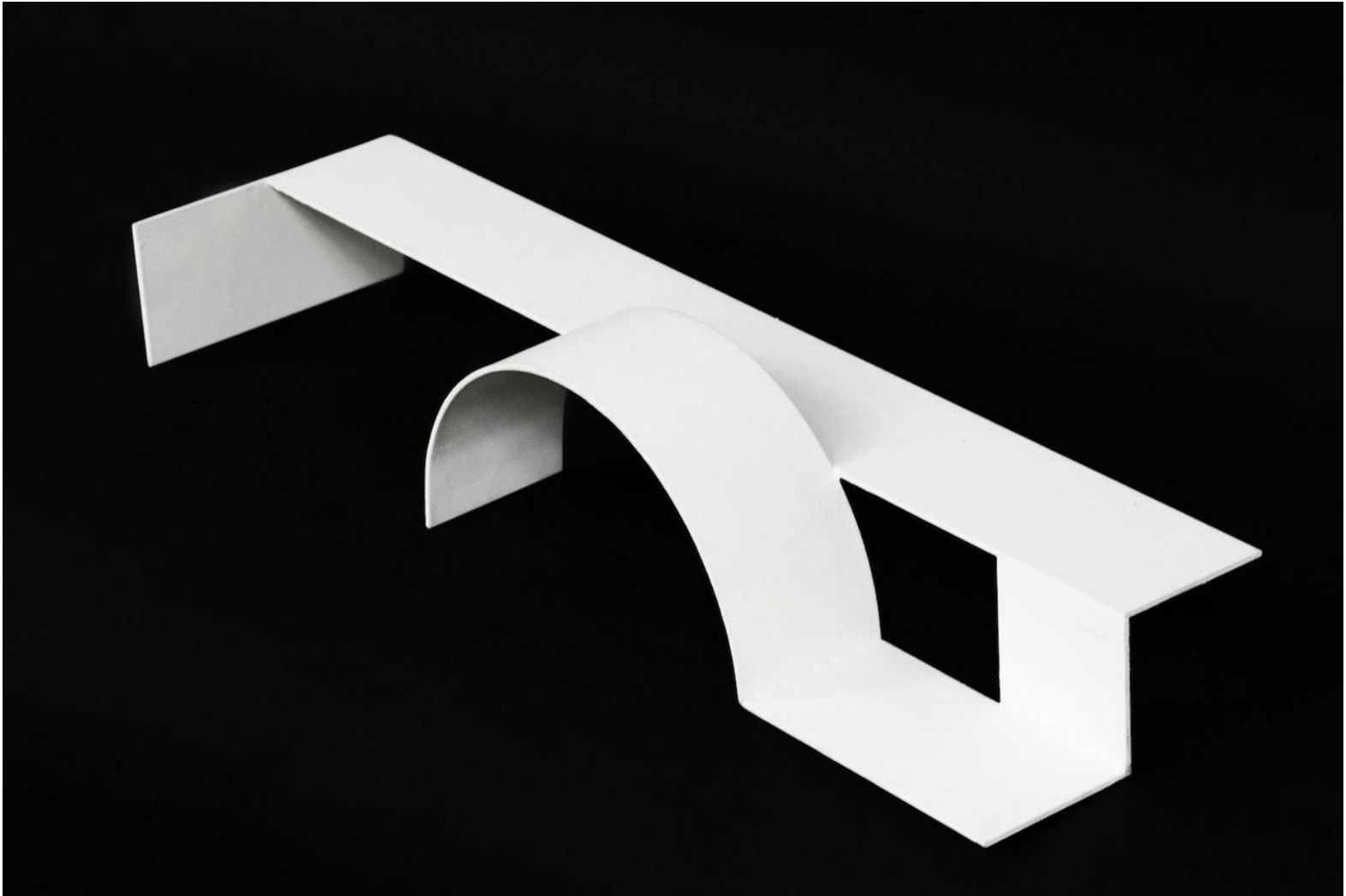


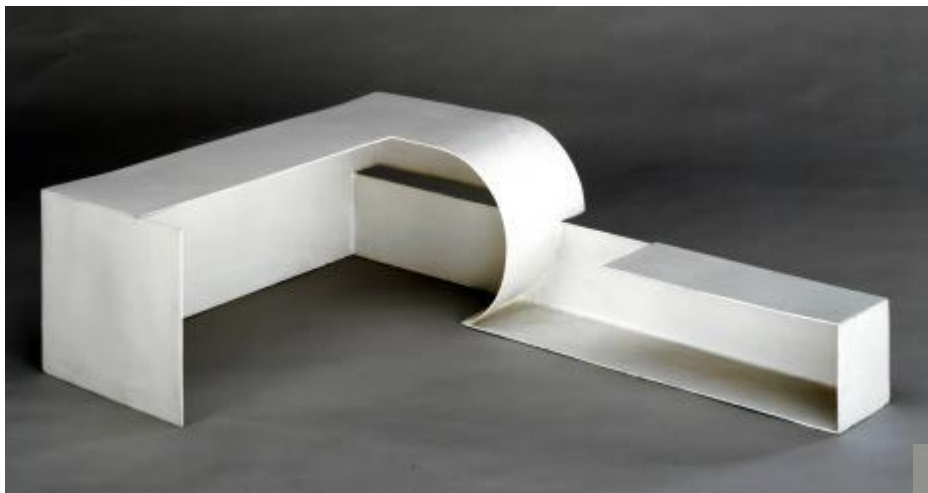


## Matematyczne inspiracje





Kobro, Kompozycja przestrzenna 7, 1931

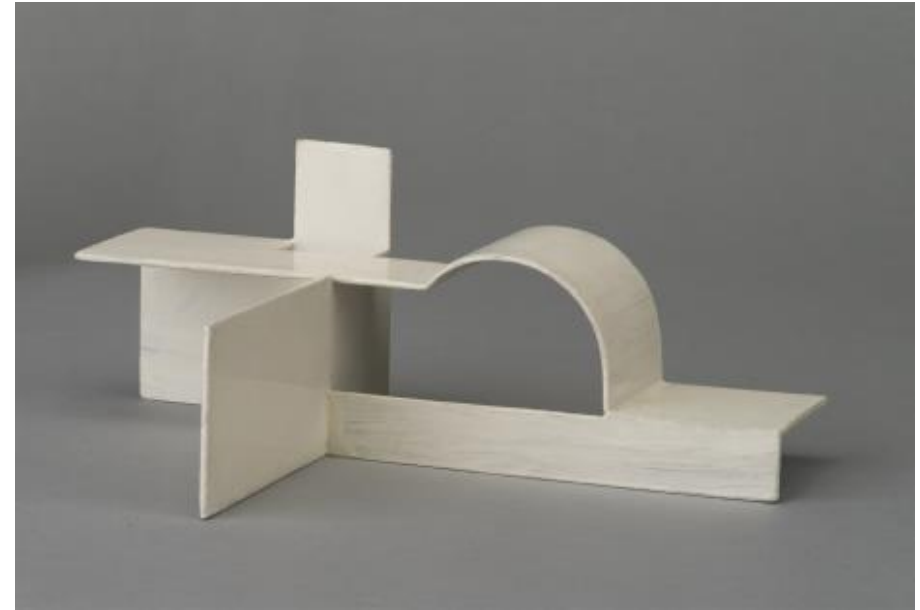


Kompozycja przestrzenna 1, 1925



Rzeźba przestrzenna 1, 1925

Kompozycja przestrzenna 3, 1928

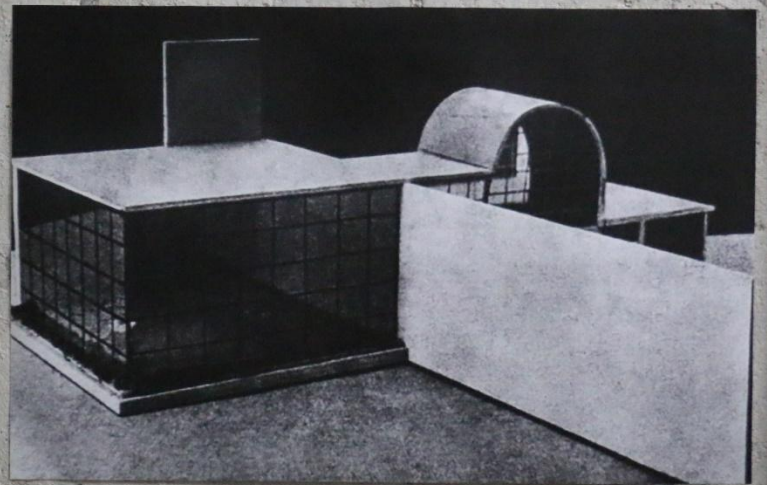
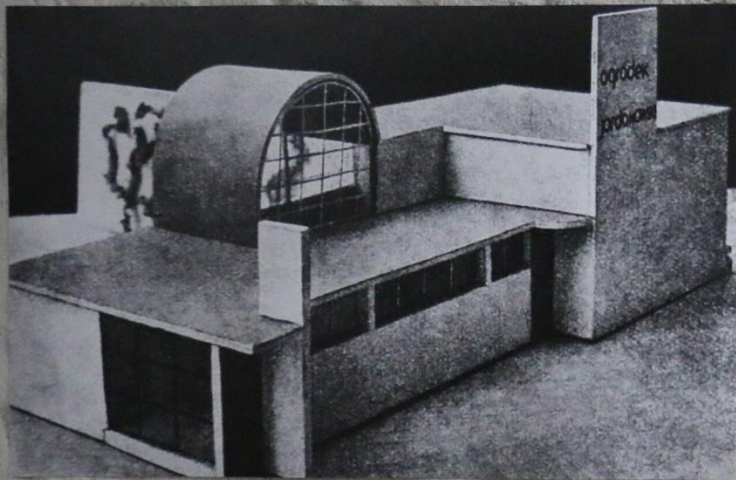


