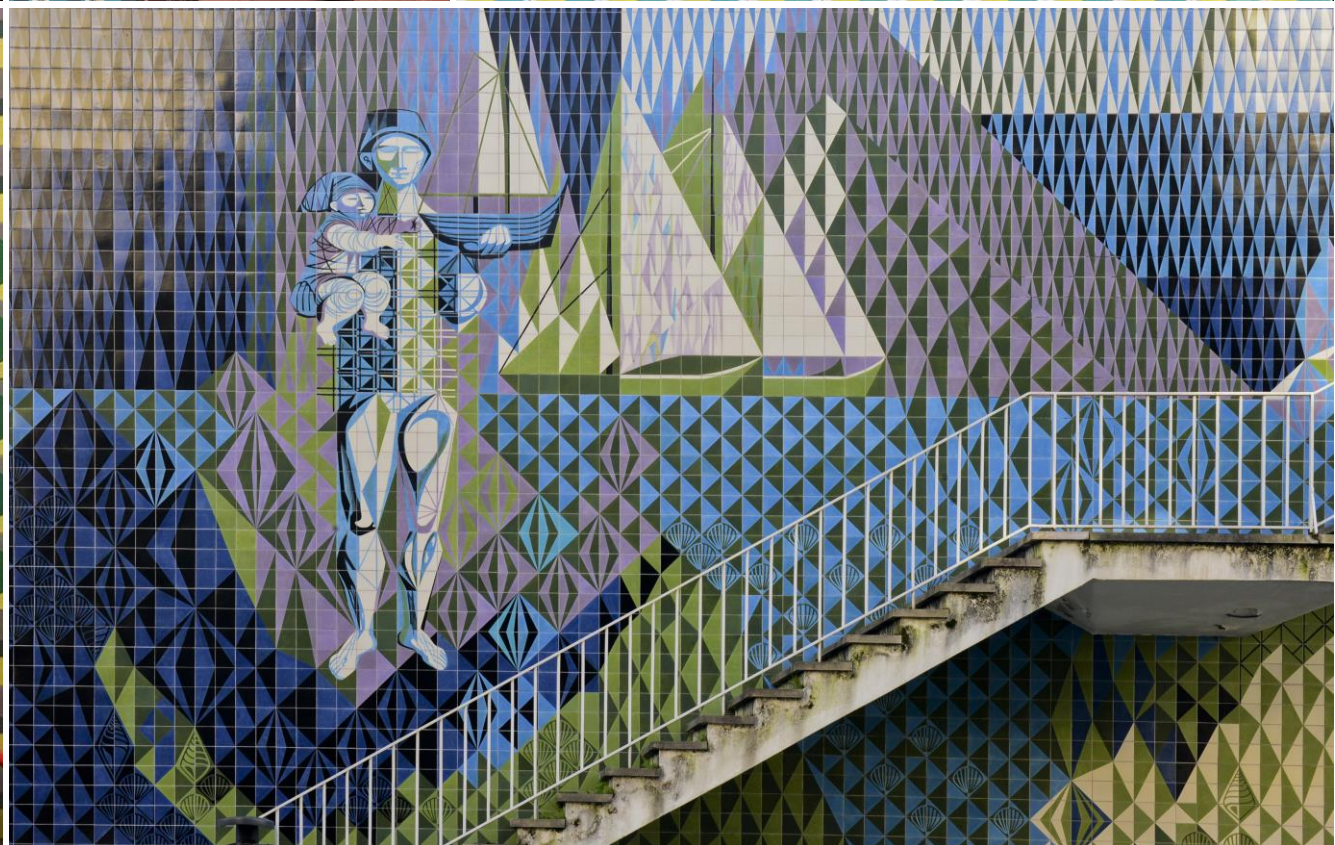


MARIA KEIL (MK)





Athos Bulcão diversidade da obra



Maria Keil diversidade da obra

MARIA KEIL (MK)

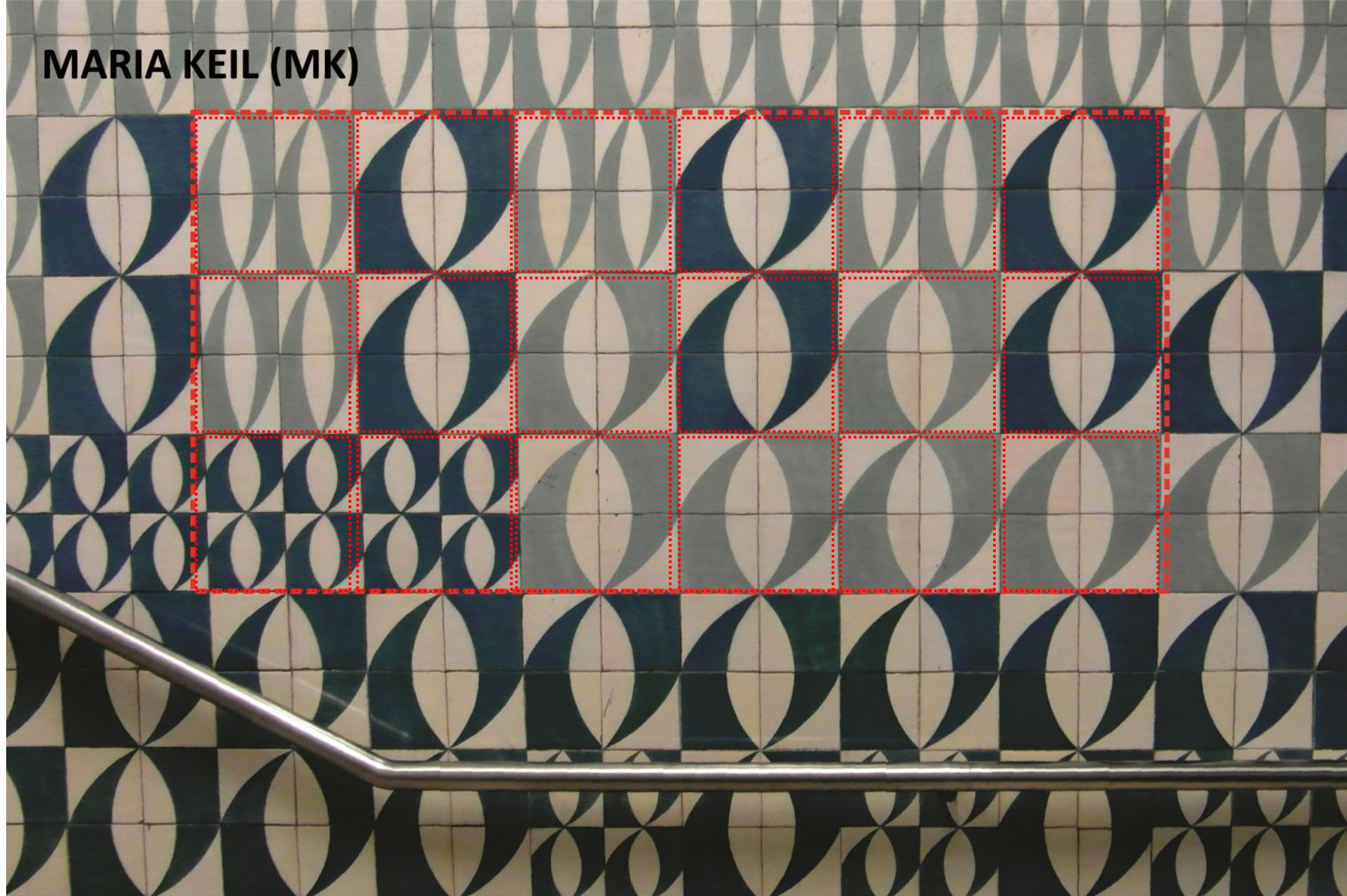
Seleção
2,4 m x 1,2 m



MARIA KEIL (MK)

Seleção
2,4 m x 1,2 m

Divisão em 18 quadrados
de 40 cm

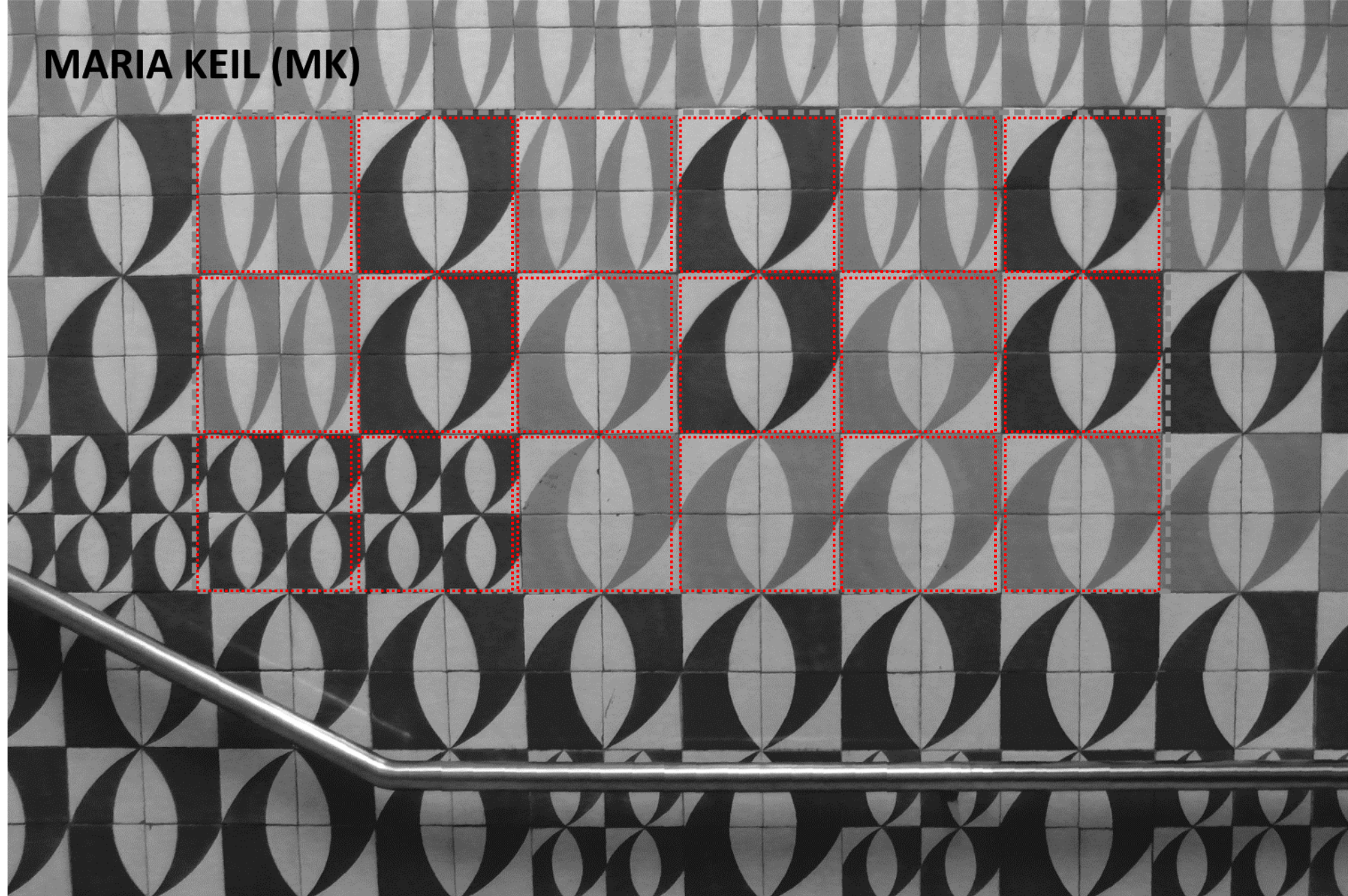


MARIA KEIL (MK)

Seleção
2,4 m x 1,2 m

Divisão em 18 quadrados
de 40 cm

As cores foram desconsideradas



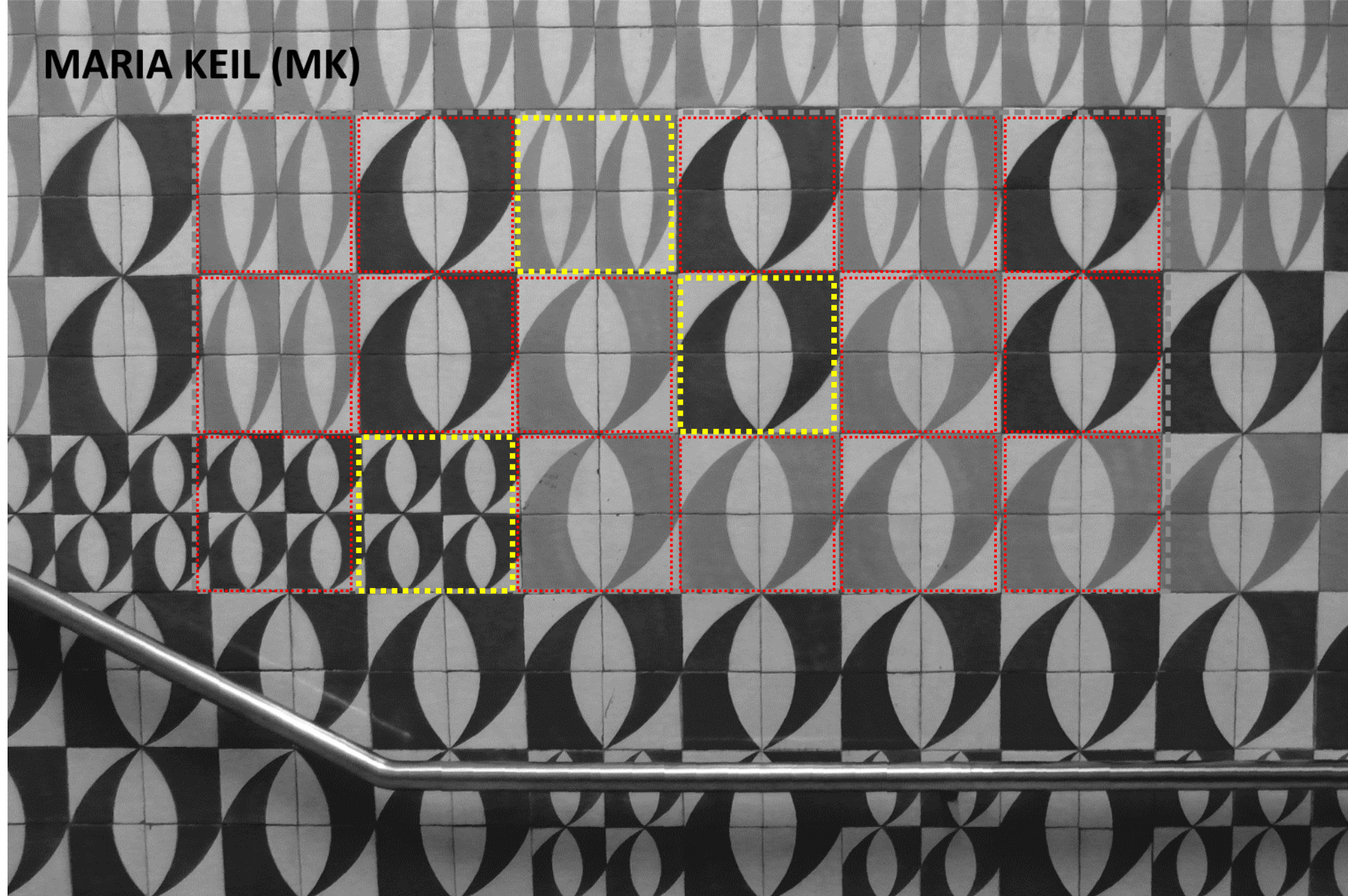
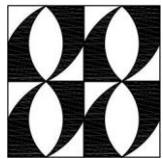
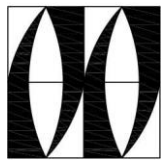
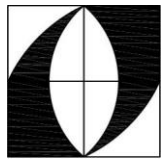
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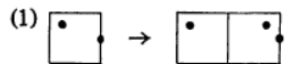
Contendo 3 variações do
mesmo tipo



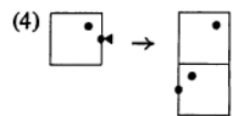
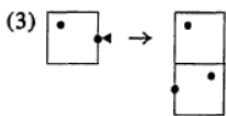
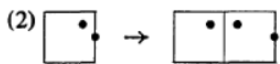
Modelo de apoio:
Ice-ray: a note on the generation of Chinese
lattice designs **Stiny**

S: —

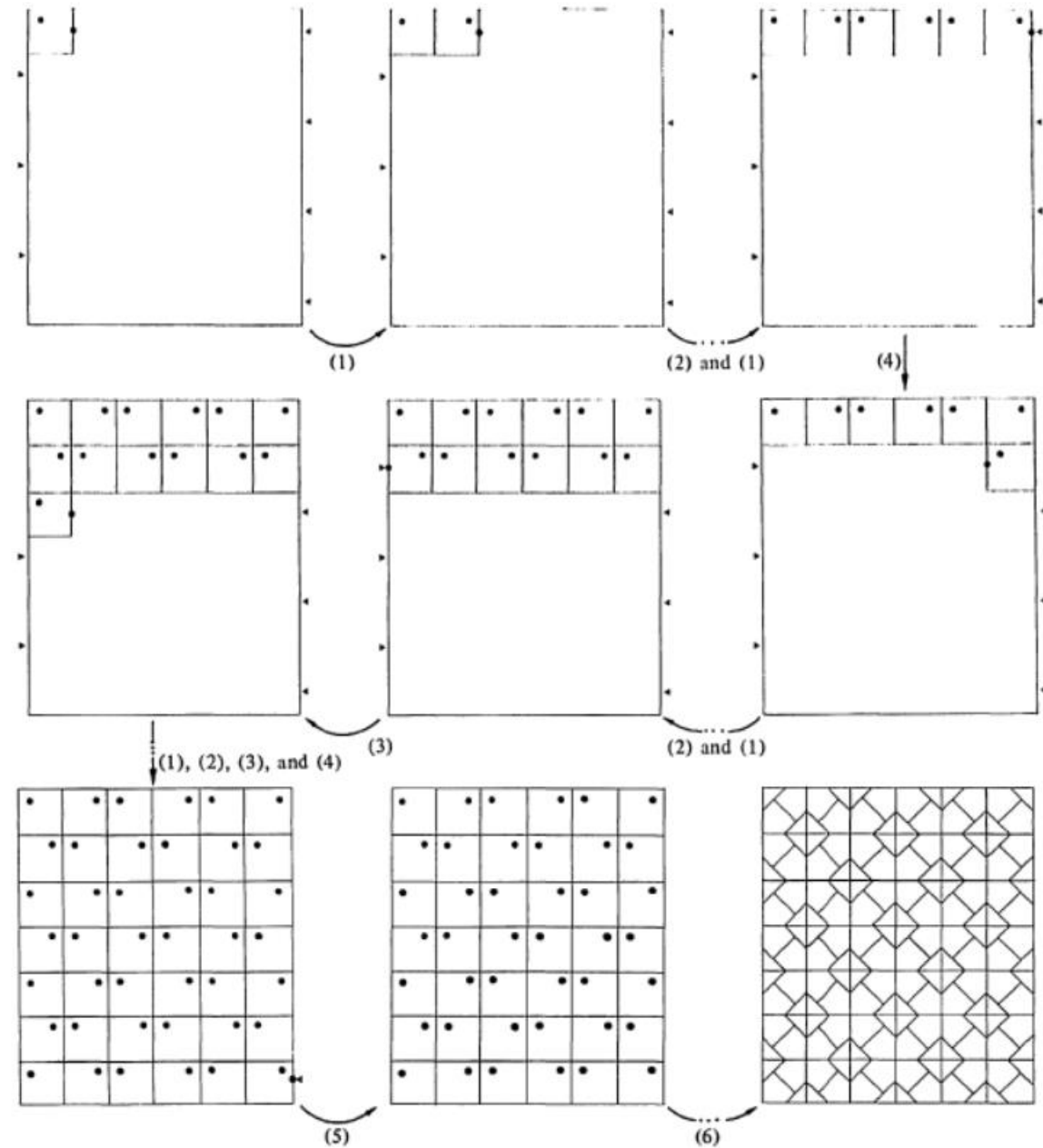
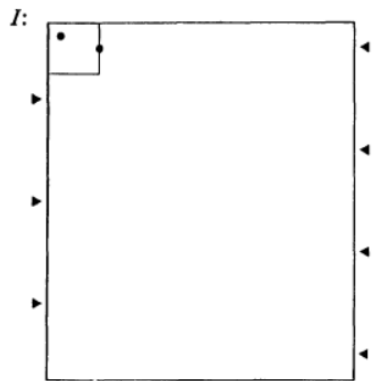
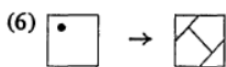
R:



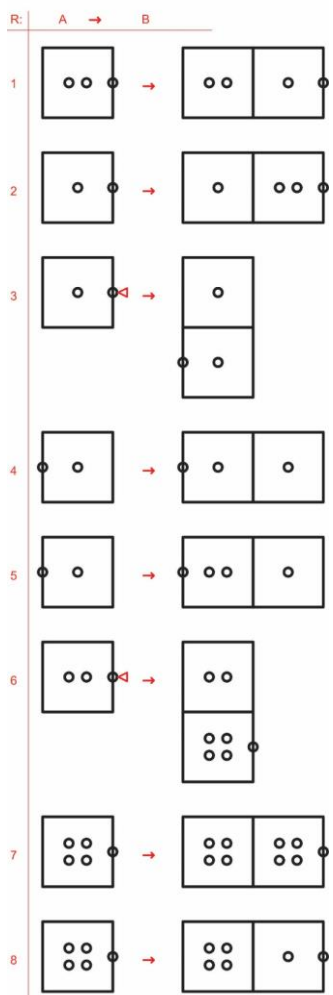
L: $\{(0, 0) : \bullet\}, \{(0, 0) : \blacktriangle\}$



(5) $\langle s_\emptyset, \{(0, 0) : \bullet, (0, 0) : \blacktriangle\} \rangle$
 $\rightarrow \langle s_\emptyset, \emptyset \rangle$



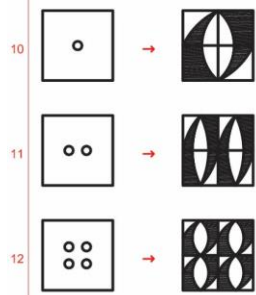
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Forma inicial

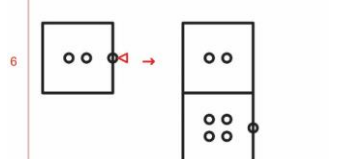
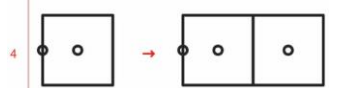
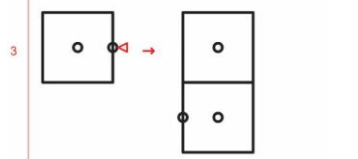
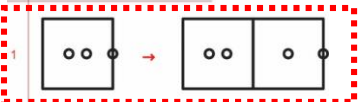


9 $\langle \bullet, \{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \bullet\} \rangle \rightarrow \langle \bullet, \emptyset \rangle$

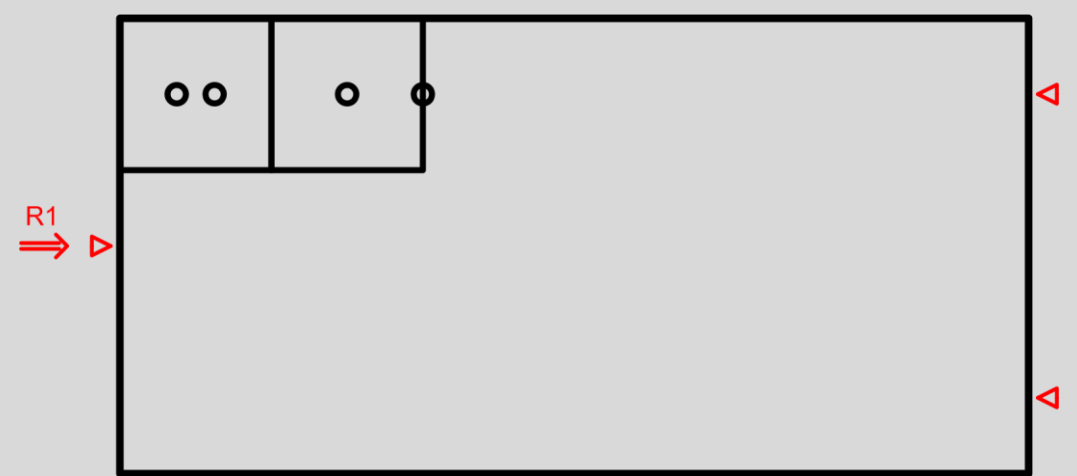
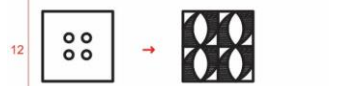


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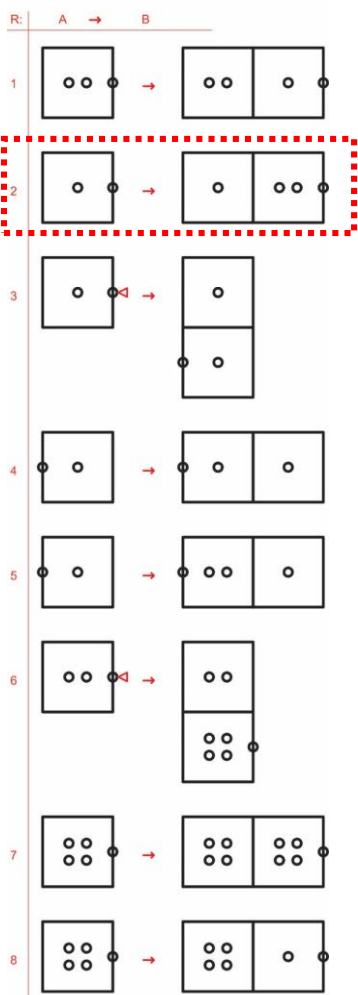
R: A \rightarrow B



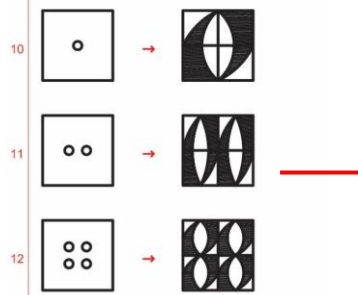
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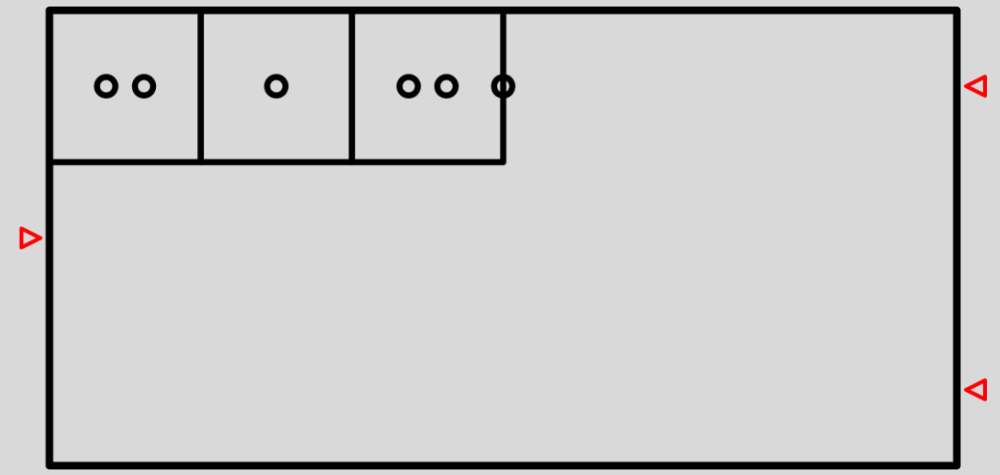
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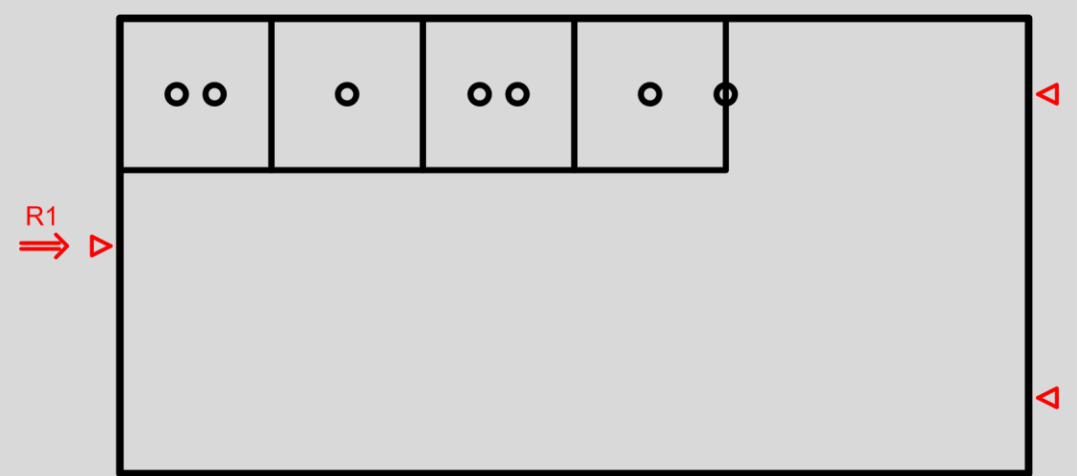
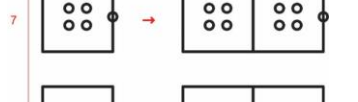
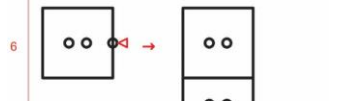
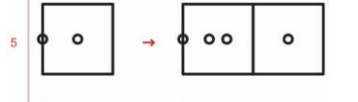
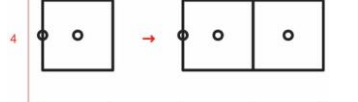
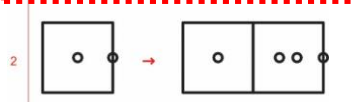
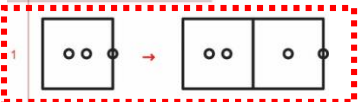


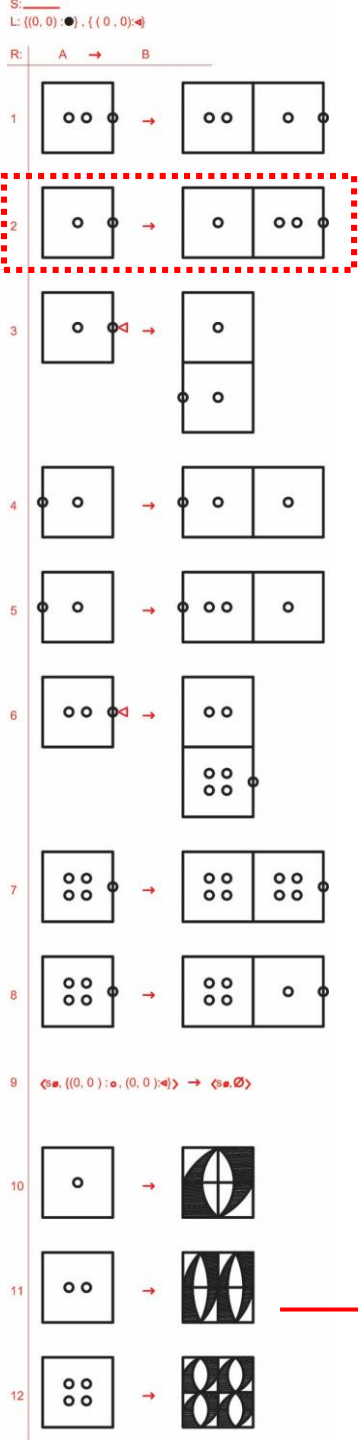
R2 \Rightarrow



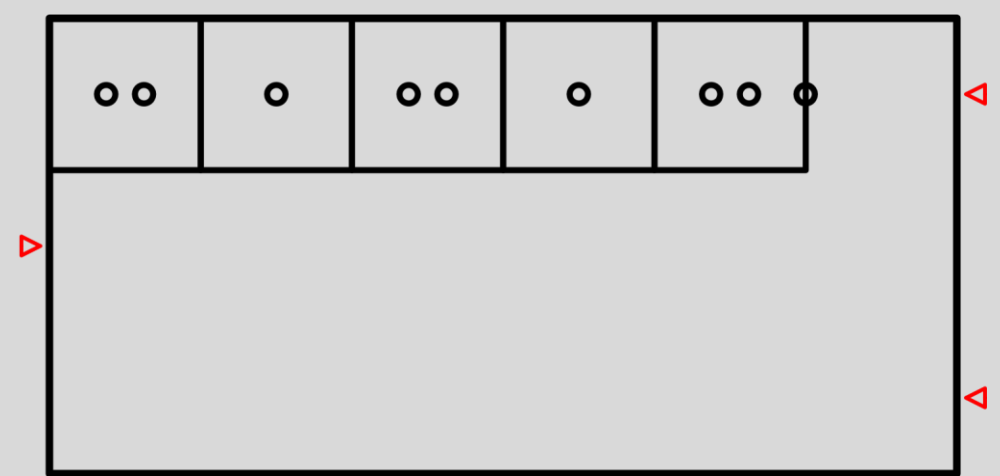
L: $\{(0,0): \bullet, (0,0): \blacktriangleleft\}$

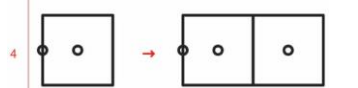
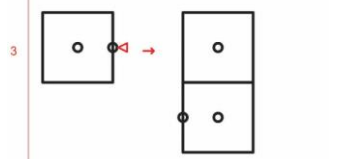
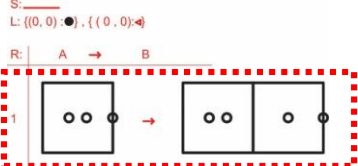
R: A \rightarrow B



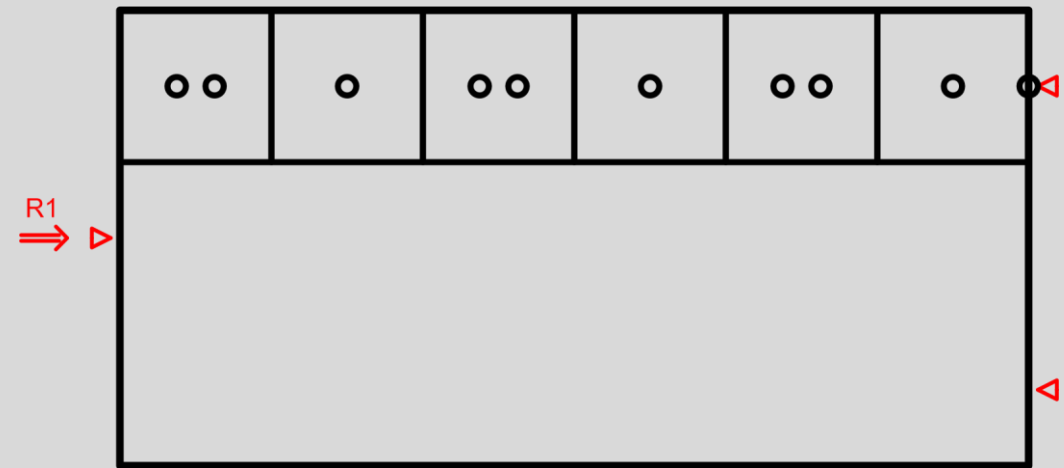
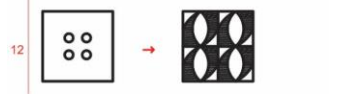


R2

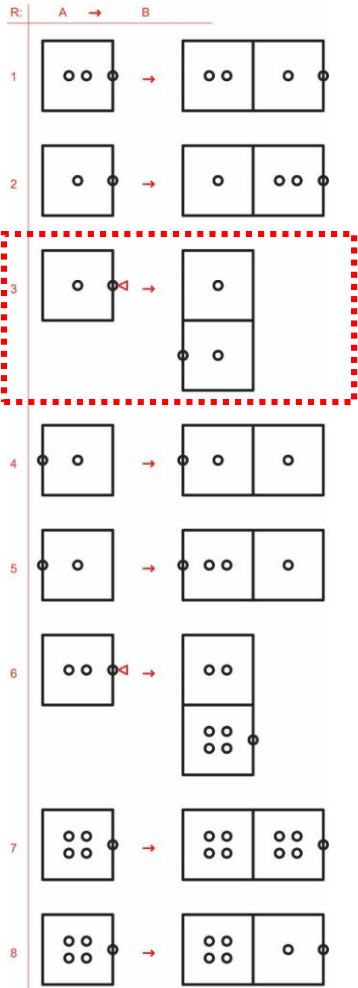




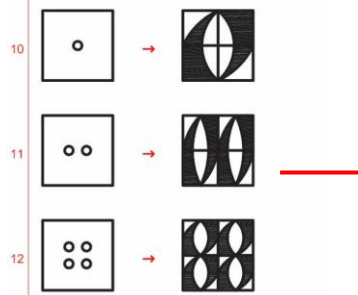
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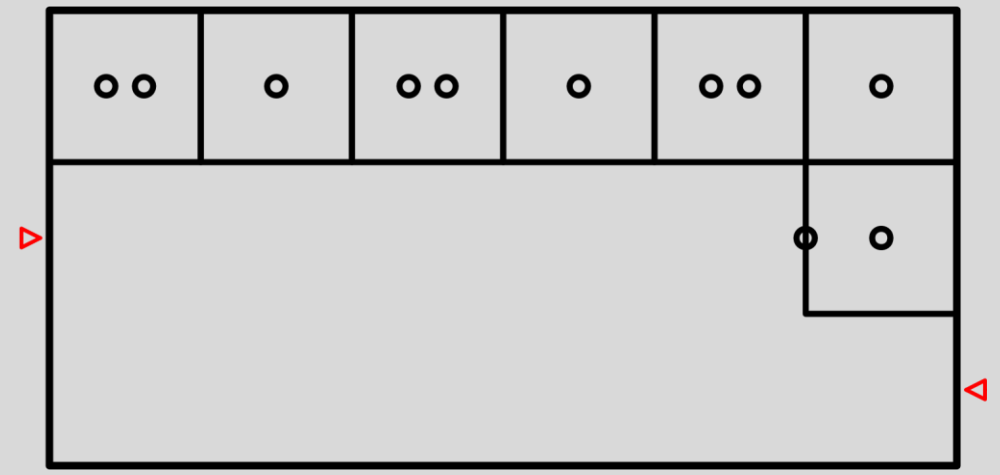
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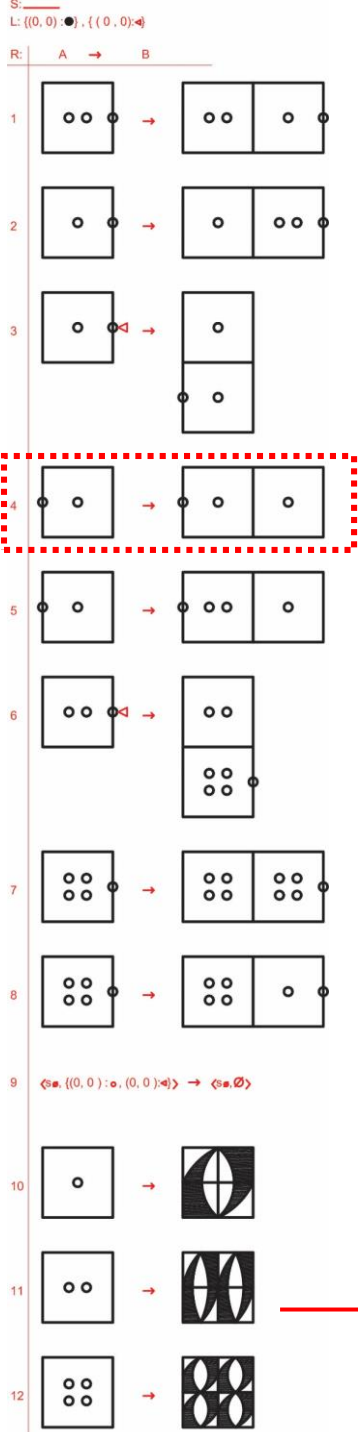


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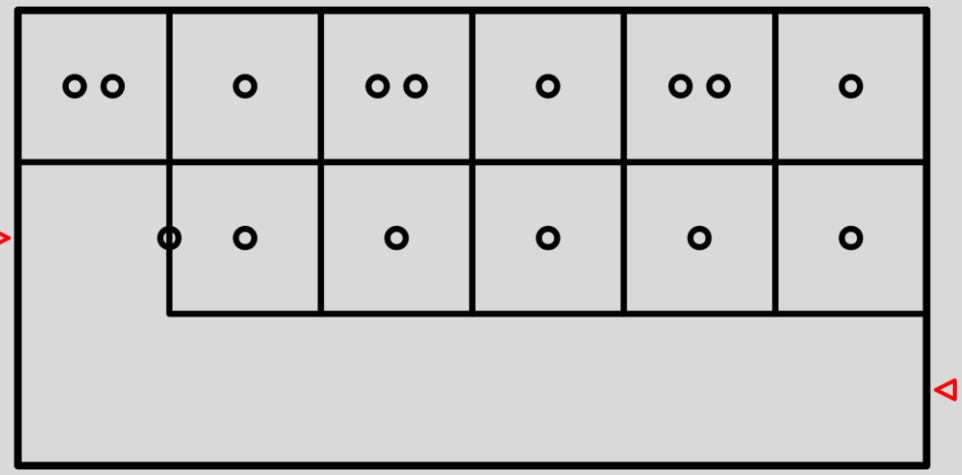


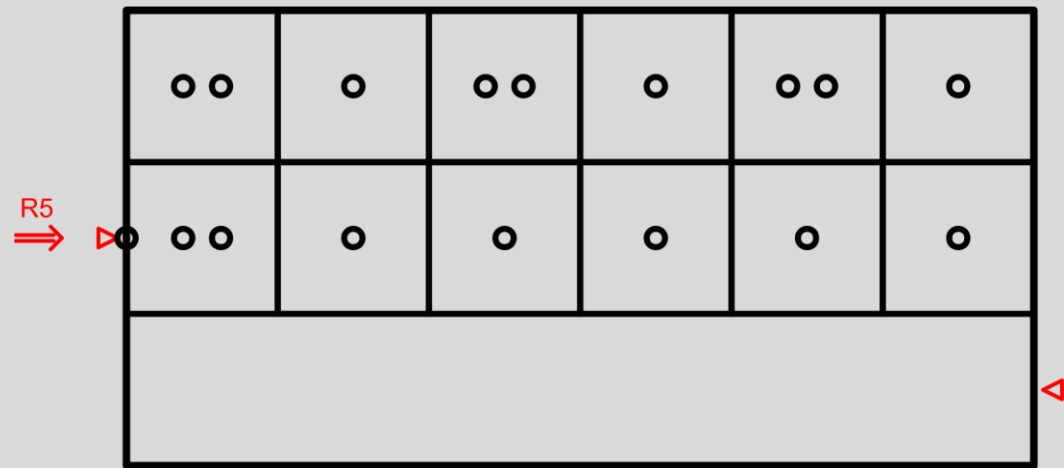
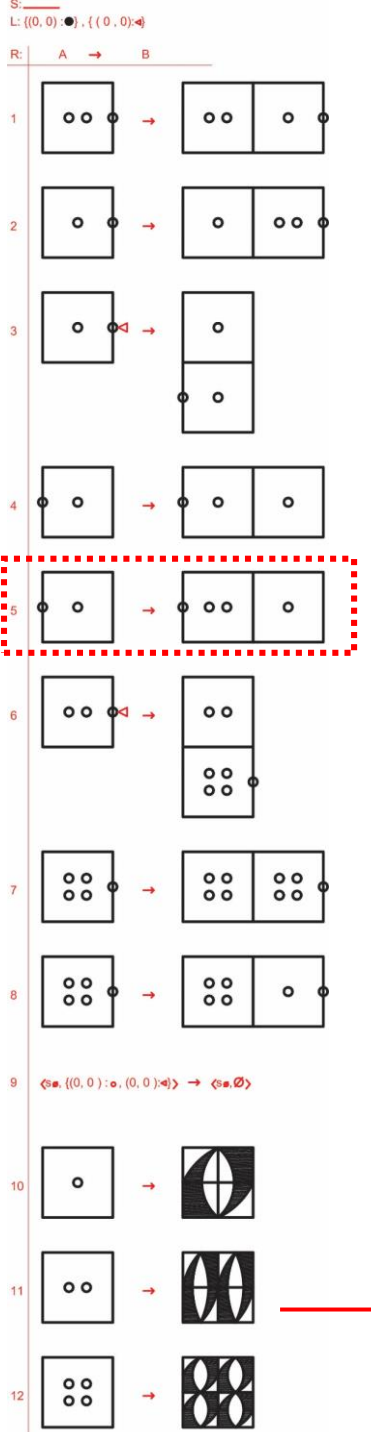
R3