Kompozycja przestrzenna 8, 1932



Kompozycja przestrzenna 5, 1929-30





Kompozycja przestrzenna 2, 1928



Rzeźba przestrzenna, 1928





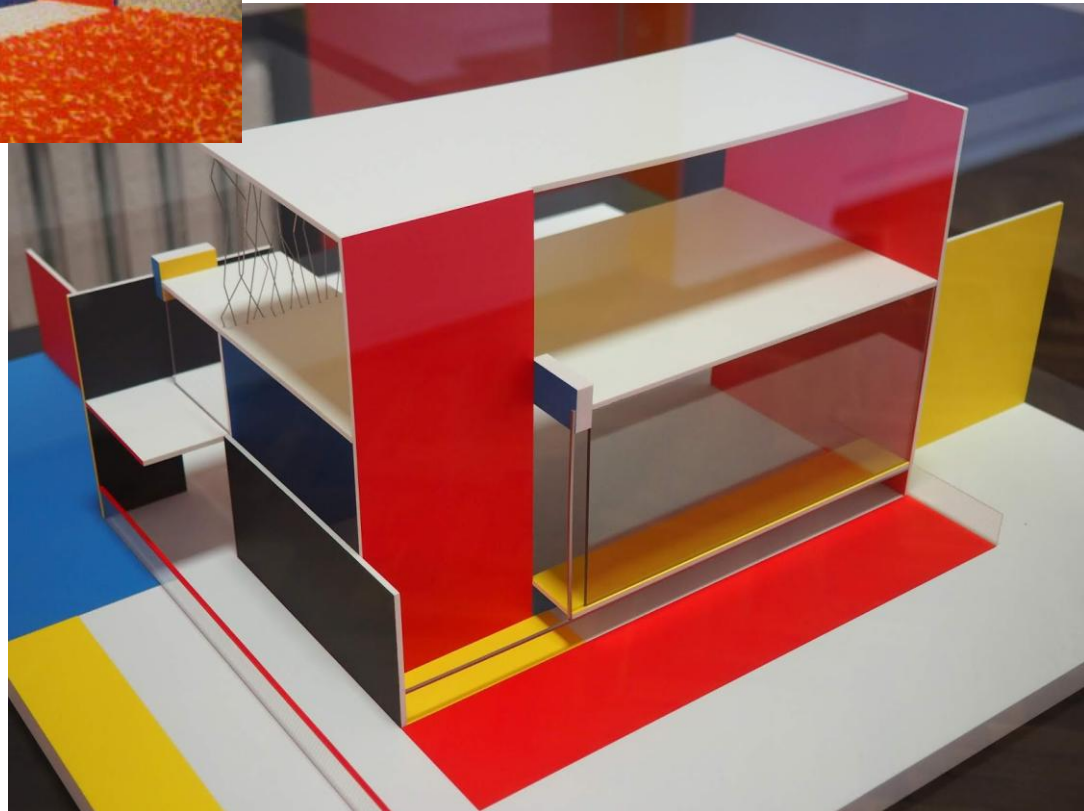
Kompozycja przestrzenna 4, 1929





1948

Władysław Strzemiński, 1930

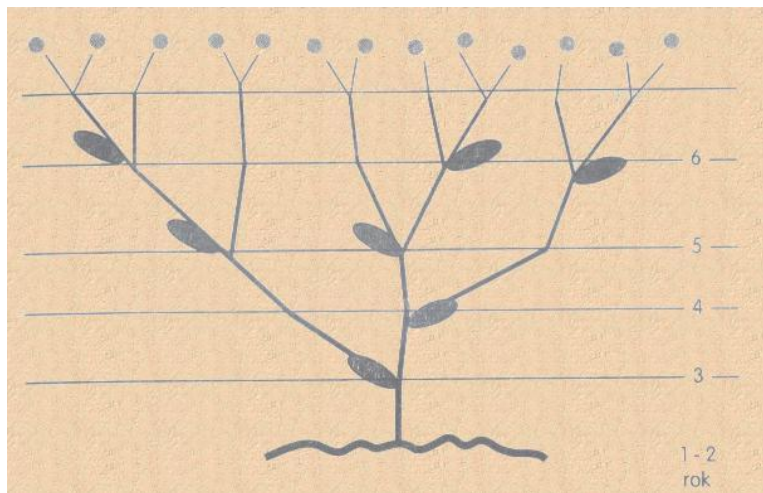




## Ciąg Fibonacciego (*Liber Abaci* 1202)

*Hodowca ma parę królików. Ile par będzie miał po roku, jeżeli co miesiąc każda para płodzi nową parę, a nowa para jest zdolna do reprodukcji dwa miesiące po urodzeniu?*

$$F_n = \{1, 1, 2, 3, 5, 8, \dots\}$$

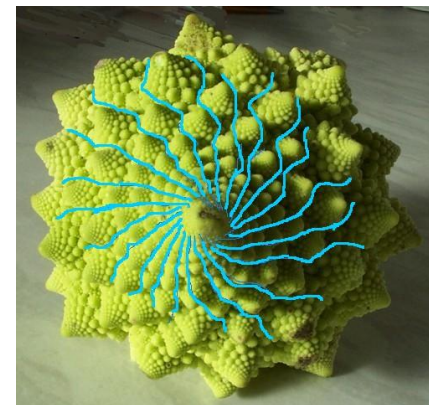
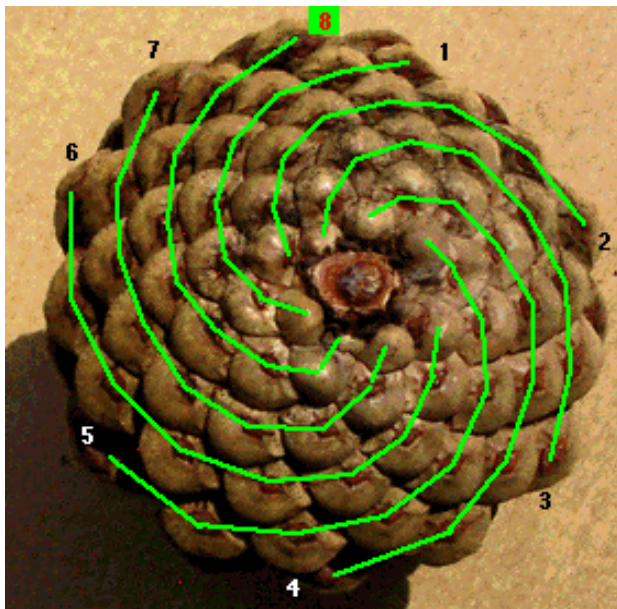


Leonardo z Pizy 1175-1250

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 618, 987, 1605, 2592...

## W przyrodzie

- liczba spiral  
(nasion / łusek / pąków)



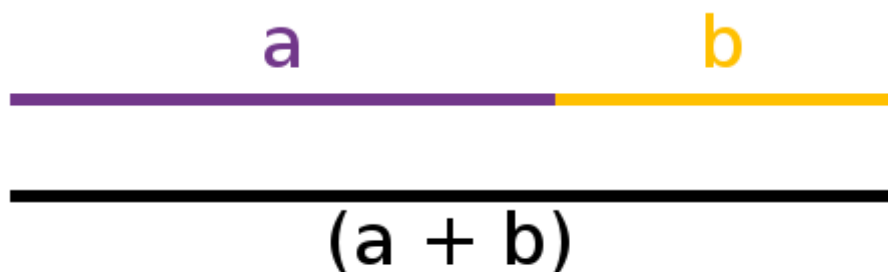


## W przyrodzie

- liczba spiral
- liczba płatków
- układ liści na łodydze



## Złoty podział



## Złota liczba

$$\varphi = \frac{a}{b} = \frac{a+b}{a}$$

$$\frac{a+b}{a} = \frac{a}{a} + \frac{b}{a} = 1 + \frac{b}{a} = 1 + \frac{1}{\varphi}$$

$$\varphi = 1 + \frac{1}{\varphi}$$

$$\varphi^2 = \varphi + 1$$

$$\varphi^2 - \varphi - 1 = 0$$

$$\Delta = 1 + 4 = 5$$

$$\varphi = \frac{1 + \sqrt{5}}{2} \quad \vee \quad \varphi = \frac{1 - \sqrt{5}}{2}$$



# Liczba jako ułamek łańcuchowy

$$125 + \frac{1}{4 + \frac{1}{3 + \frac{1}{3 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{1 + \frac{1}{14 + \frac{1}{2}}}}}}}}}$$

$$\varphi = 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \dots}}}}}}}} = \frac{1 + \sqrt{5}}{2} = 1,618033\dots$$

$$\frac{F_{n+1}}{F_n}$$

$$\lim_{n \rightarrow \infty} \frac{F_n}{F_{n-1}}$$

$$\varphi = 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \dots}}}}}}}$$

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 618, 987, 1605, 2592...

# Klasyczny kanon piękna











~510

~1180

~1910

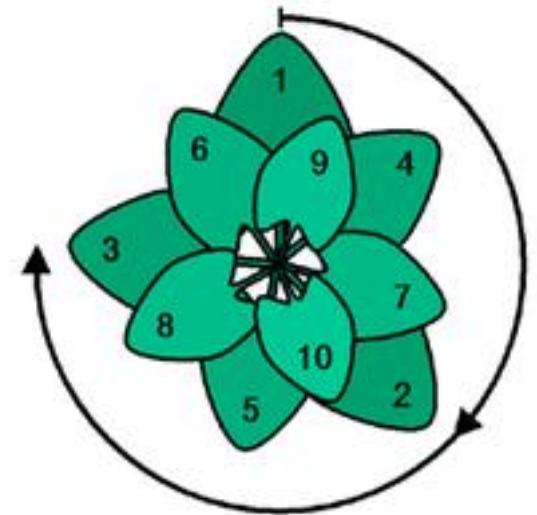
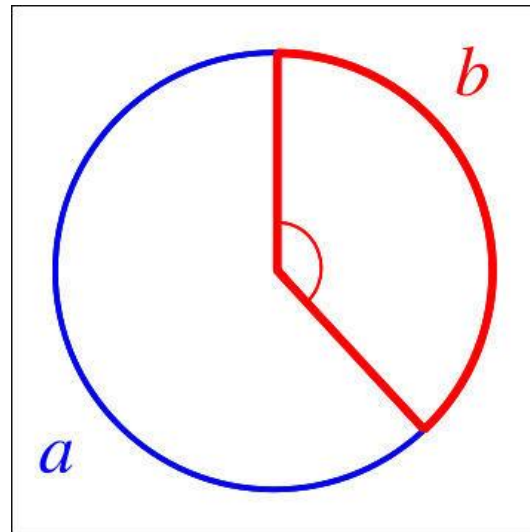
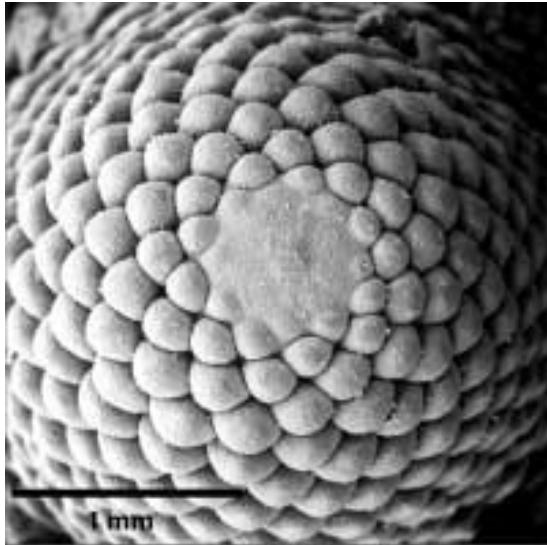
~825