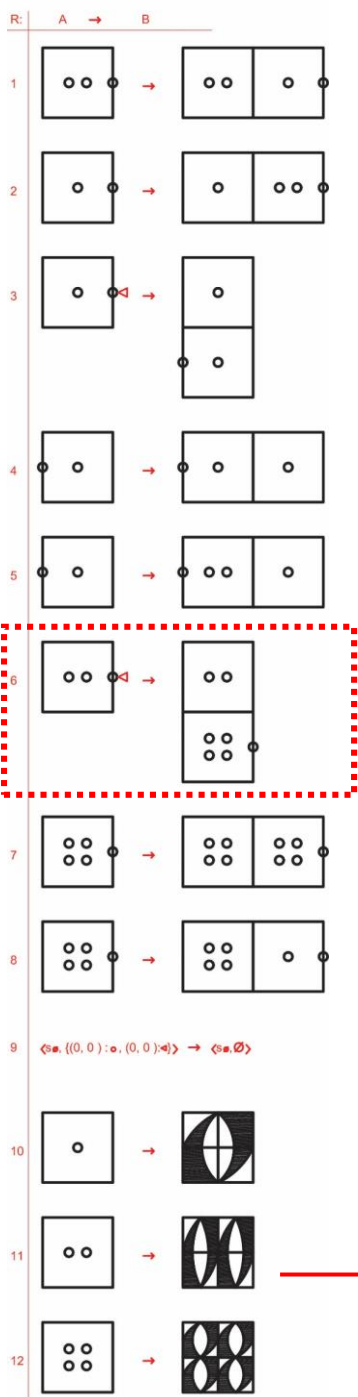


$\Rightarrow R4_{(4x)}$

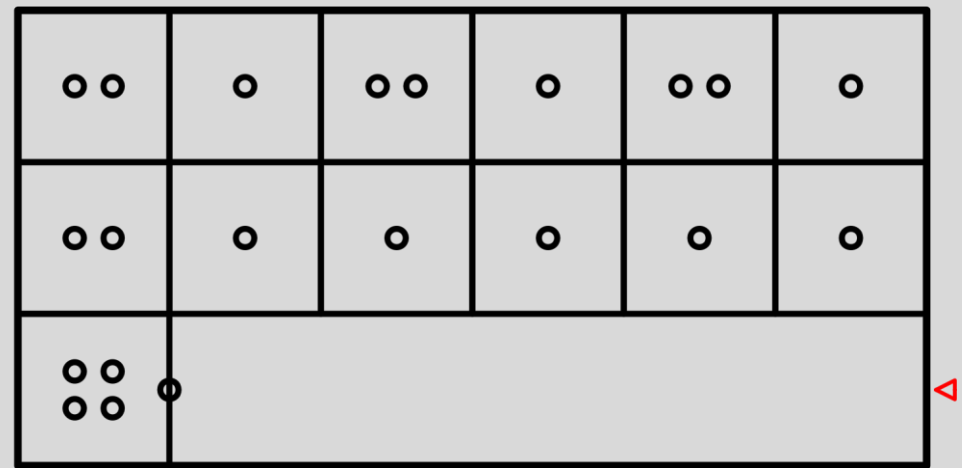




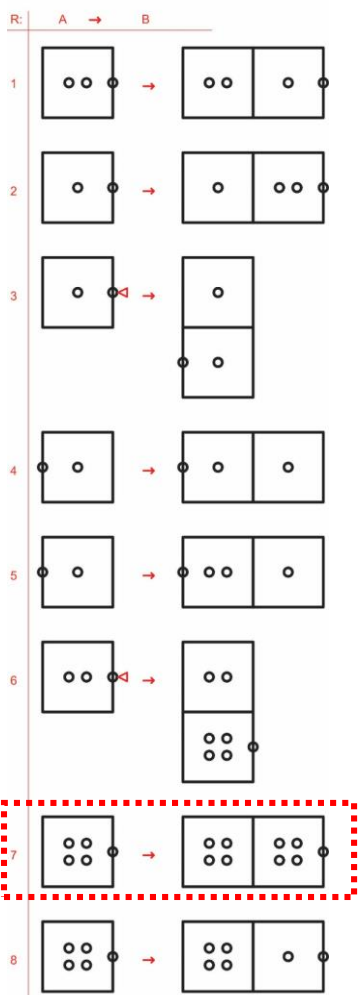
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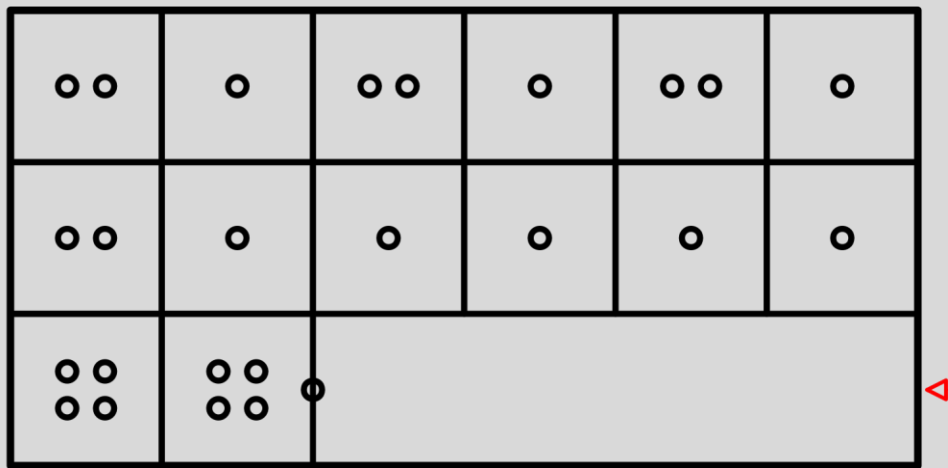
R6



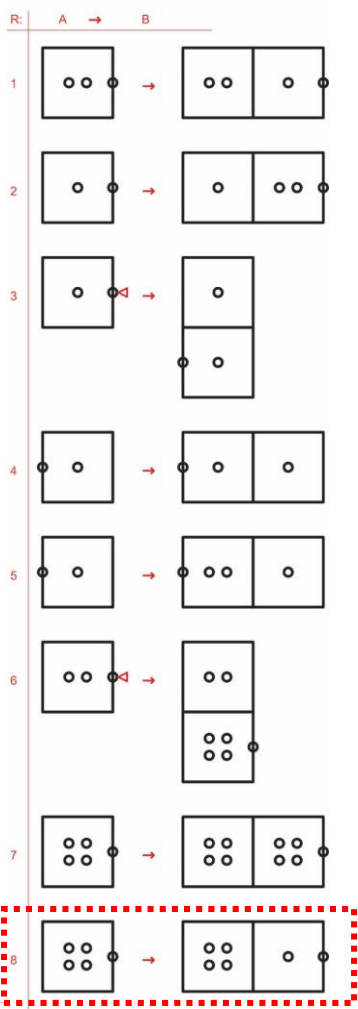
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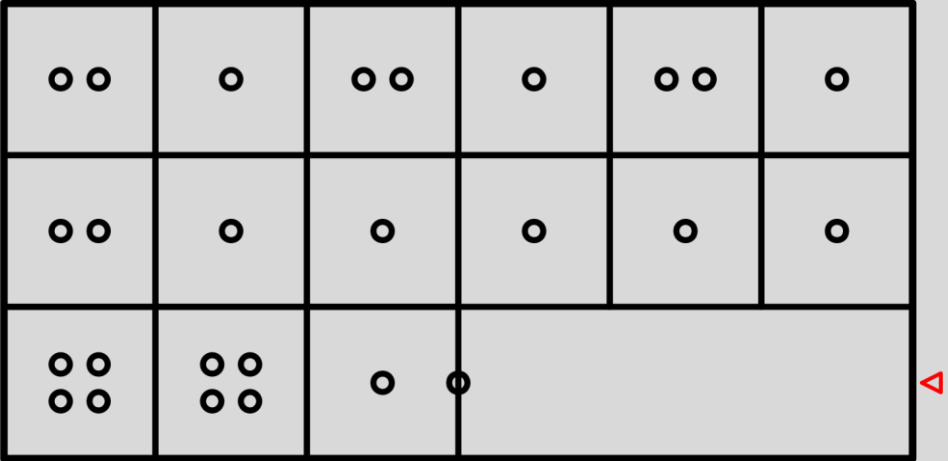
R7
 \Rightarrow



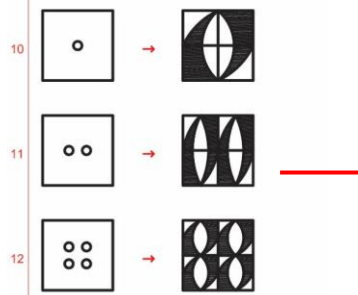
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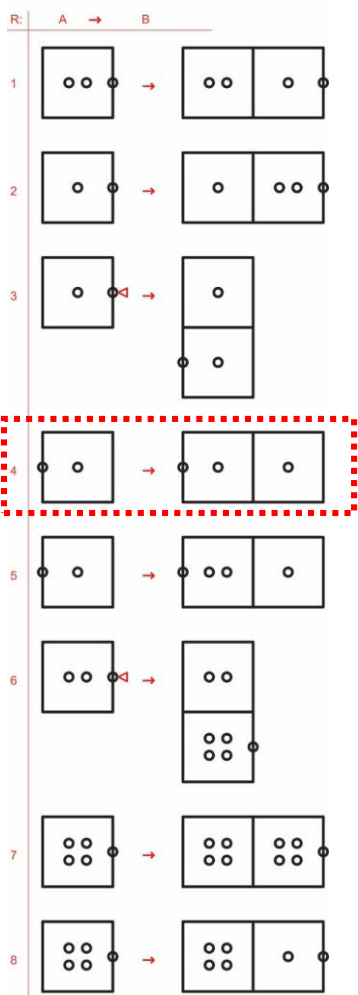
R8



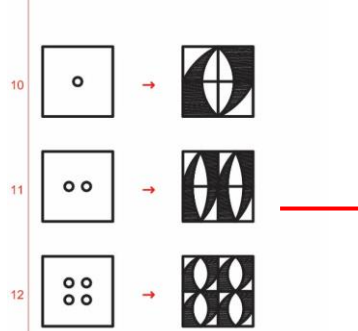
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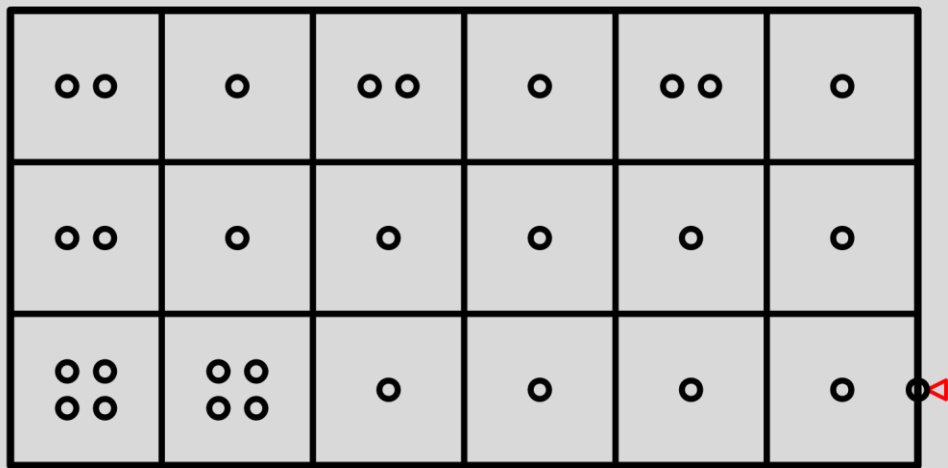
R: $\{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \blacktriangleleft\}$



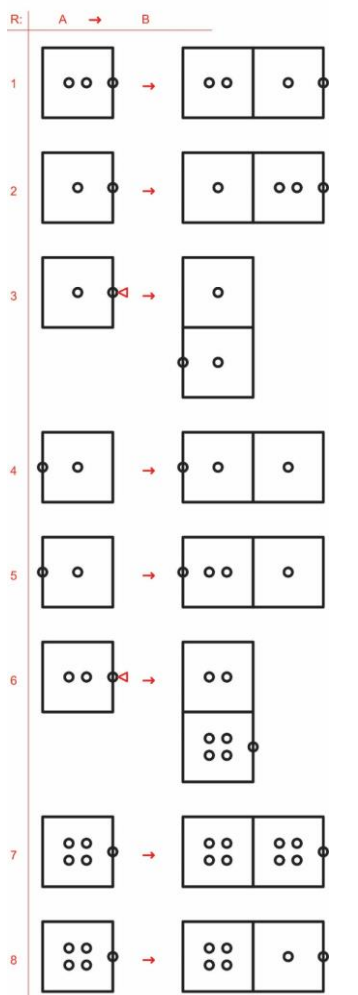
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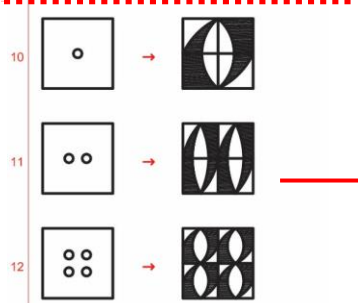
$R4_{(3x)}$
 \Rightarrow



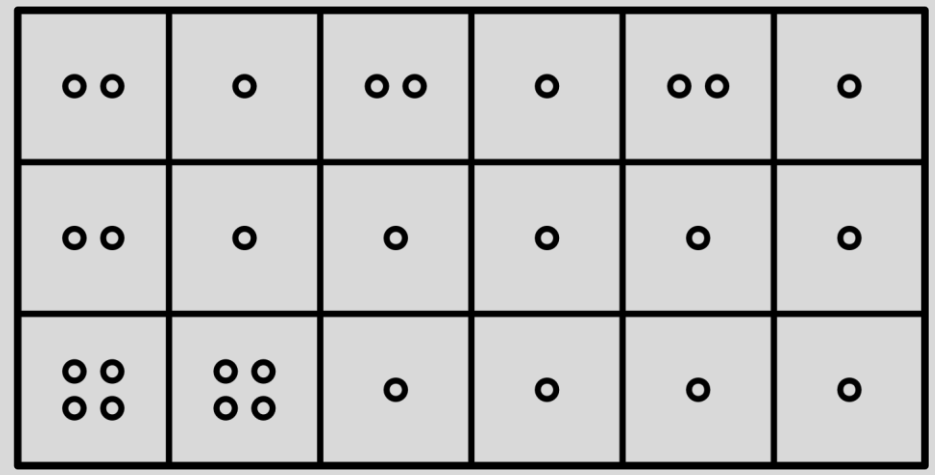
L: $\{(0,0) \rightarrow \bullet, \{(0,0) \rightarrow \bullet\}$



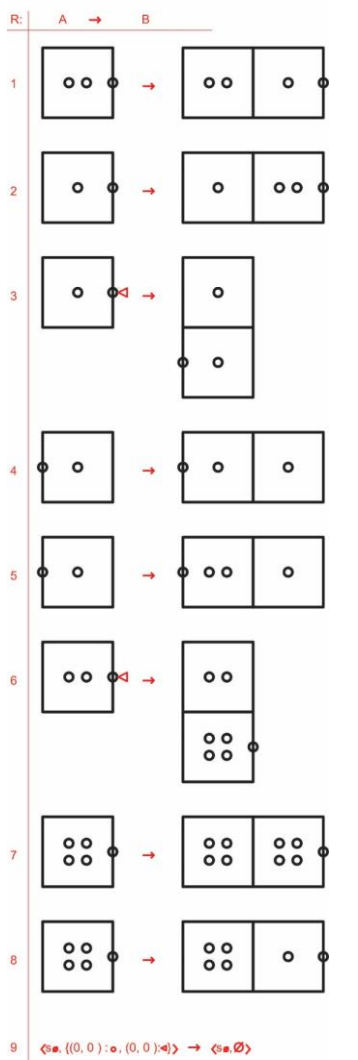
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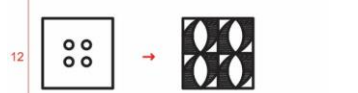
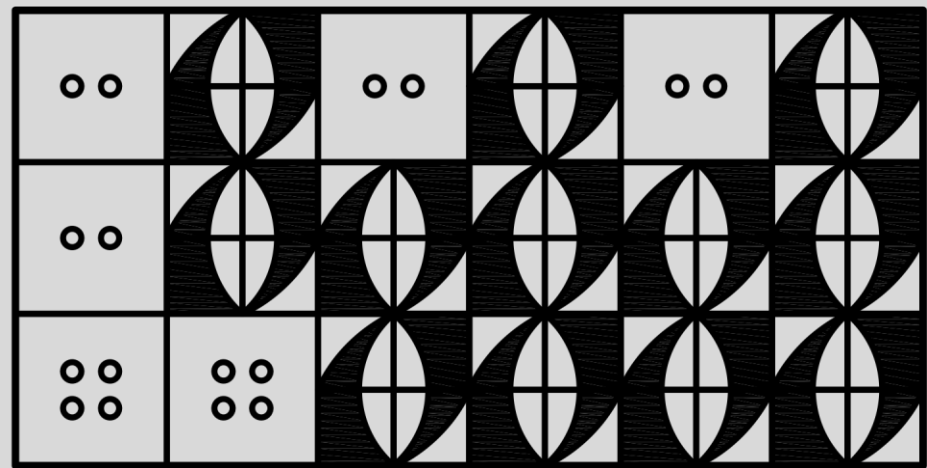
R9
⇒



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

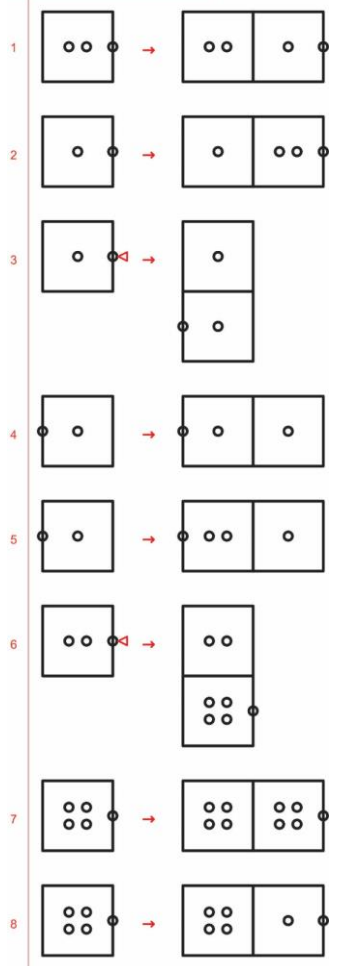


R10

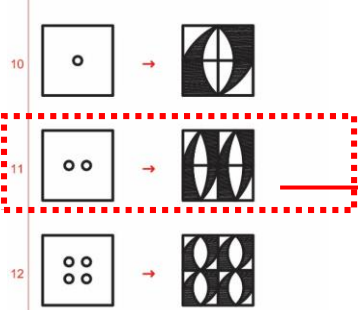



L: $\{(0,0):\bullet\}, \{(0,0):\blacktriangleleft\}$

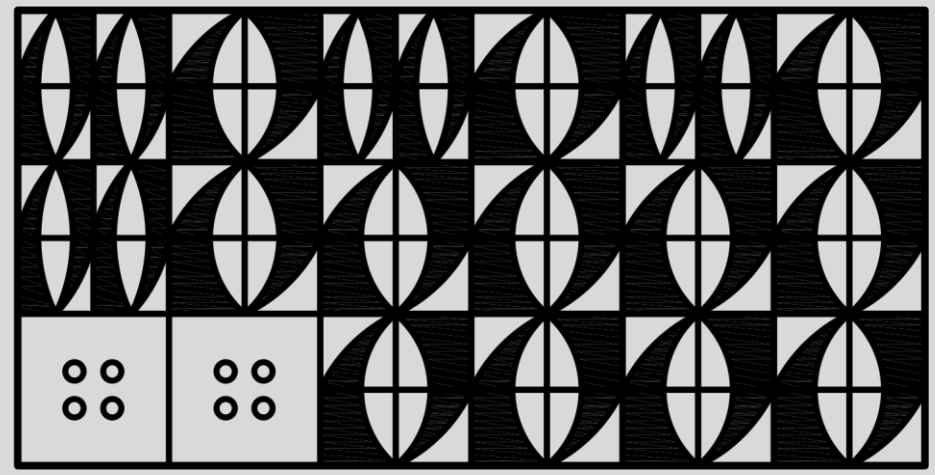
R: A \rightarrow B



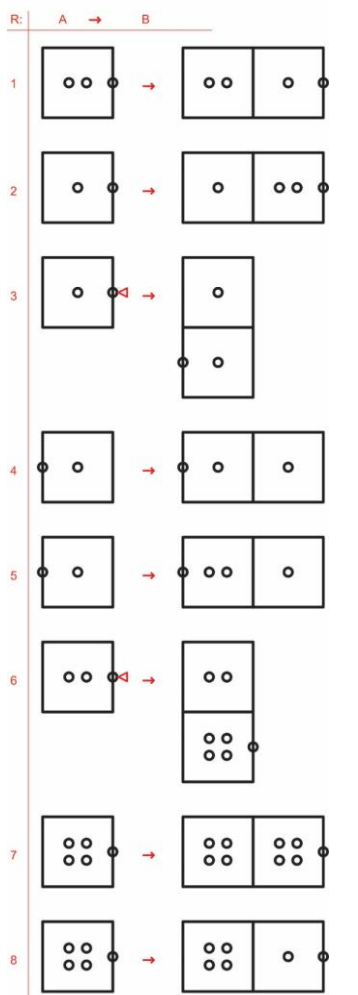
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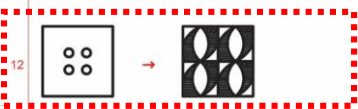
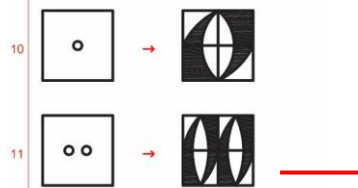
R11 \Rightarrow



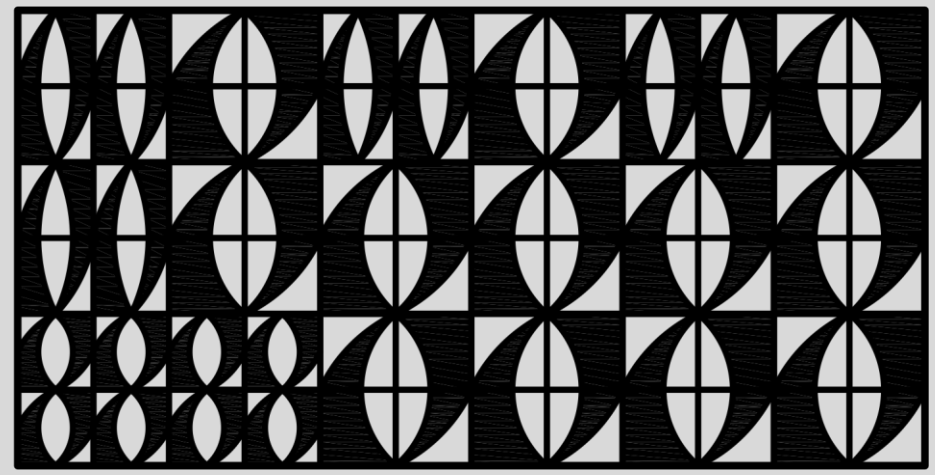
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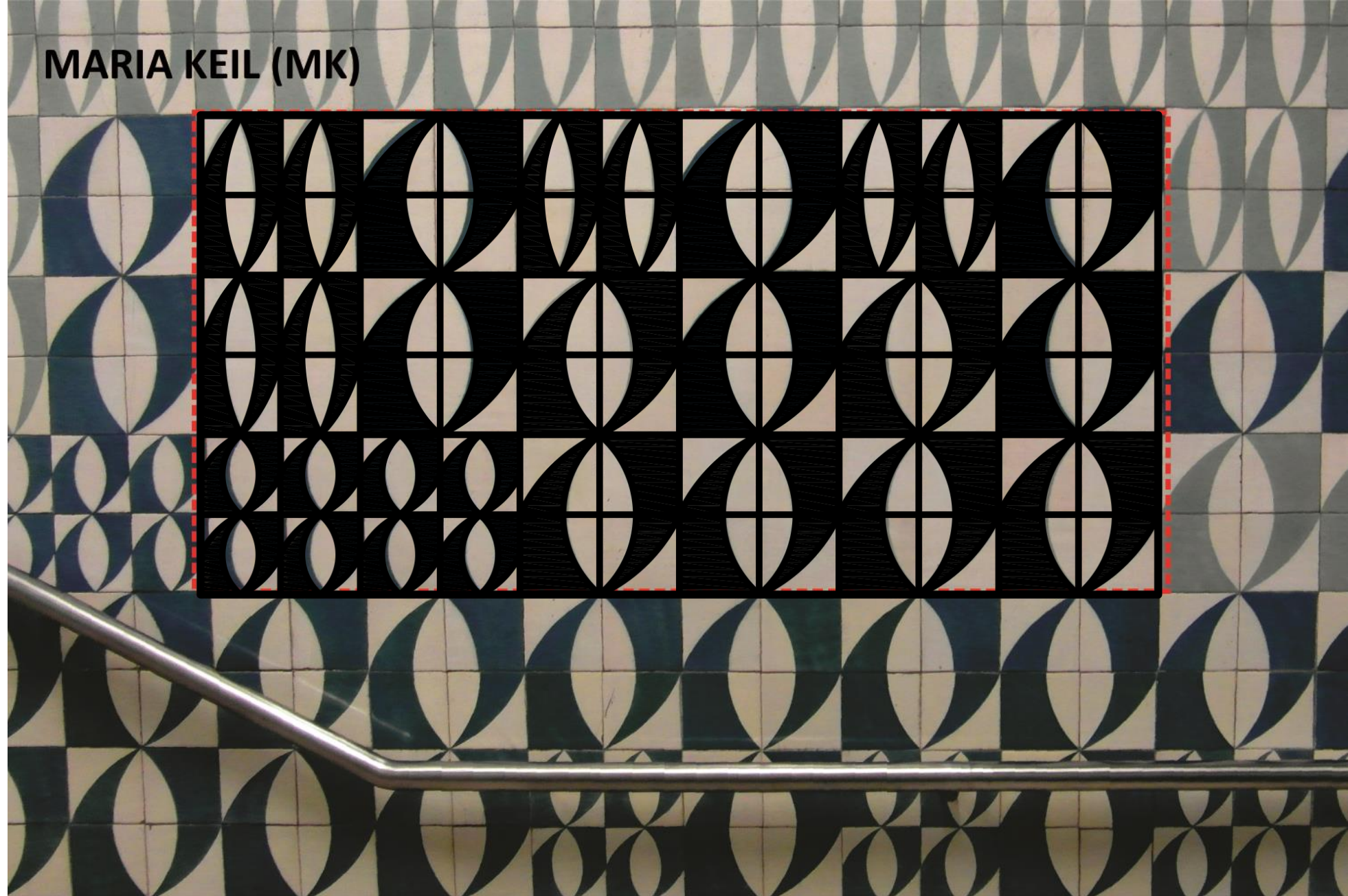
R12
⇒



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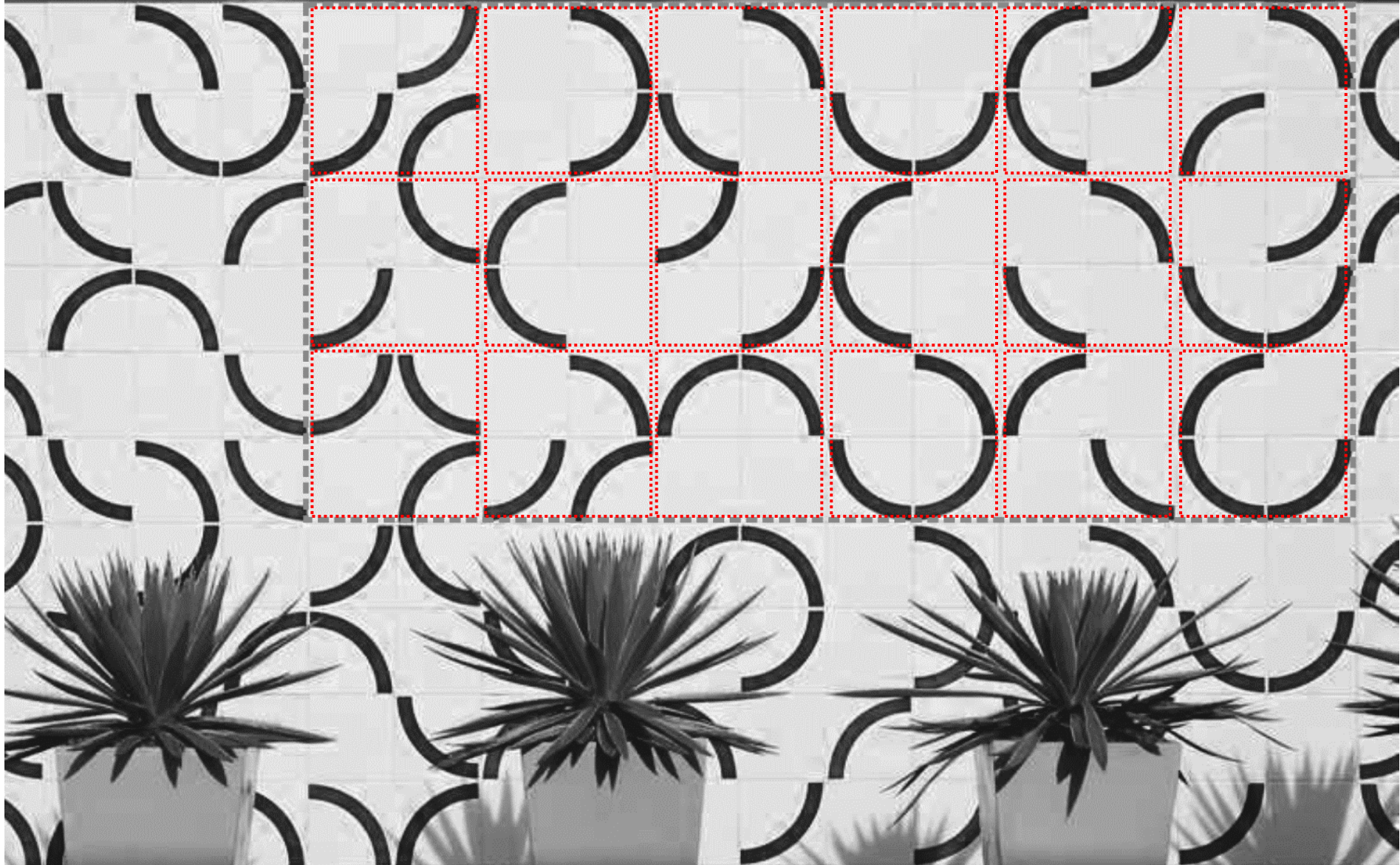


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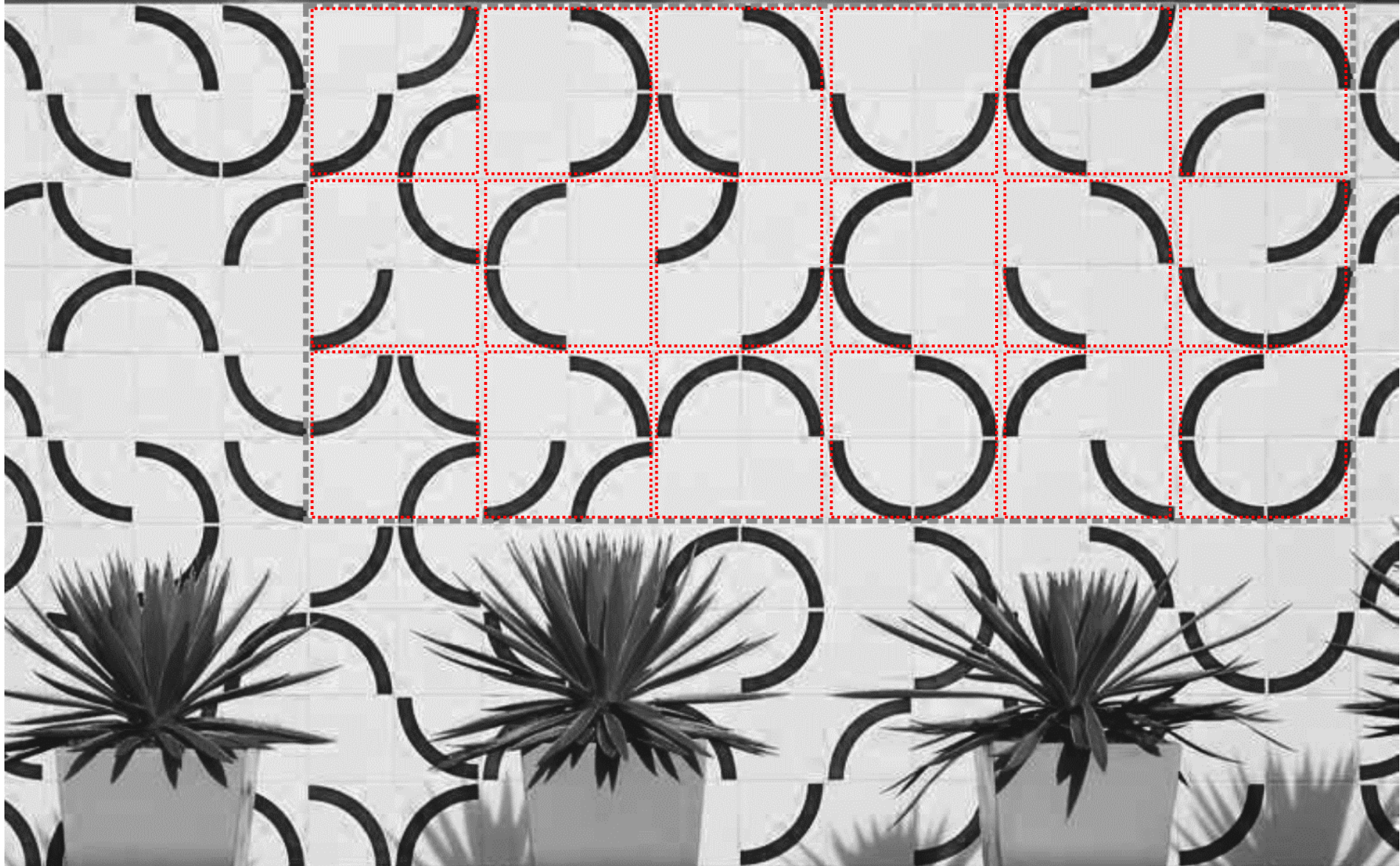
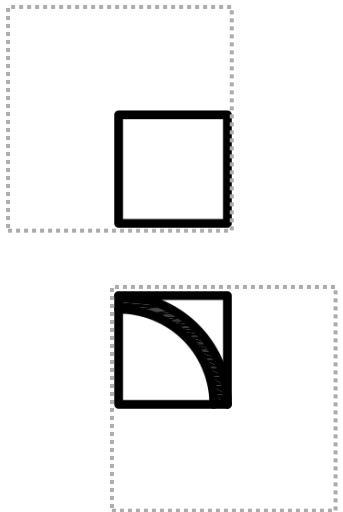
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2,4 m x 1,2 m

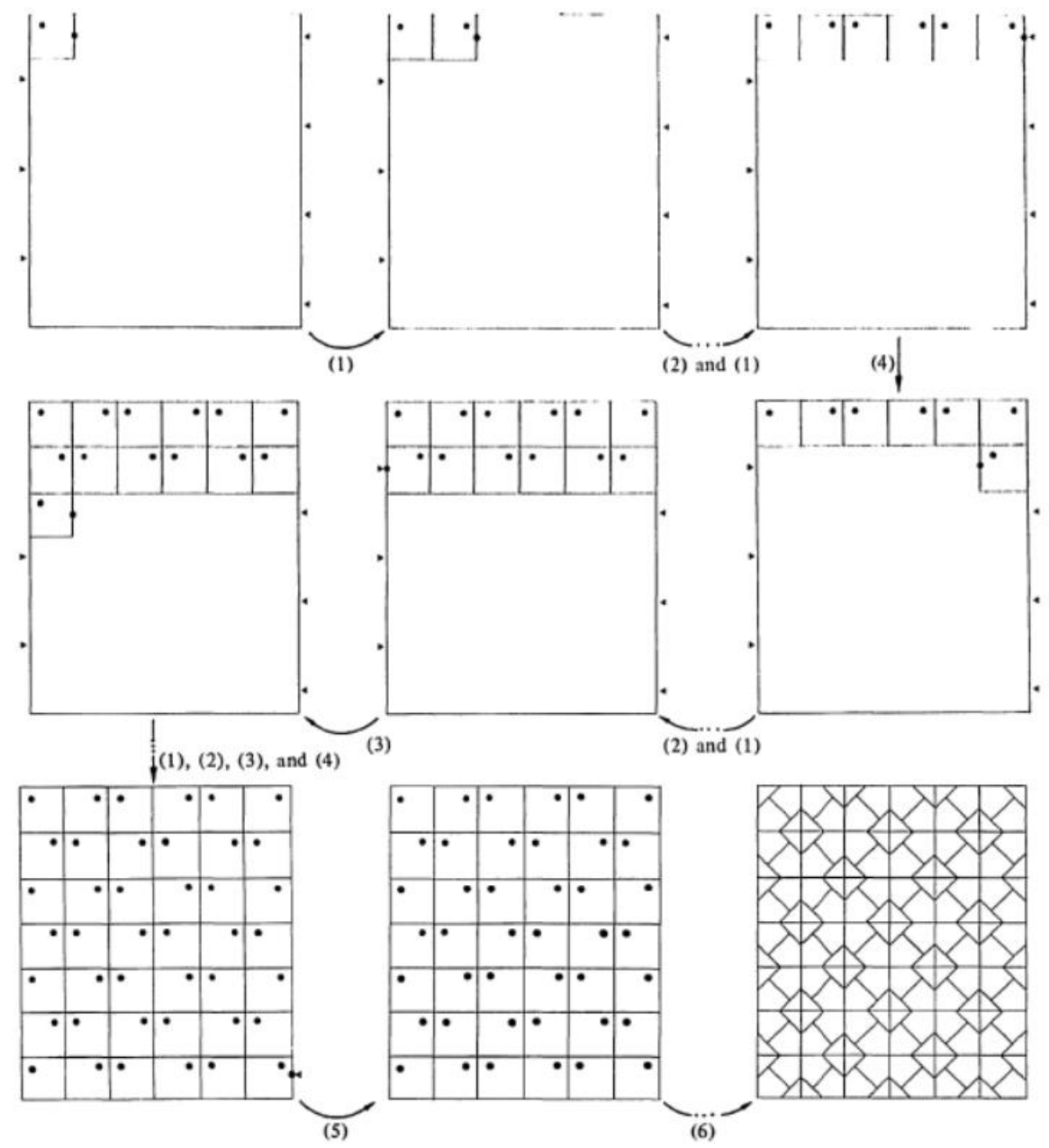
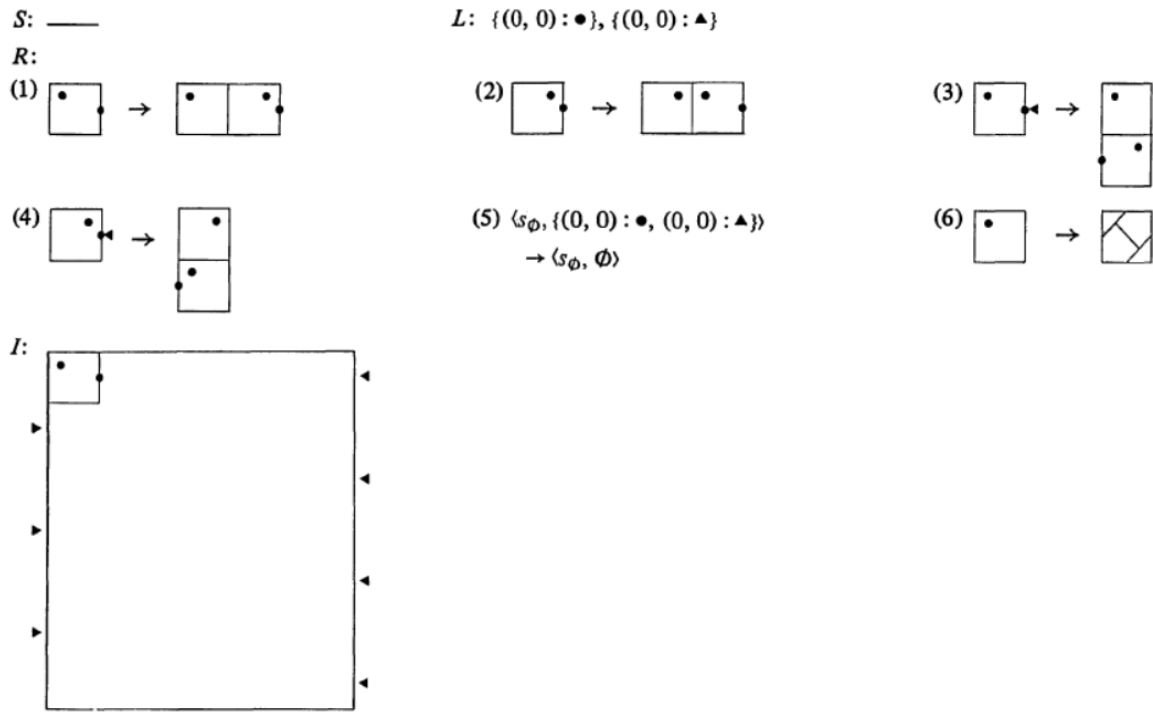
Divisão em 18 quadrados
de 40 cm

As cores foram desconsideradas

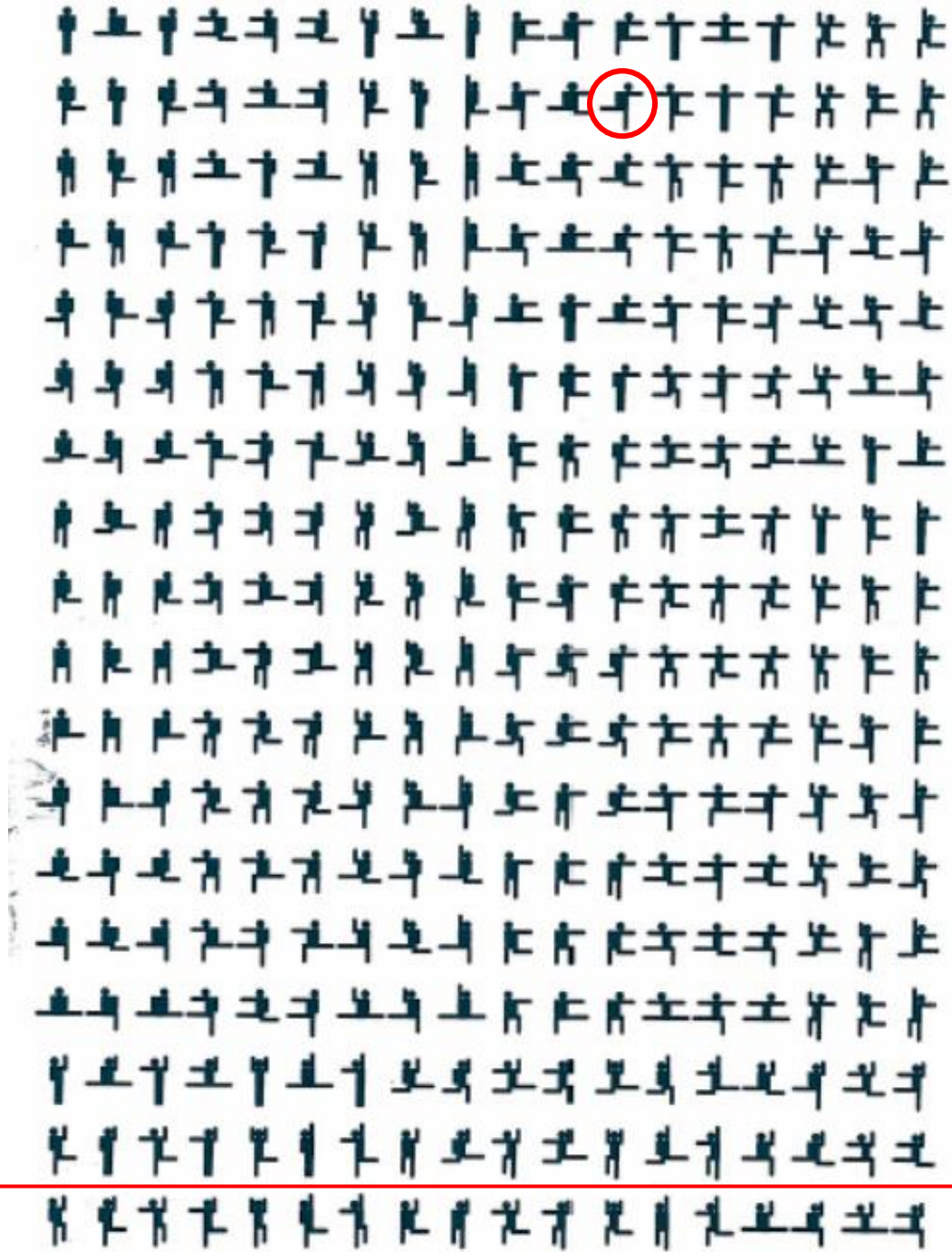
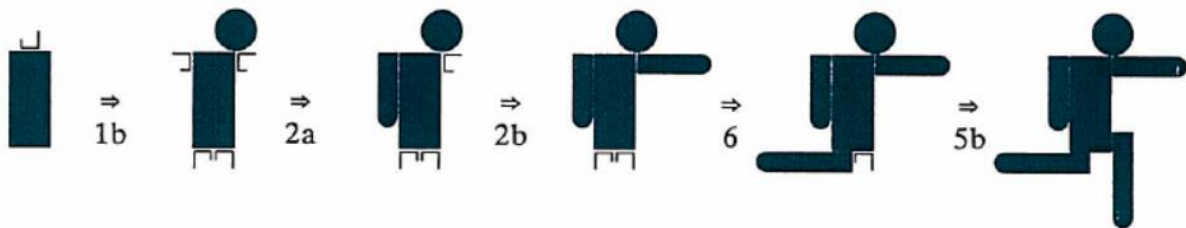
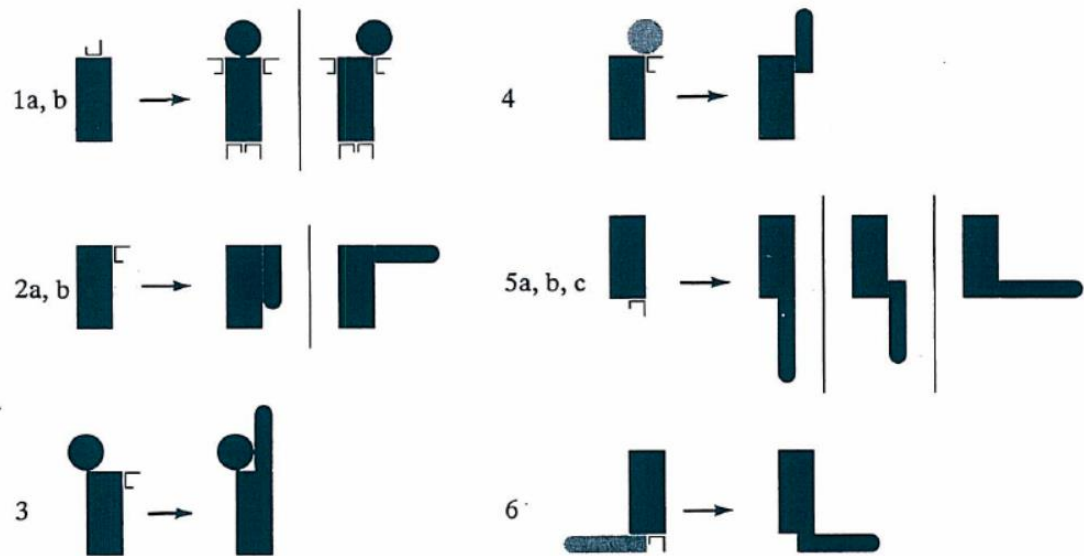
**Contendo 18 variações, sendo
estas compostas por apenas
dois tipos**



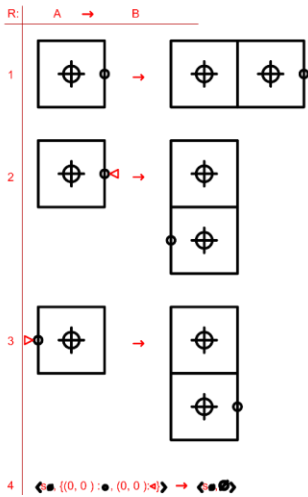
Modelo de apoio para a primeira fase da decomposição:
 Ice-ray: a note on the generation of Chinese lattice designs_**Stiny**



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



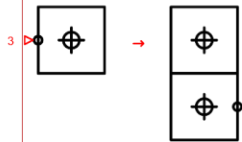
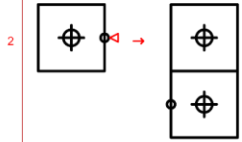
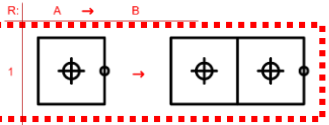
5a, b, c, d, e, f, g, h, i, j



formalismo

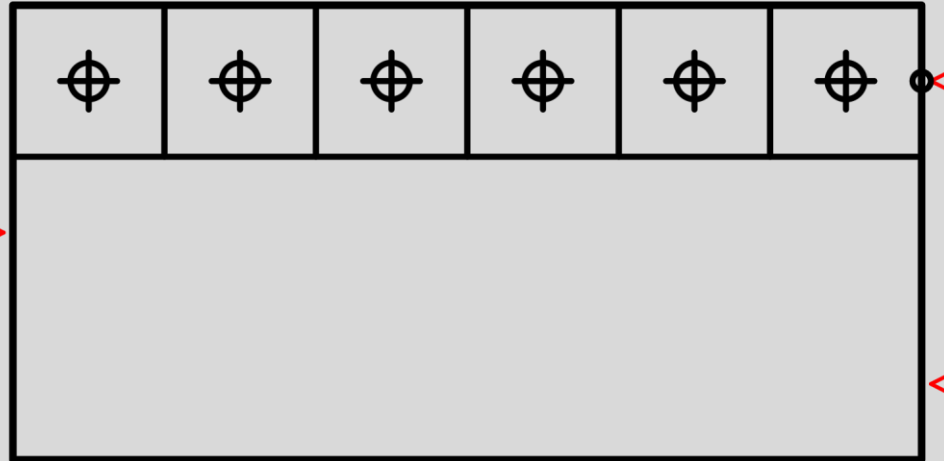
AB

S: _____
L: {(0, 0)} •, {(0, 0)} ◀



4 ◀ •, {(0, 0)} •, {(0, 0)} ◀ → ◀ • • ◀

R1_(5x)



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



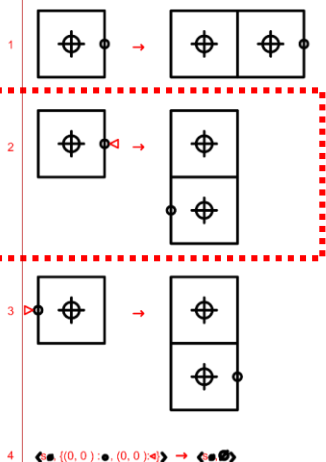
formalismo

AB

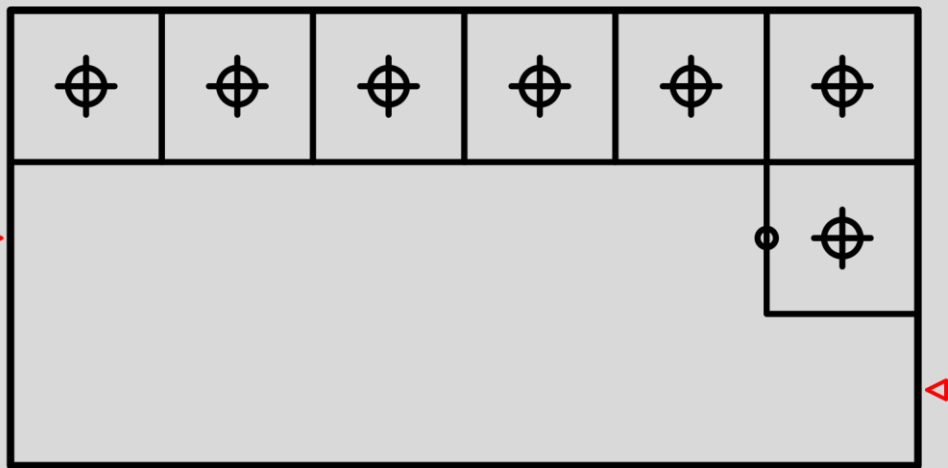
S: _____

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

R: A → B



R2



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

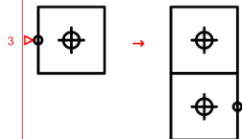
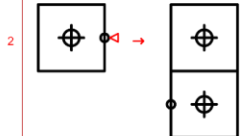
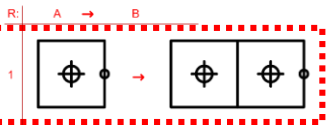


formalismo

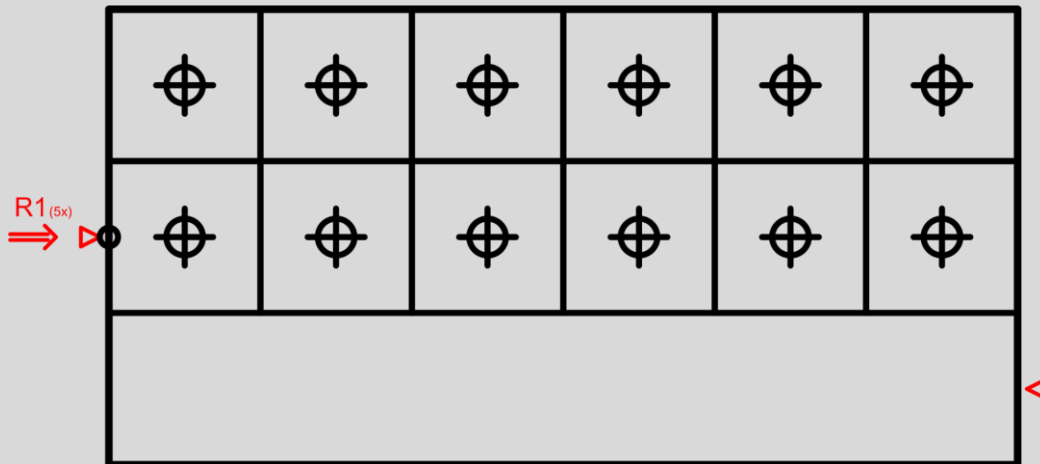
AB

S: _____

L: {(0,0)} •, {(0,0)} ◀



4 ◀ •, {(0,0)} •, {(0,0)} ◀ → ◀ • •



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



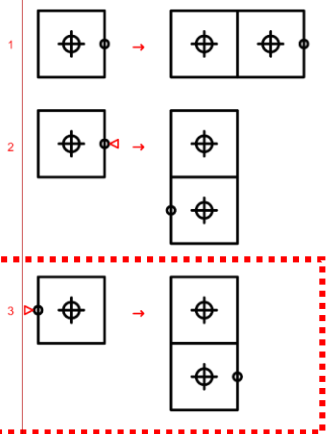
formalismo

AB

S: _____

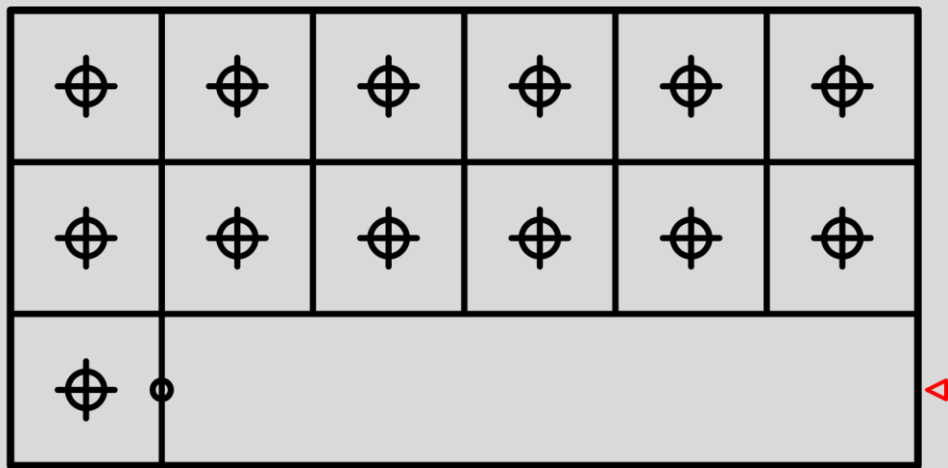
L: $\{(0, 0) \bullet, \cdot (0, 0)\}$

R: A \rightarrow B



4 $\langle \bullet, (0, 0) \bullet, \cdot (0, 0) \rangle \rightarrow \langle \bullet \bullet \rangle$

R3 \Rightarrow



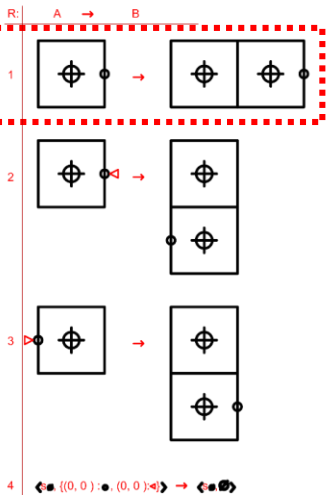
5a, b, c, d, e, f, g, h, i, j



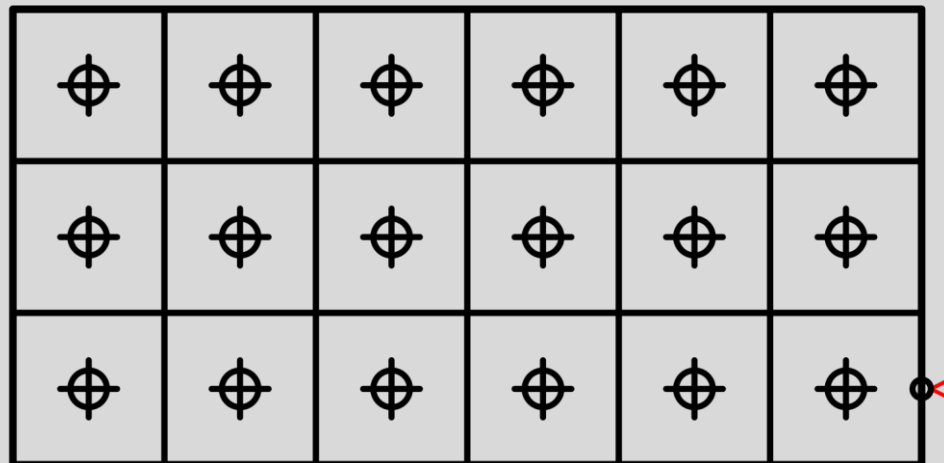
formalismo

AB

S: _____
L: {(0,0) •}, {(0,0) ◀}



$R1_{(5x)}$



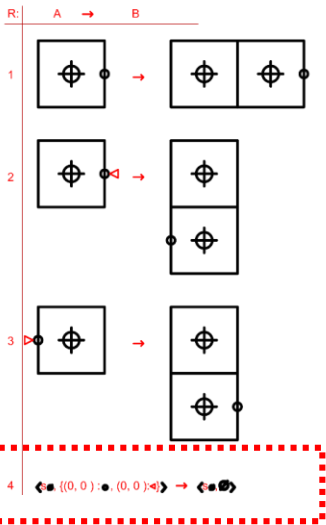
5a, b, c, d, e, f, g, h, i, j



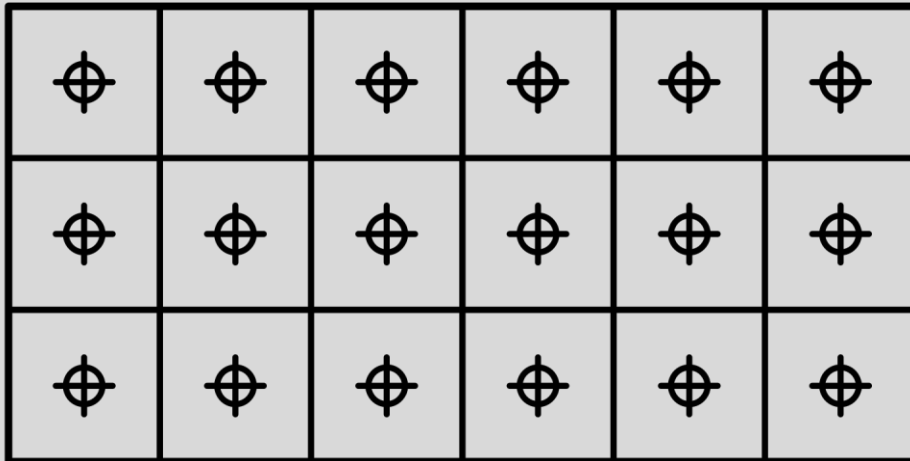
formalismo

AB

S: _____
L: {(0, 0)} •, {(0, 0)} ◀



R4
⇒



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

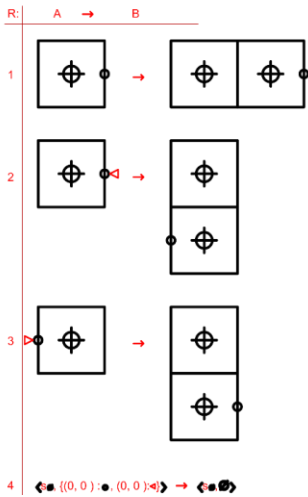


formalismo

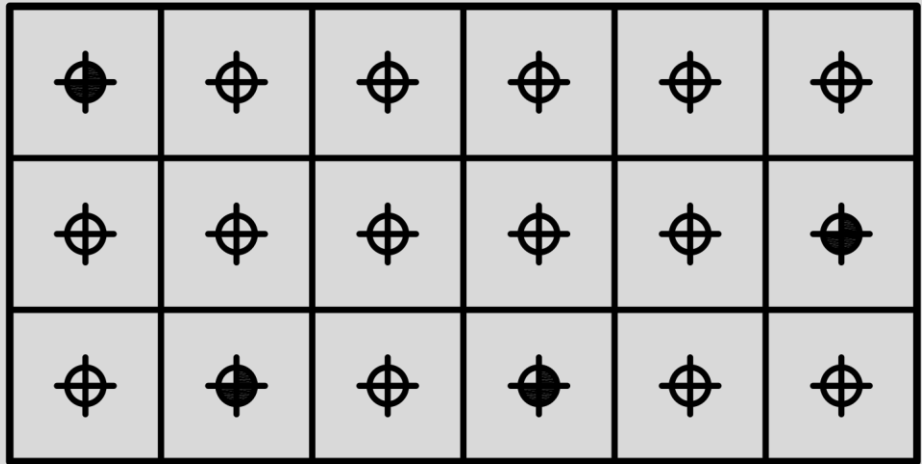
AB

S: _____

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

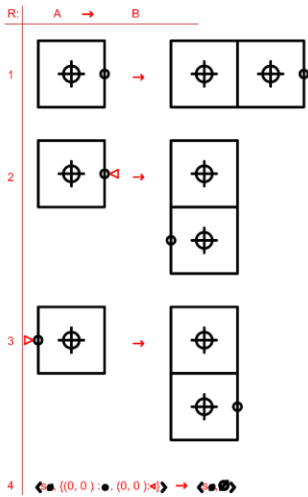


\Rightarrow R5a_(4x)

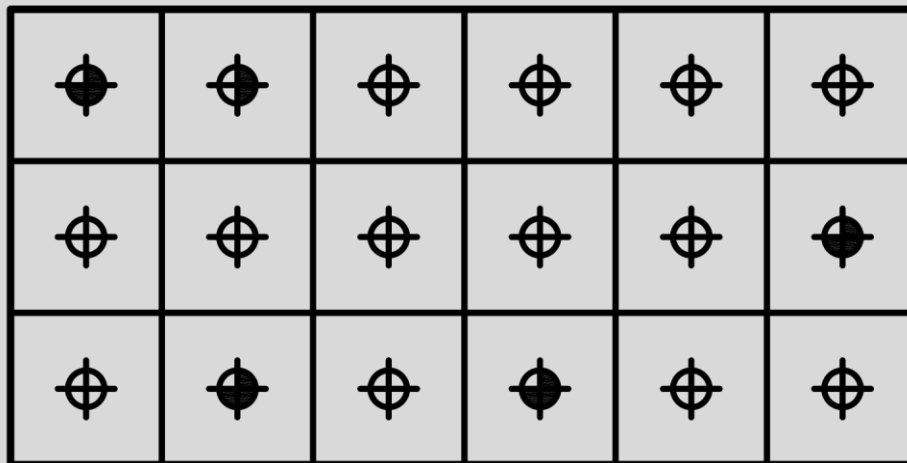


S: _____

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



R5b
⇒

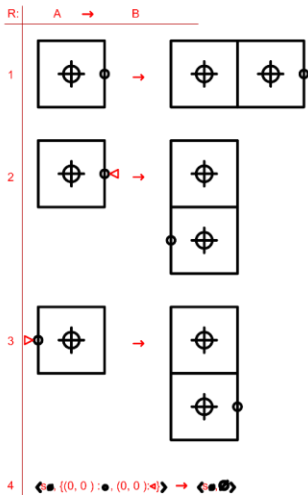


formalismo

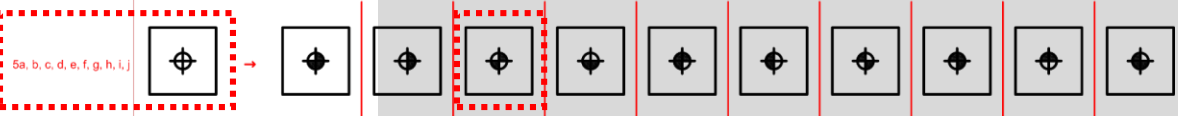
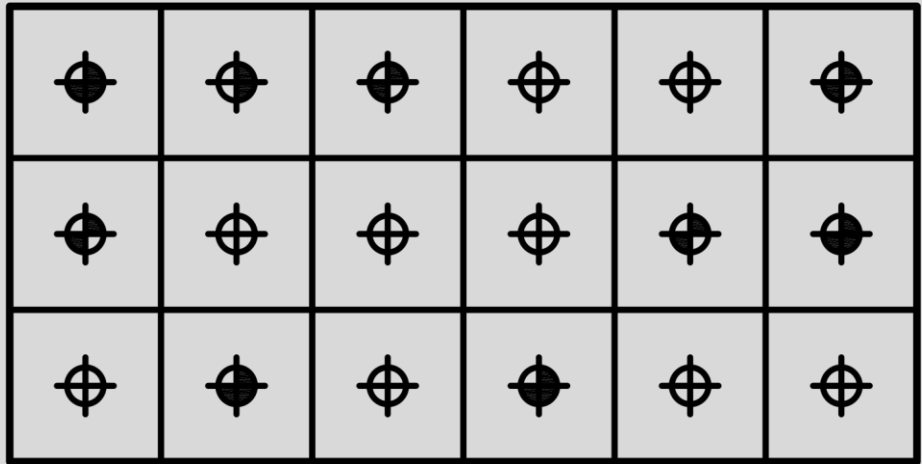
AB

S: _____

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

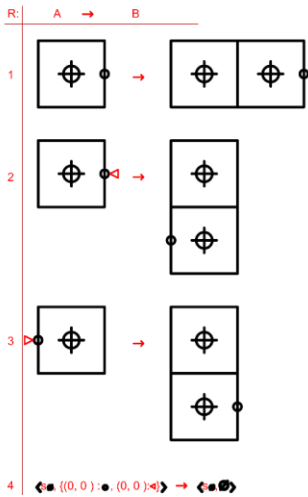


\Rightarrow R5C_(4x)

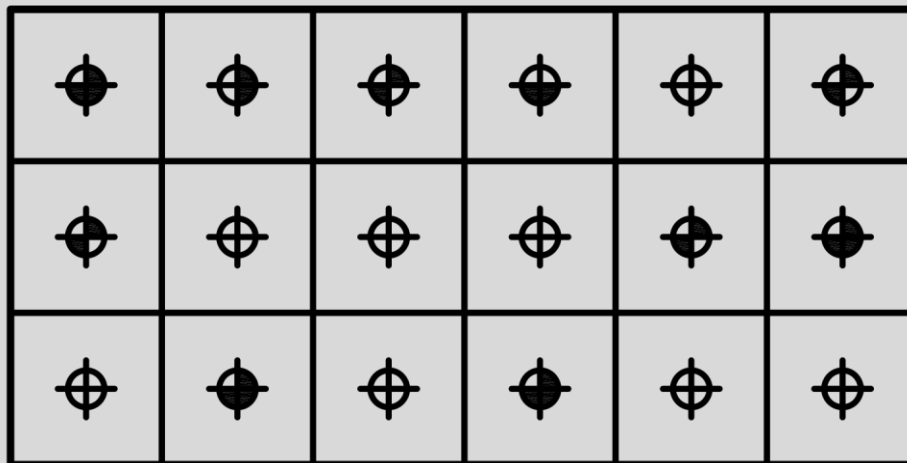


S: _____

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



R5d
⇒

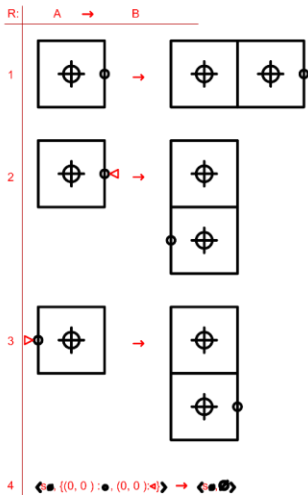


formalismo

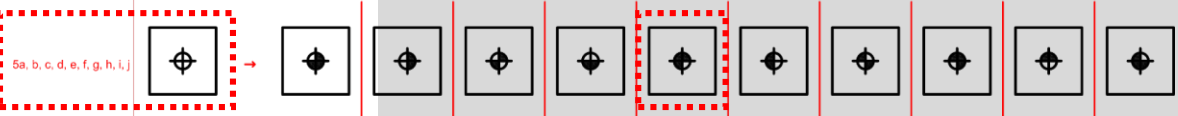
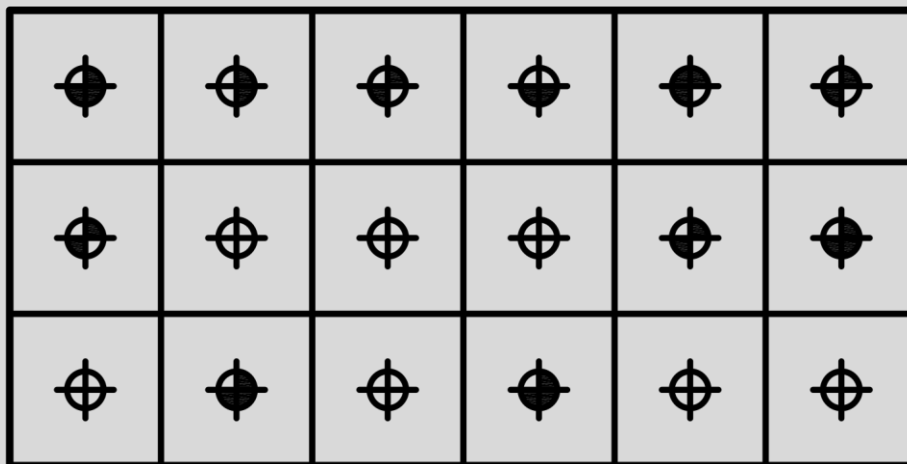
AB

S: _____

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



R5e
⇒

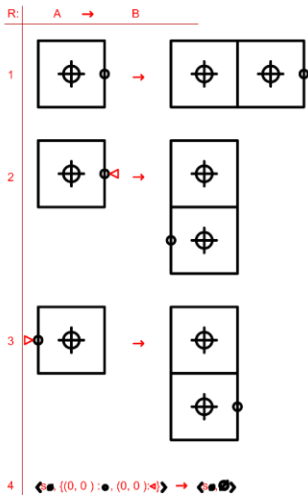


formalismo

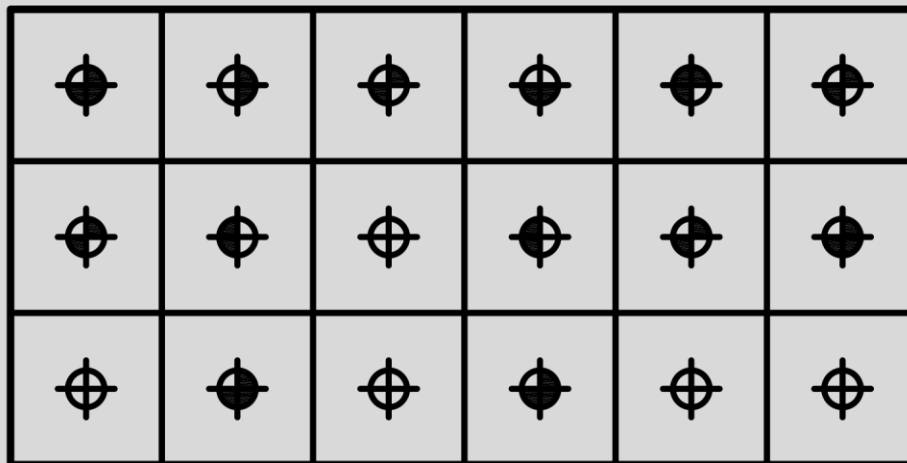
AB

S: _____

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



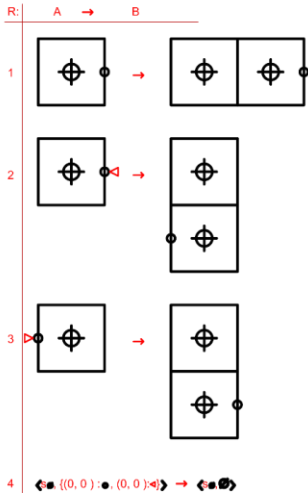
$R5f_{(2x)}$



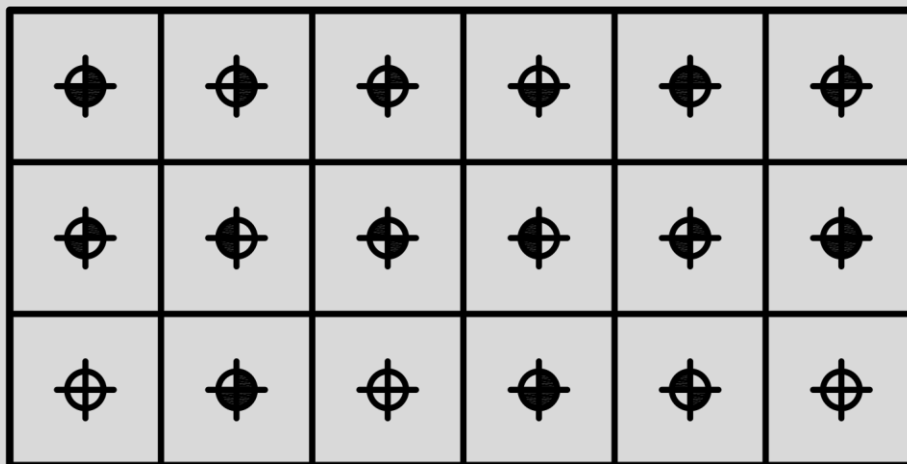
formalismo

AB

S: _____
L: {(0, 0)} •, {(0, 0)} ◊



$R5g_{(2x)}$

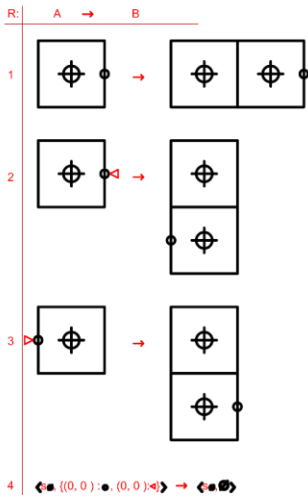


formalismo

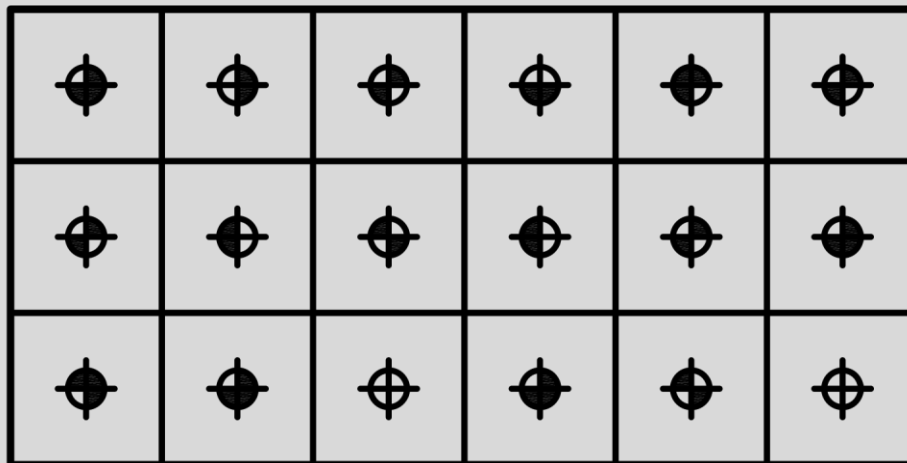
AB

S: _____

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



R5h
⇒

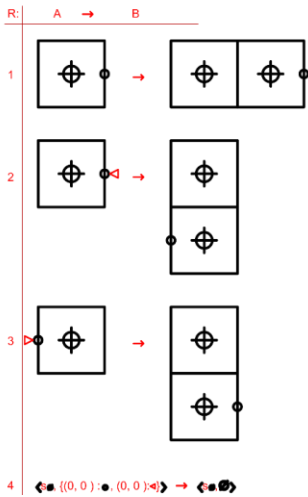


formalismo

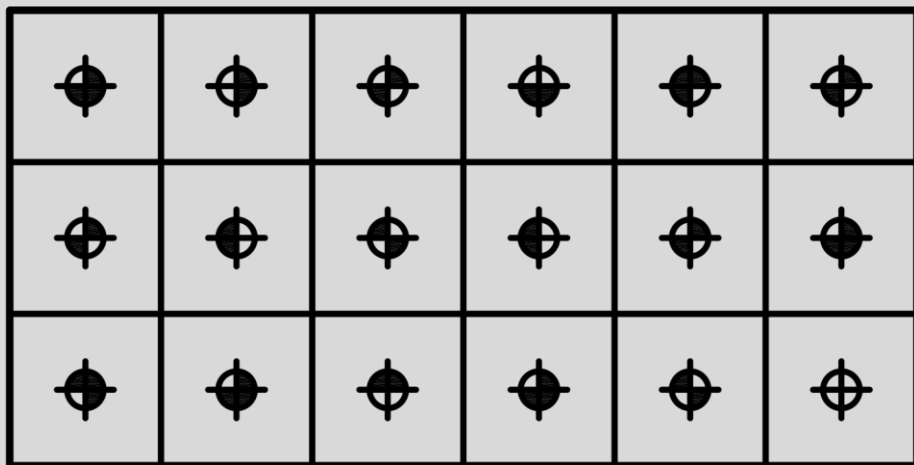
AB

S: _____

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



R5i
⇒

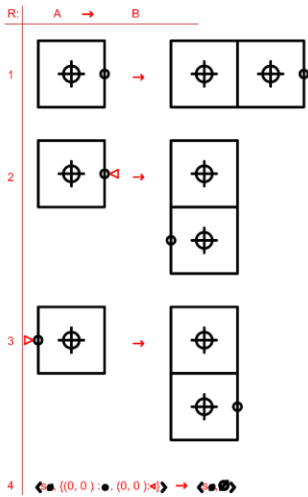


formalismo

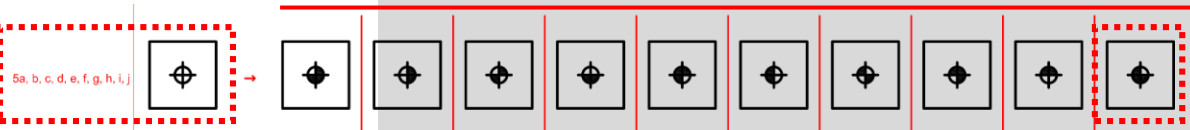
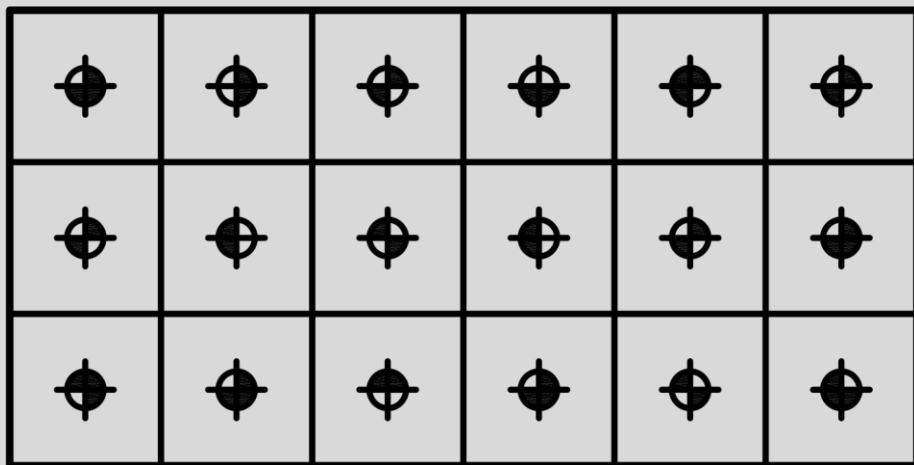
AB

S: _____

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



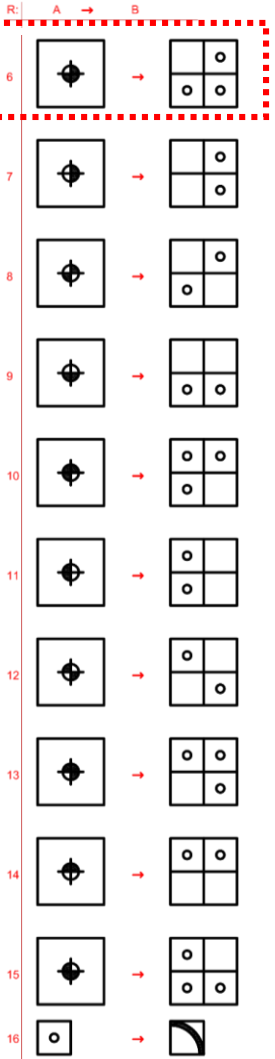
R5j



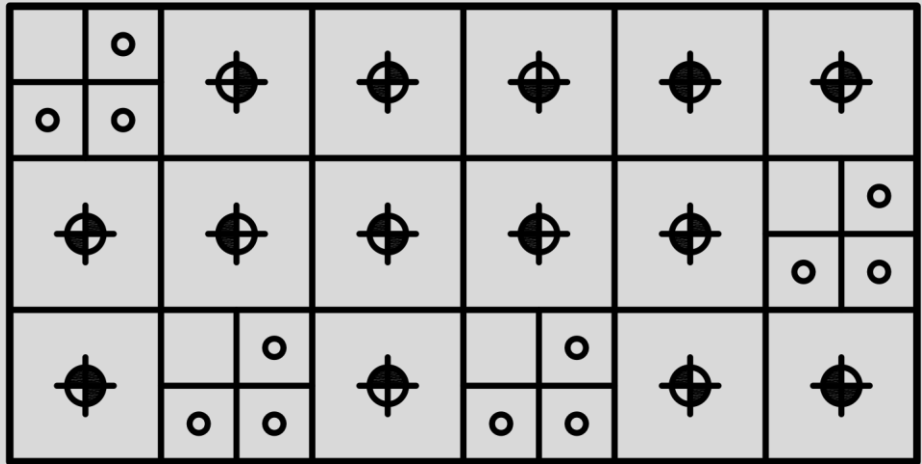
formalismo

AB

S: _____
L: {(0, 0) •}, {(0, 0) ◐}



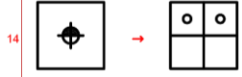
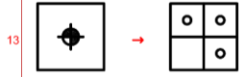
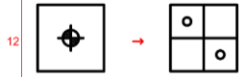
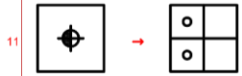
R6 (4x)