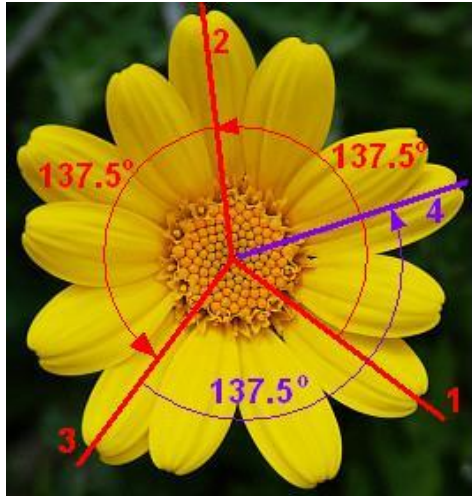


# A skąd przyroda to wie?

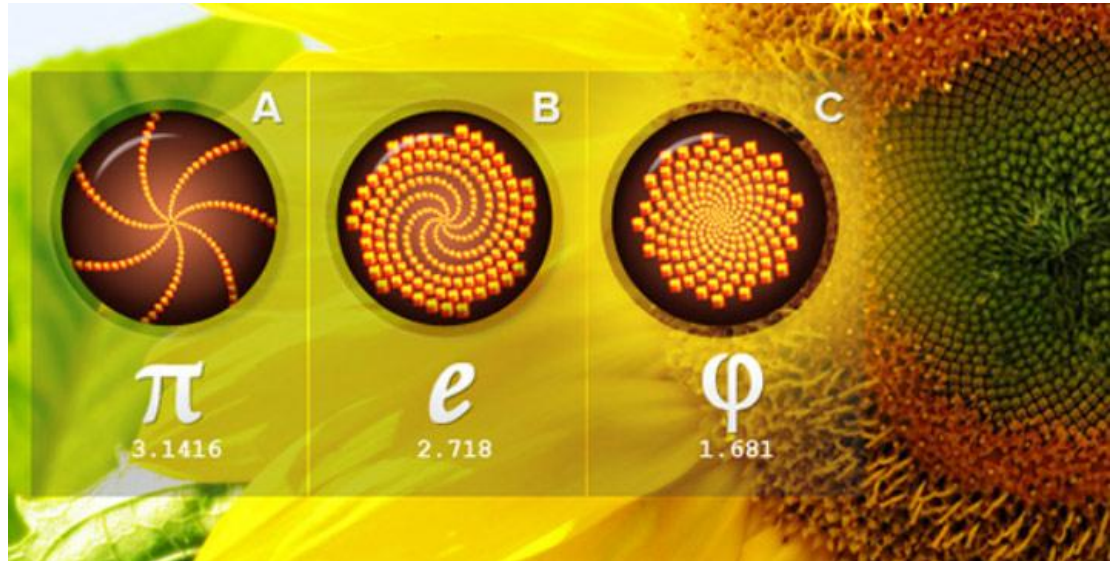
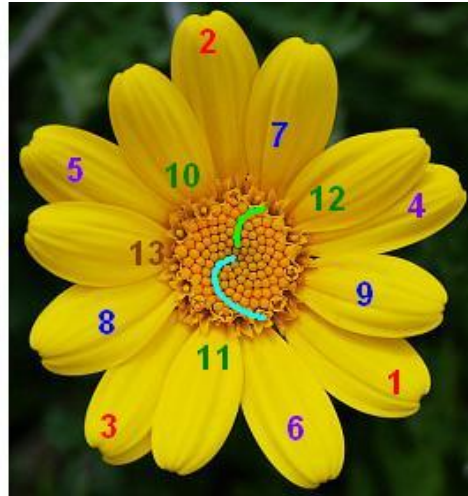


Złoty kąt

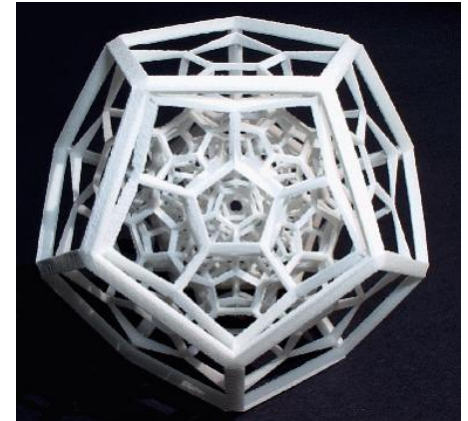
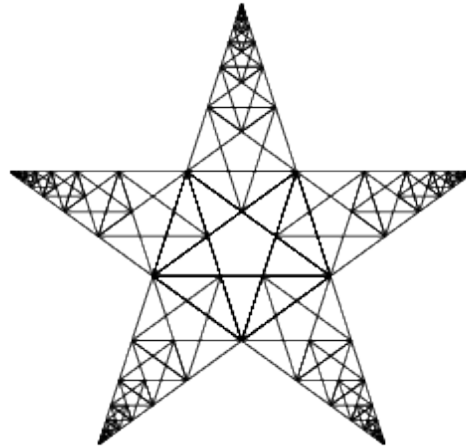
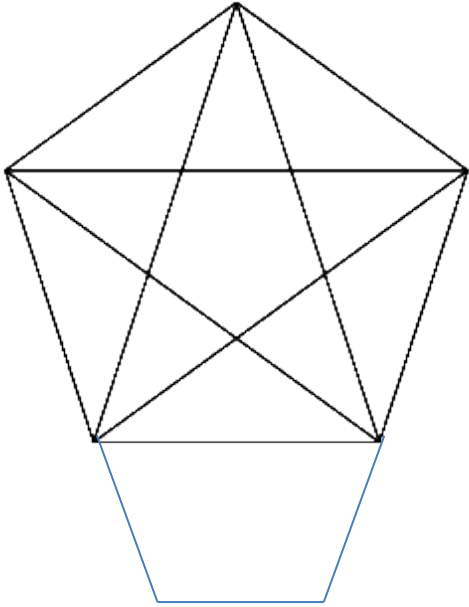




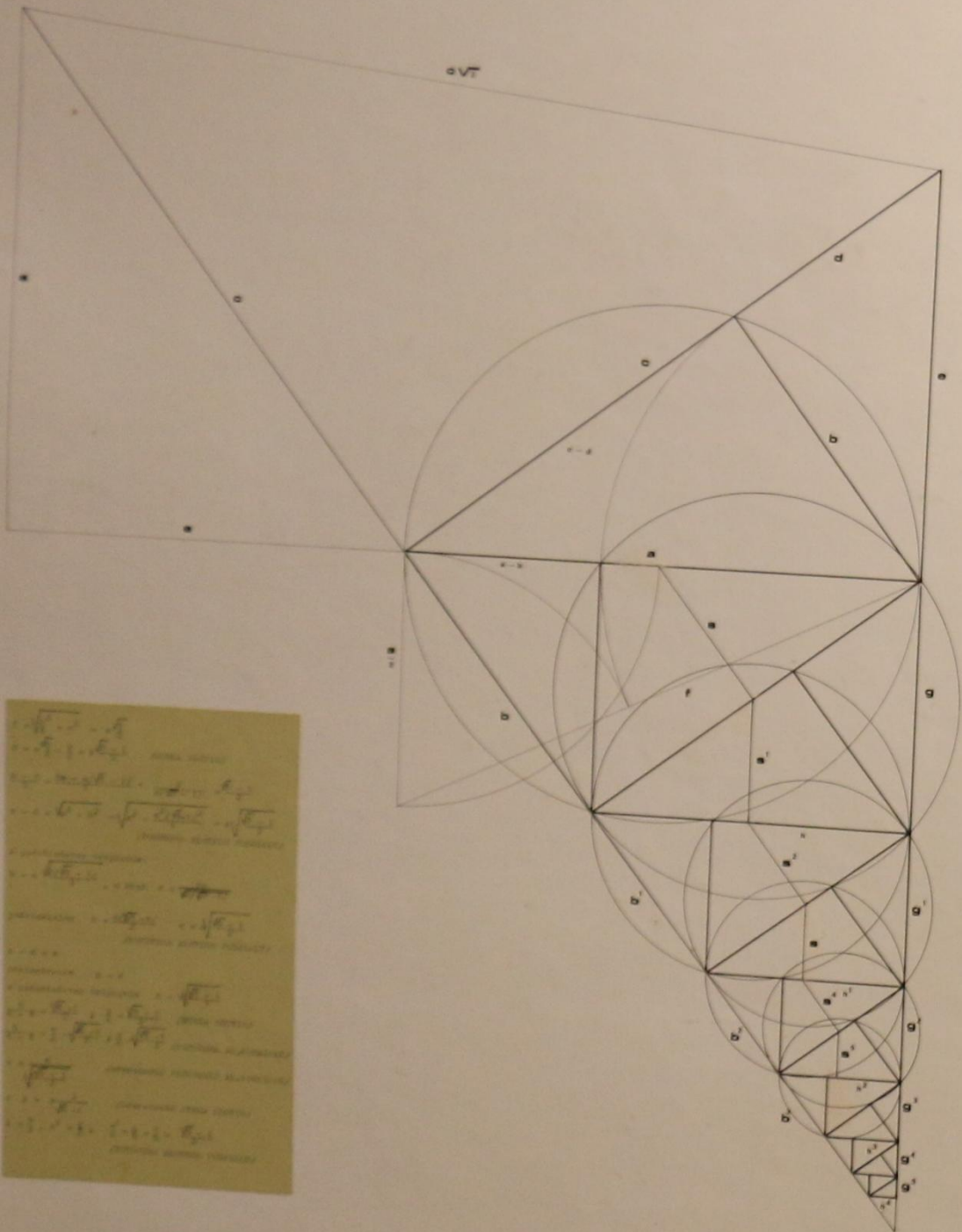
azorawski.com



# Gwiazda pitagorejska



*[Handwritten notes on a yellow sticky note, partially obscured and difficult to read.]*





$$f = \sqrt{\frac{a^2}{4} + a^2} = a \sqrt{\frac{5}{2}}$$

$$b = a \sqrt{\frac{5}{2}} - \frac{a}{2} = a \sqrt{\frac{5-1}{2}}$$

/AUREA SECTIO/

$$\frac{a-b}{b} = \frac{2a - a/\sqrt{5} - 1/2}{a/\sqrt{5} - 1/2} = \frac{\sqrt{5} - 1}{2}$$

$$c-d = \sqrt{a^2 - b^2} = \sqrt{a^2 - \frac{a^2(\sqrt{5}-1)^2}{4}} = a \sqrt{\frac{\sqrt{5}-1}{2}}$$

/POCHODNA ZŁOTEGO PODZIAŁU



z podobieństwa trójkątów:

$$b = e \frac{\sqrt{2/\sqrt{5} - 1/2}}{2}, \text{ a więc } e = \frac{2b}{\sqrt{2/\sqrt{5} - 1/2}}$$

podstawiając  $b = \frac{a\sqrt{5} - 1/2}{2}$   $e = a\sqrt{\frac{\sqrt{5} - 1}{2}}$

/POCHODNA ZŁOTEGO PODZIAŁU/

$$c - d = e$$

analogicznie  $g = d$

z podobieństwa trójkątów  $d = b\sqrt{\frac{\sqrt{5} - 1}{2}}$

$$\frac{d}{e} = \frac{\sqrt{5} - 1}{2}; \quad \frac{g}{e} = \frac{\sqrt{5} - 1}{2} \quad \text{/AUREA SECTIO/}$$