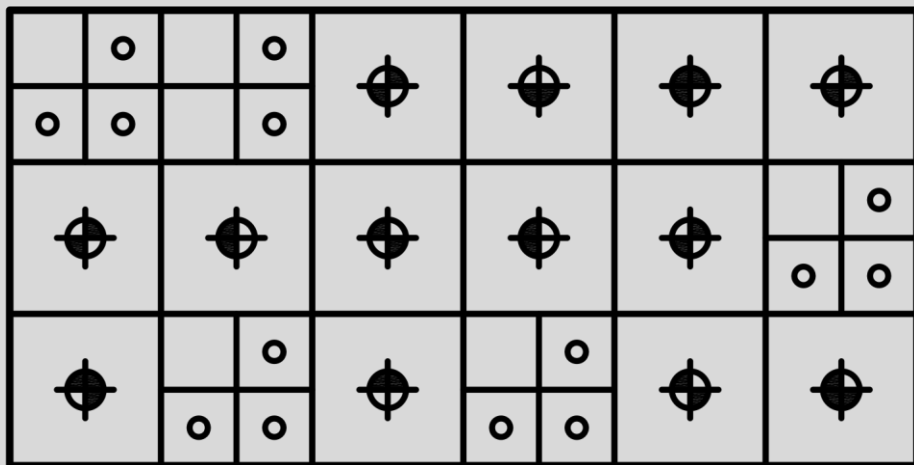
S: _____

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

R: A → B

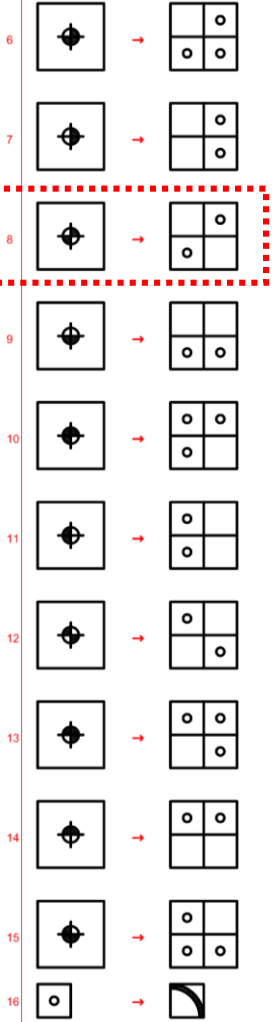


R7

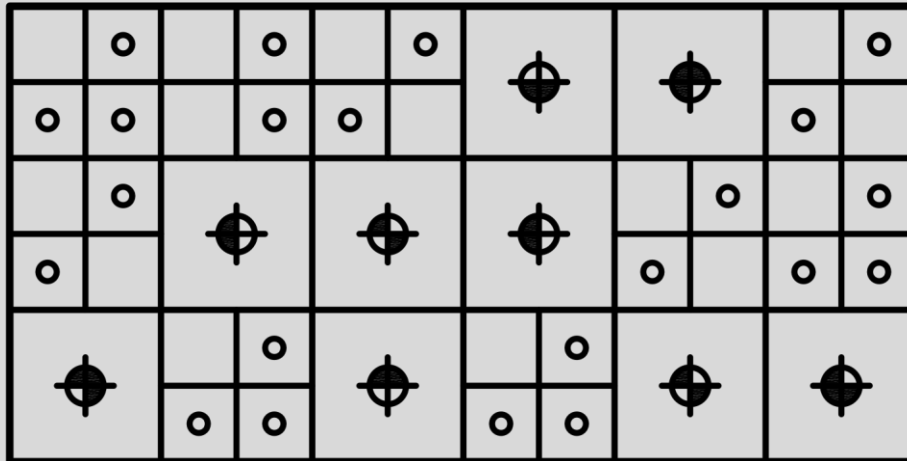


S: $\{ (0,0) \}$, $\{ (0,0) \}$

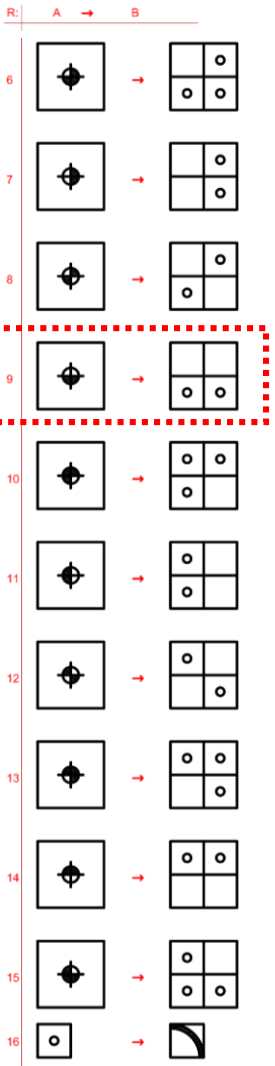
R: A \rightarrow B



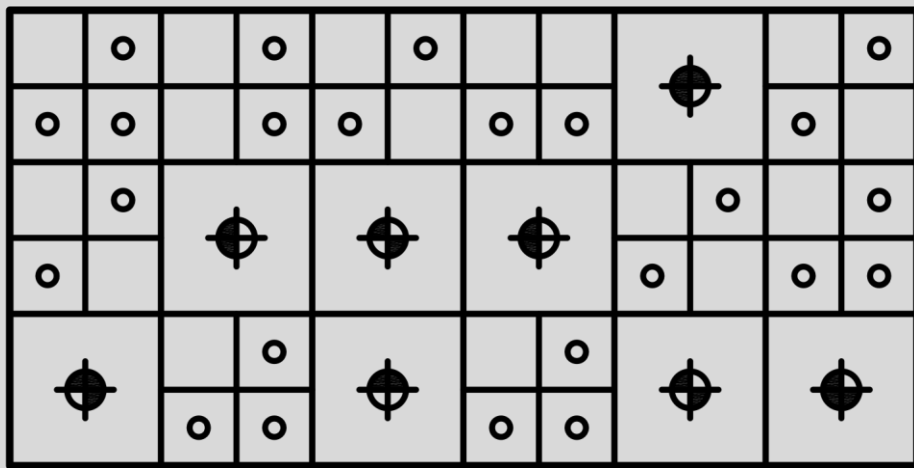
R8 (4x)
 \Rightarrow



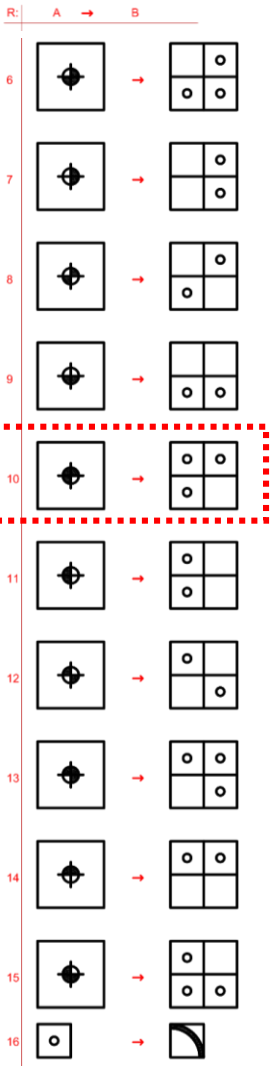
S: _____
L: {(0, 0) •}, {(0, 0) ◐}



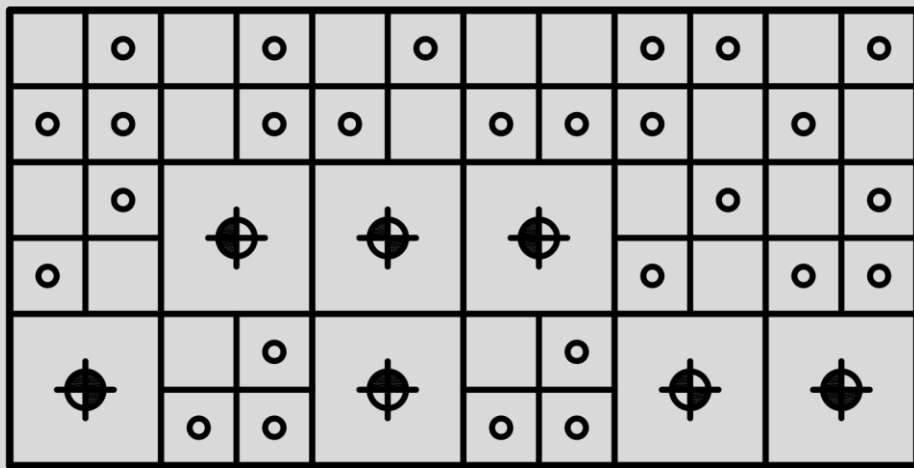
R9
⇒



S: _____
L: {(0,0), (1,1)} → {(0,0)}

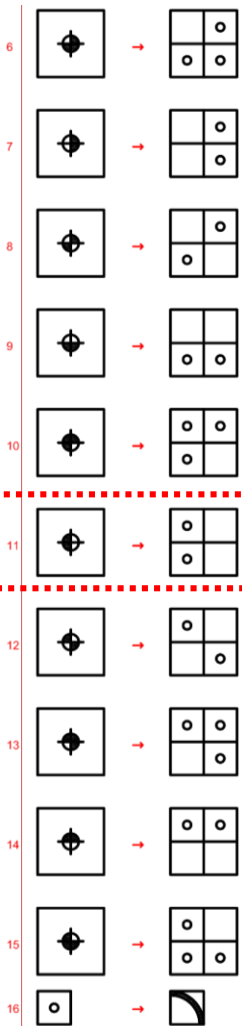


R10
⇒

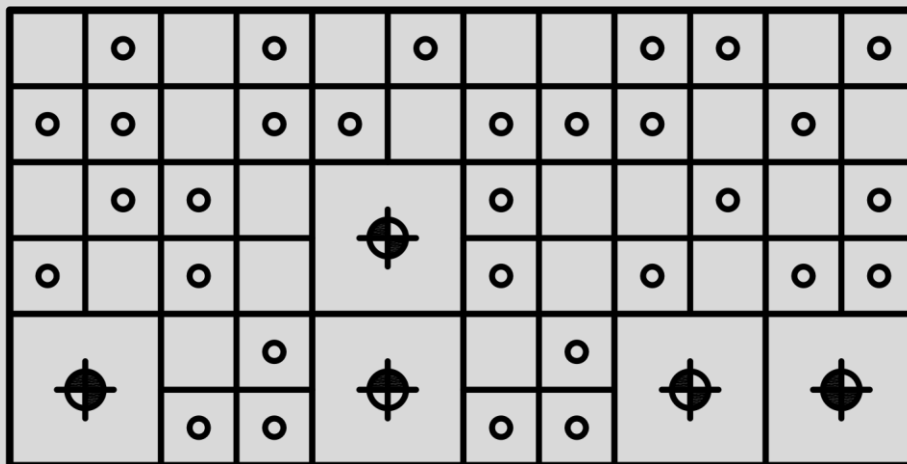


S: L: $\{(0,0), \bullet, \cdot, \cdot, (0,0)\}$

R: A \rightarrow B

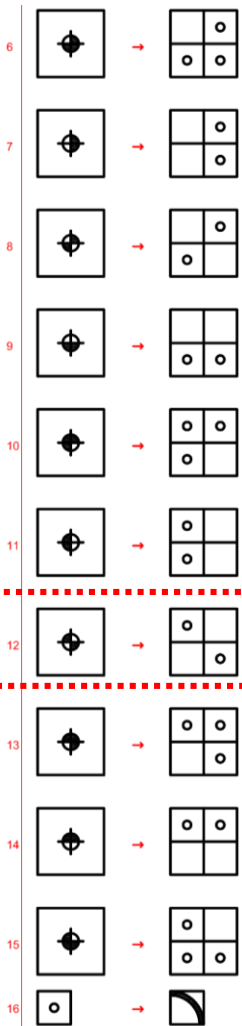


$R11_{(2x)}$

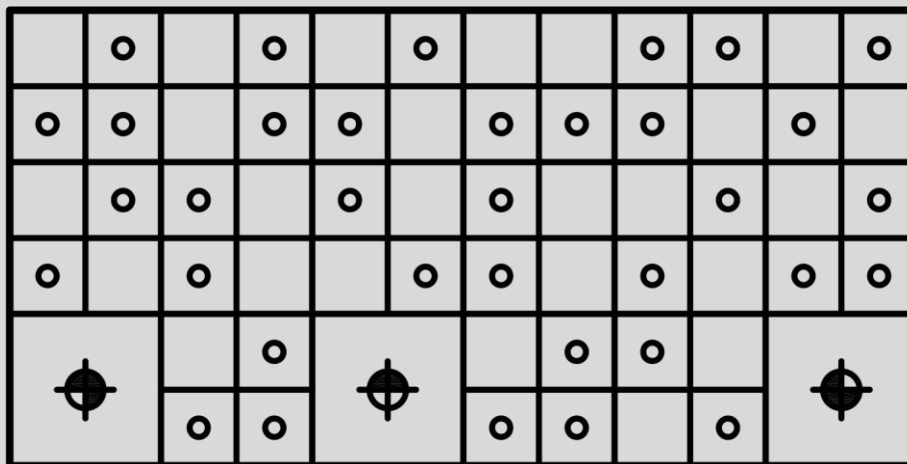


S: _____
L: {(0,0) •}, {(0,0) ◀}

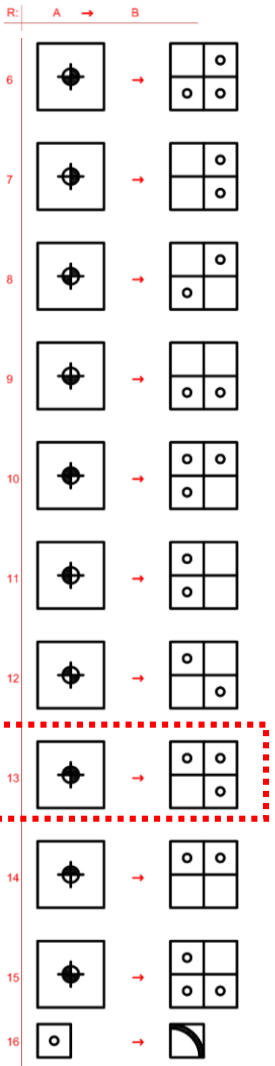
R: A → B



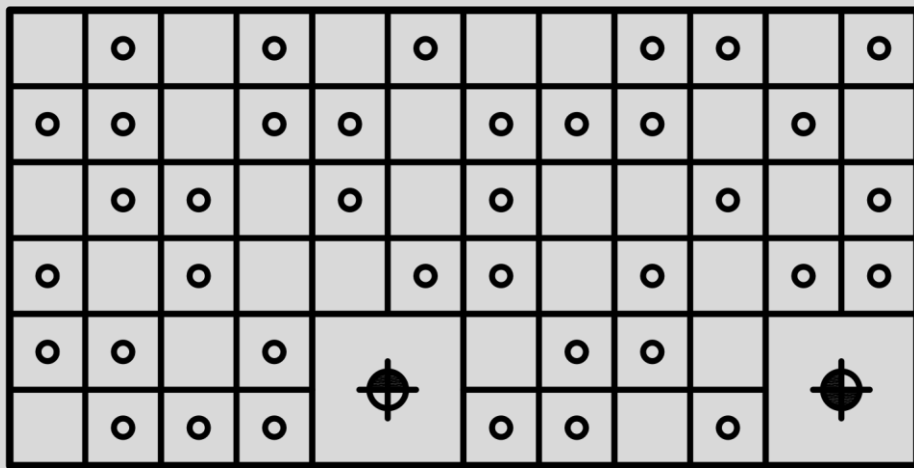
R12_(2x) →



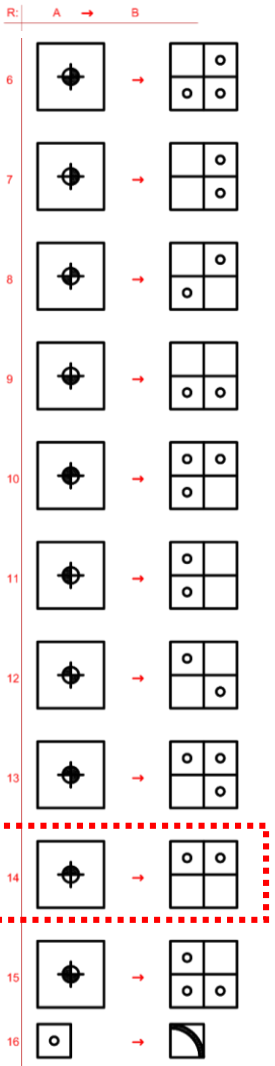
S: _____
L: {(0,0), (0,0)}, {(0,0)}



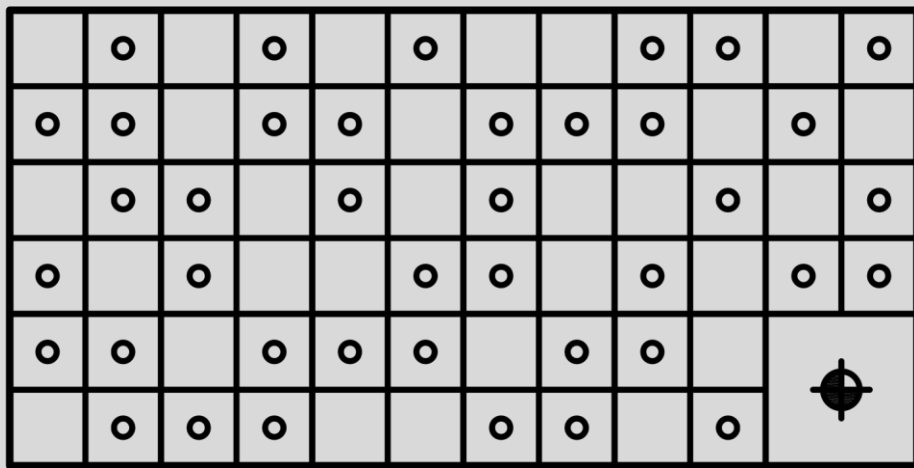
R13
⇒



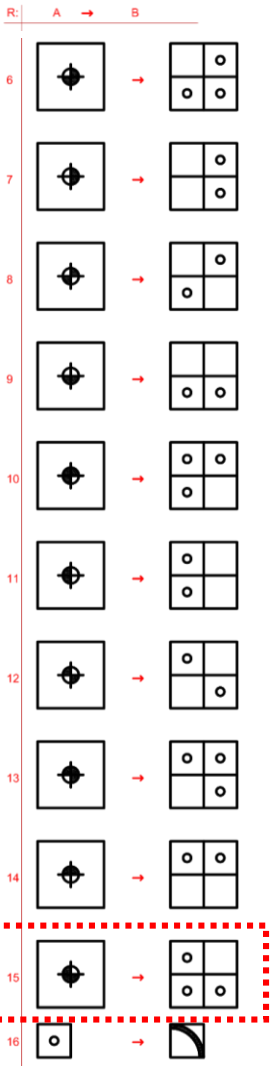
S:  L: $\{(0,0), (1,0)\}$



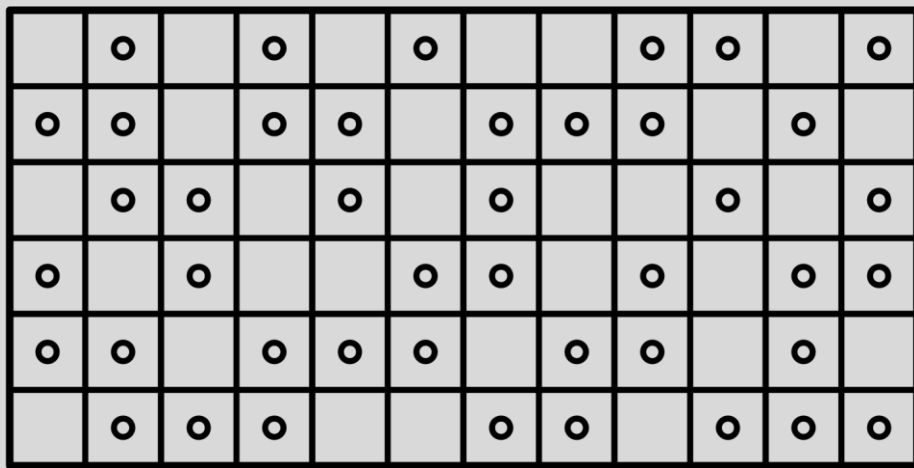
R14
⇒



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

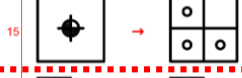
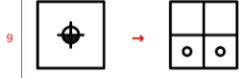
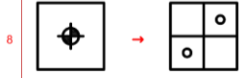
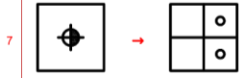
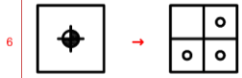


R15
⇒

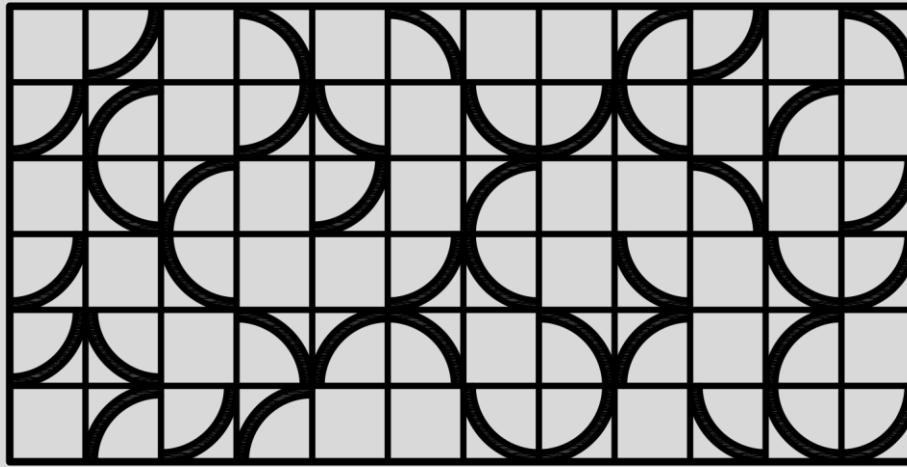


S:  , $\{(0, 0)\}$

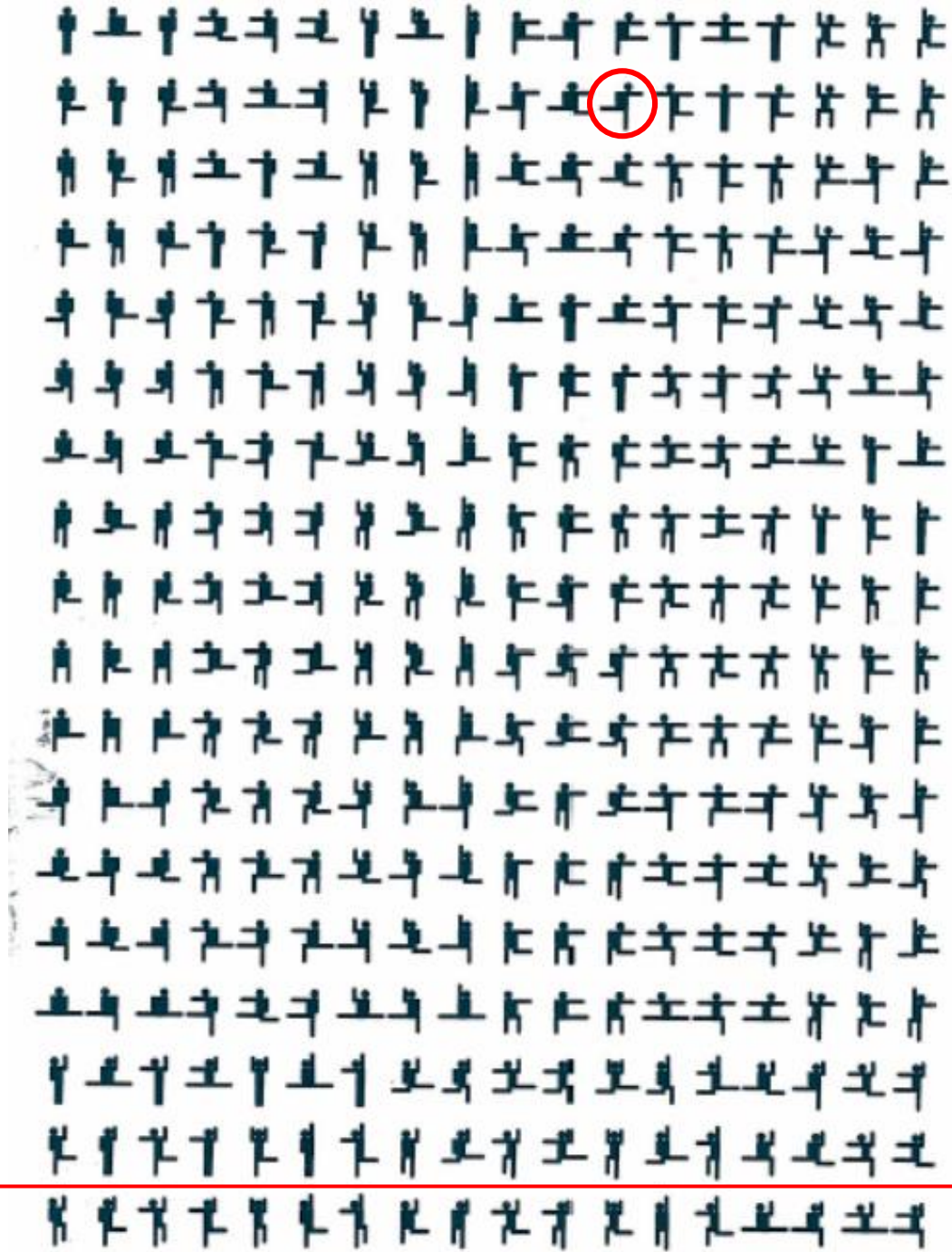
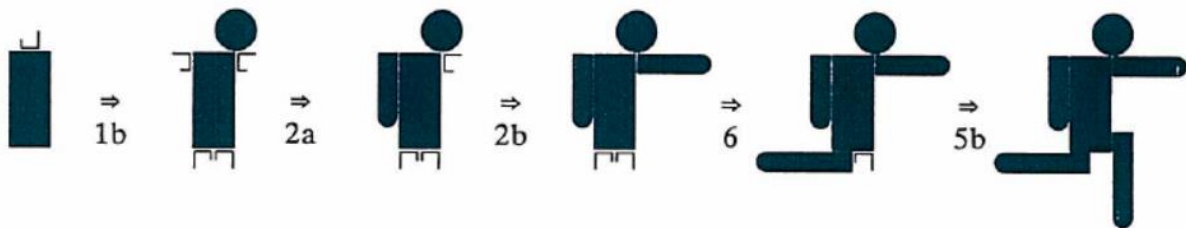
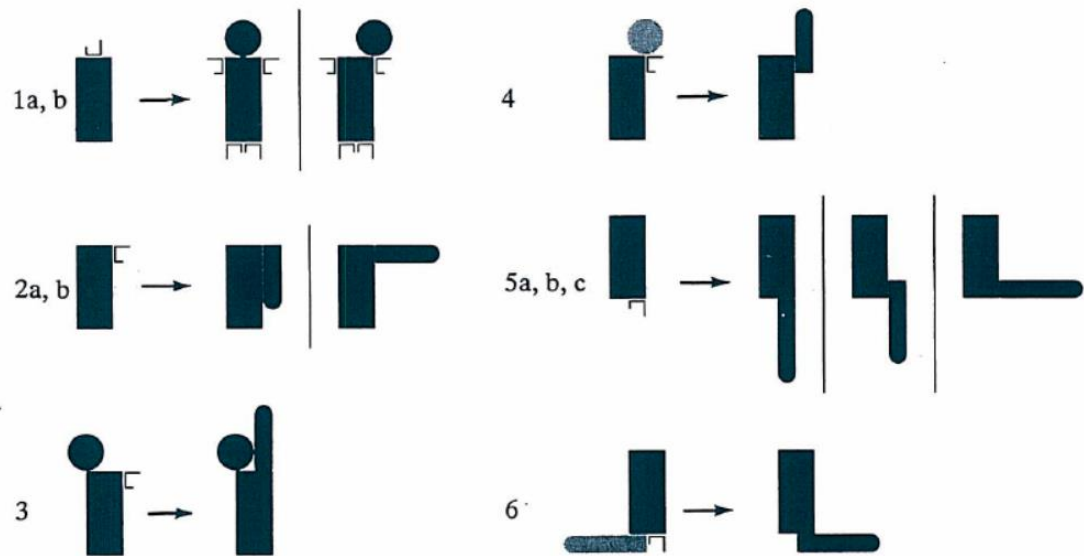
R: A \rightarrow B



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;



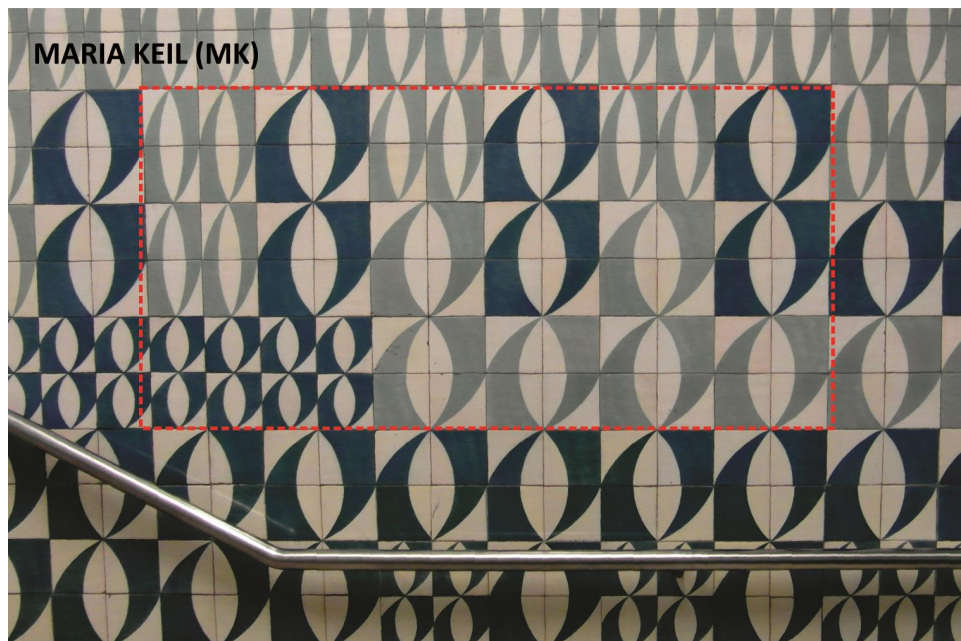
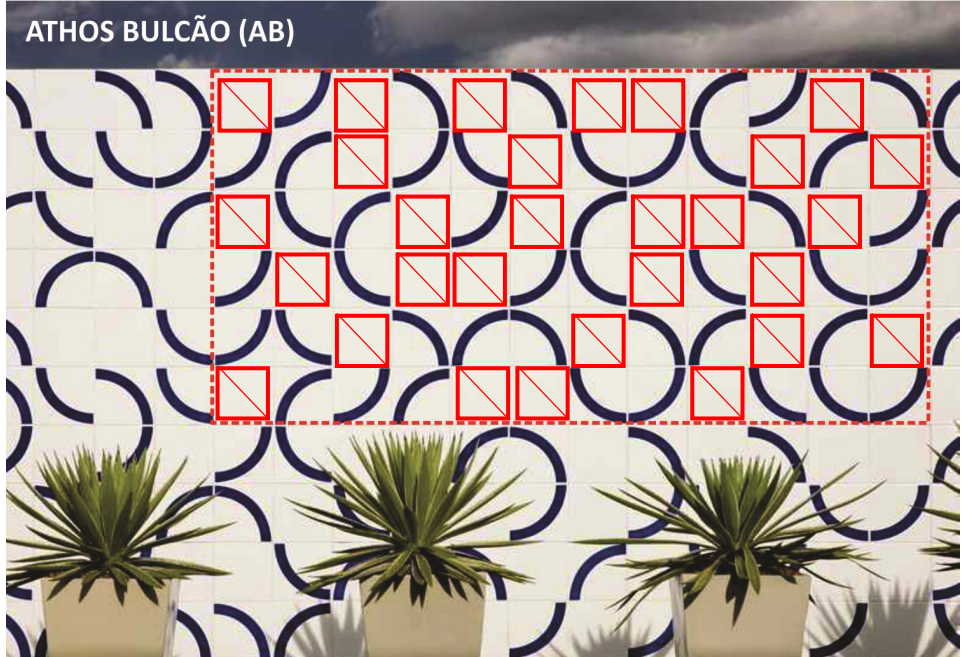
2 - Forma simples – Arco;

3 - Aleatoriedade.

Maria Keil

4 - Diferentes escalas;

5 - Distorção da forma.



Características selecionadas:

Athos Bulcão

1 - Trabalhar com o vazio;

2 - Forma simples – Arco;

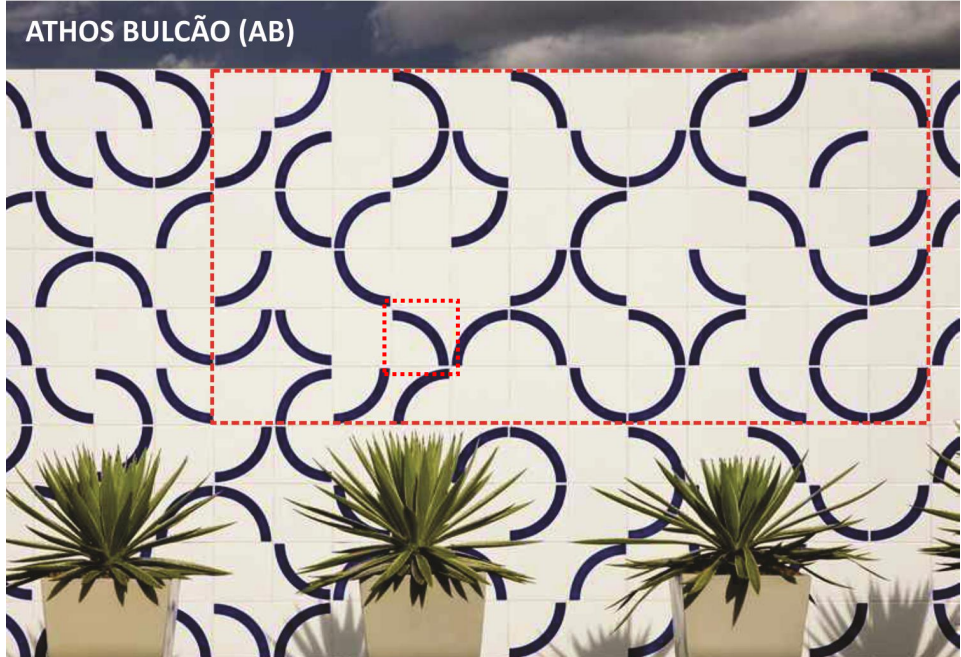


3 - Aleatoriedade.

Maria Keil

4 - Diferentes escalas;

5 - Distorção da forma.



Características selecionadas:

Athos Bulcão

1 - Trabalhar com o vazio;

2 - Forma simples – Arco;

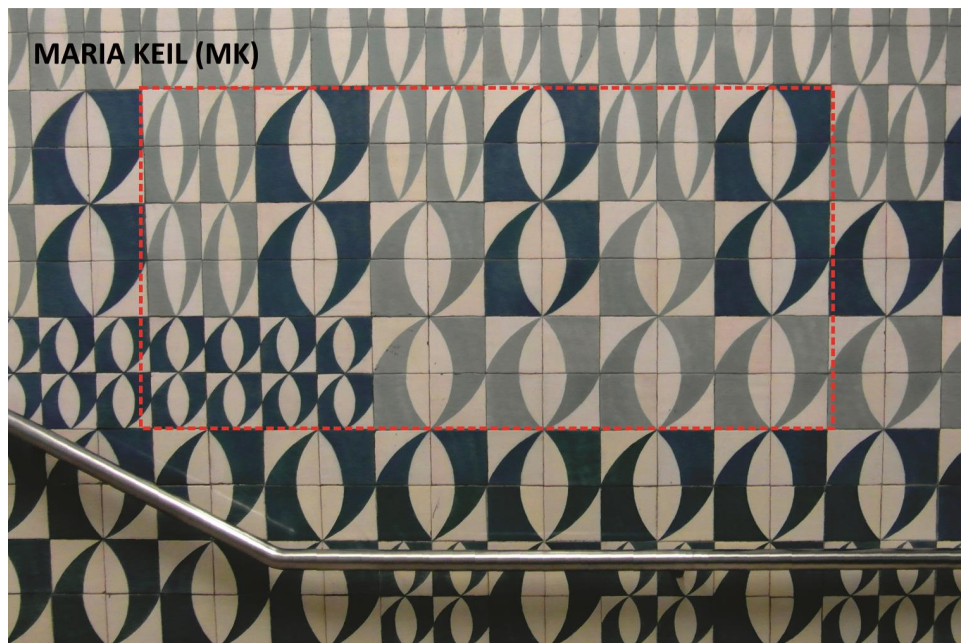
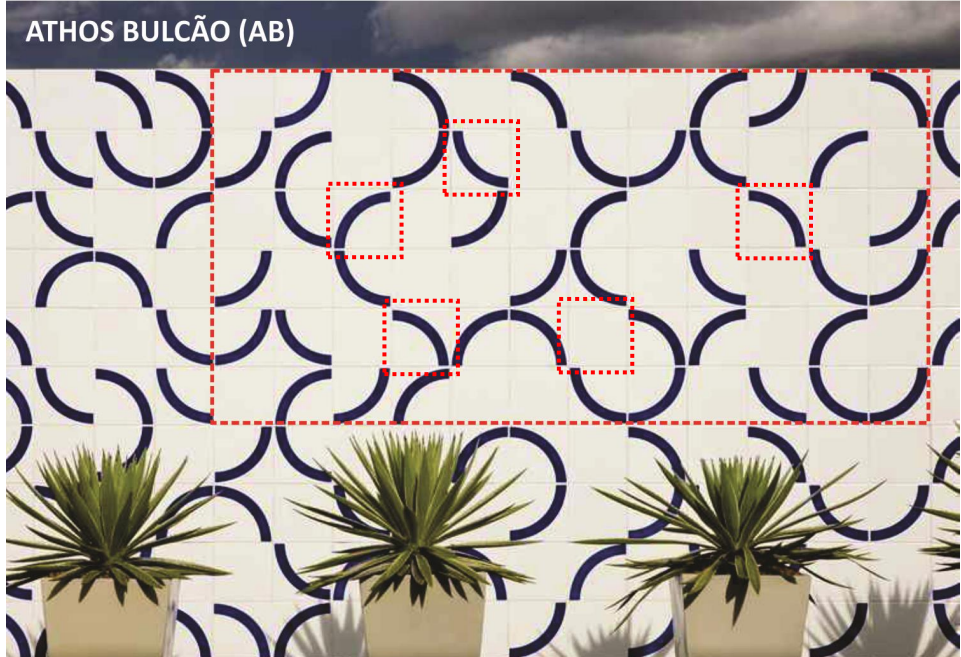
3 - Aleatoriedade.



Maria Keil

4 - Diferentes escalas;

5 - Distorção da forma.



Características selecionadas:

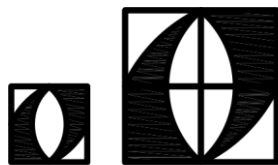
Athos Bulcão

1 - Trabalhar com o vazio;

2 - Forma simples – Arco;

3 - Aleatoriedade.

Maria Keil



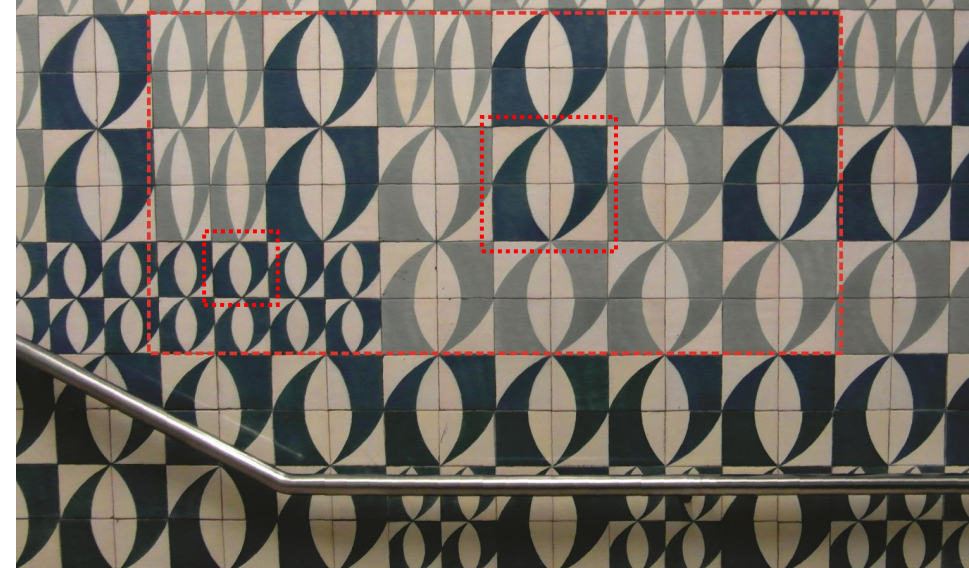
4 - Diferentes escalas;

5 - Distorção da forma.

ATHOS BULCÃO (AB)



MARIA KEIL (MK)



Características selecionadas:

Athos Bulcão

1 - Trabalhar com o vazio;

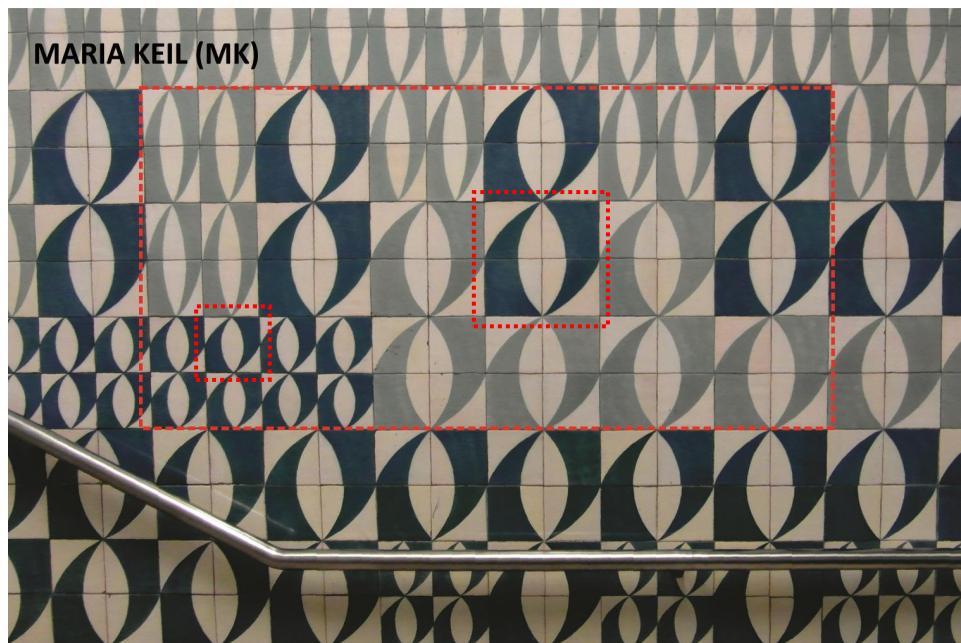
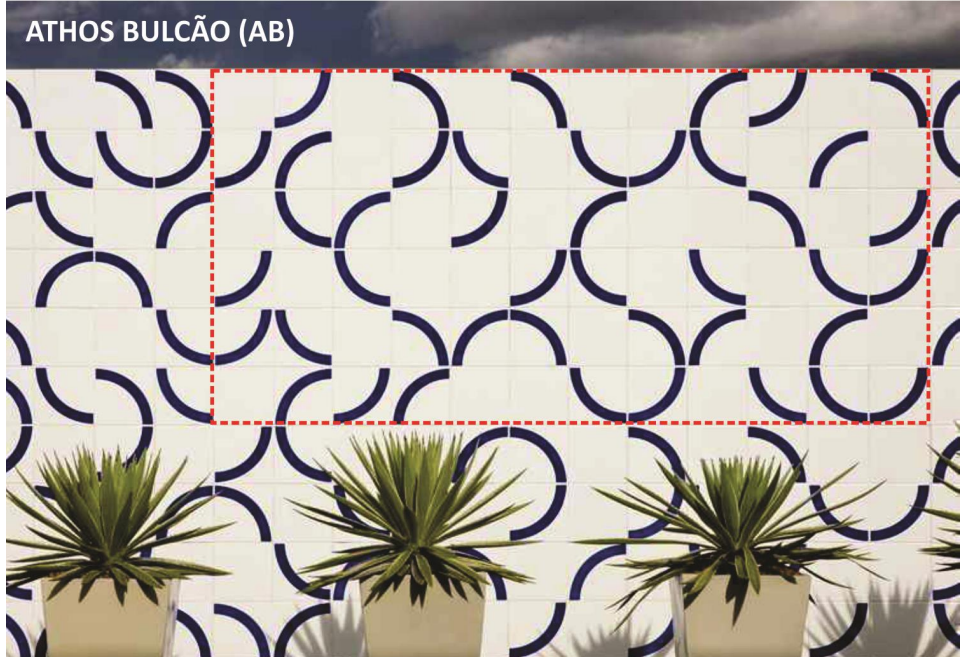
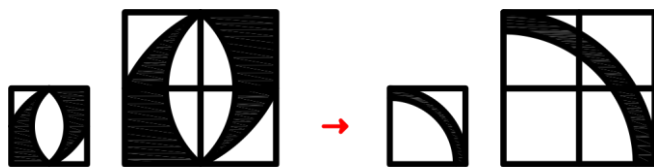
2 - Forma simples – Arco;

3 - Aleatoriedade.

Maria Keil

4 - Diferentes escalas;

5 - Distorção da forma.



Características selecionadas:

Athos Bulcão

1 - Trabalhar com o vazio;

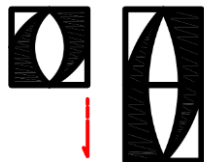
2 - Forma simples – Arco;

3 - Aleatoriedade.

Maria Keil

4 - Diferentes escalas;

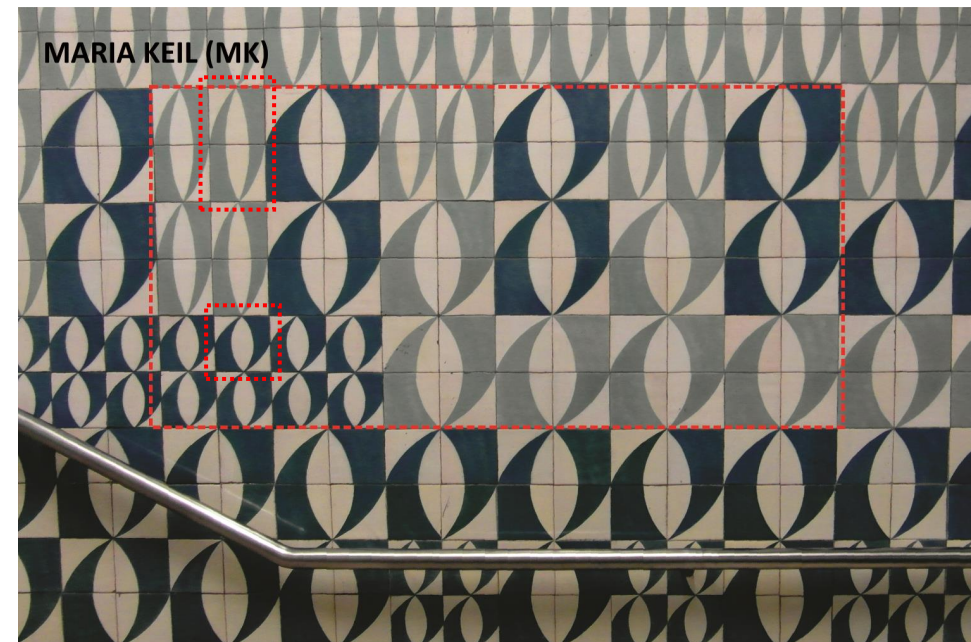
5 - Distorção da forma.



ATHOS BULCÃO (AB)



MARIA KEIL (MK)



Características selecionadas:

Athos Bulcão

1 - Trabalhar com o vazio;

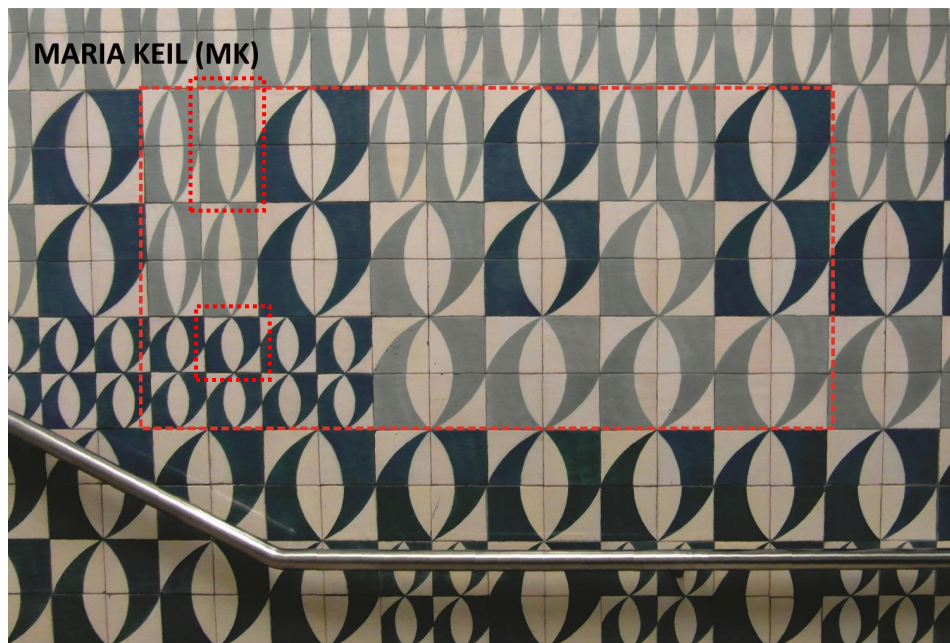
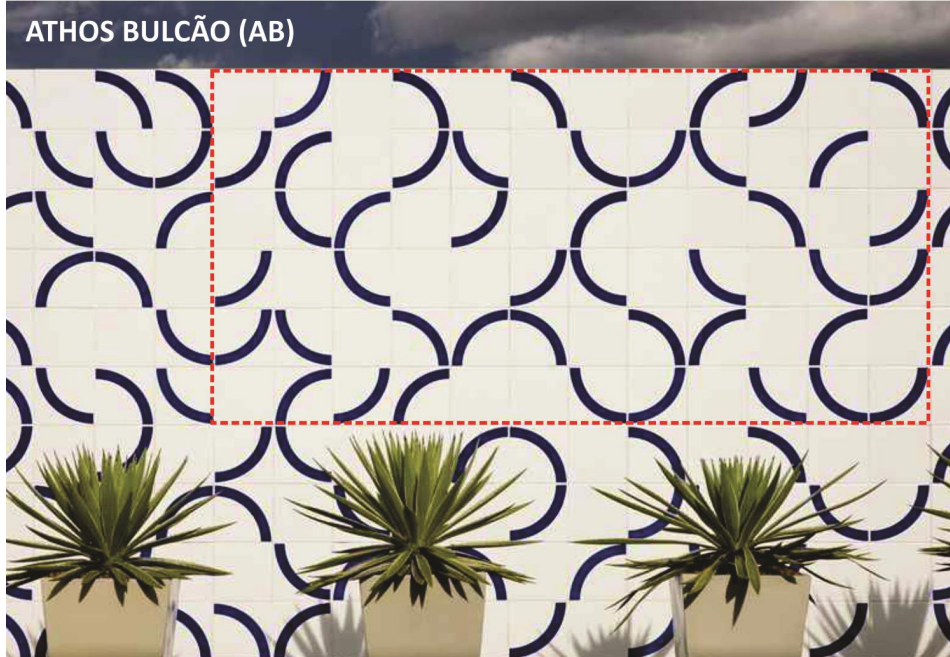
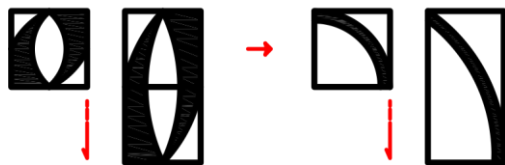
2 - Forma simples – Arco;

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.

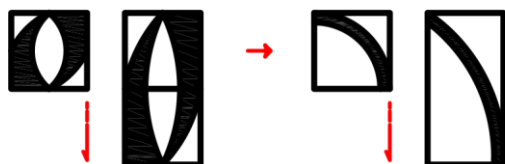


Maria Keil

4 - Diferentes escalas;



5 - Distorção da forma.



ATHOS BULCÃO (AB)

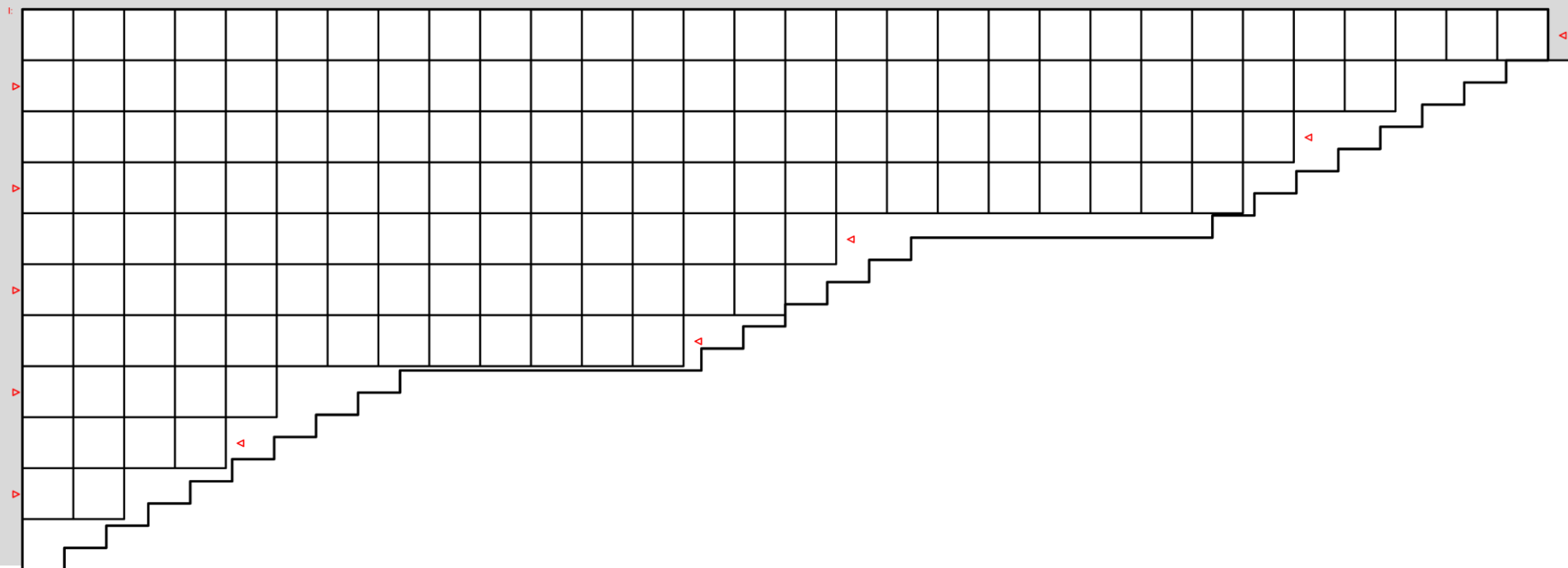


MARIA KEIL (MK)

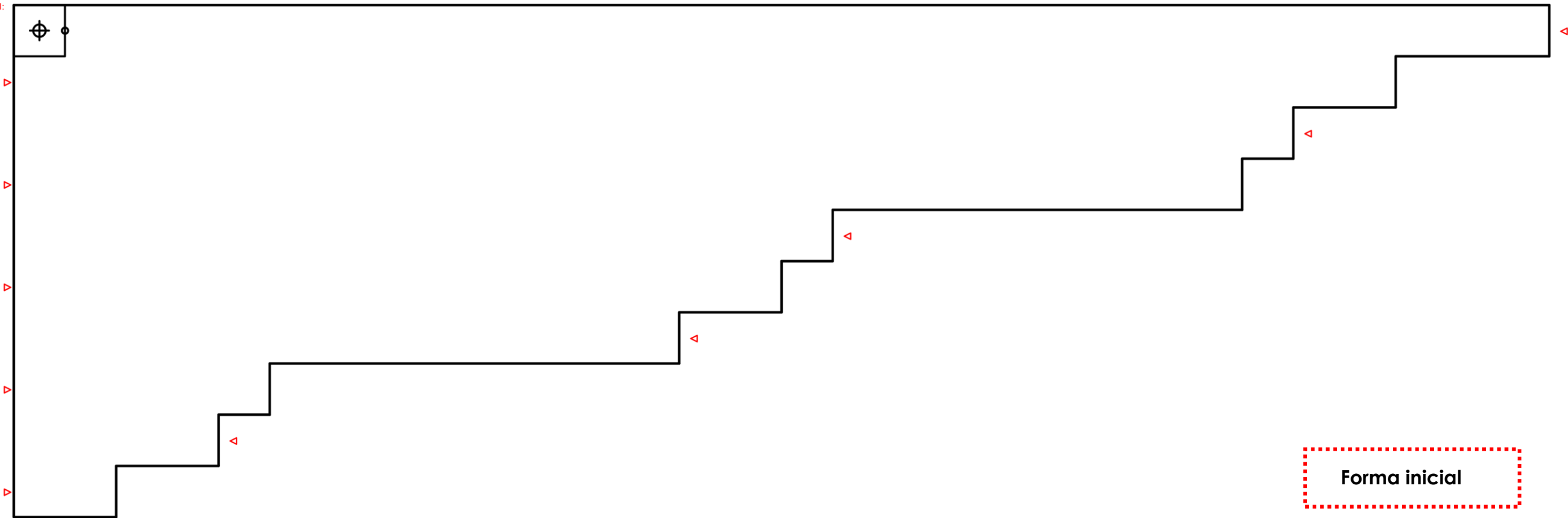
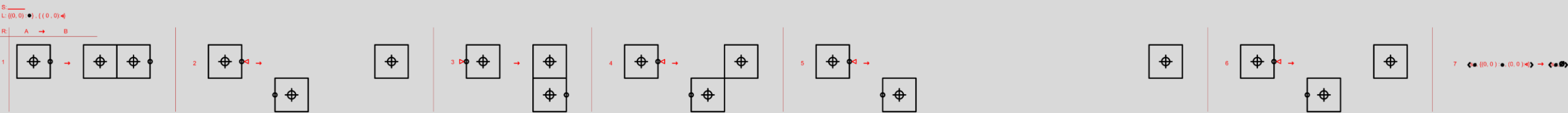


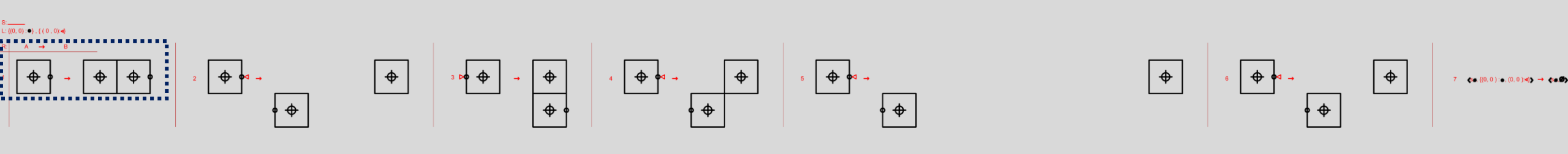
Compreendendo a Forma inicial



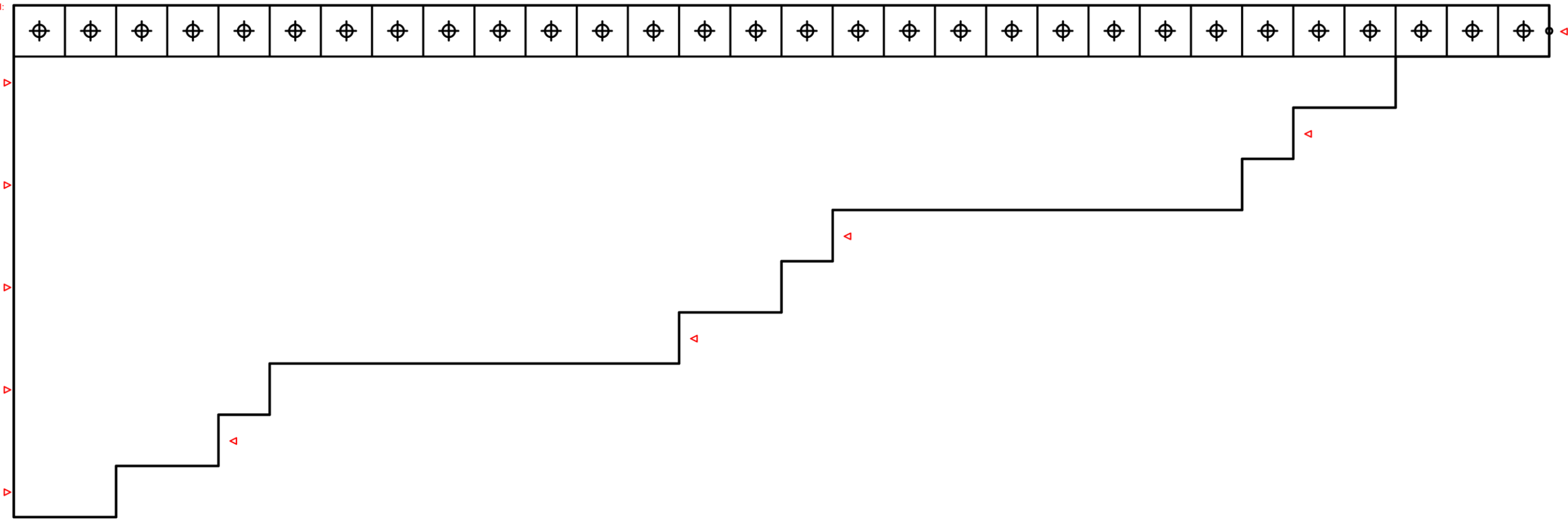


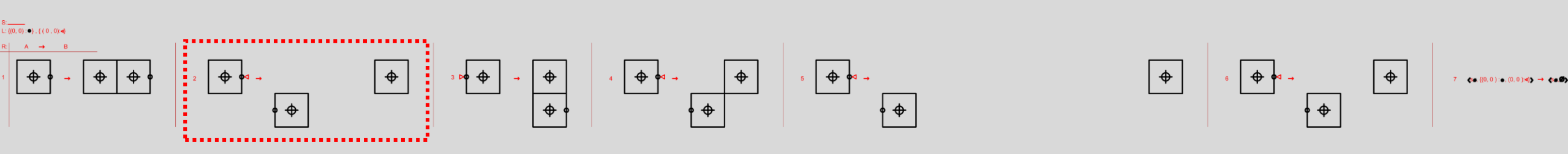
0 .4 .8



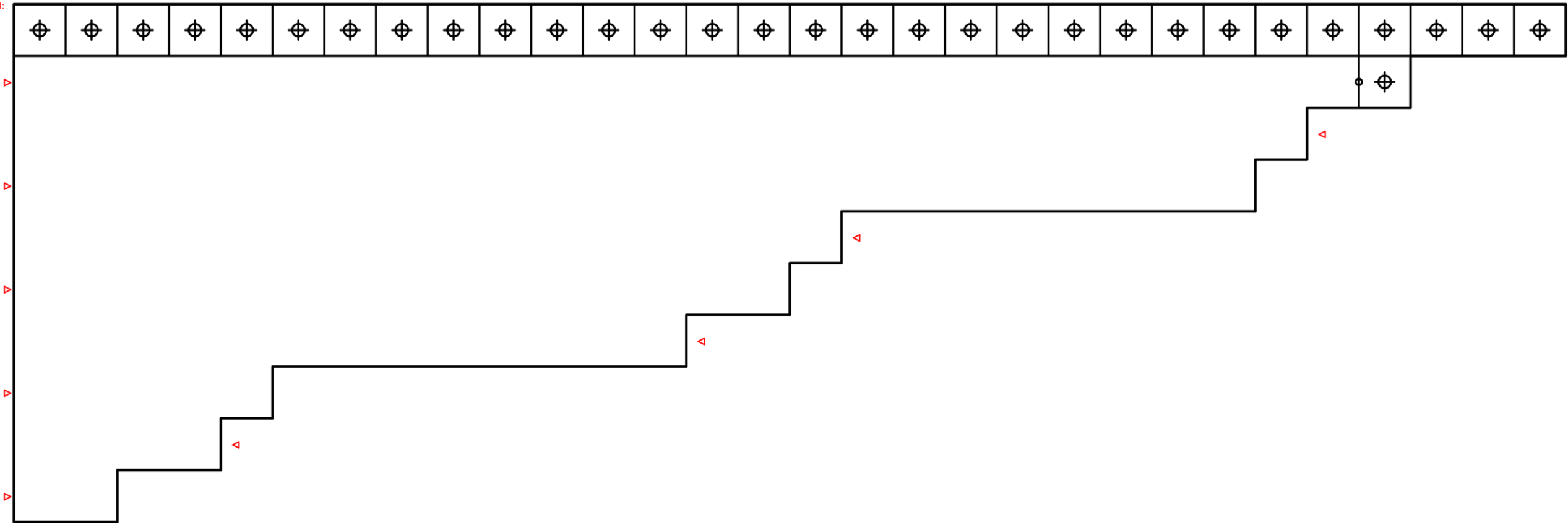


R1 (29x)





R2
 \Downarrow



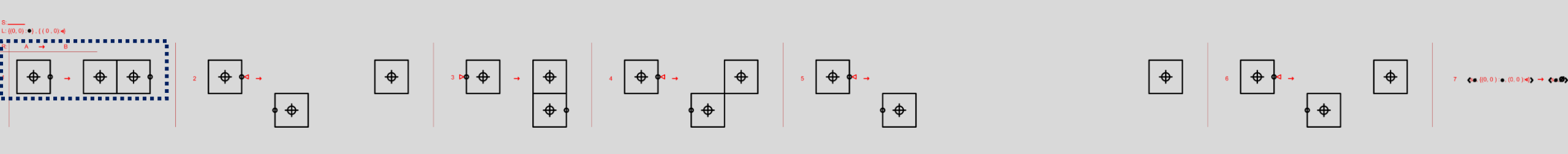
GF

aplicação

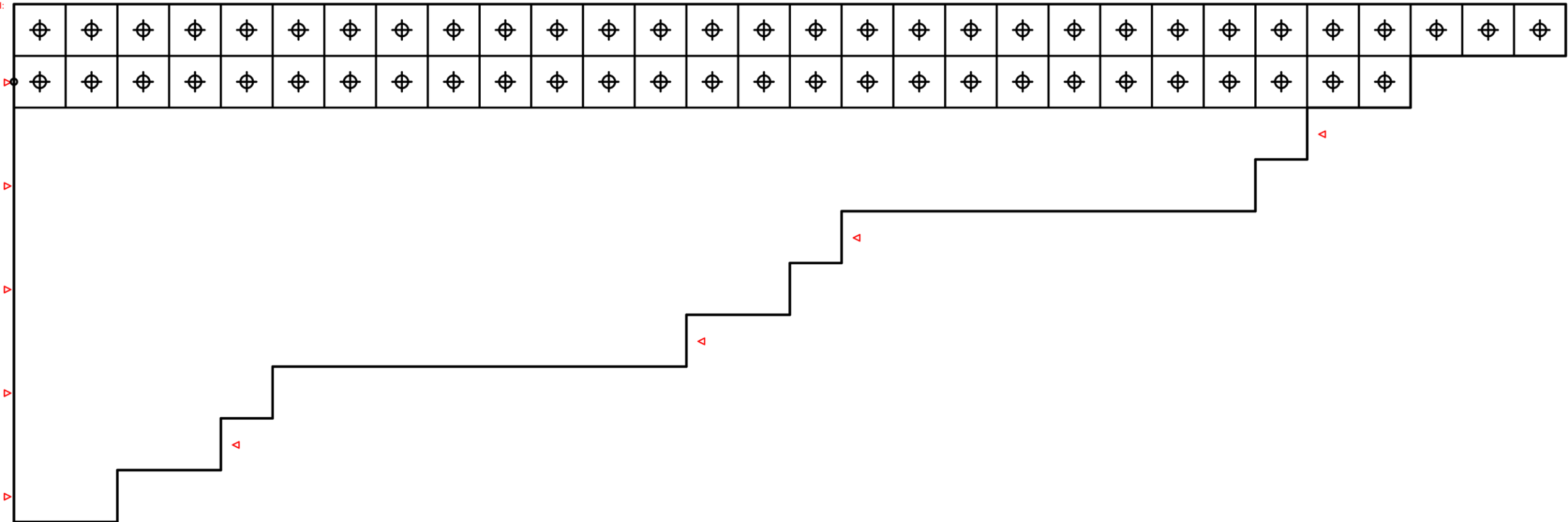
Regra AB

Regra MK

Regra nova



R1 (26x)

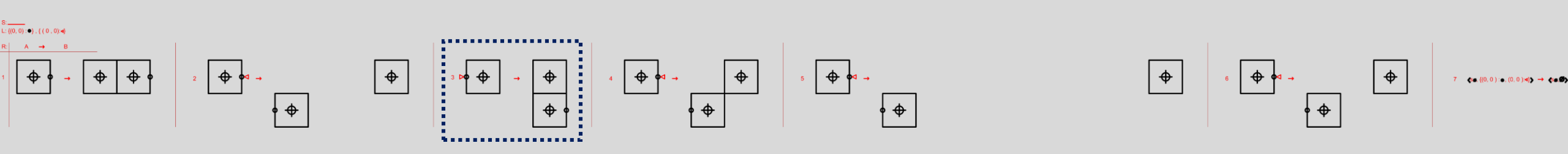


aplicação

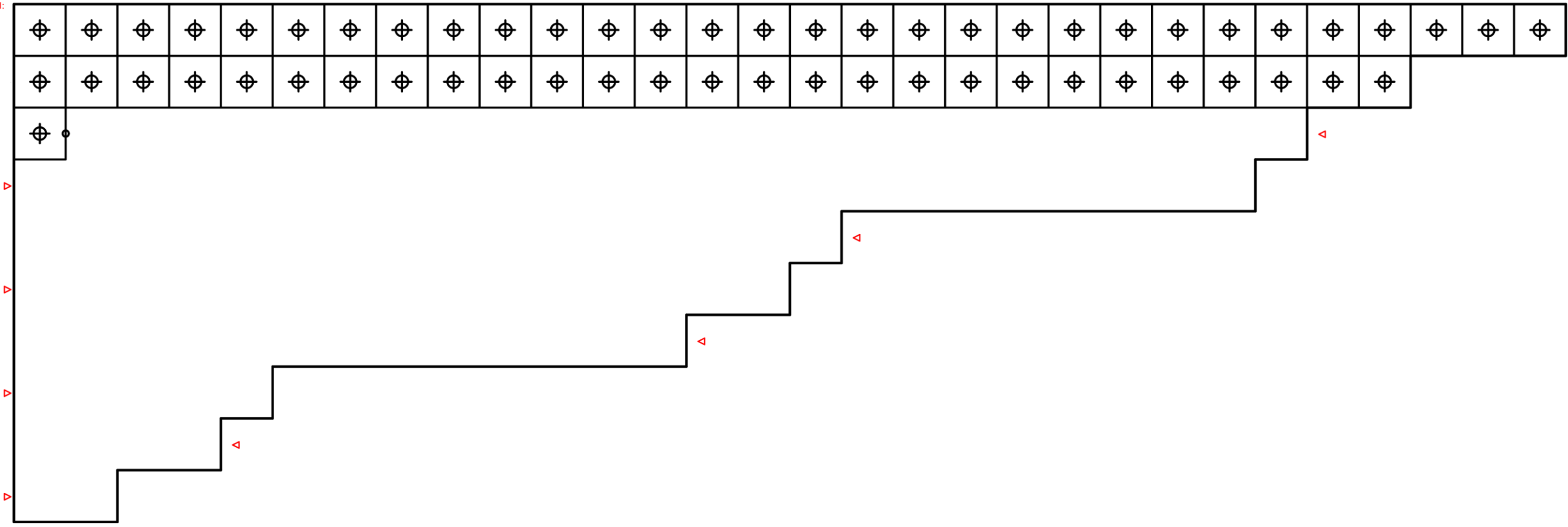
Regra AB

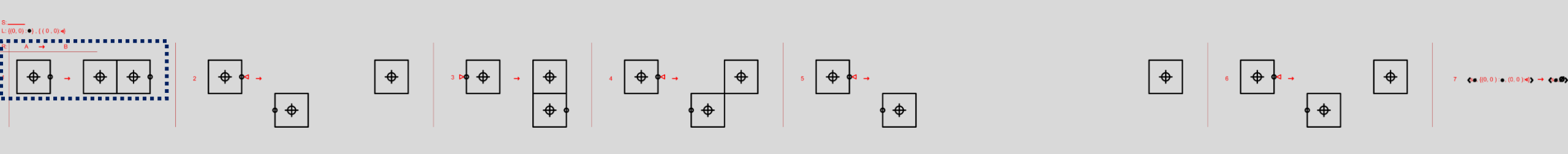
Regra MK

Regra nova

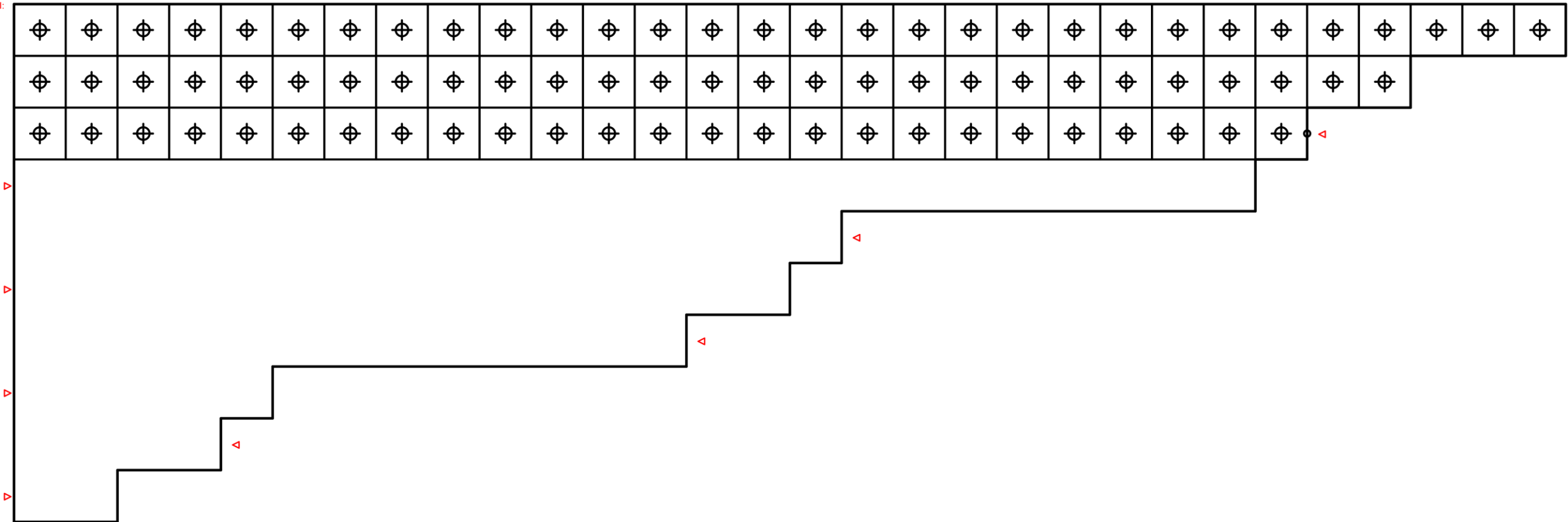


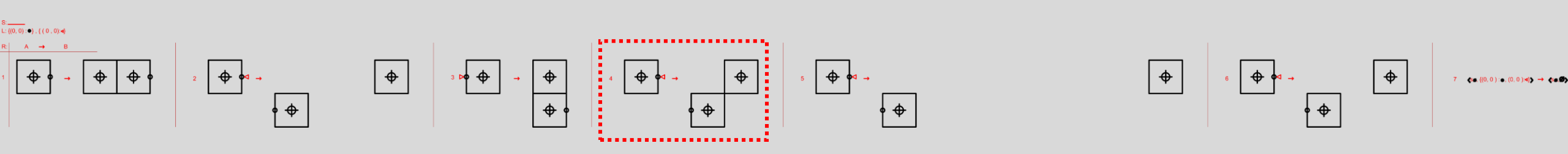
R3



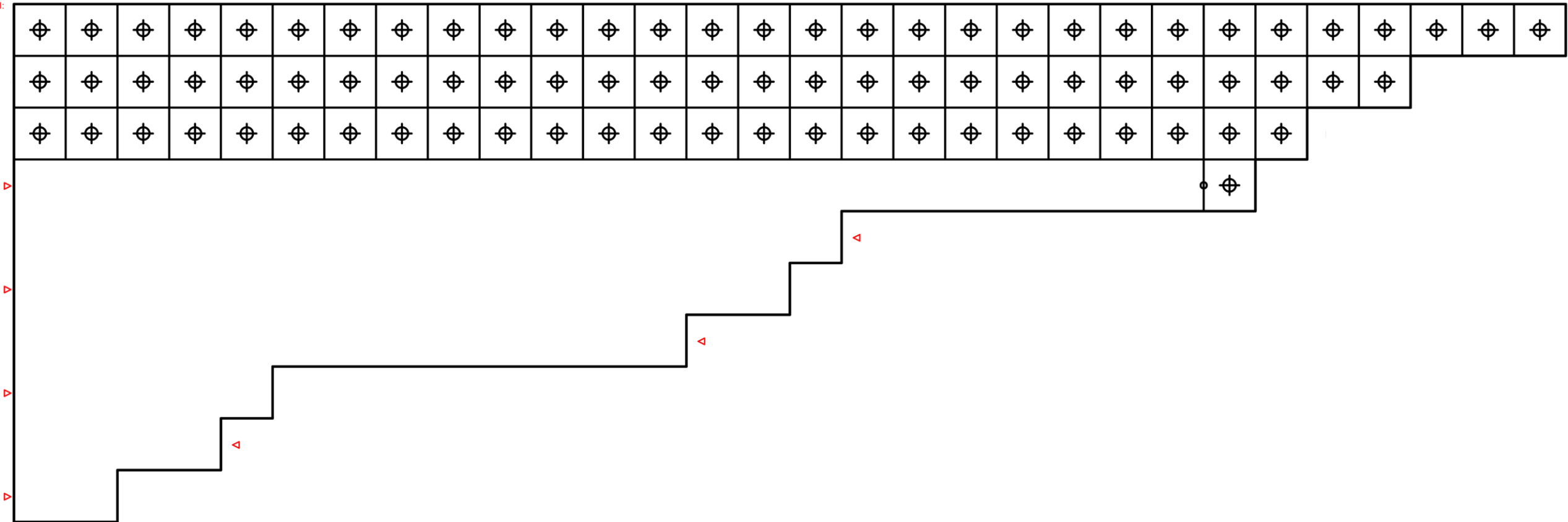


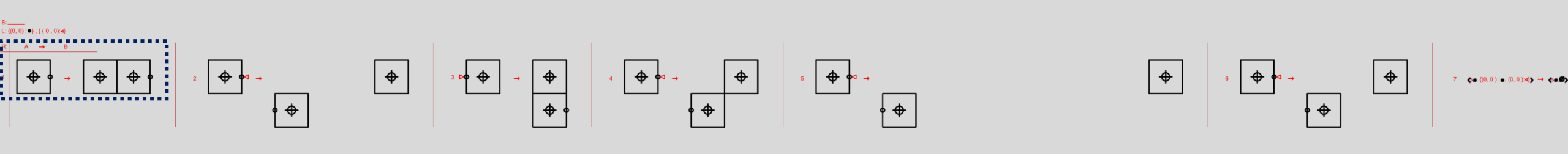
R1_(24x)



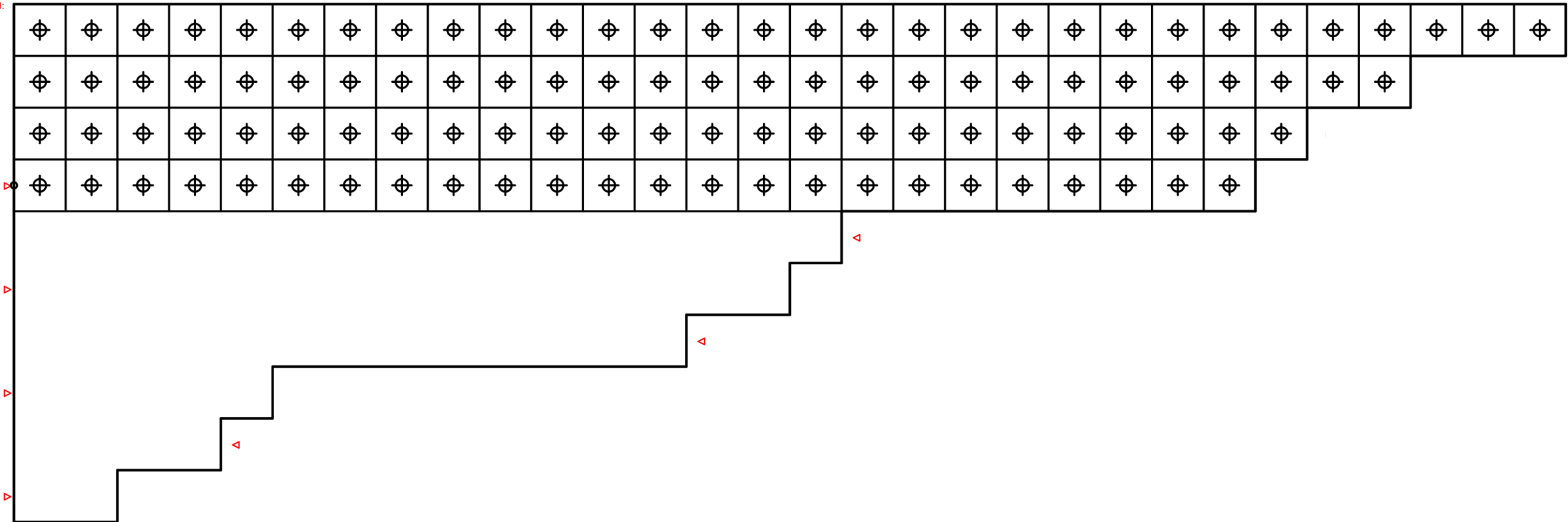


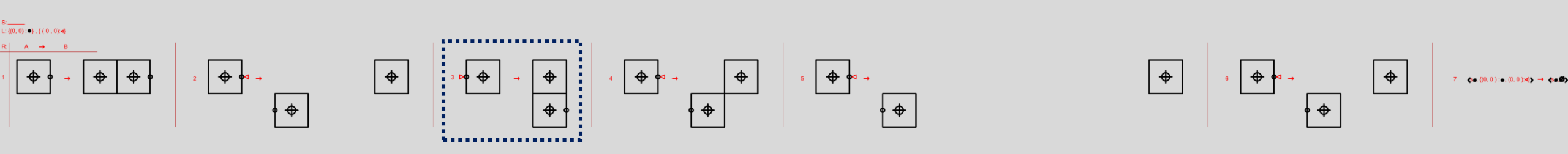
R4



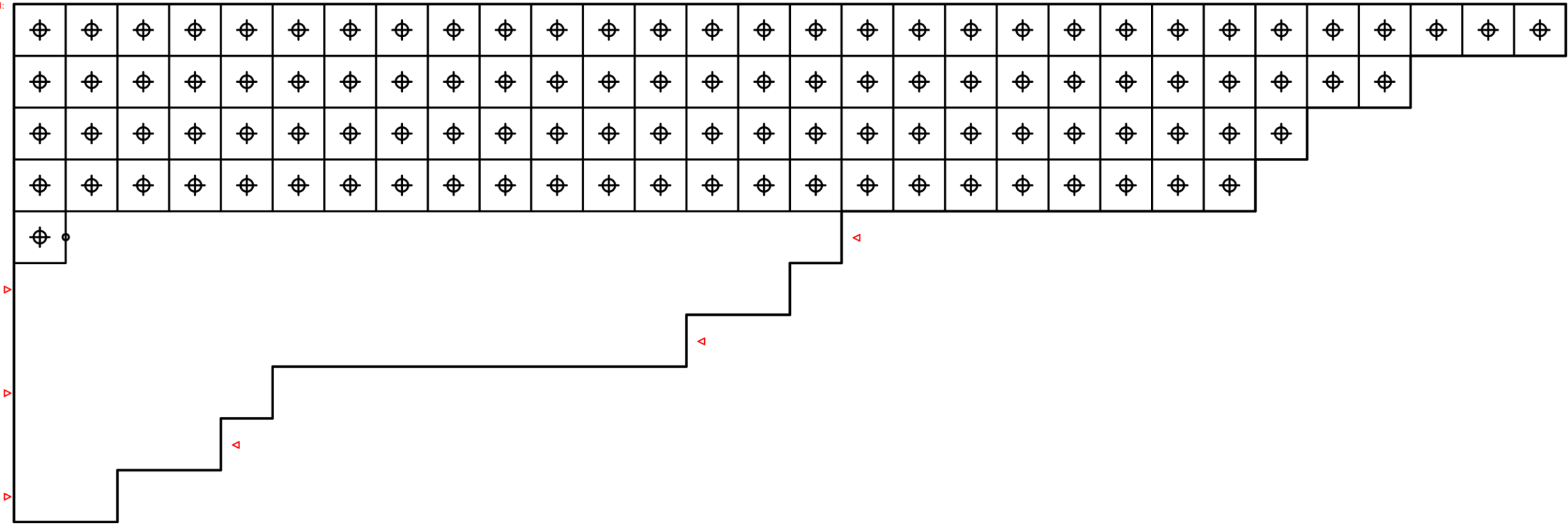


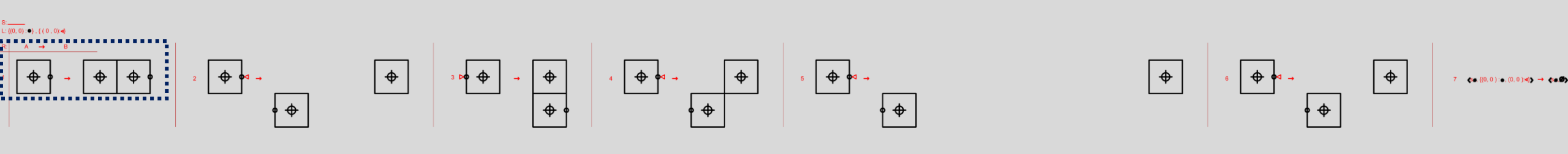
R1 (23x)