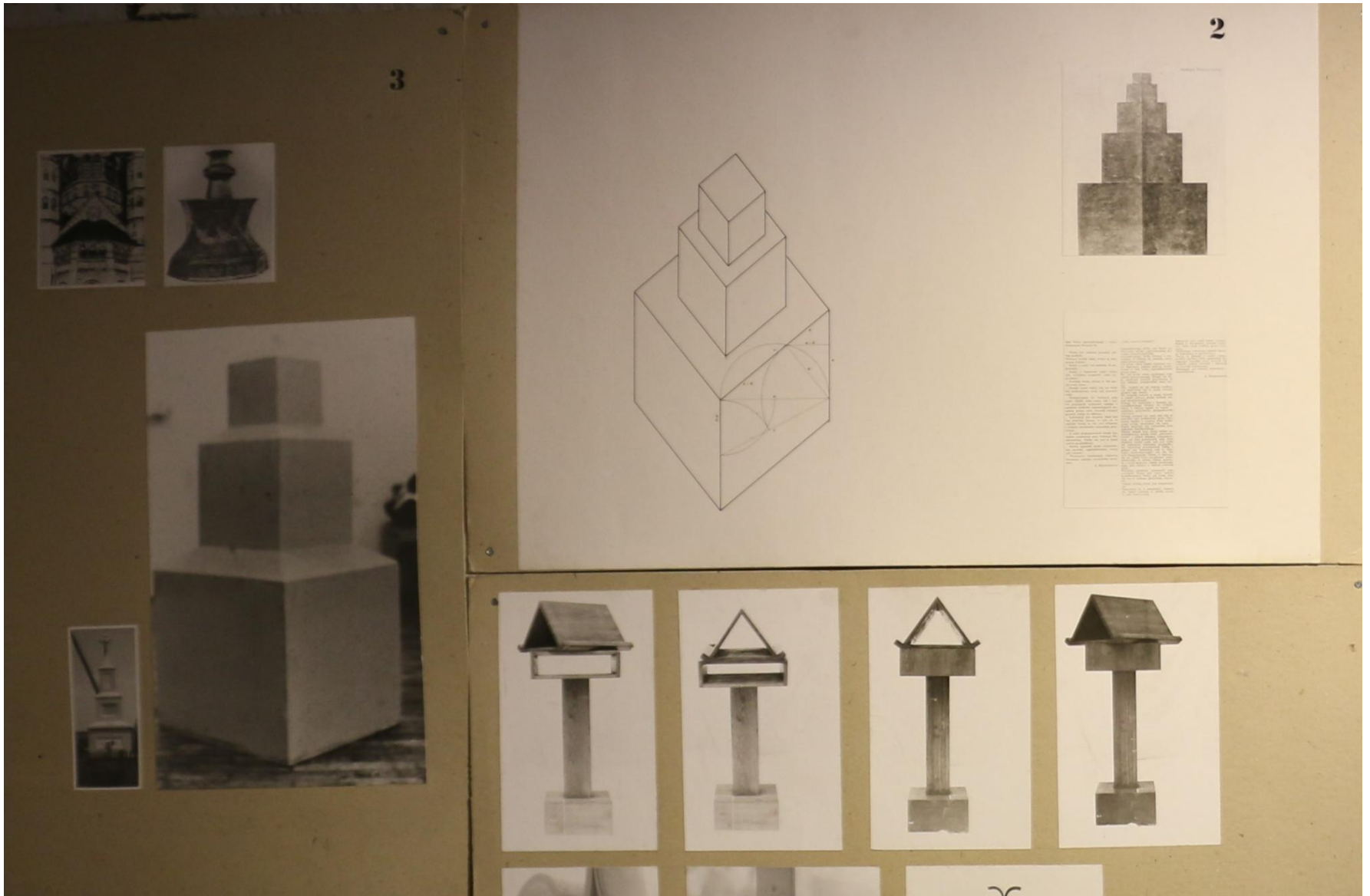
$$\frac{b}{c} = \frac{e}{a} = \sqrt{\frac{\sqrt{5} - 1}{2}}; \quad \frac{a}{c} = \sqrt{\frac{\sqrt{5} - 1}{2}} \quad \text{/POCHODNA ZŁ. PODZIAŁU/}$$

$$c = \frac{a}{\sqrt{\frac{\sqrt{5} - 1}{2}}} \quad \text{/odwrotność POCODNEJ ZŁ. PODZIAŁU/}$$

$$c^2 = a \frac{2}{\sqrt{5} - 1} \quad \text{/odwrotność AUREA SECTIO/}$$

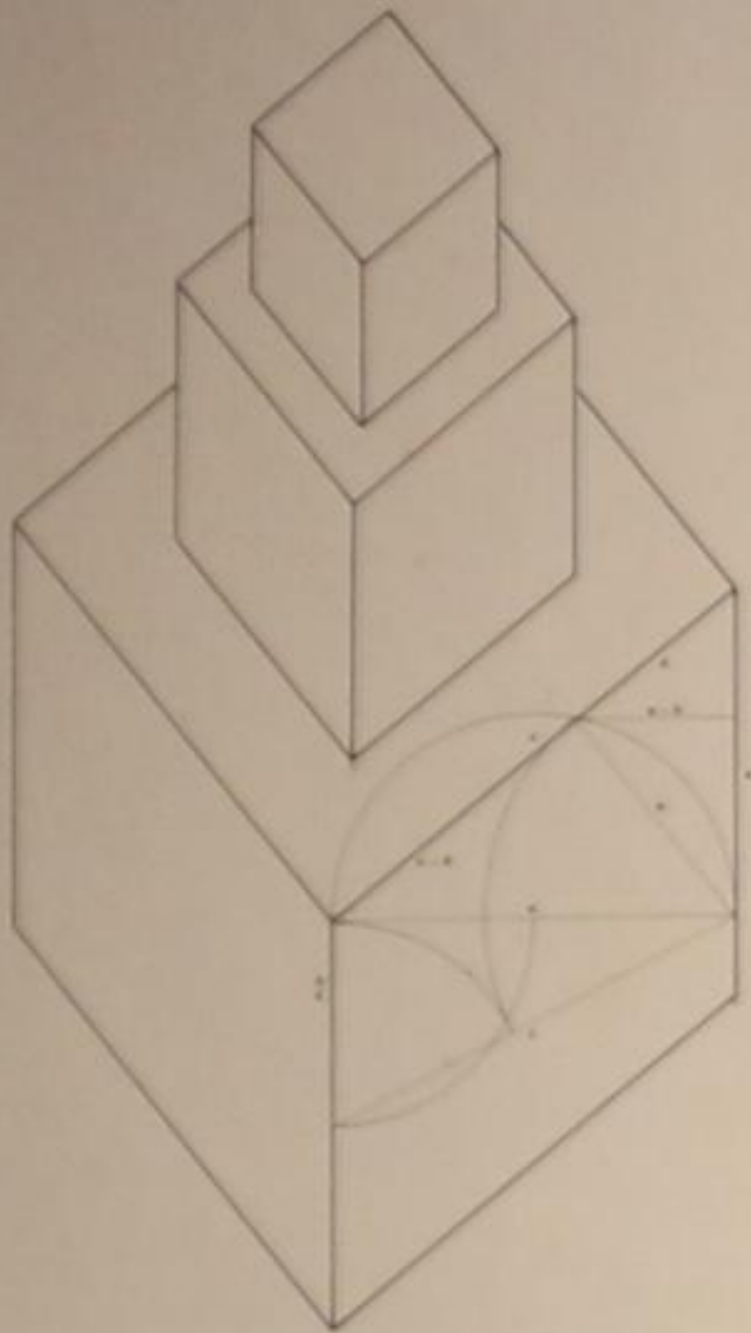
$$s = \frac{b}{2}, \quad s^1 = \frac{g}{2}; \quad \frac{s^1}{s} = \frac{g}{b} = \frac{d}{b} = \frac{\sqrt{5} - 1}{2}$$

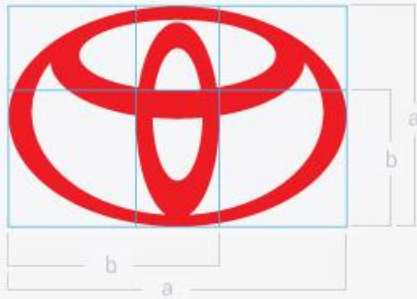
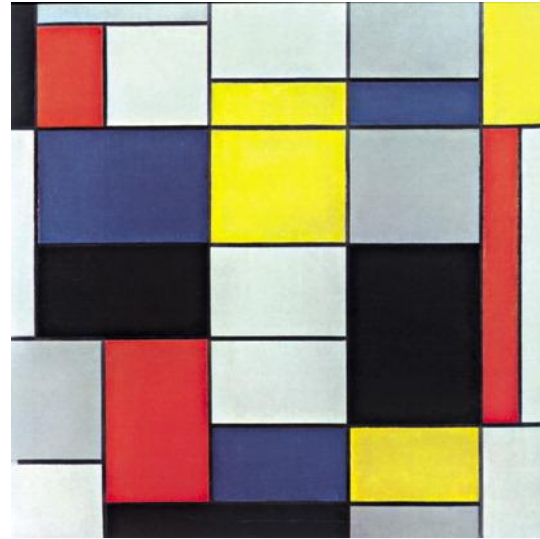
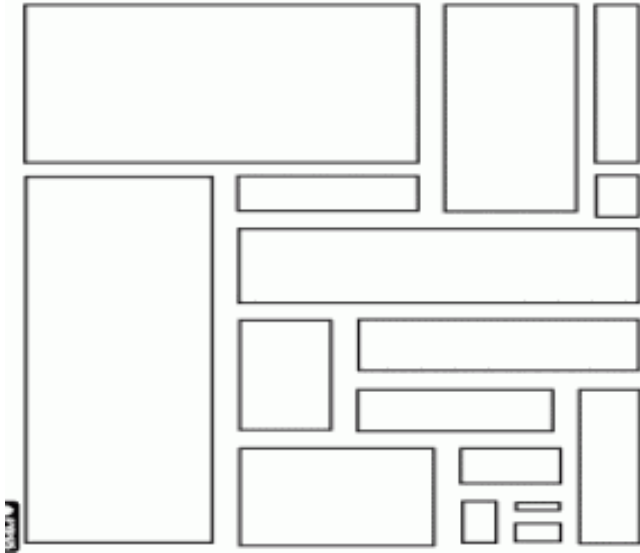
/POCHODNA ZŁOTEGO PODZIAŁU/