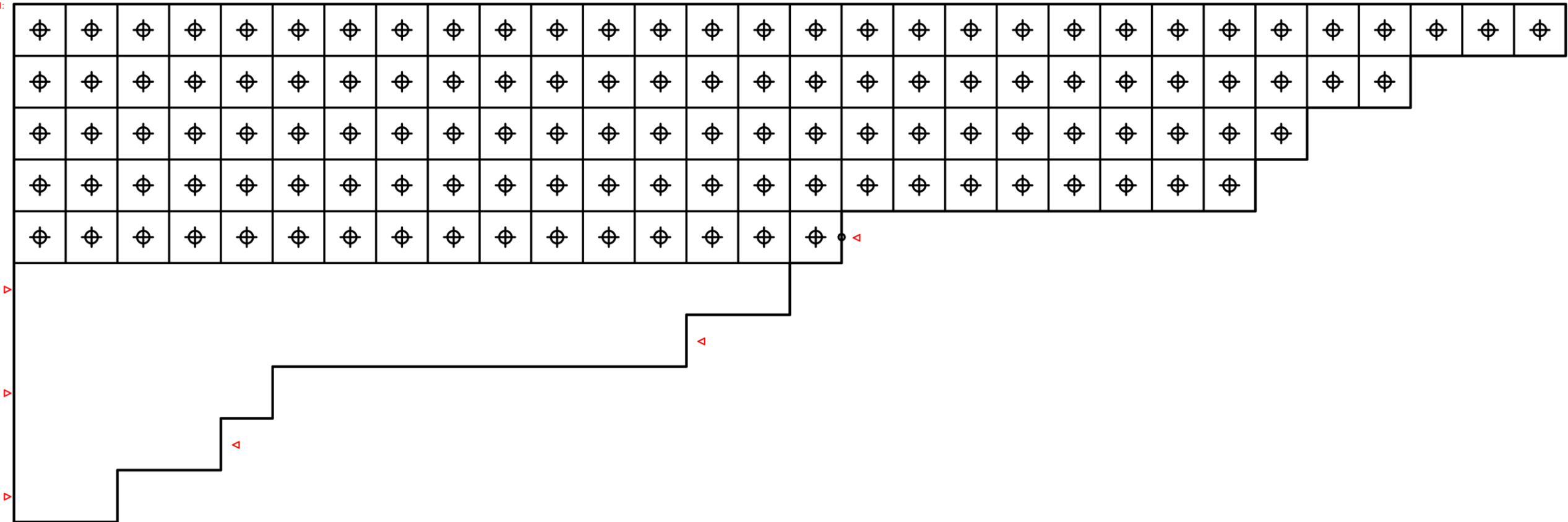


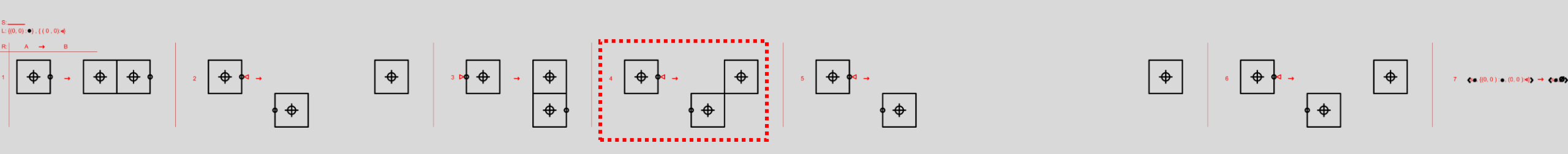
R3



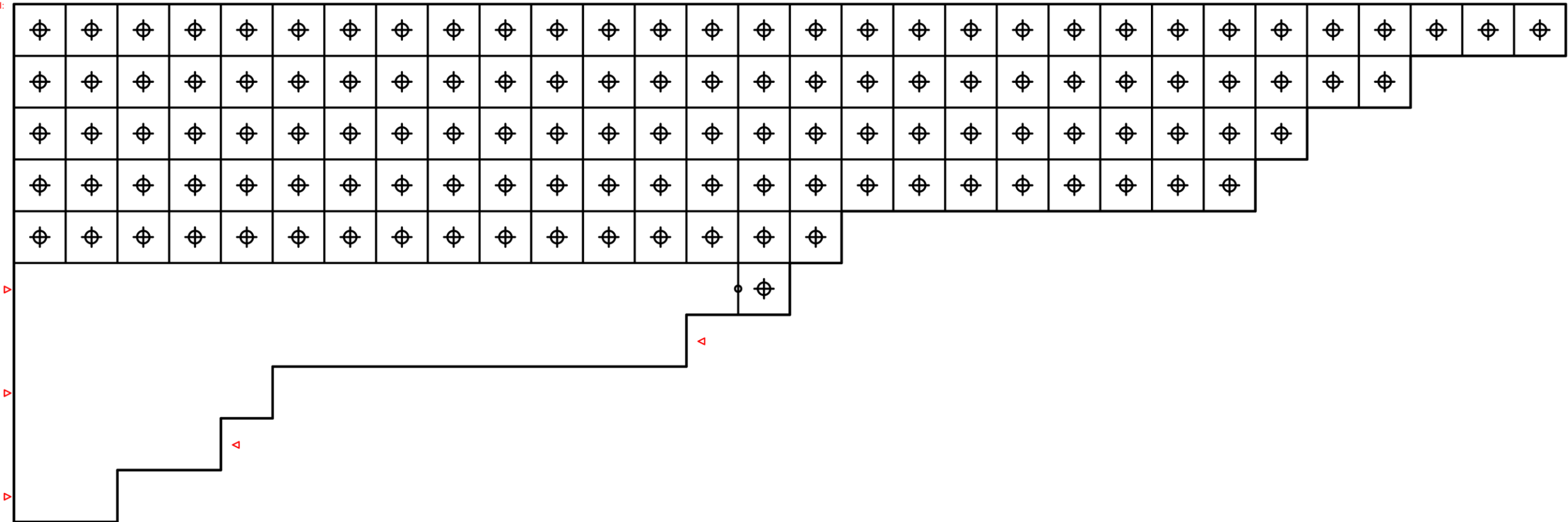


R1 (15x)





R4

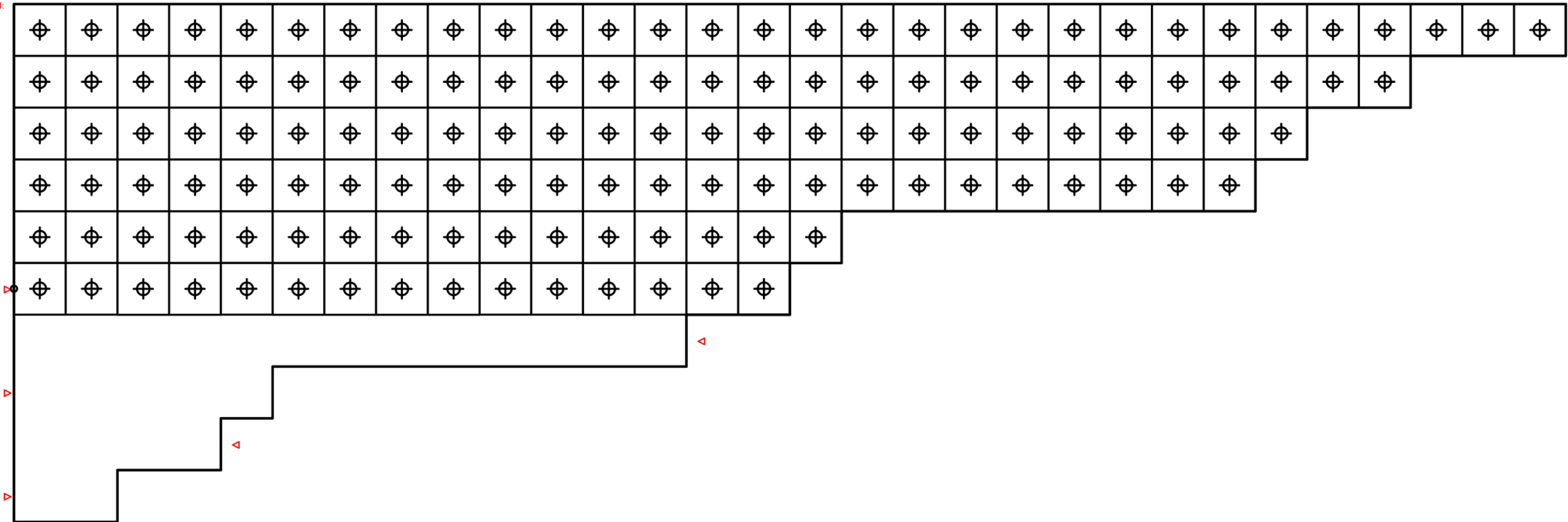
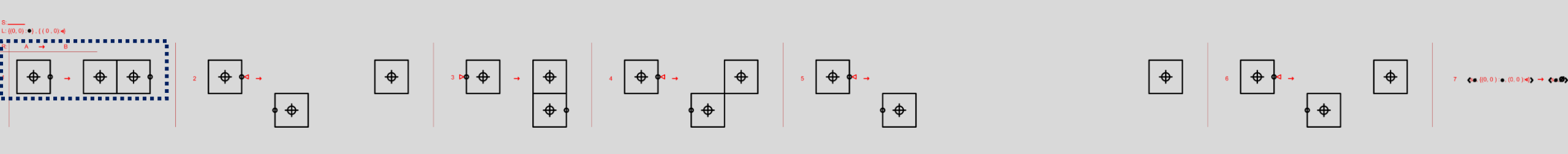


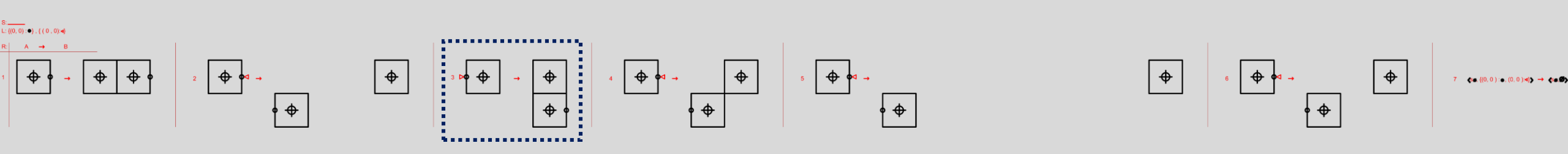
aplicação

Regra AB

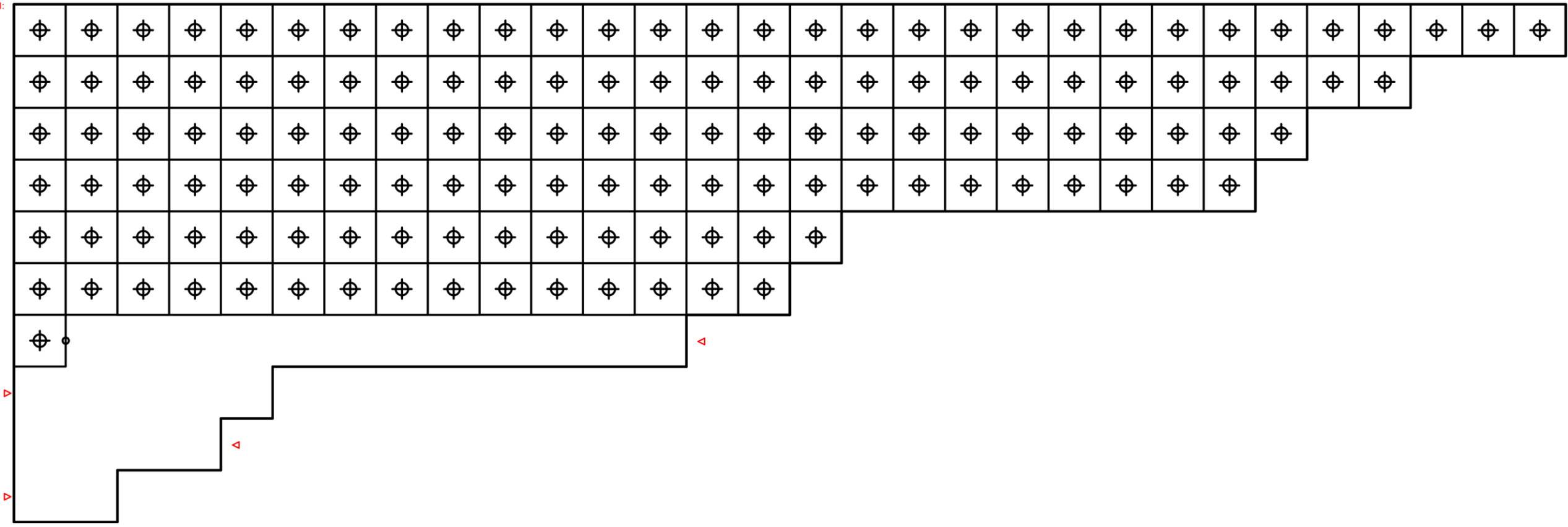
Regra MK

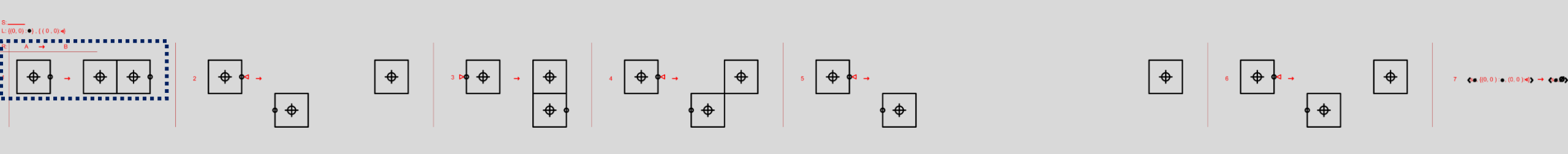
Regra nova



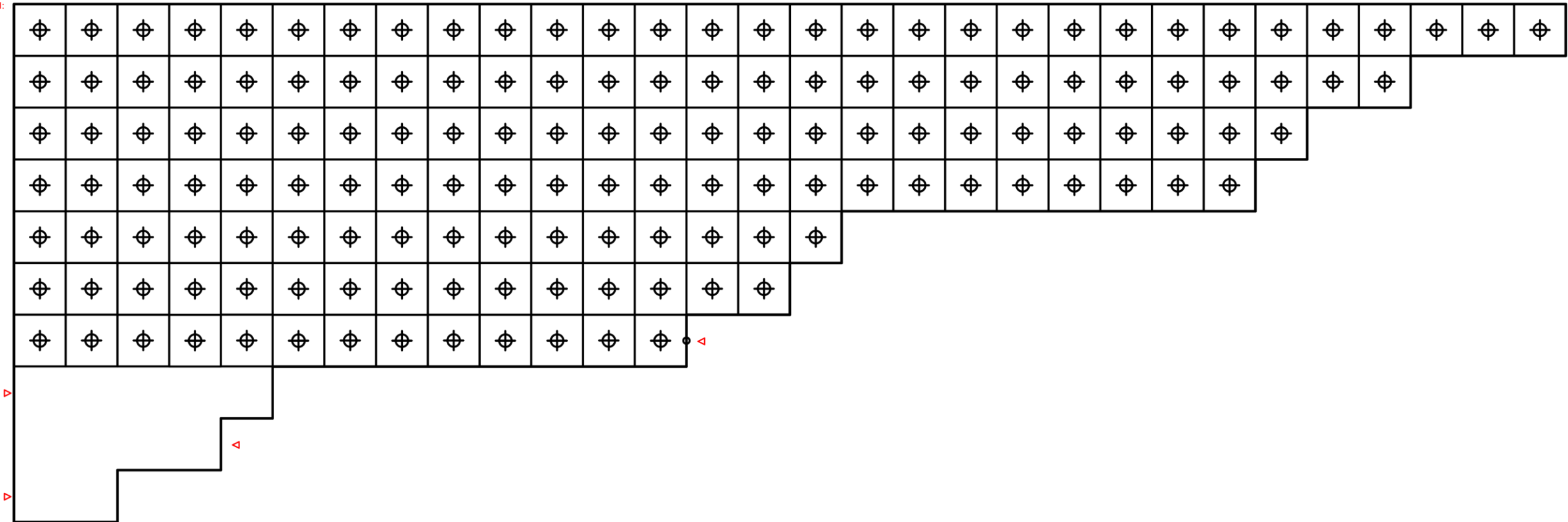


R3





R1_(12x)



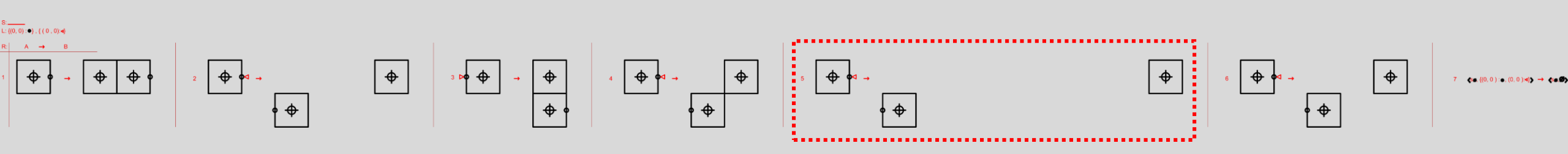
GF

aplicação

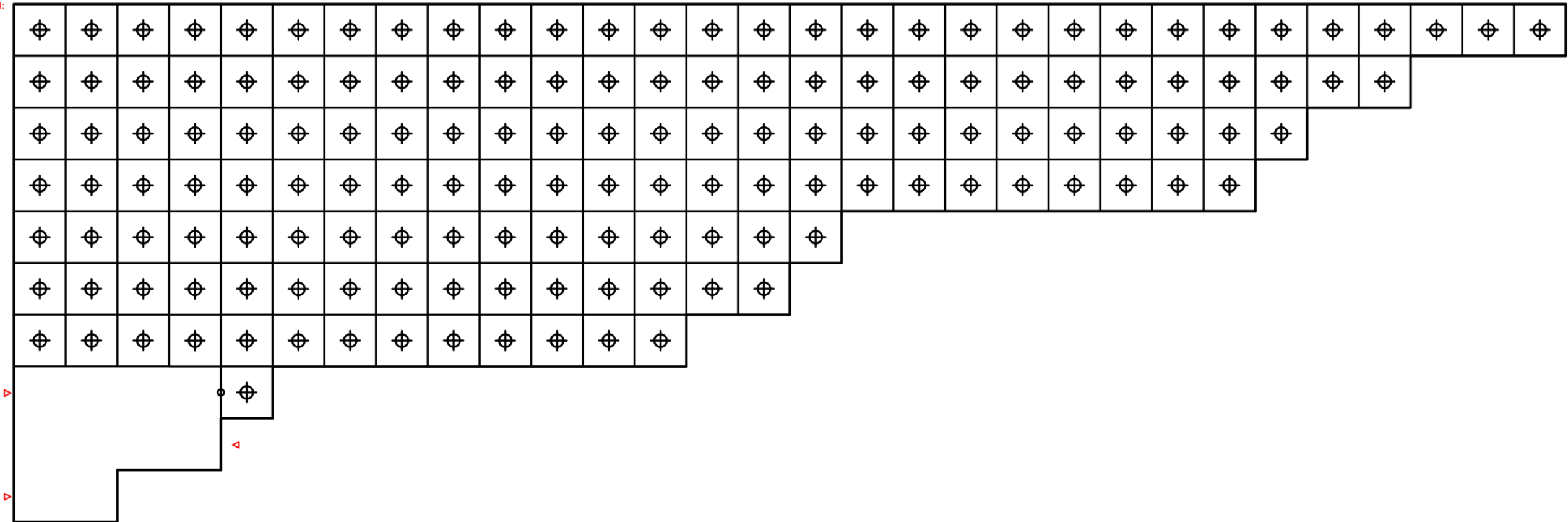
Regra AB

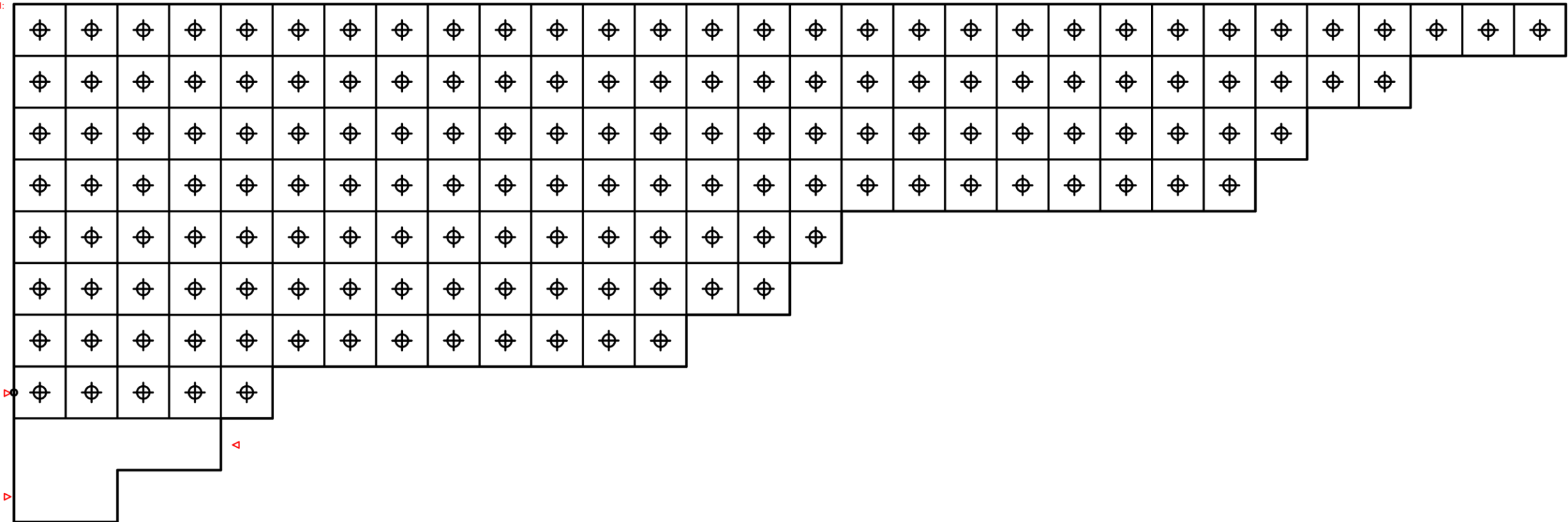
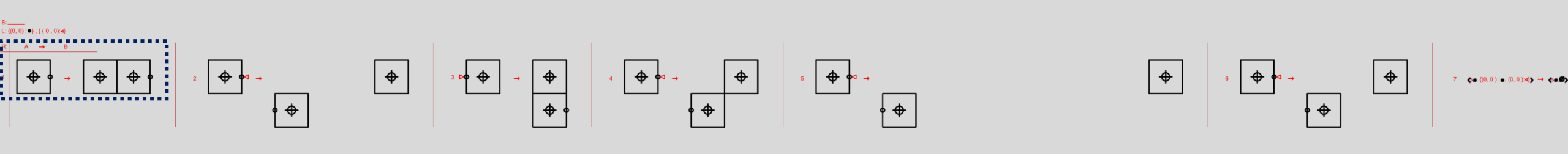
Regra MK

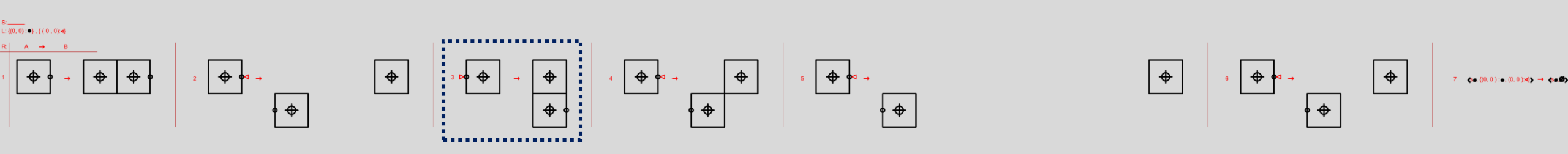
Regra nova



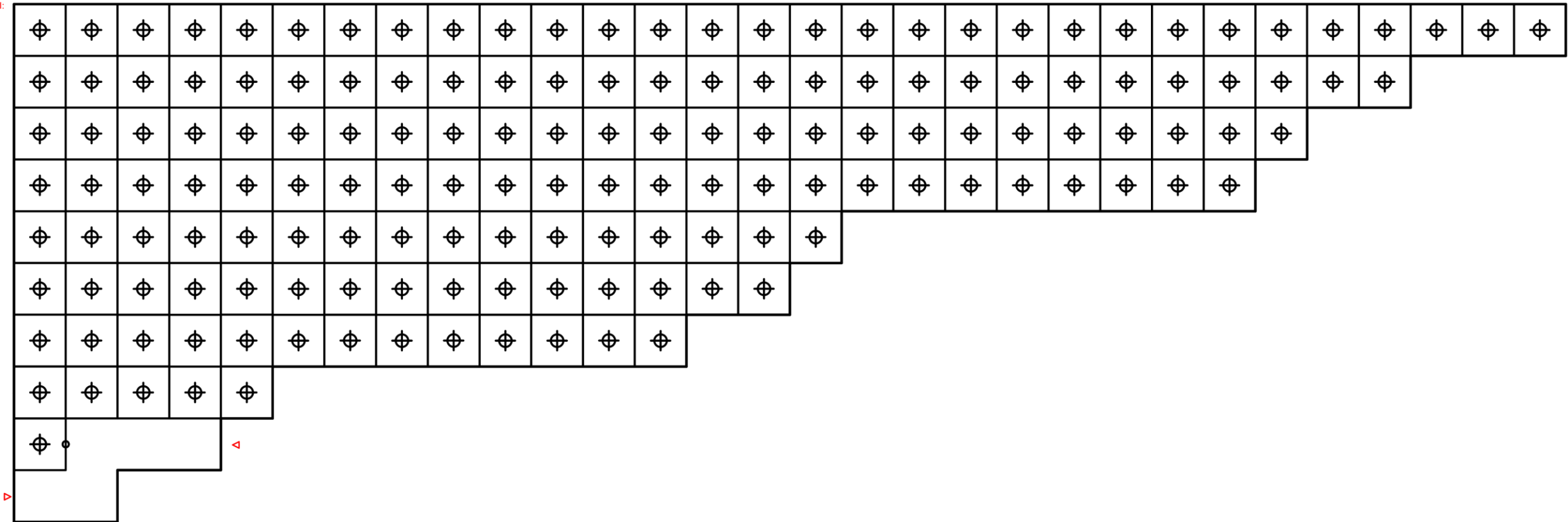
R5

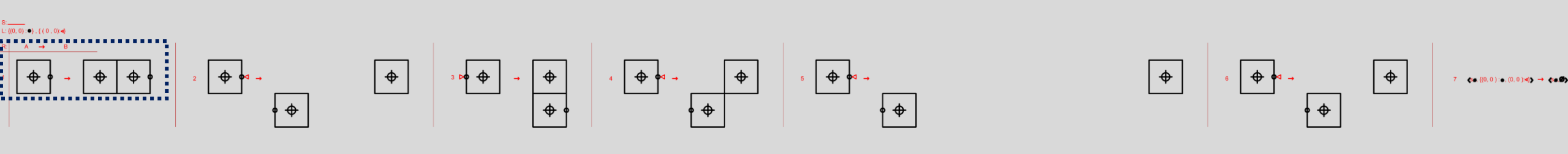




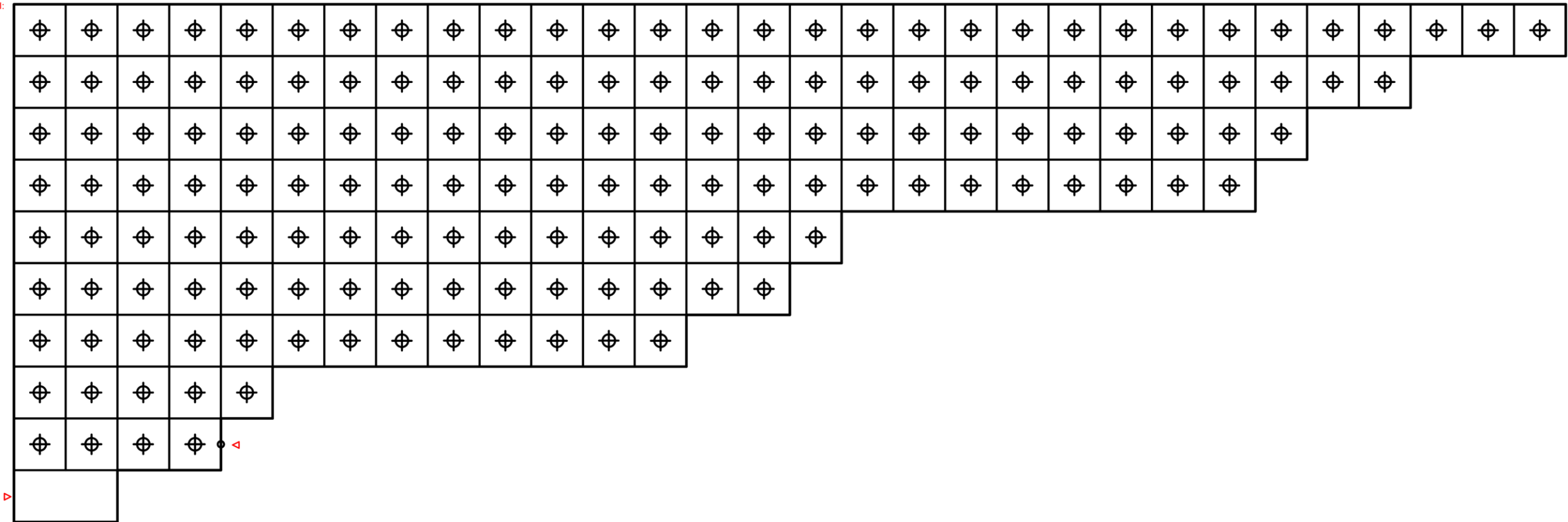


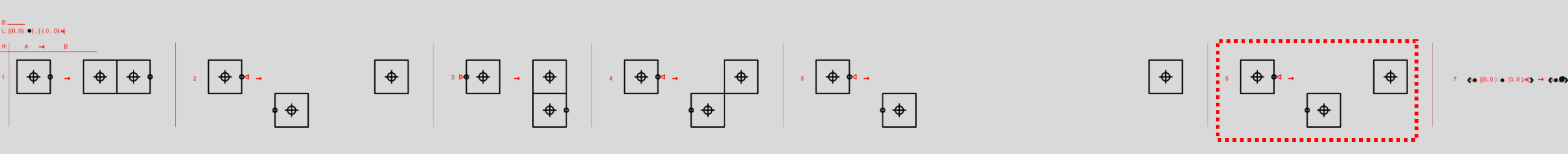
R3



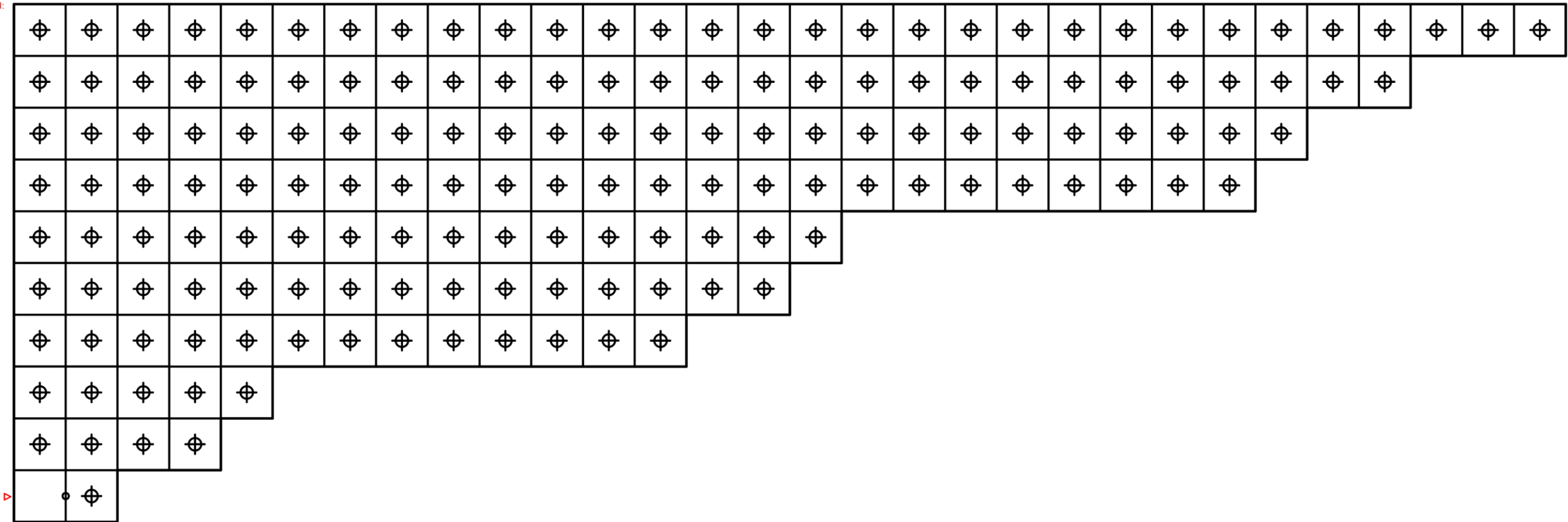


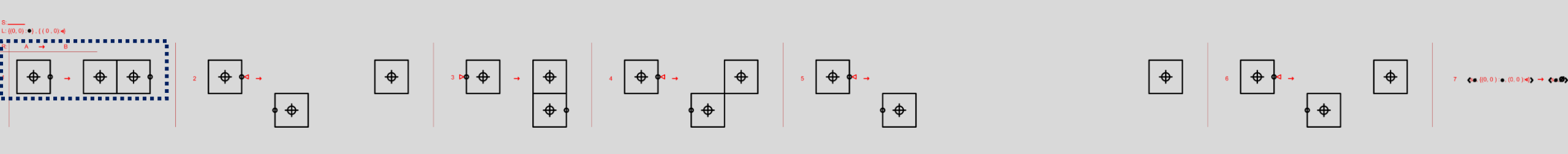
R1_(4x)



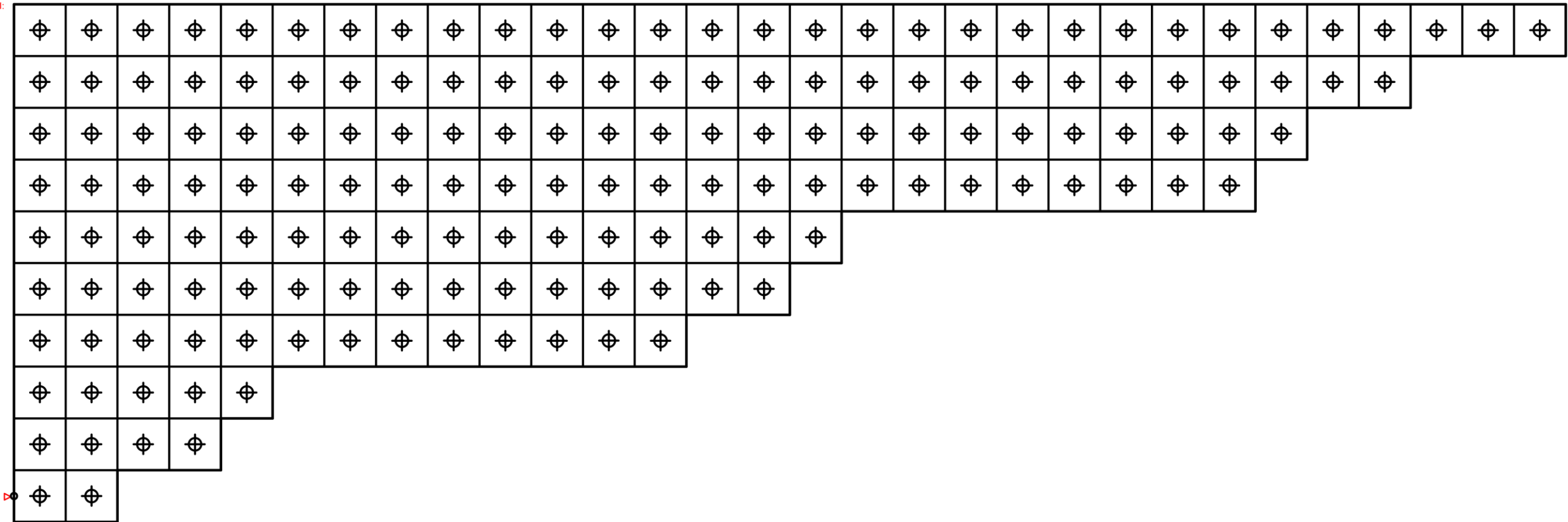


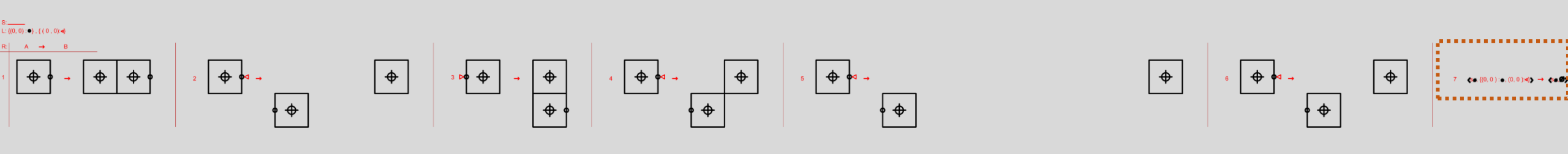
R6



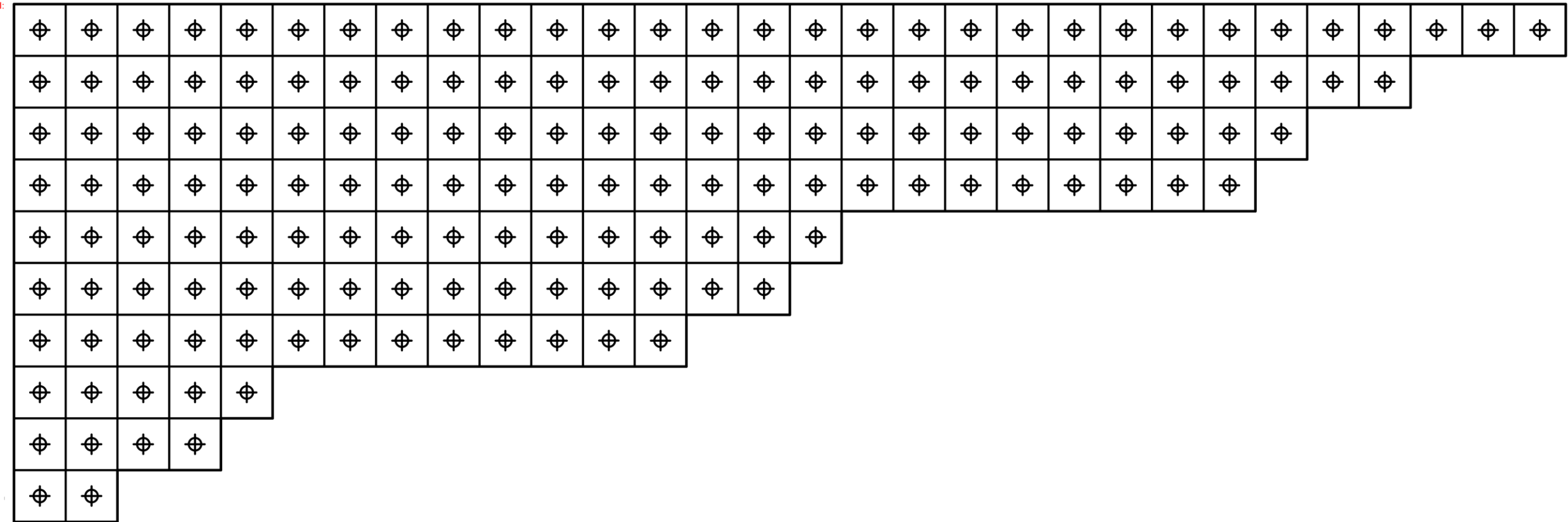


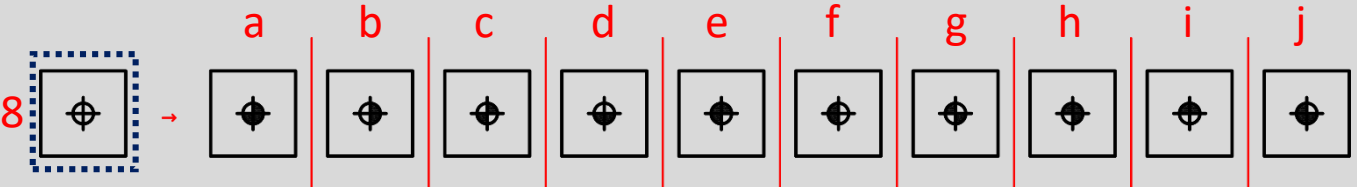
R1





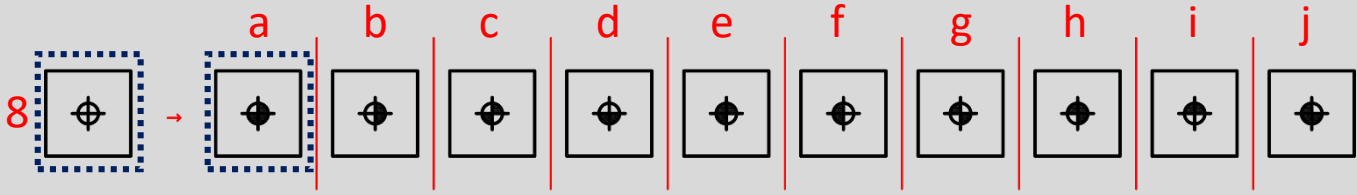
R7

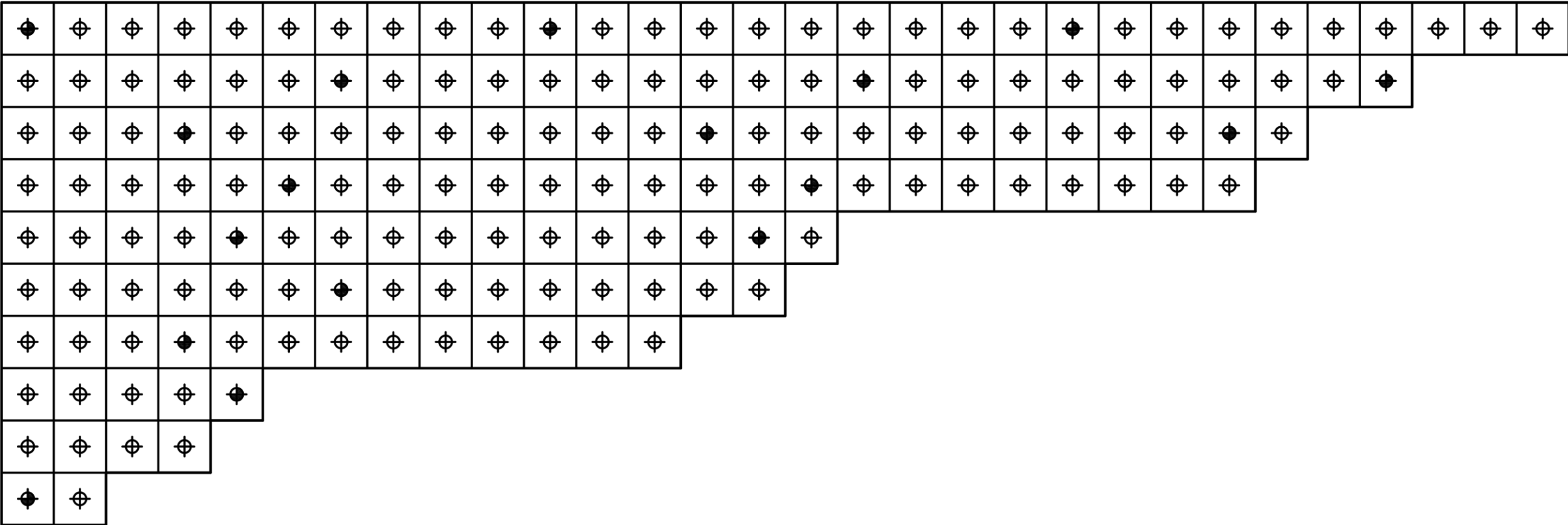


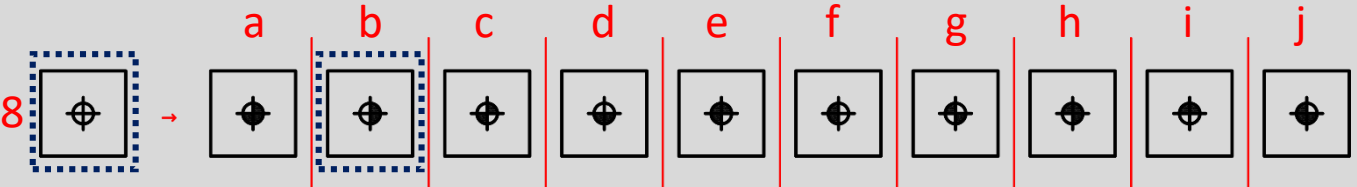
R8

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																													

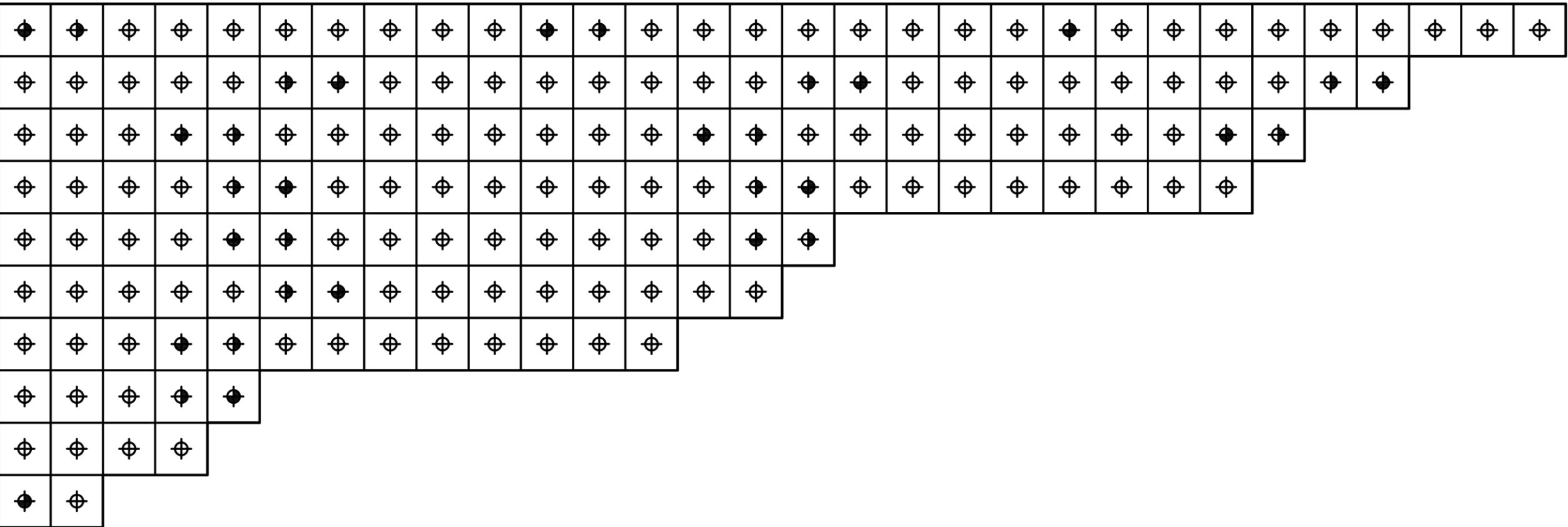


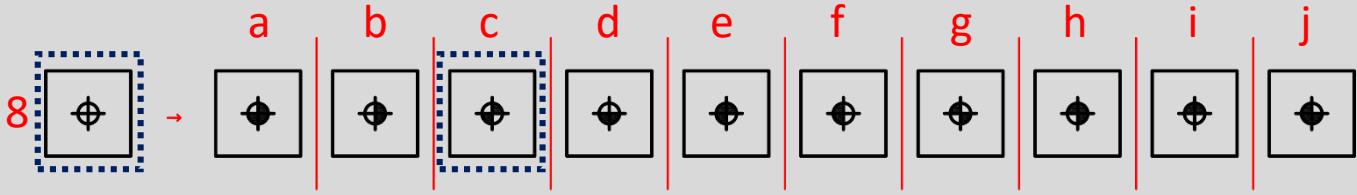
R8a_(17x)