Andrzej Wojciechowski

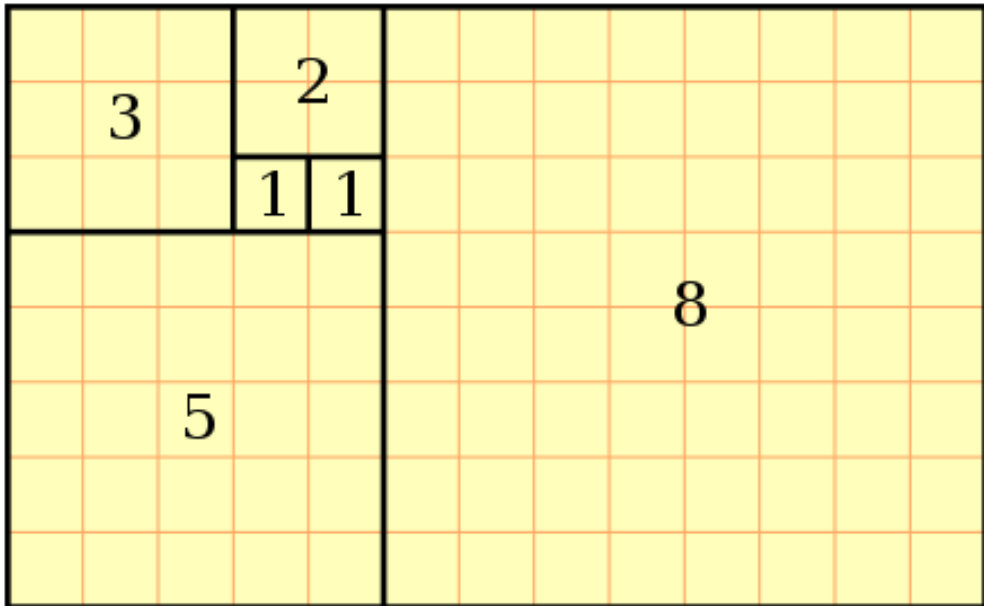




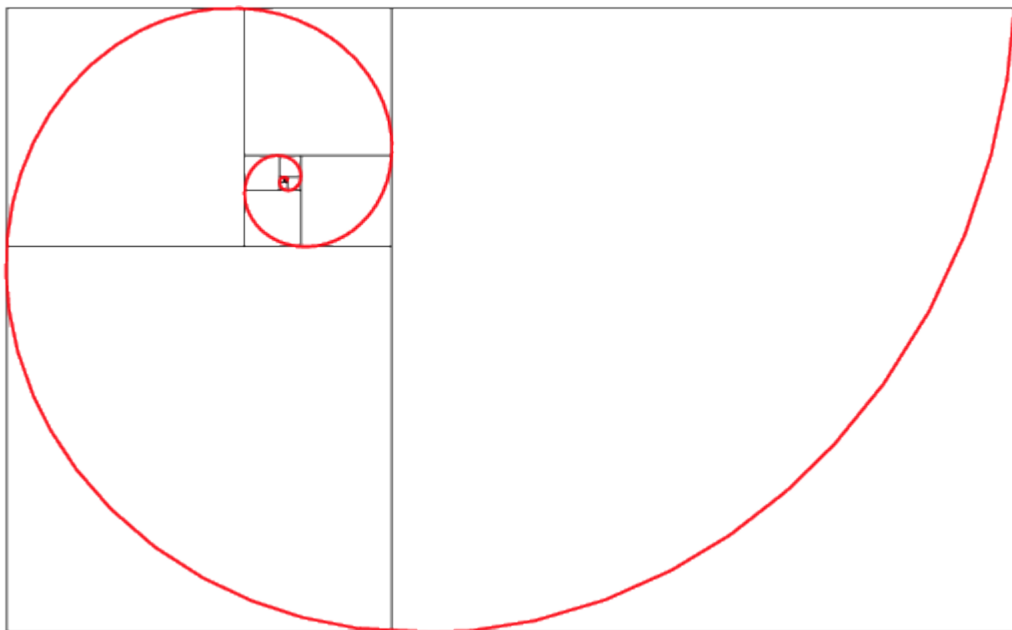


$$\frac{a}{b} = 1.618$$

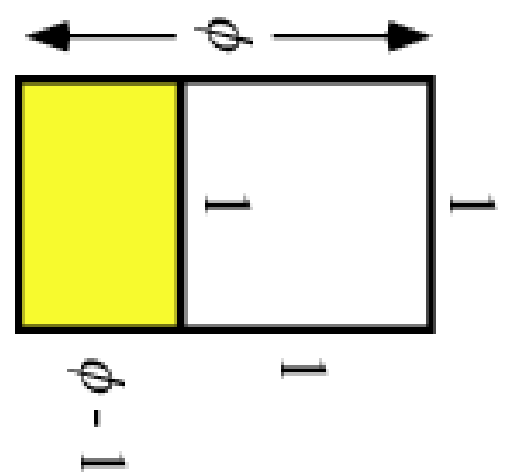
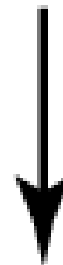
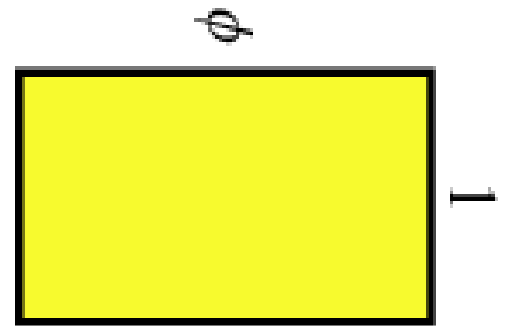
$$\frac{a'}{b'} = 1.618$$



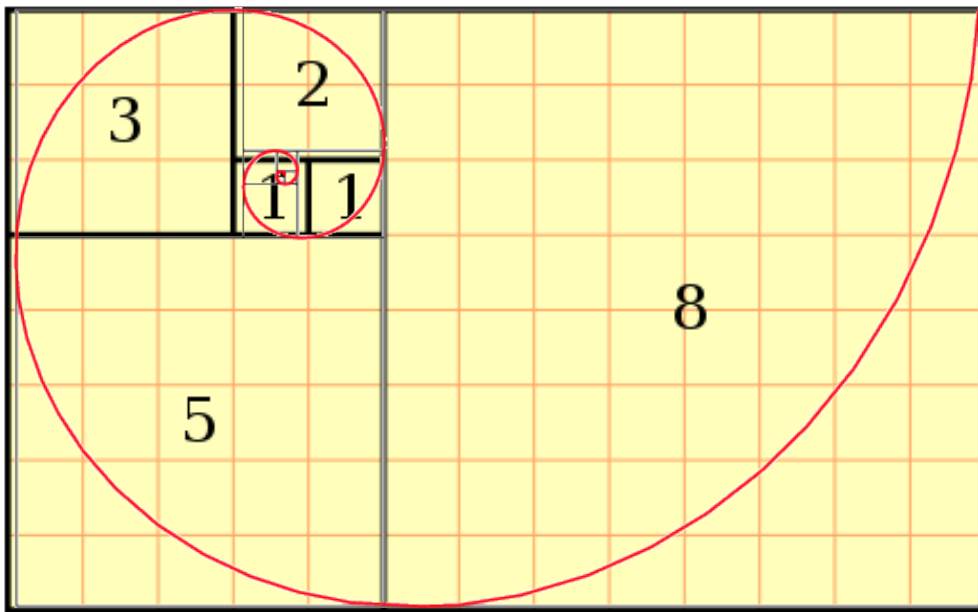
**Prostokąt Fibonacciego**



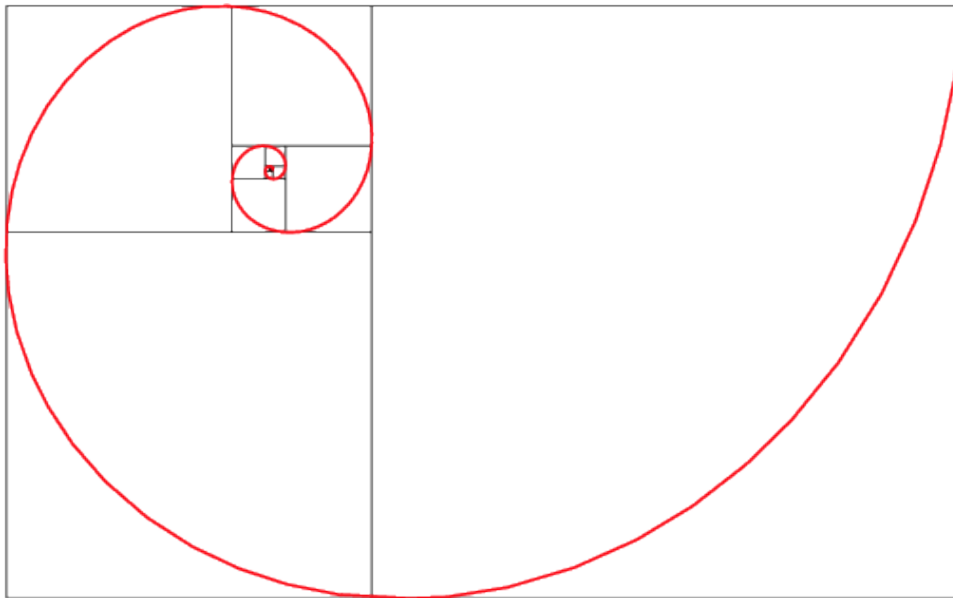
**Prostokąt złoty**



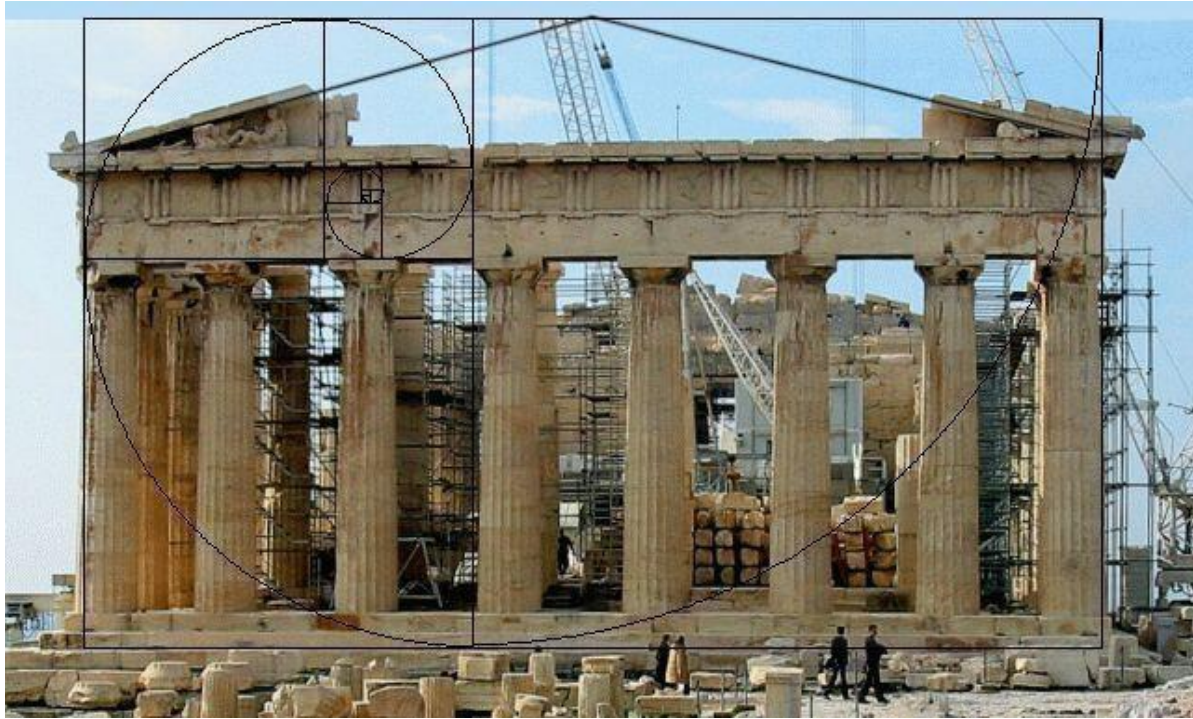


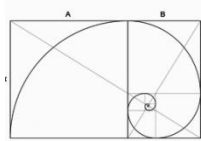


**spiralą Fibonacciego**

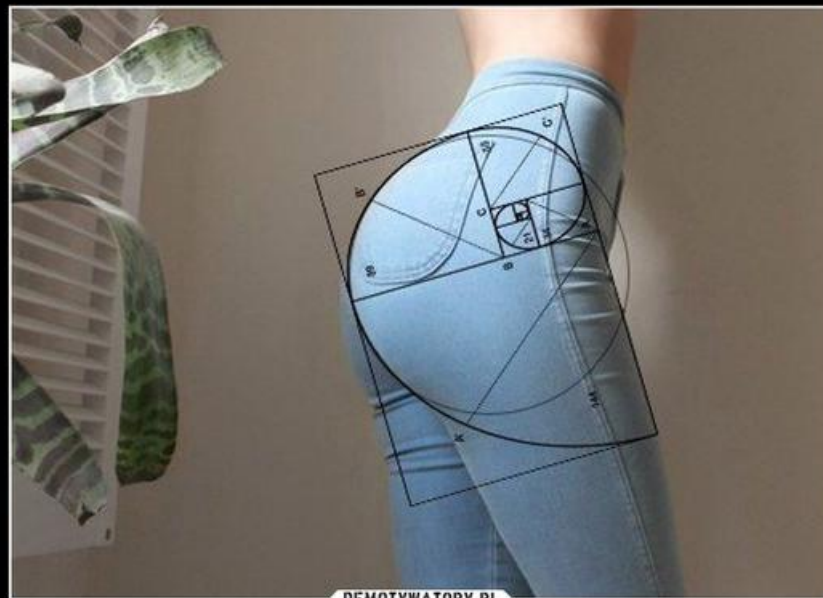
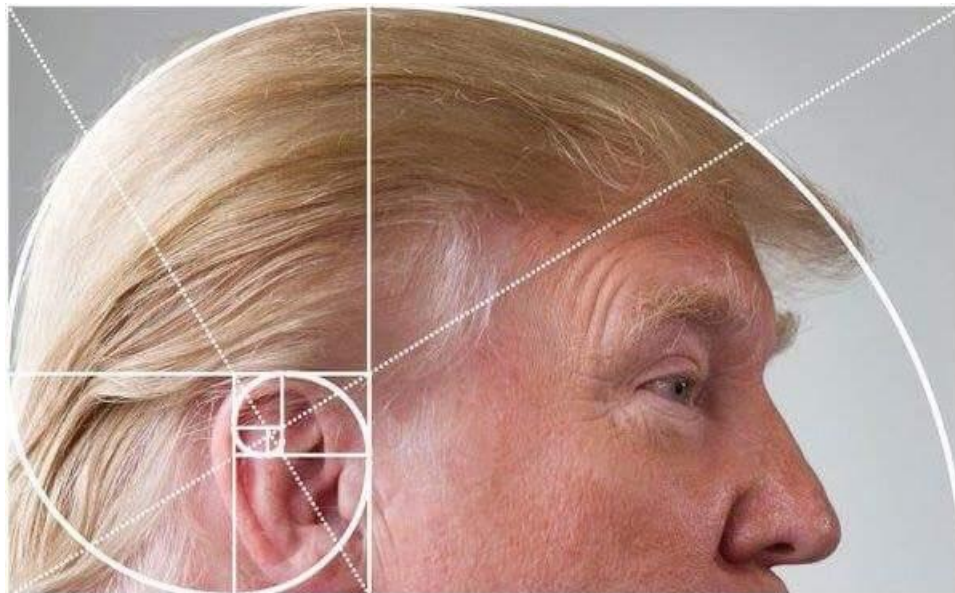
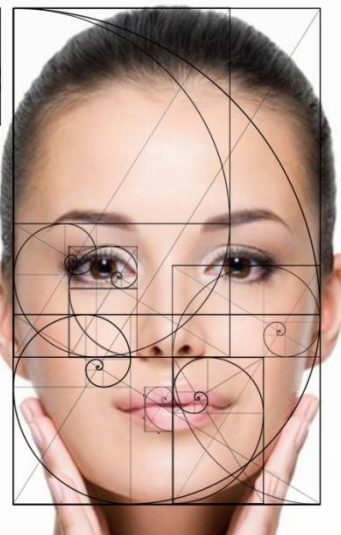