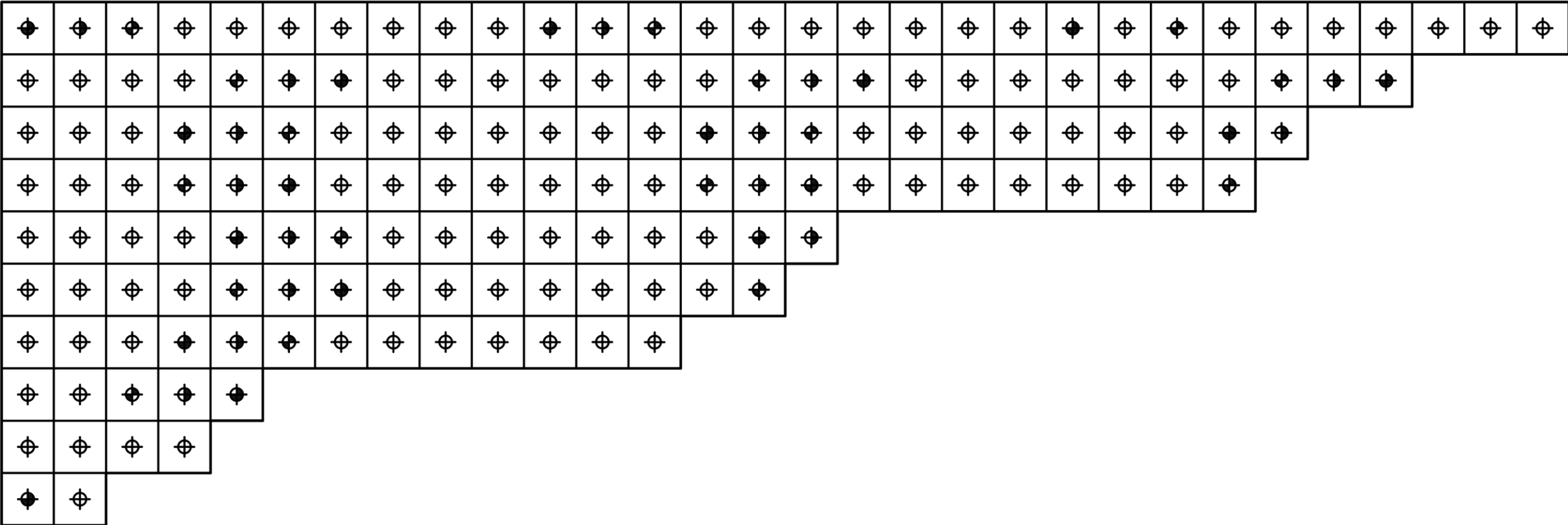


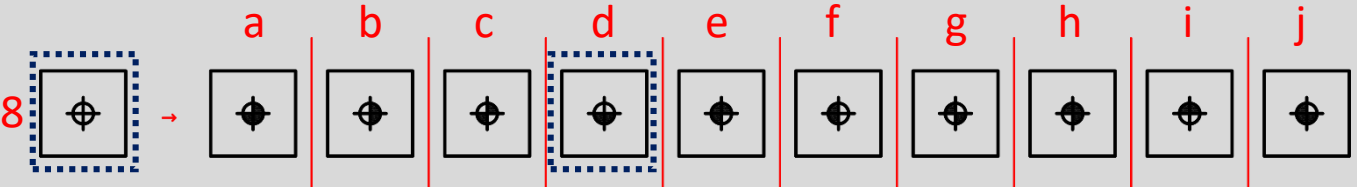
R8b_(15x)



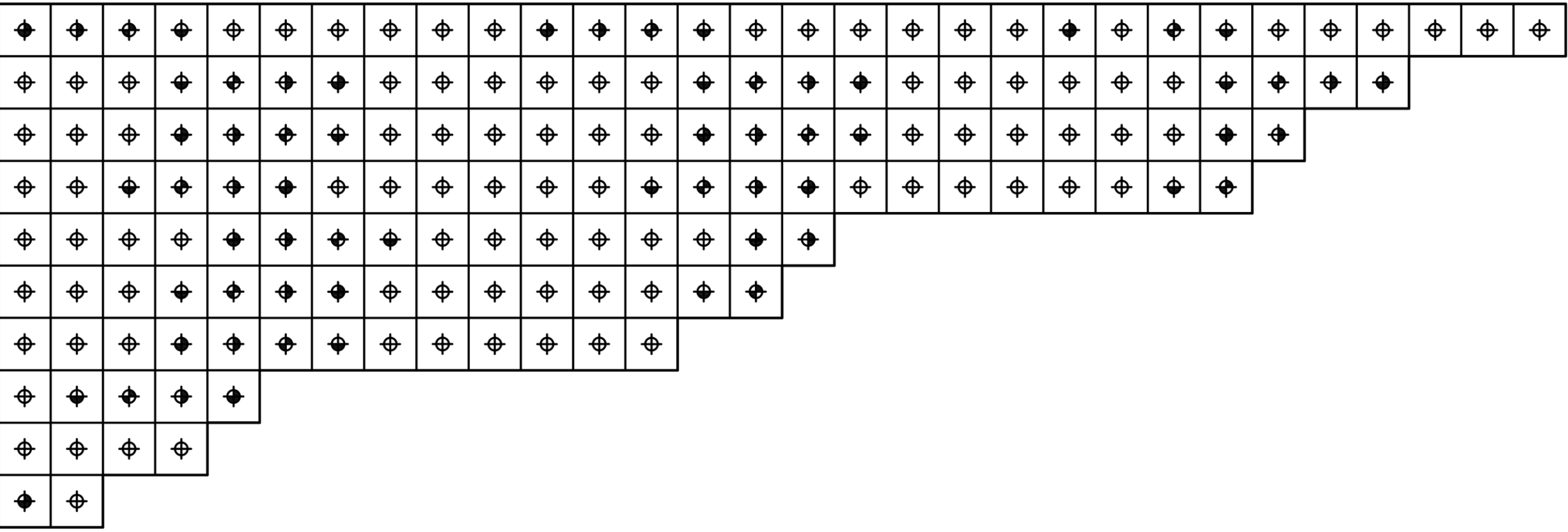


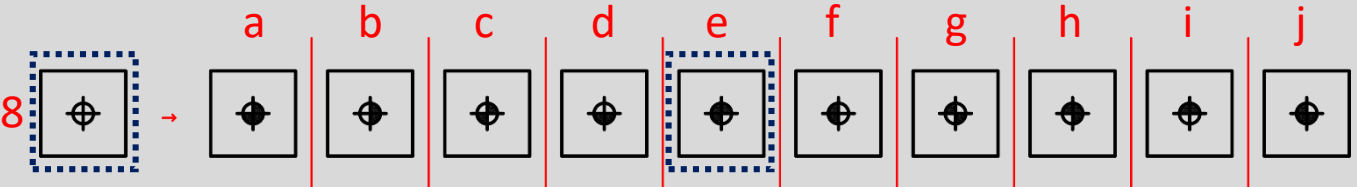
R8C_(16x)



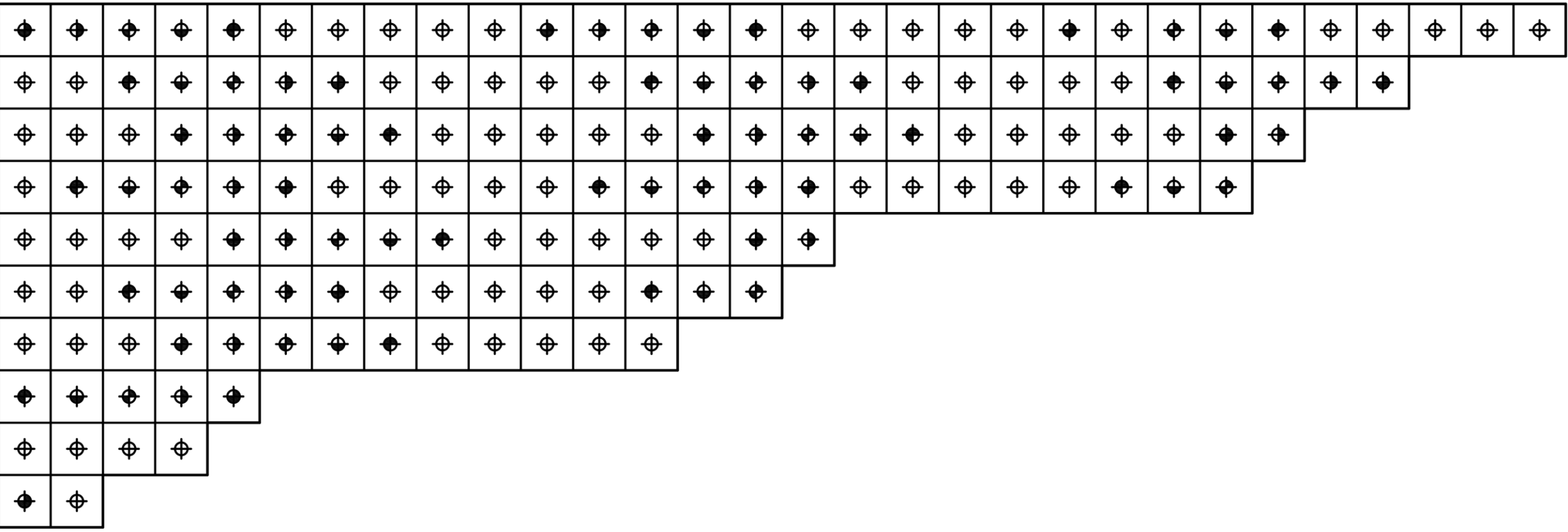


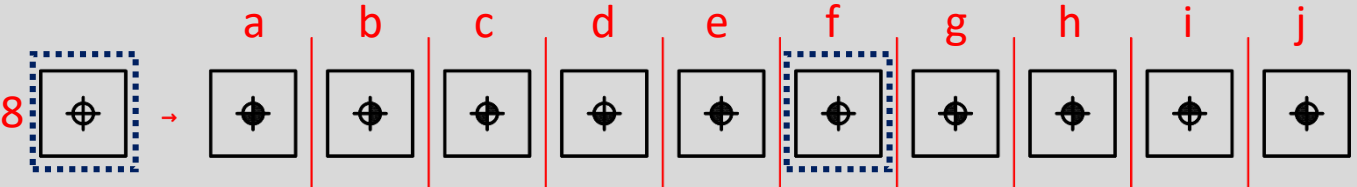
R8d_(16x)



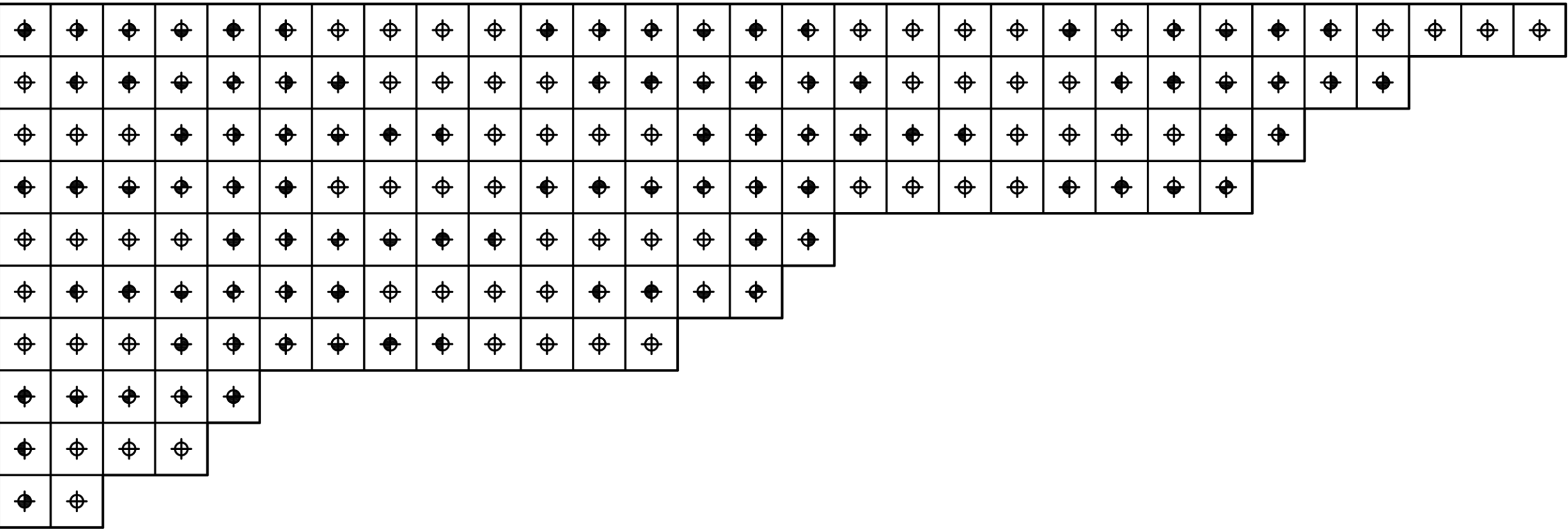


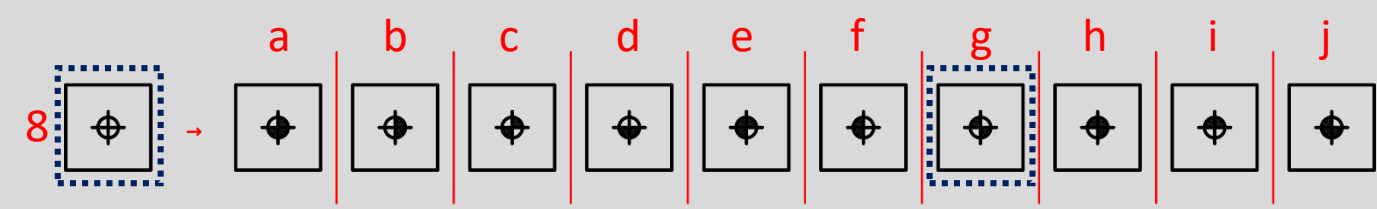
R8e_(16x)
 ↓↓



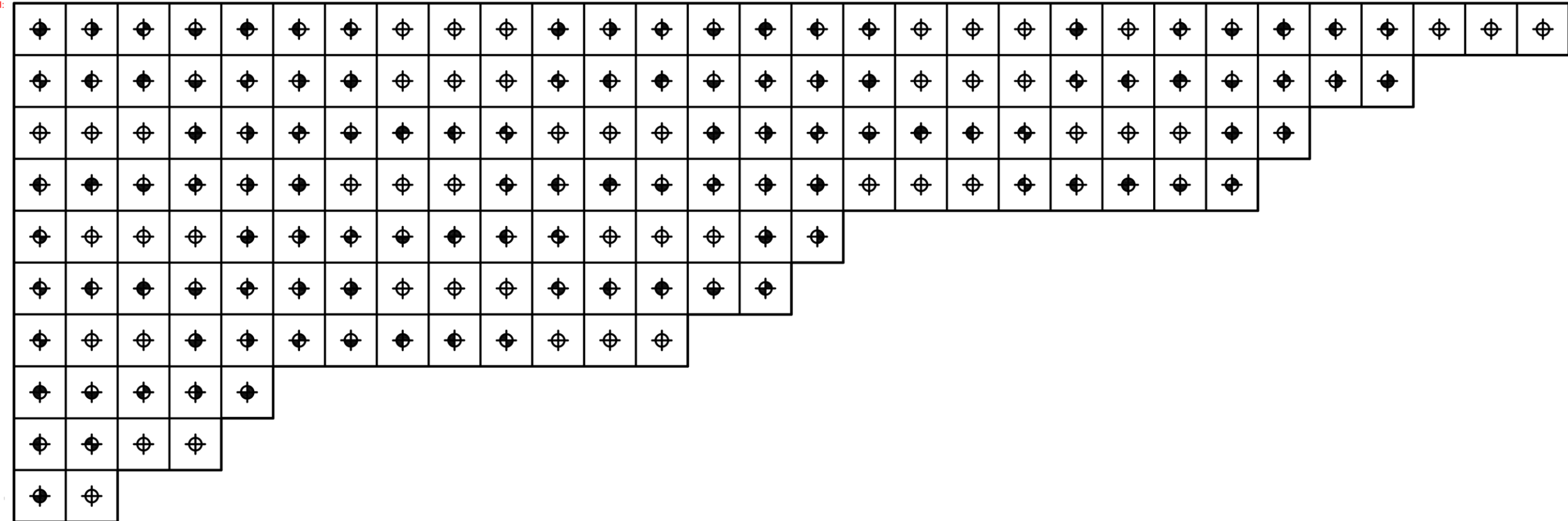


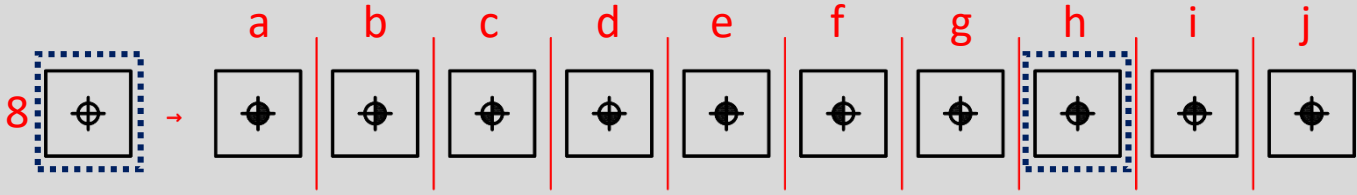
R8f (16x)



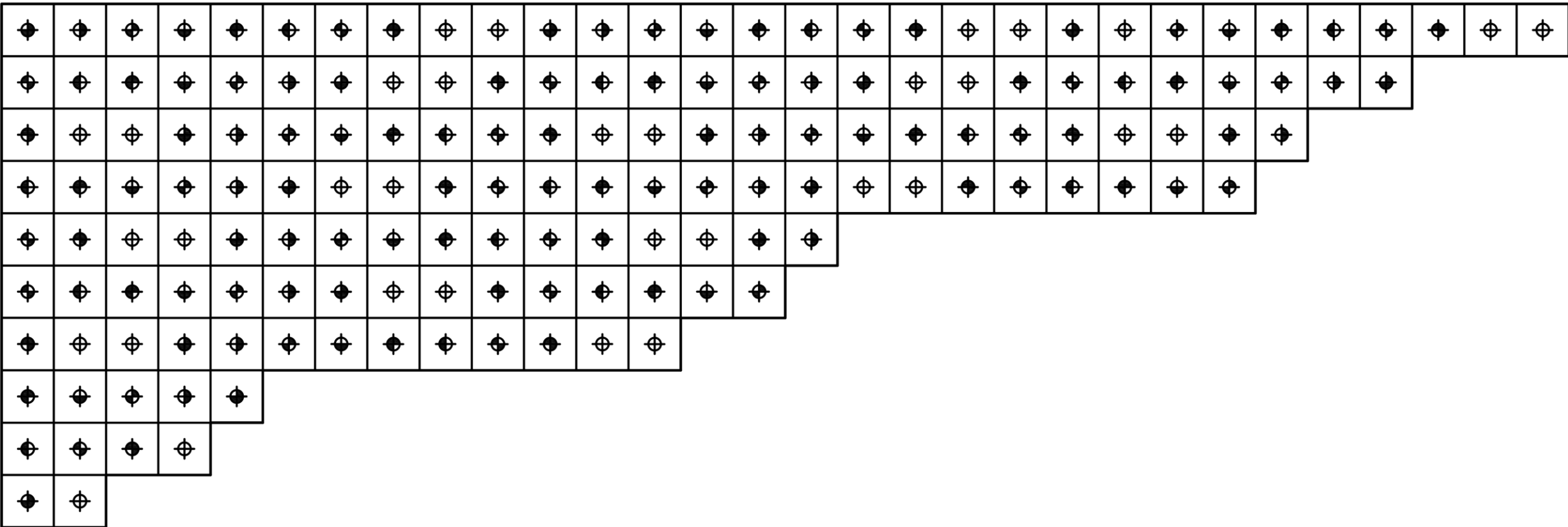


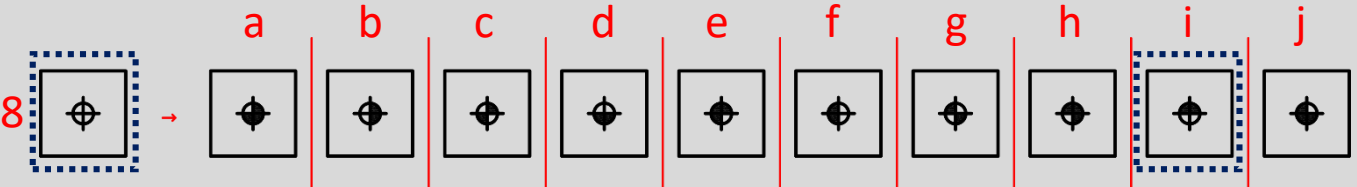
R8g_(16x)



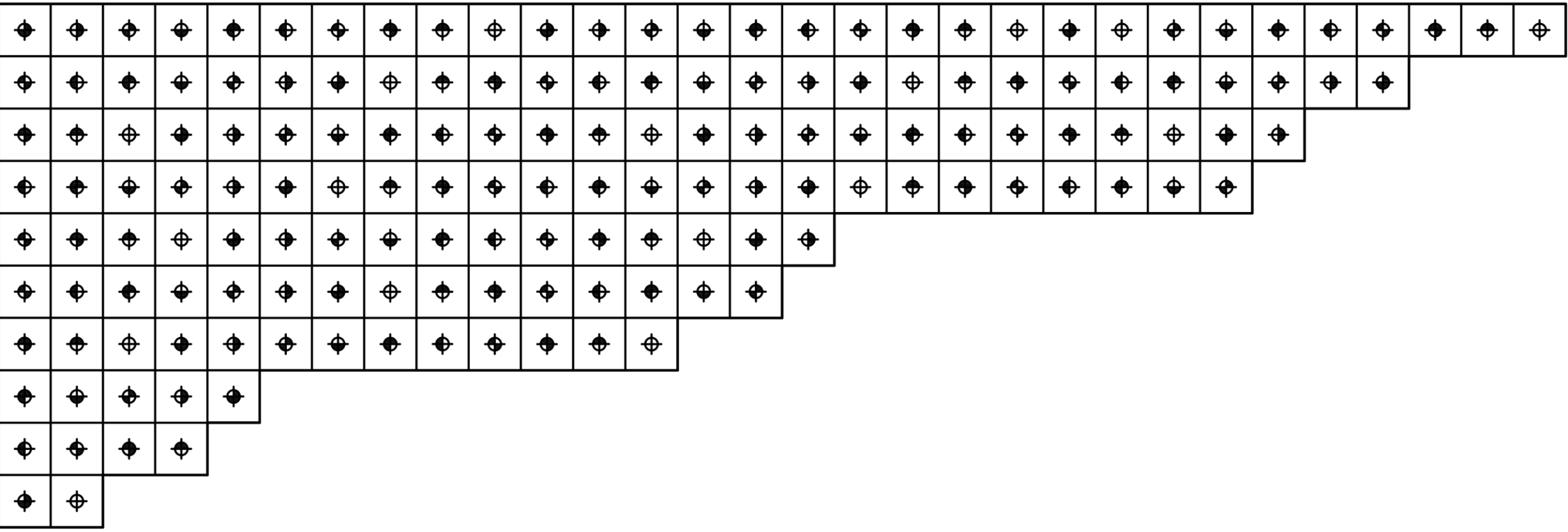


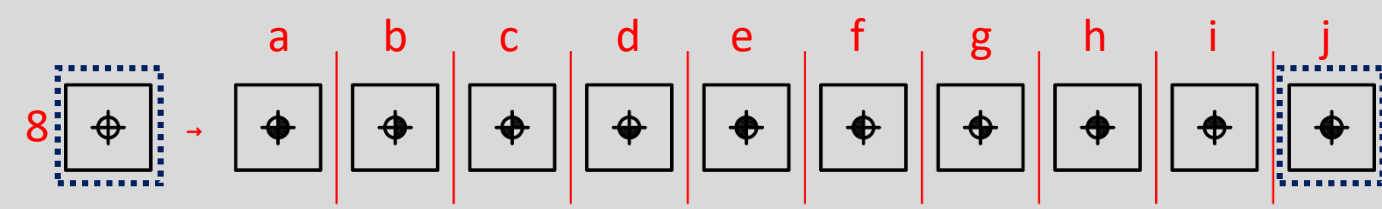
R8h_(16x)



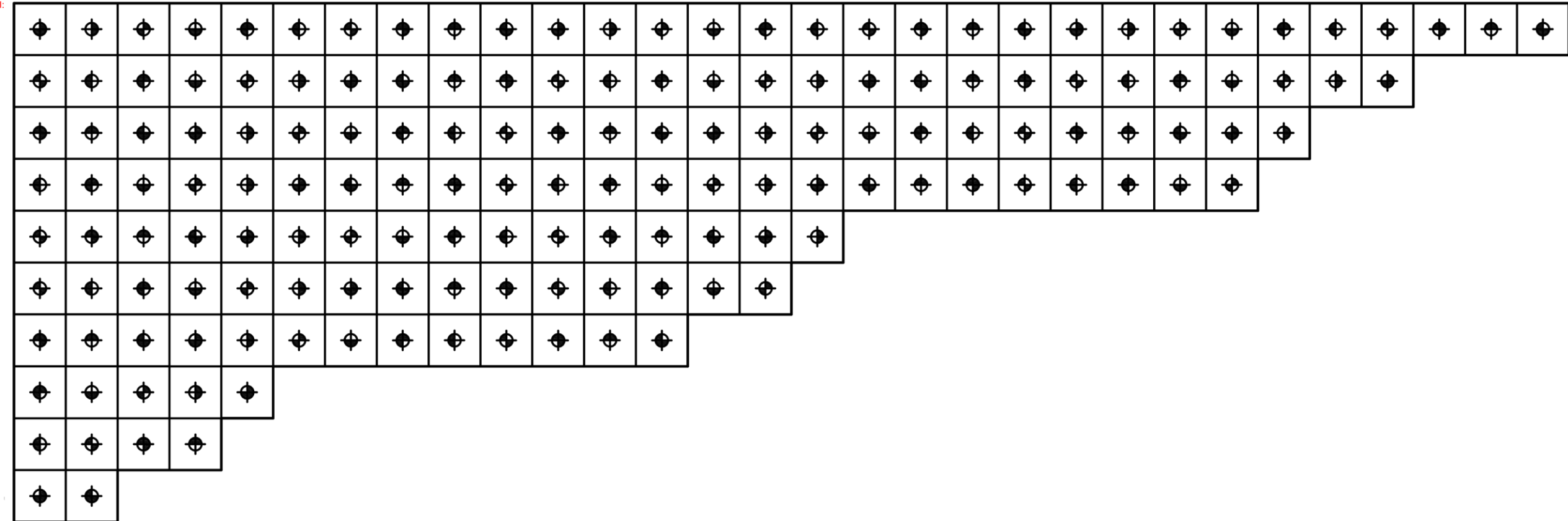


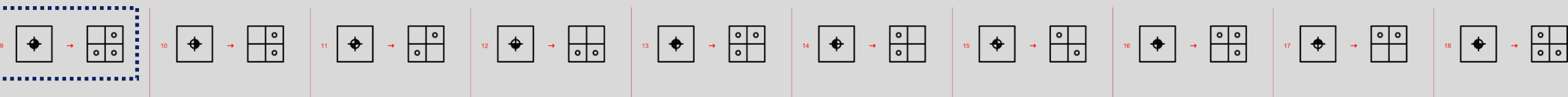
R8i (16x)
 ↓↓



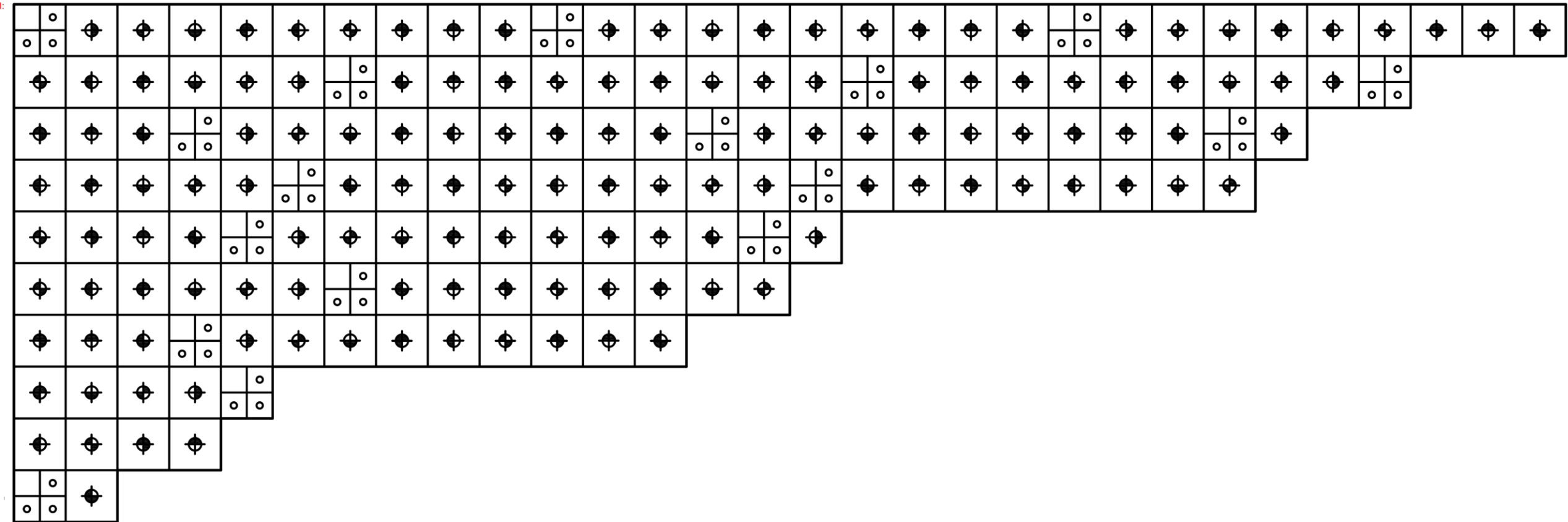


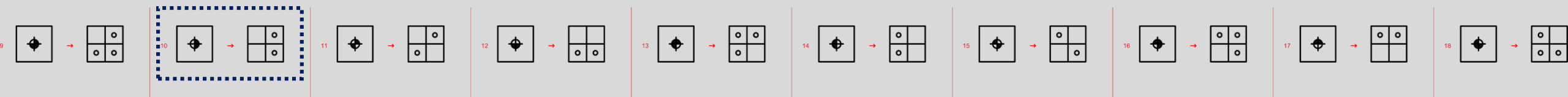
R8j (16x)



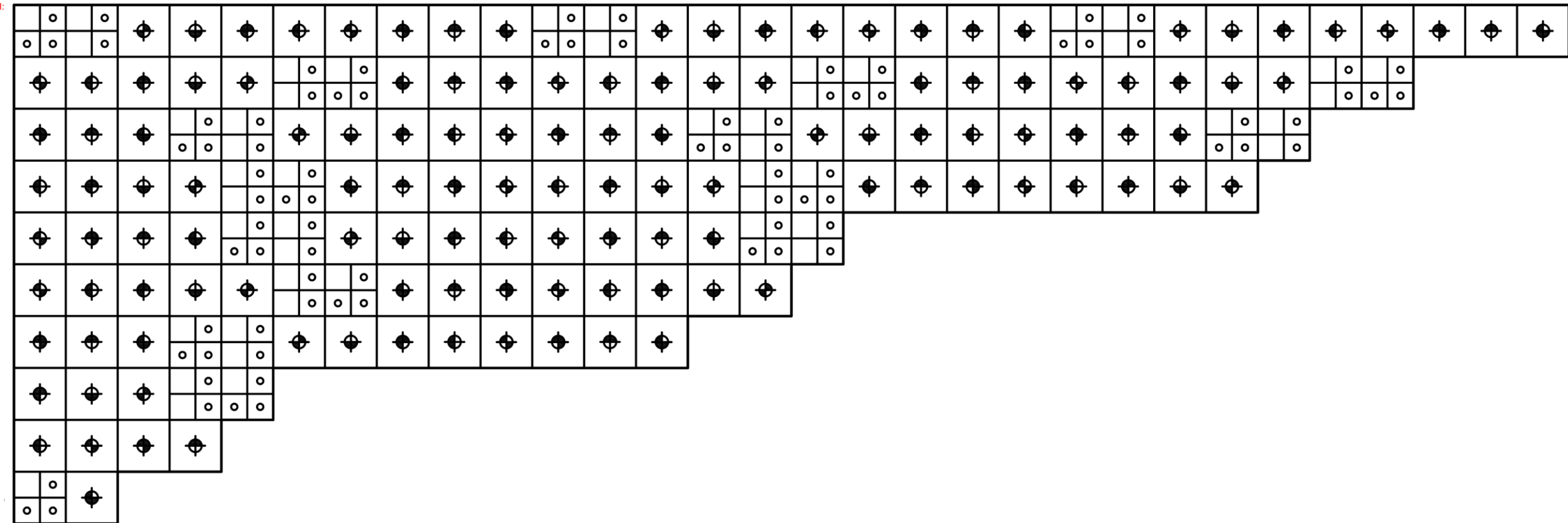


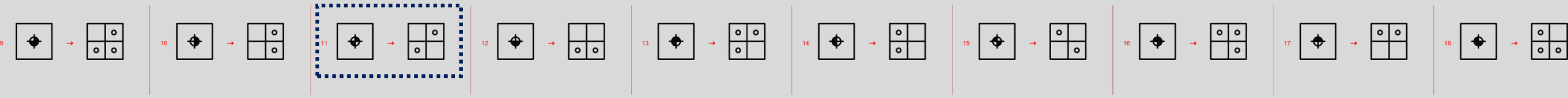
R9 (17x)



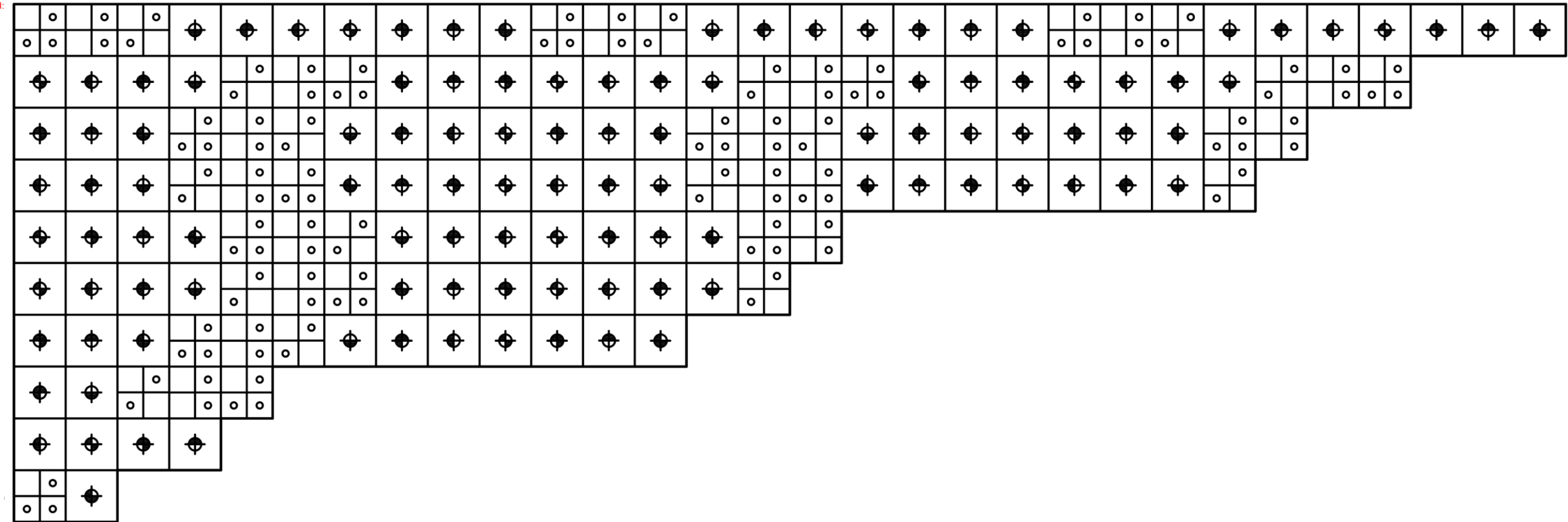


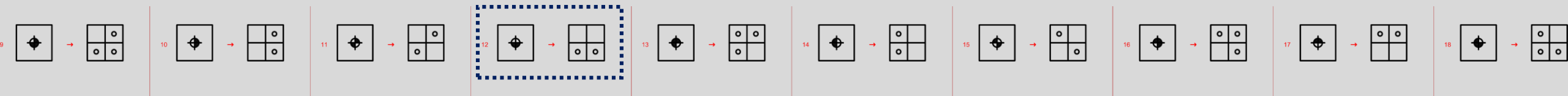
R10_(16x)



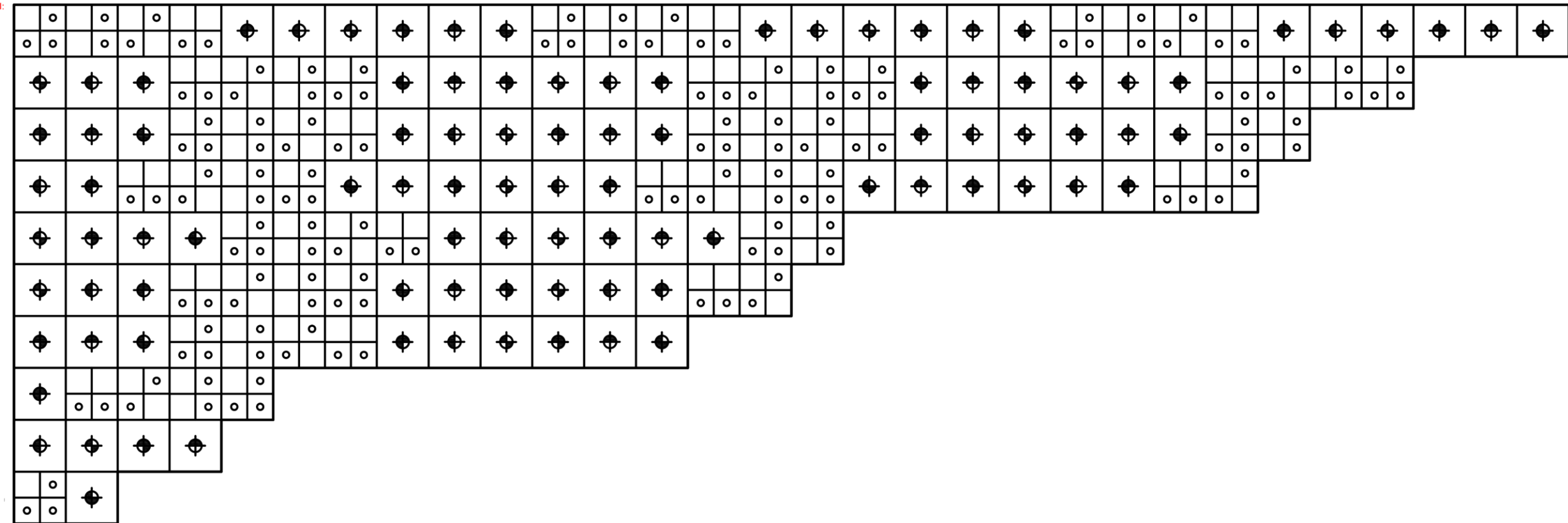


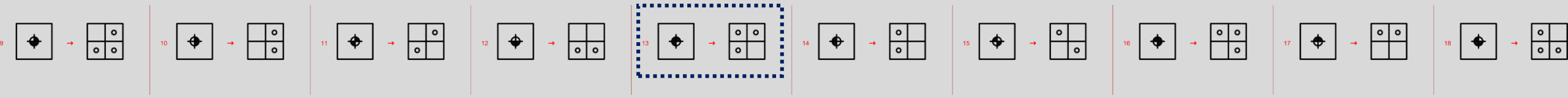
R11 (16x)