**spiralą złotą**



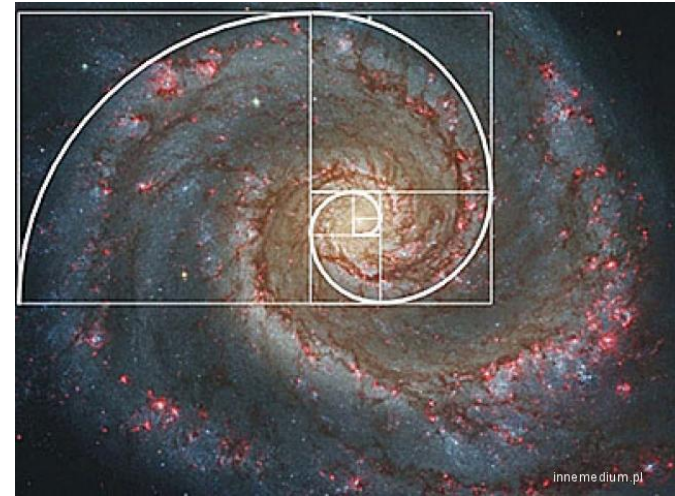


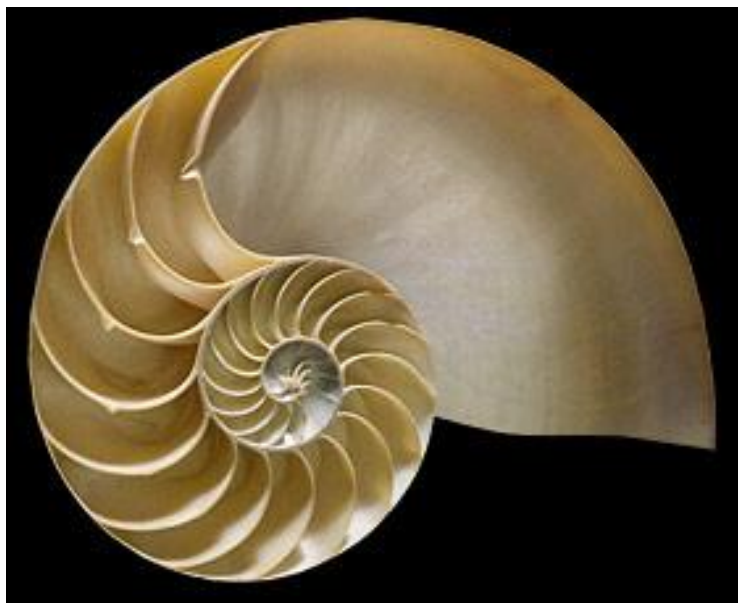
$$A/B = A + B/A = 1,61803398...$$



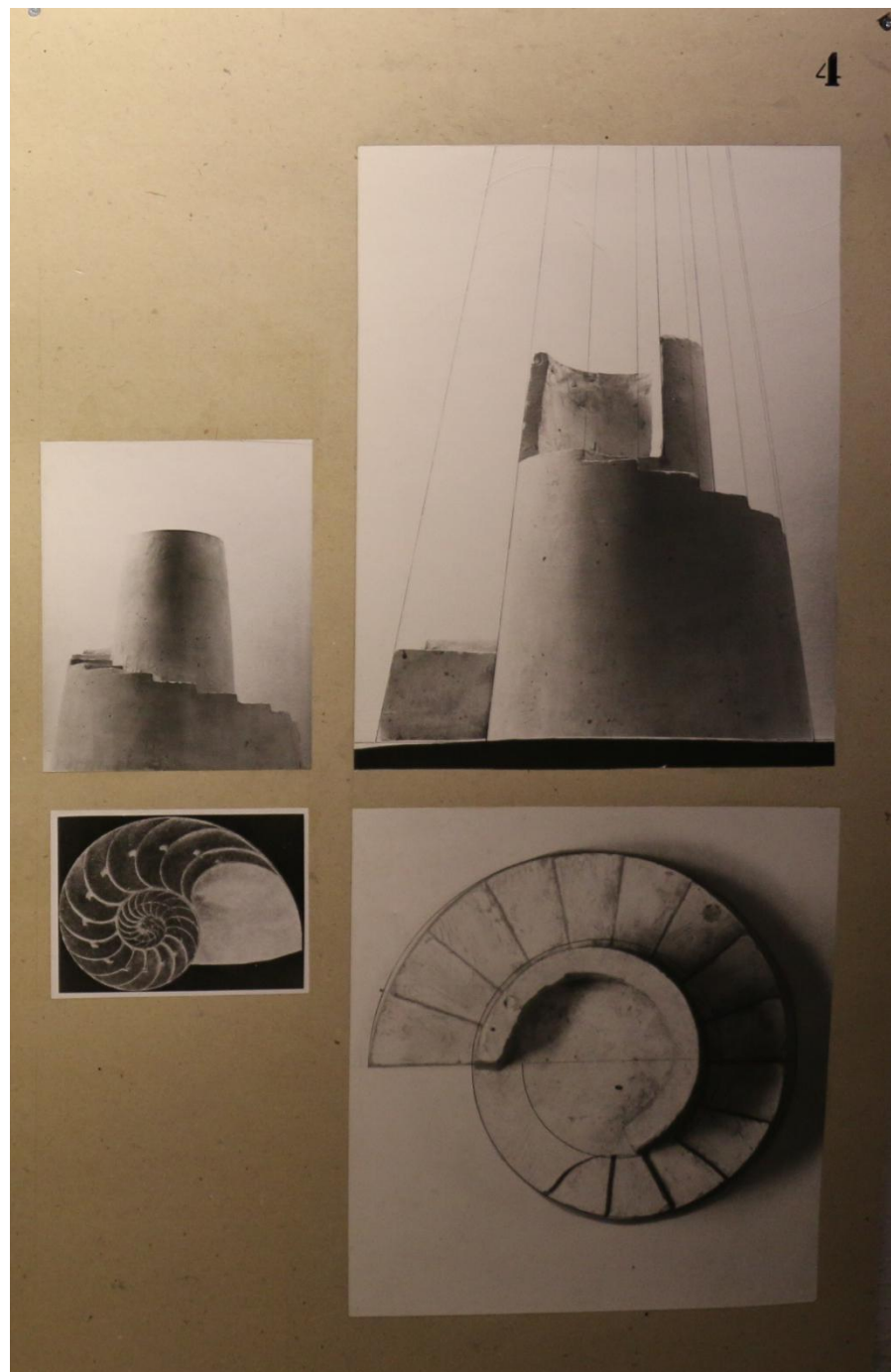


# Spira mirabilis

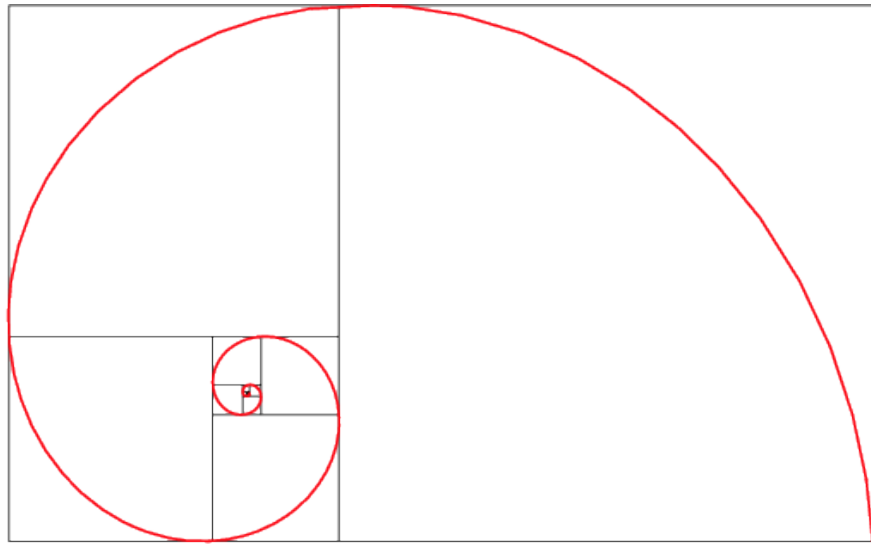




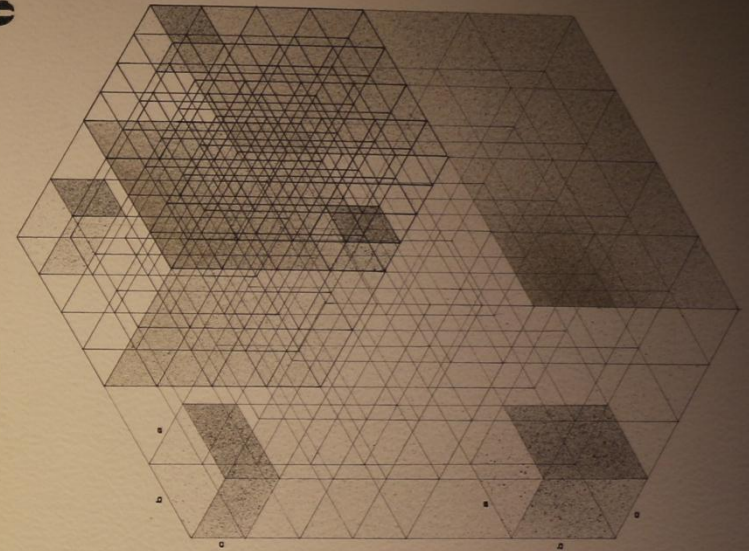
Andrzej Wojciechowski



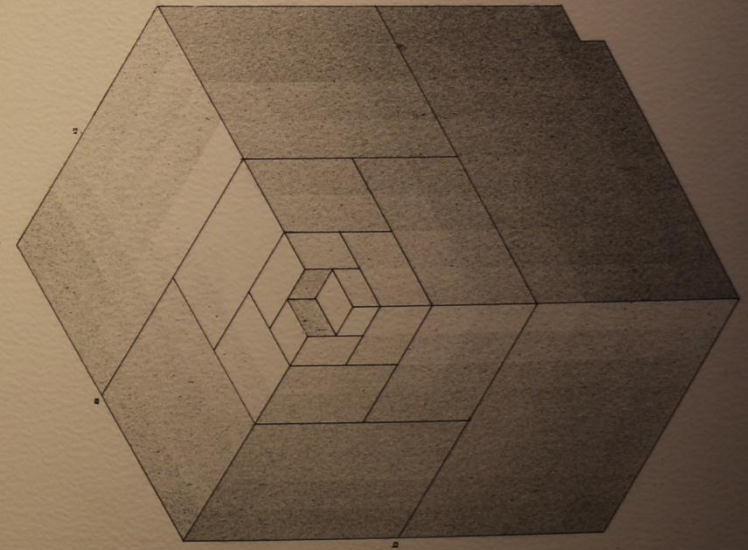




6



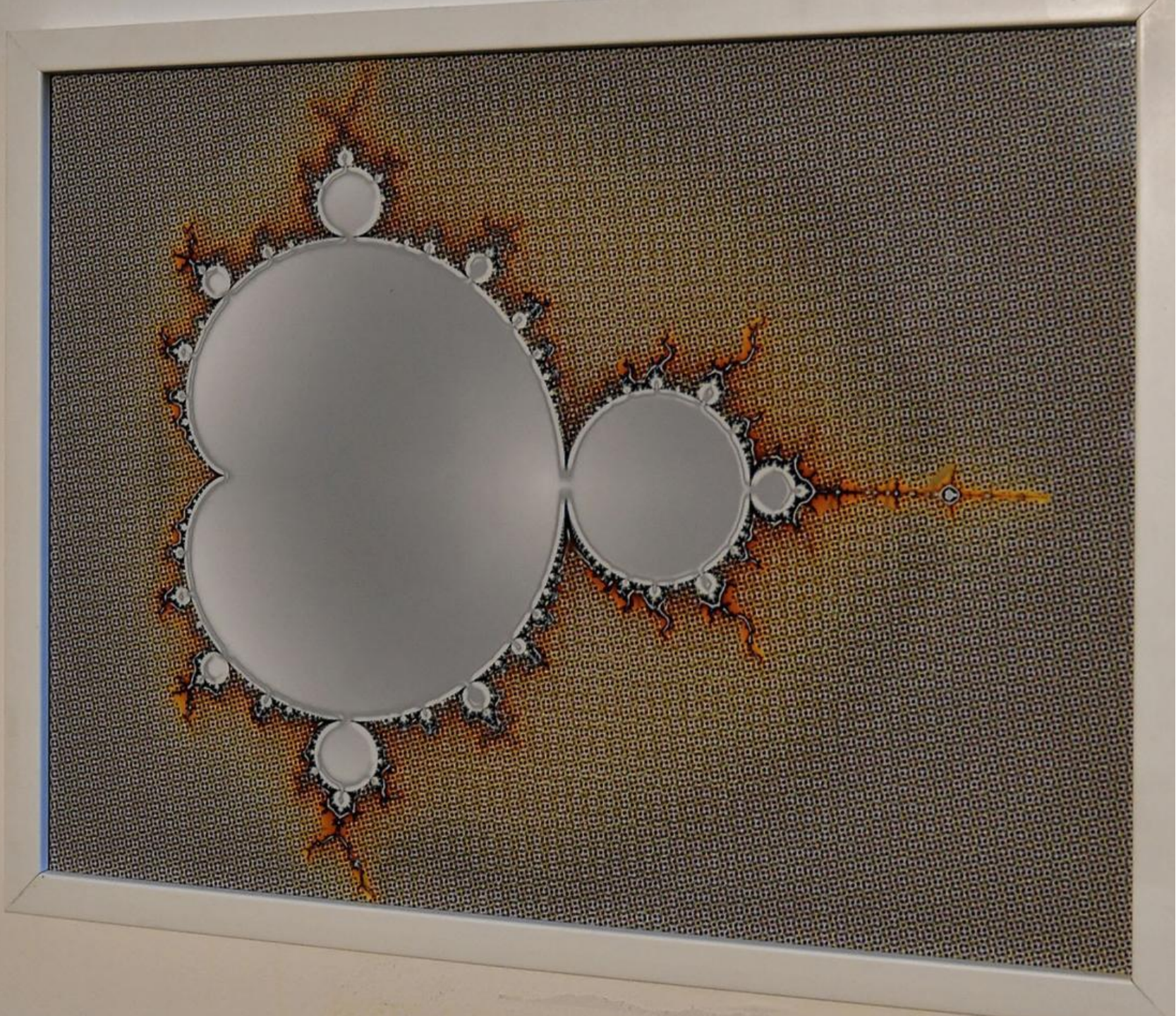
Złoty prostopadłościan  
Złota spirala 3d



stairway  
to future

math.uni.wroc.pl









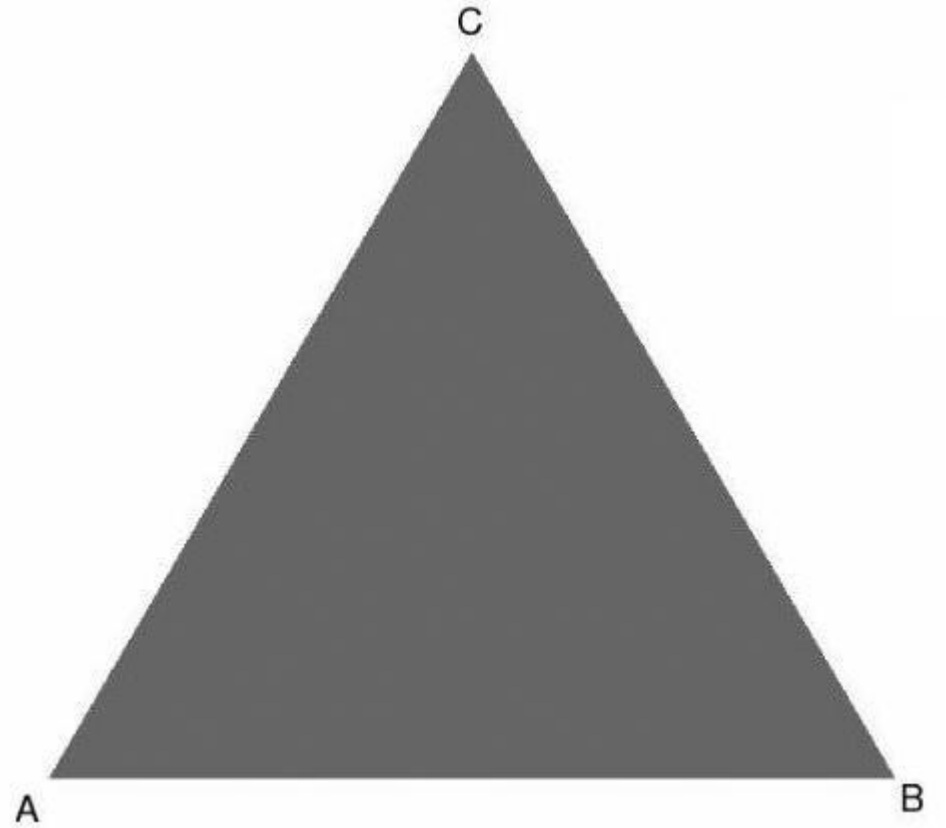
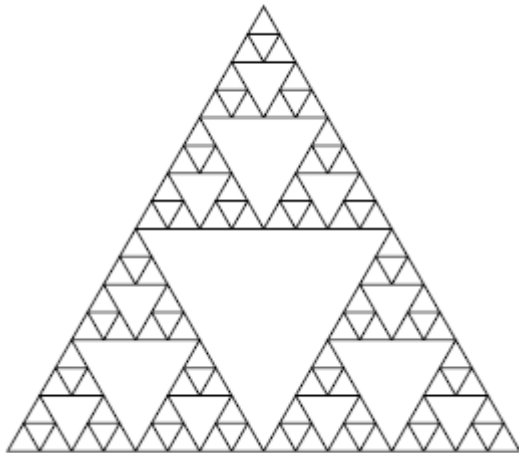
Sławomir Lipnicki  
Grenzen der Zeit