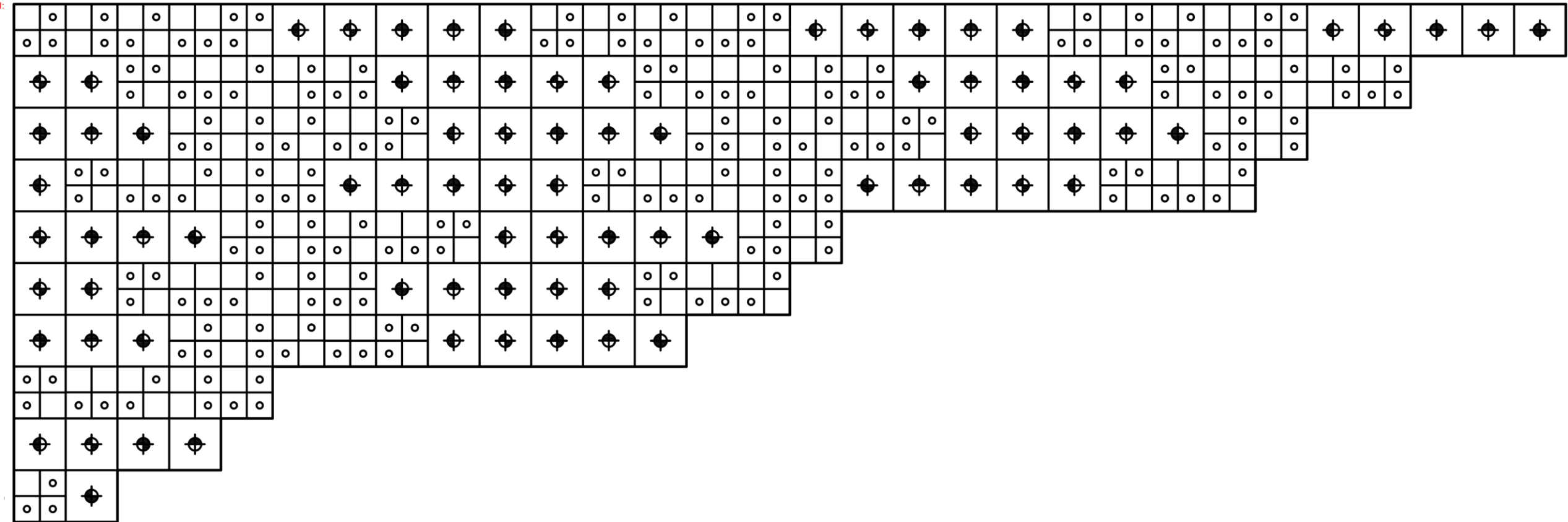


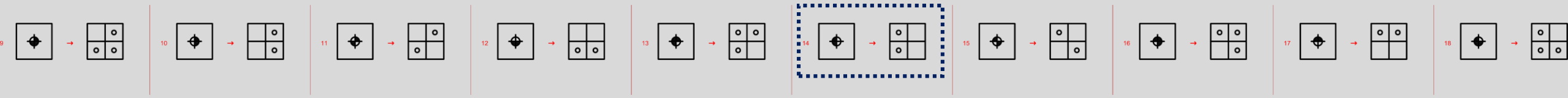
R12_(16x)



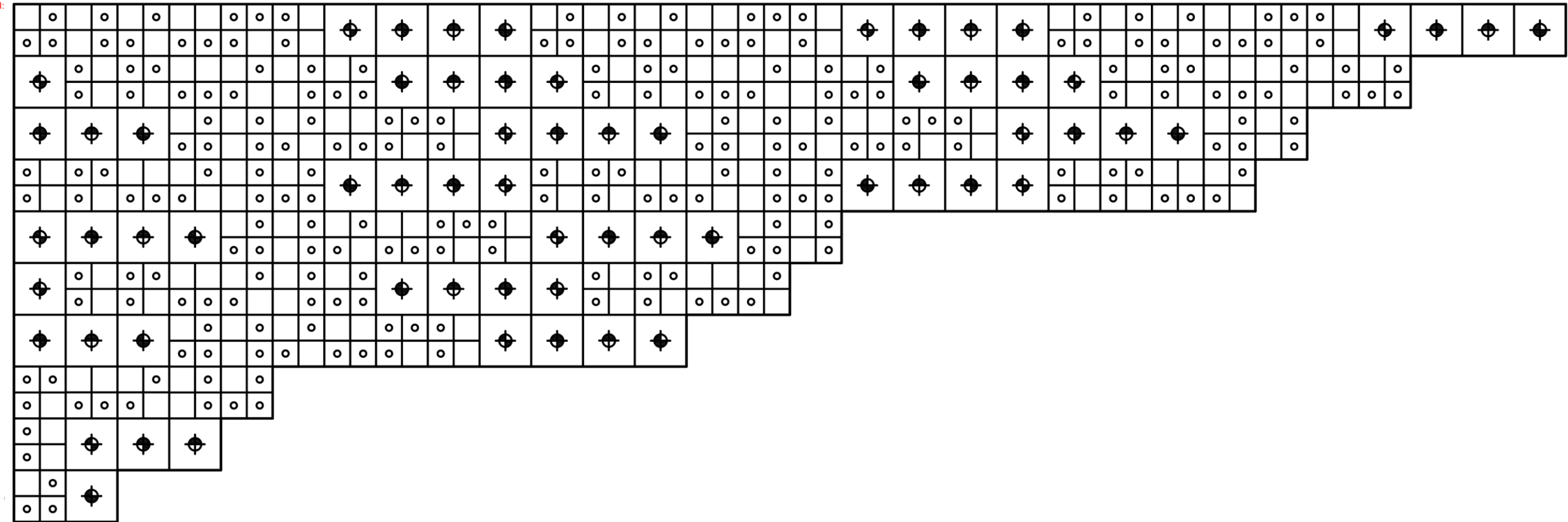


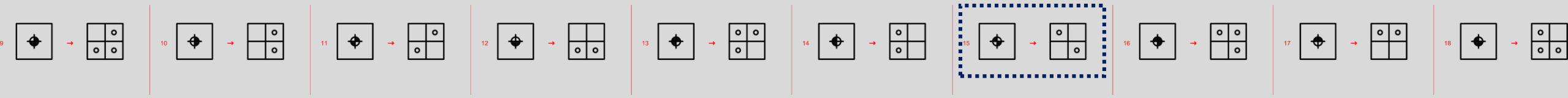
R13_(16x)



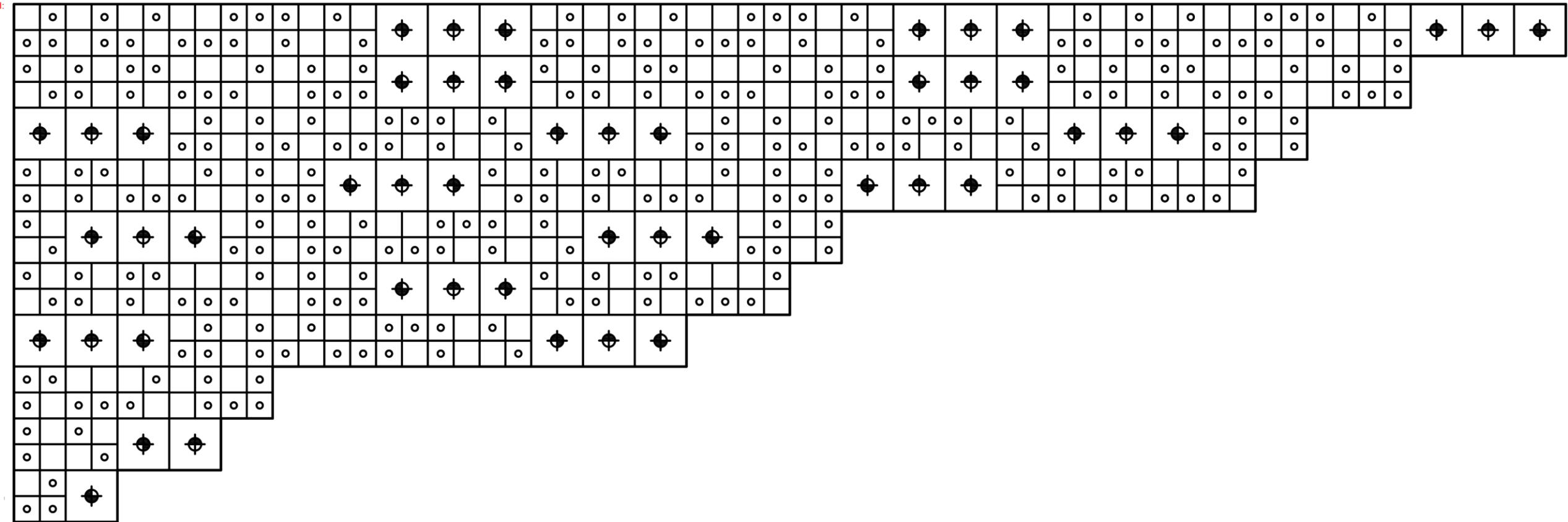


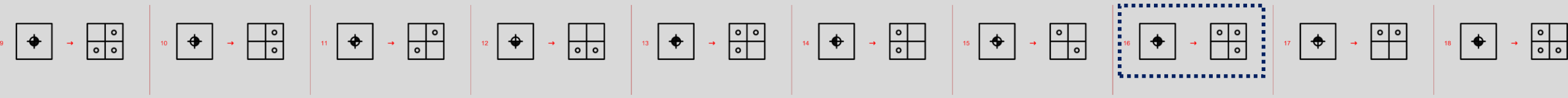
R14_(16x)



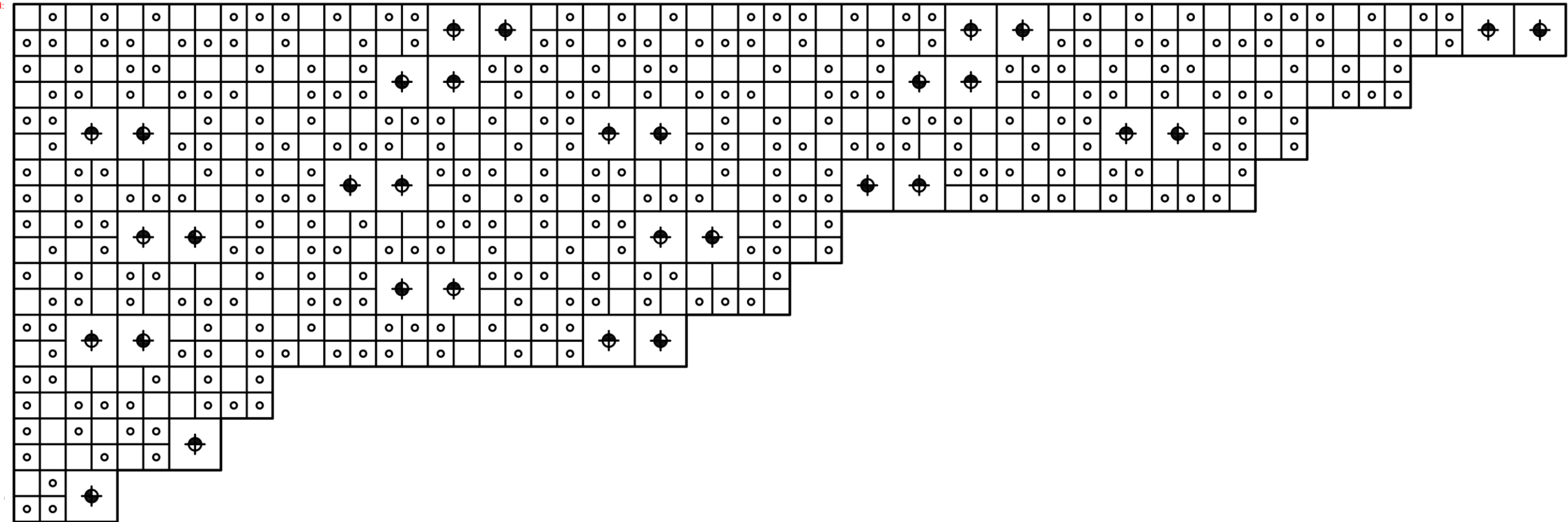


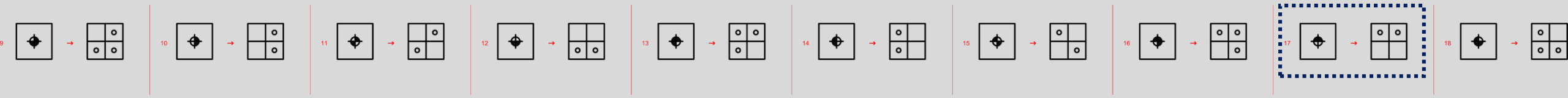
R15_(16x)



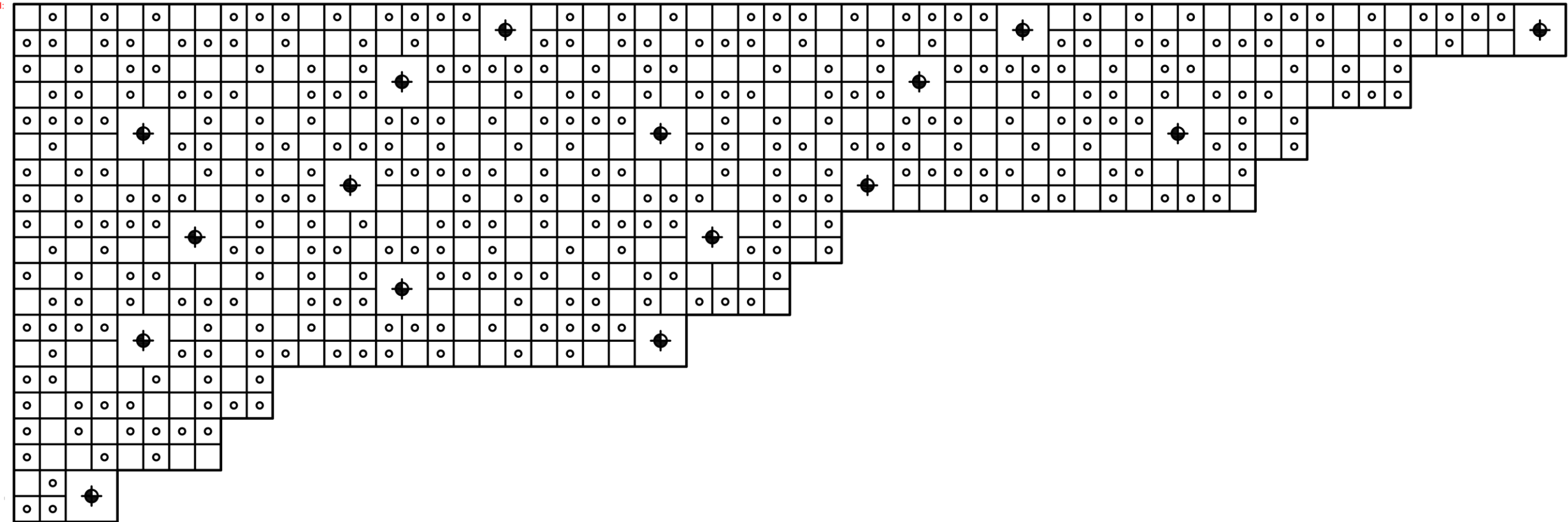


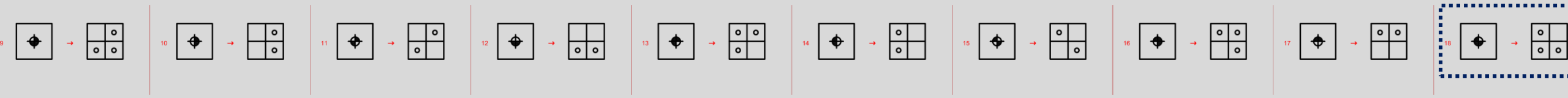
R16_(16x)



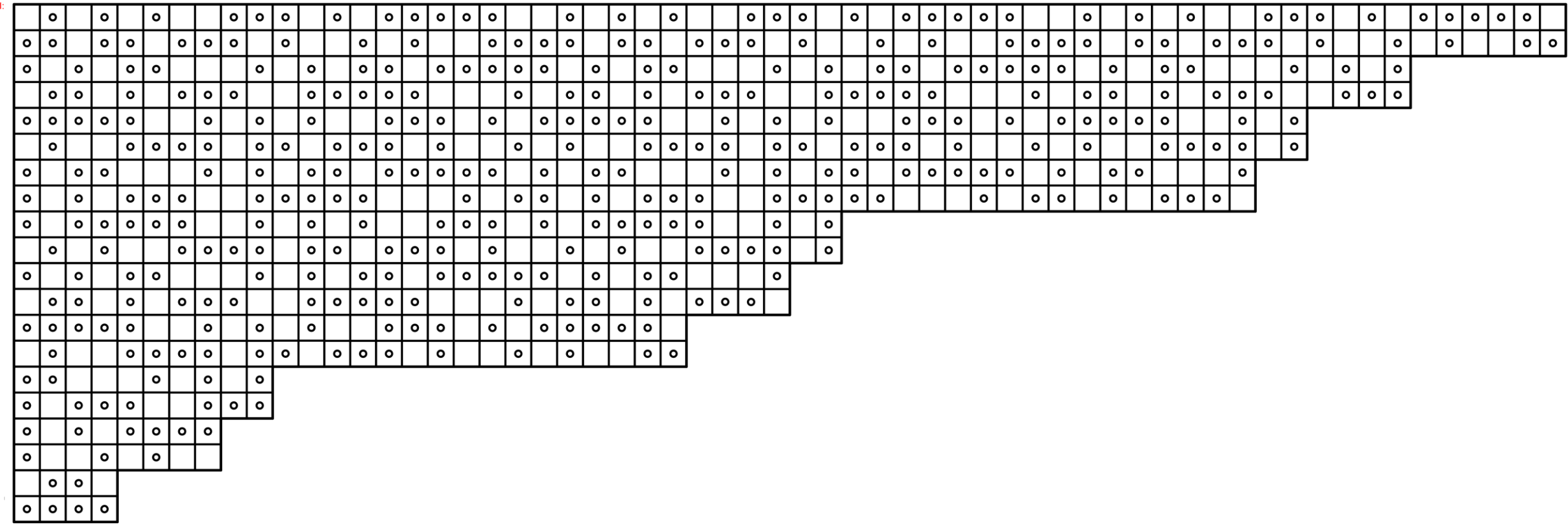


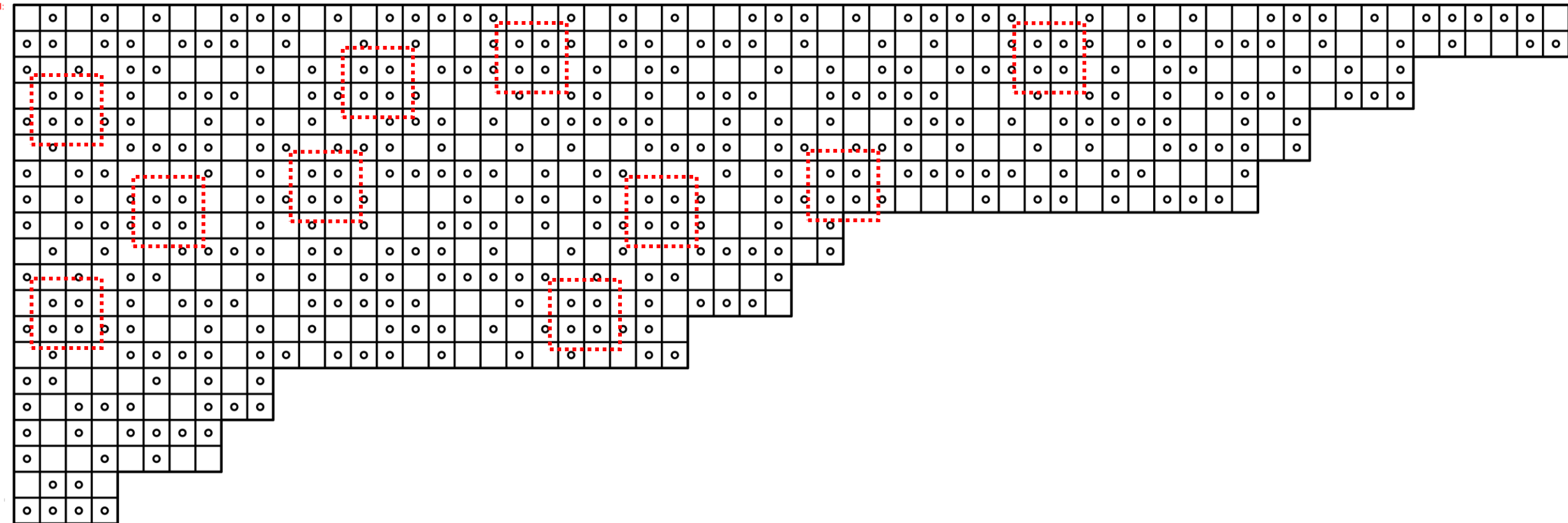
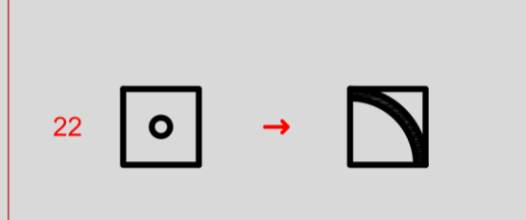
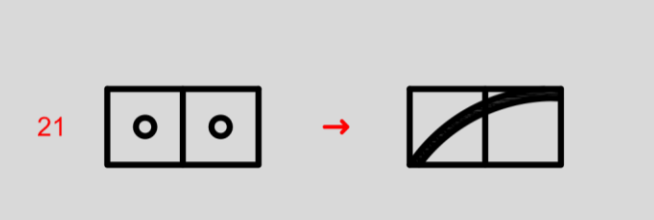
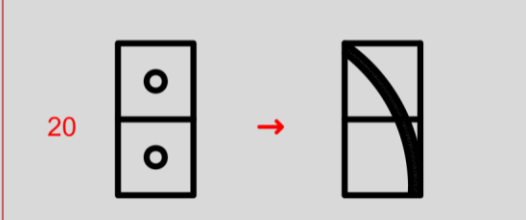
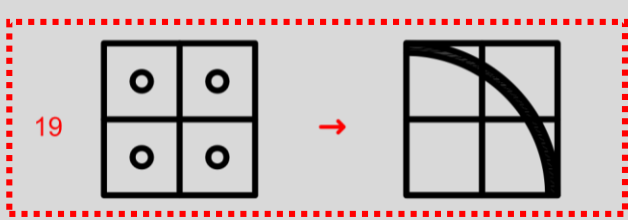
R17_(16x)

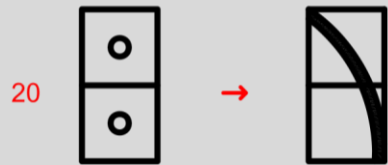
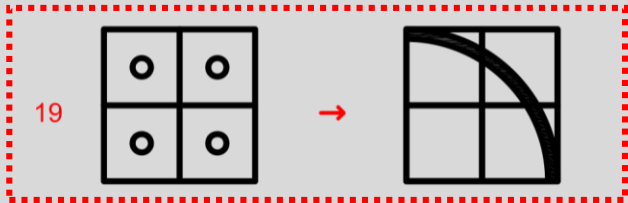




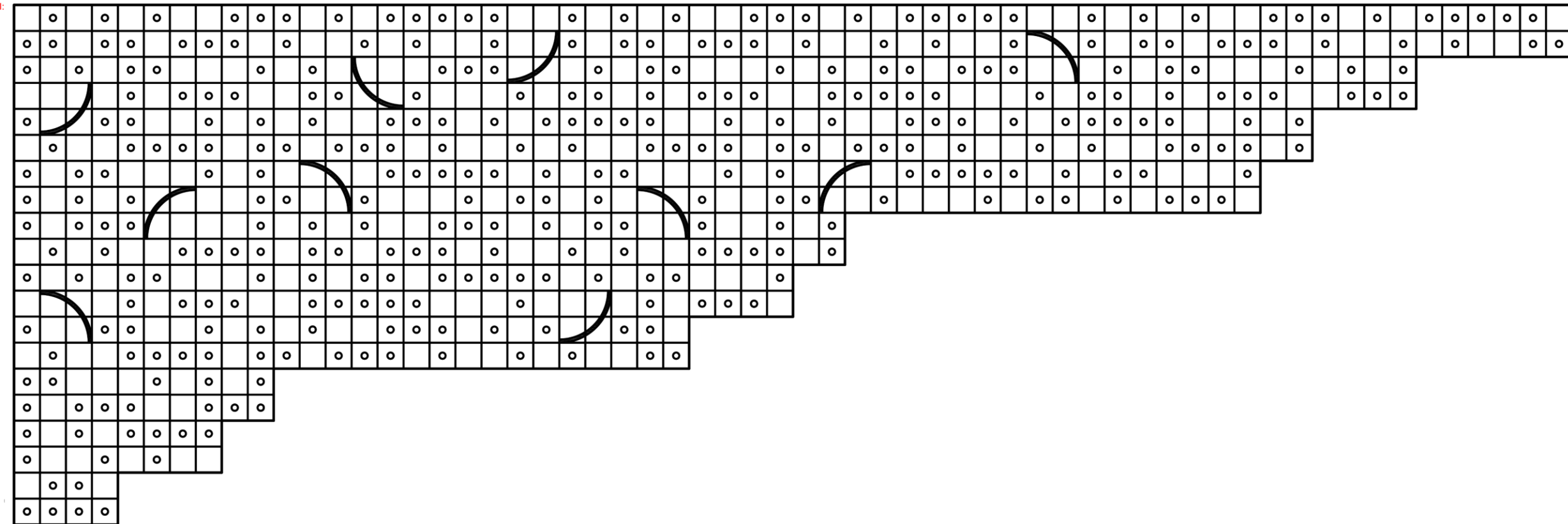
R18_(16x)



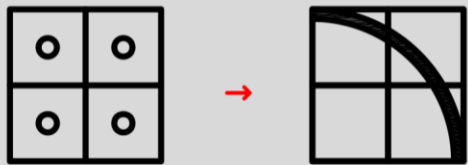




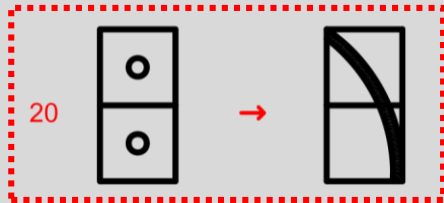
R19_(10x)



19



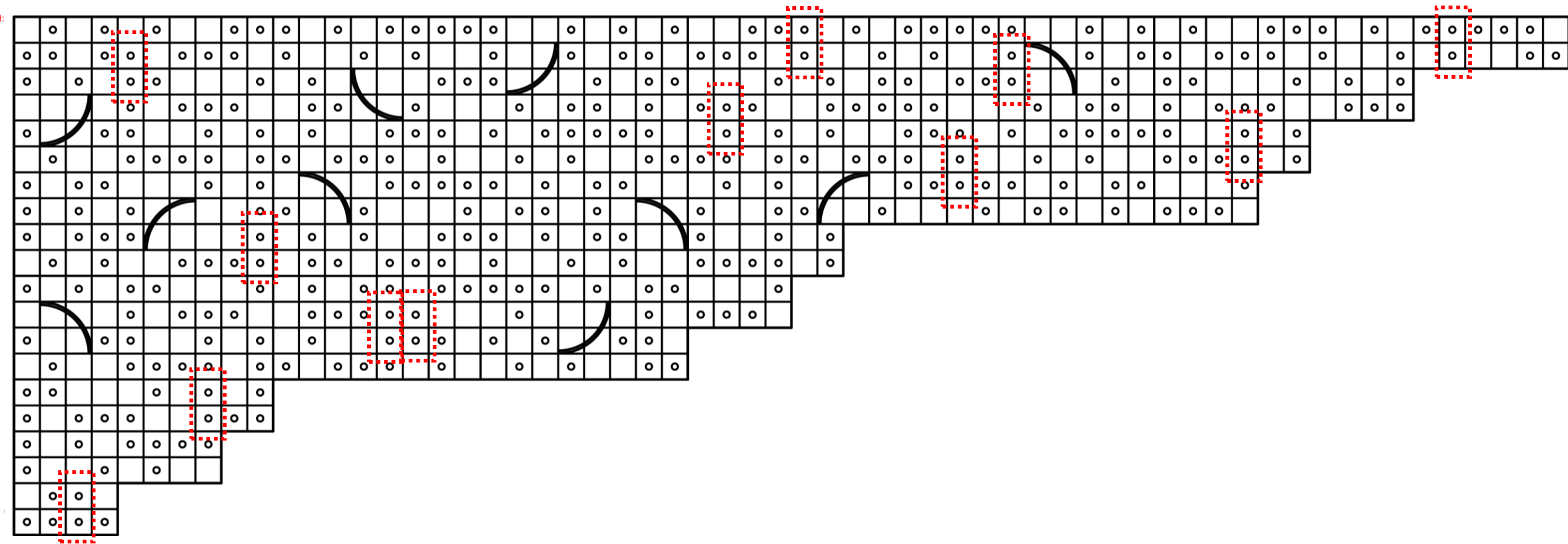
20



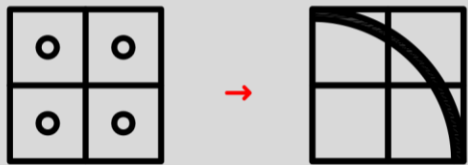
21



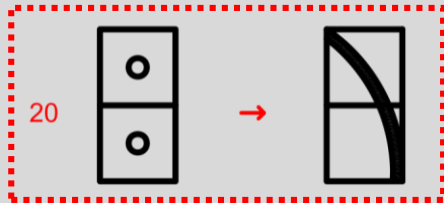
22



19



20



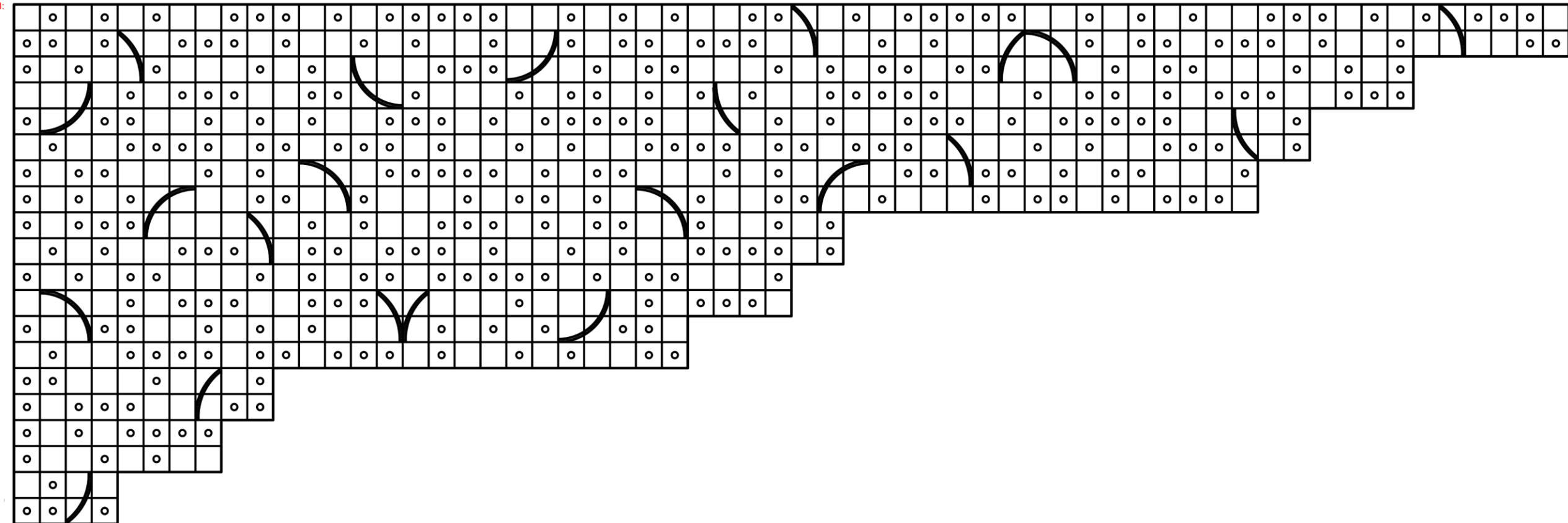
21



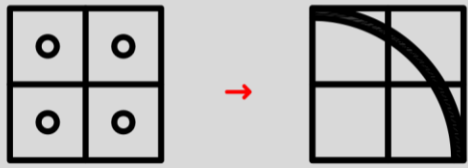
22



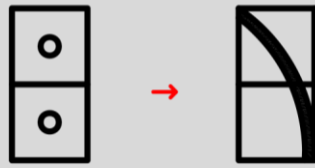
R20_(12x)



19



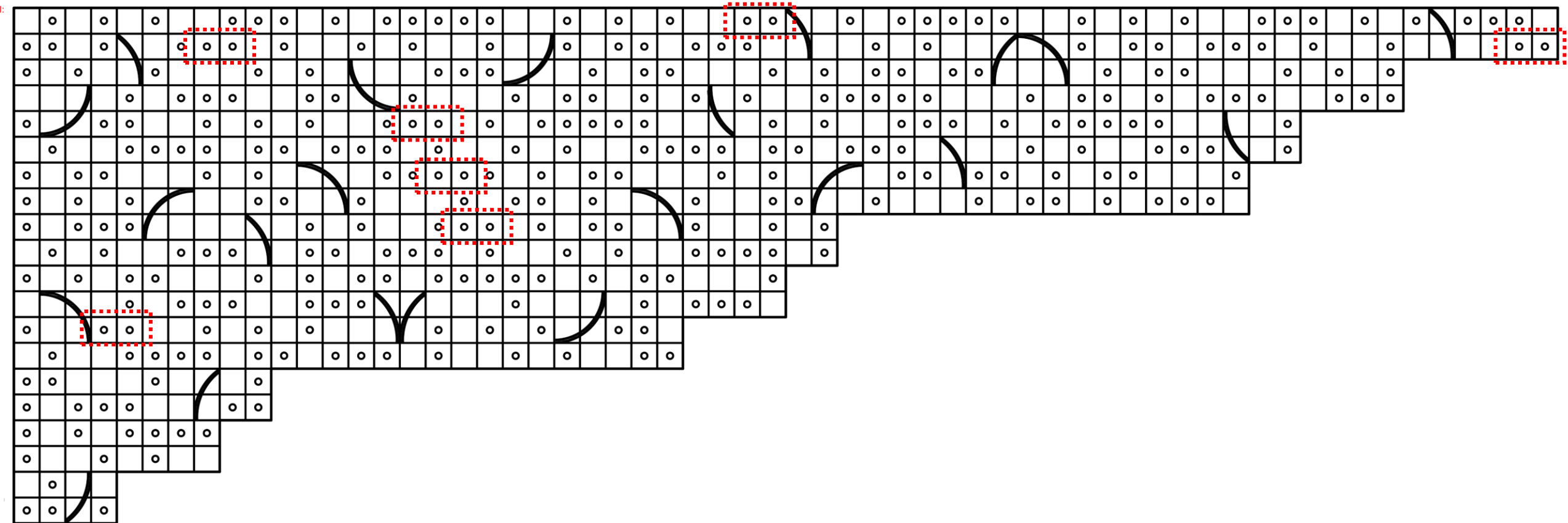
20



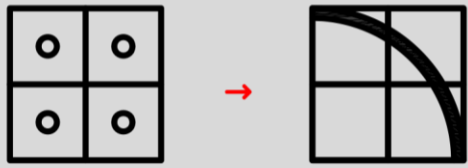
21



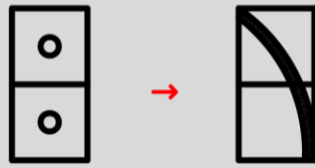
22



19



20



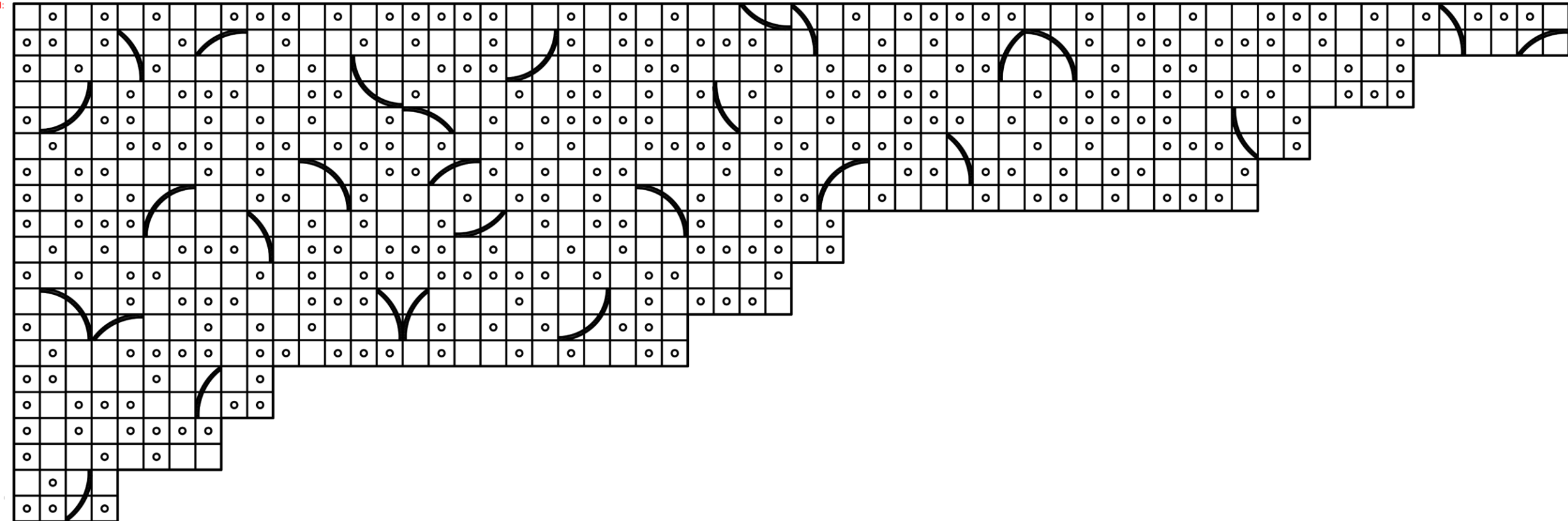
21



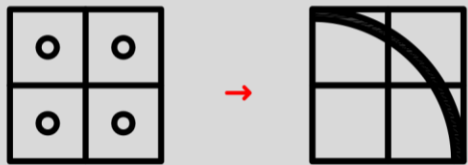
22



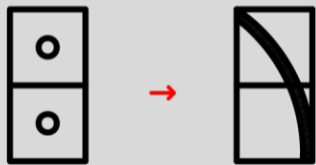
R21_(7x)



19



20



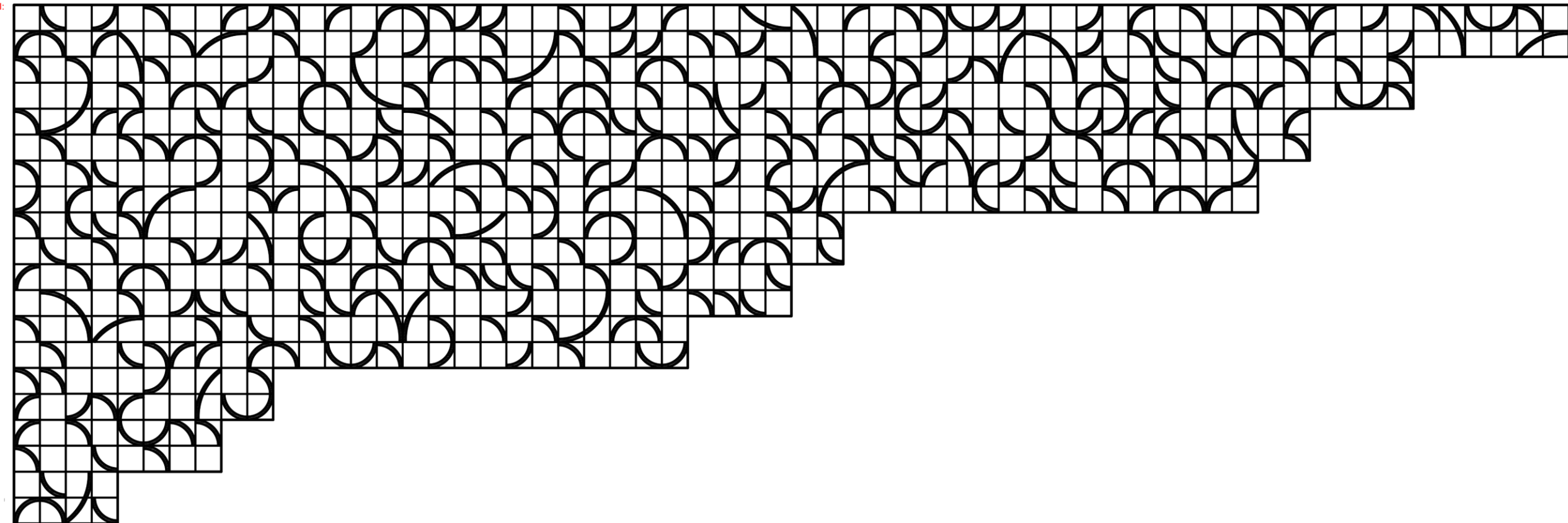
21

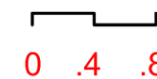
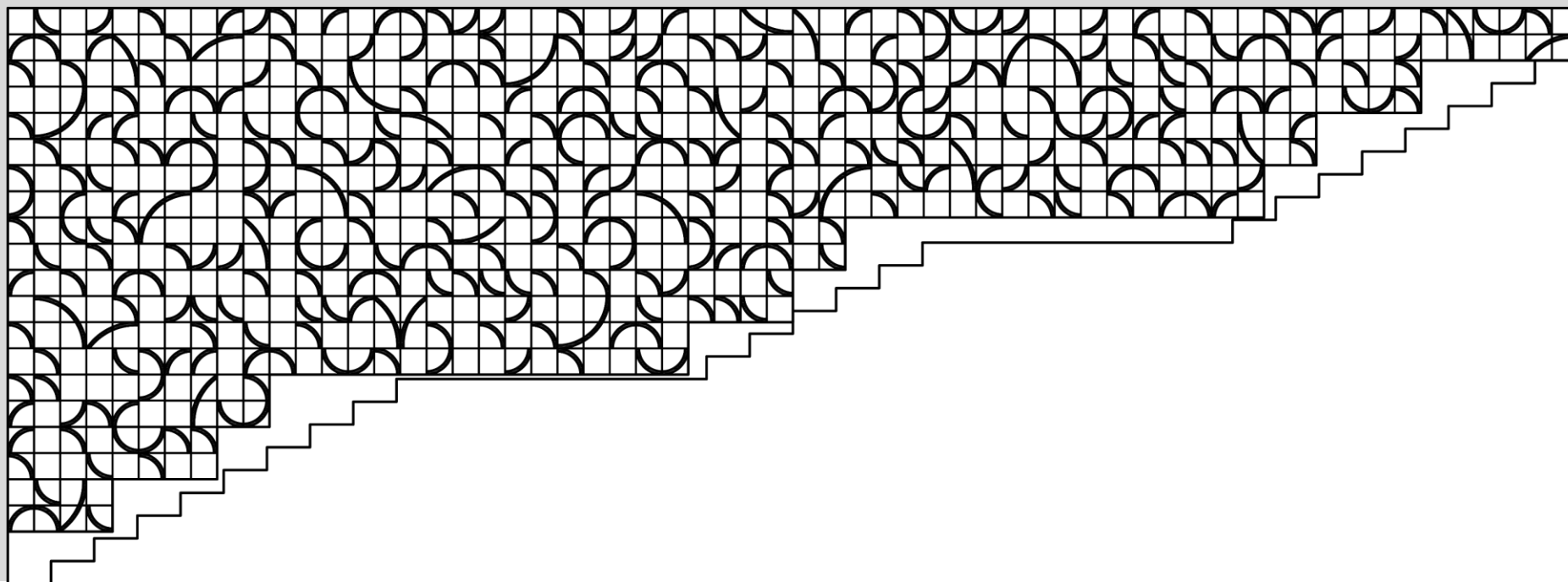
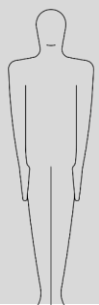


22



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)