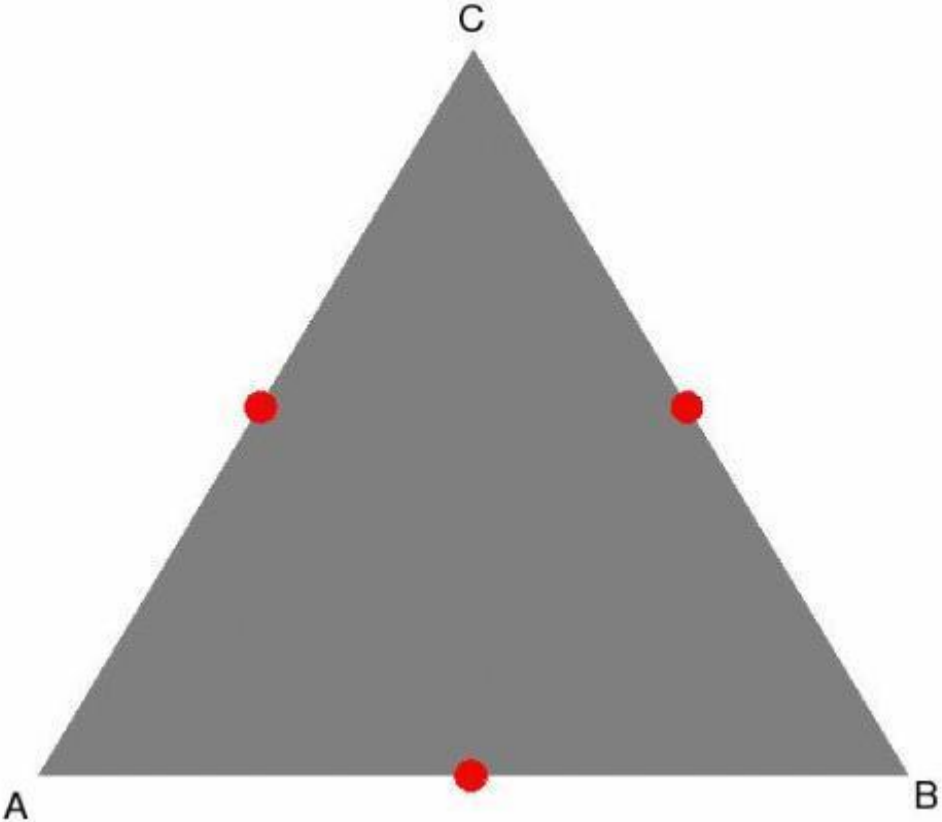
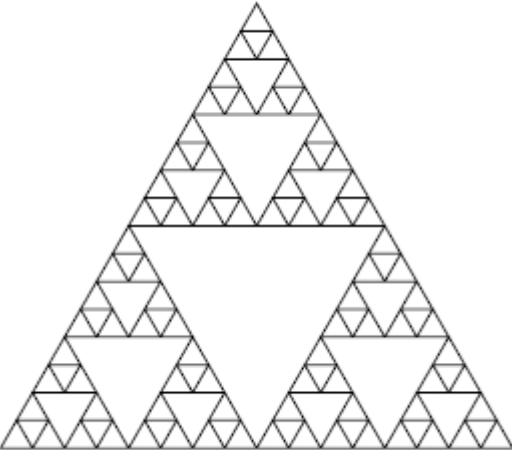
**Iwona Teodorczuk-Moździńska**  
*raz, dwa, trzy – początek gry*

WYKAZ PRAC  
Iwona Teodorczuk-Moździńska  
raz, dwa, trzy – początek gry  
2010  
Technika: papier, farby akrylowe, klej, nitki  
Wymiary: 100 x 100 cm  
Cena: 1200 zł

# Trójkąt Sierpińskiego

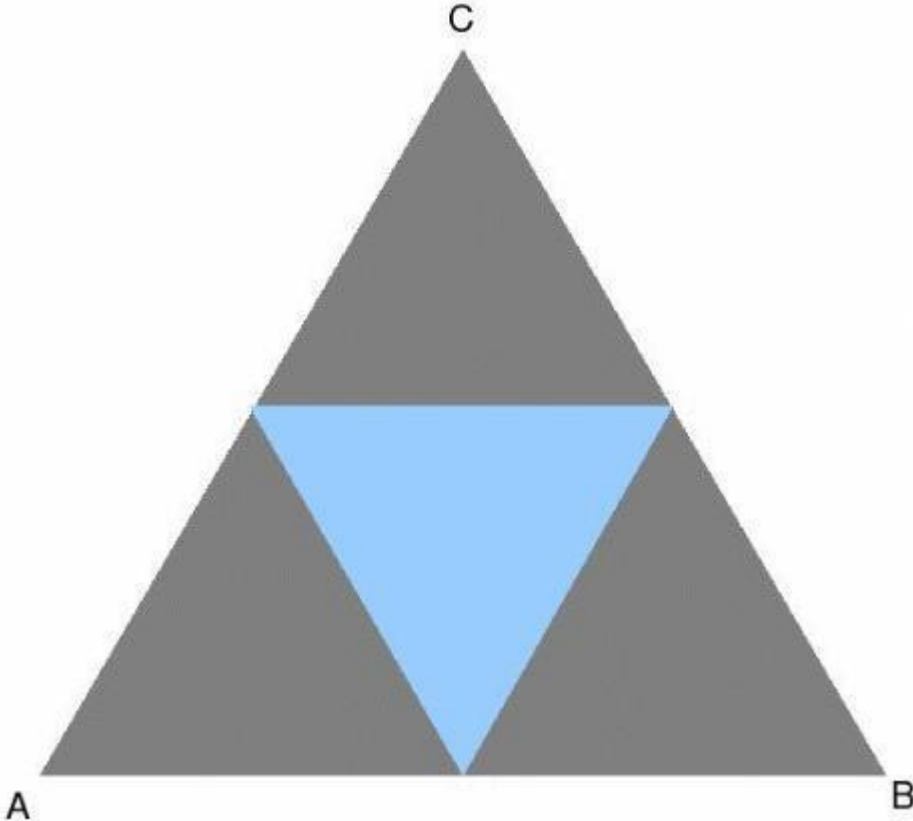
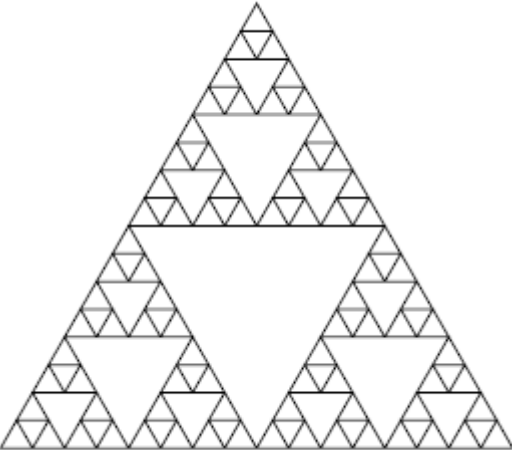


Konstrukcja trójkąta Sierpińskiego

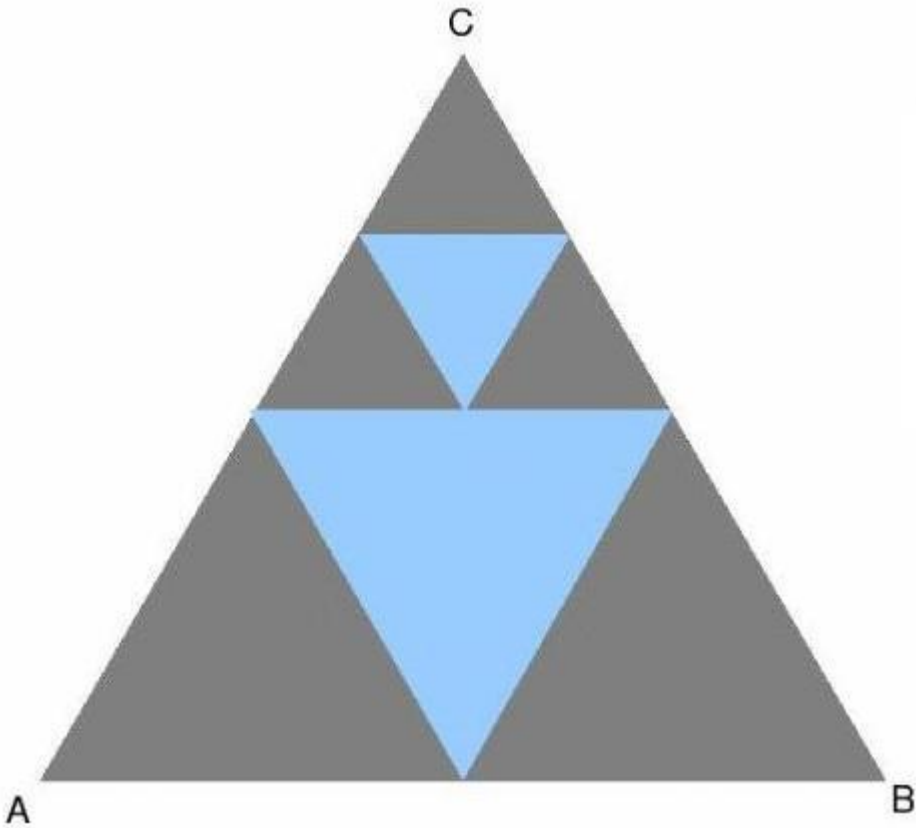
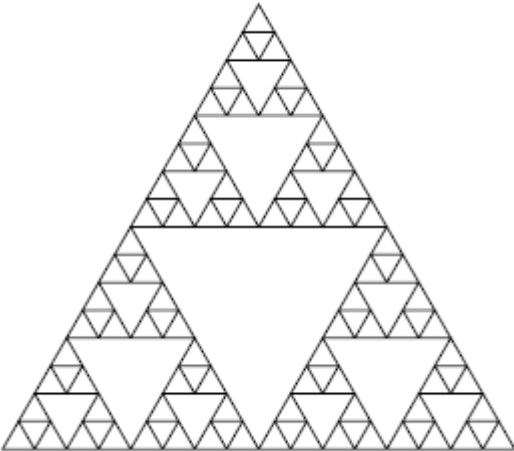




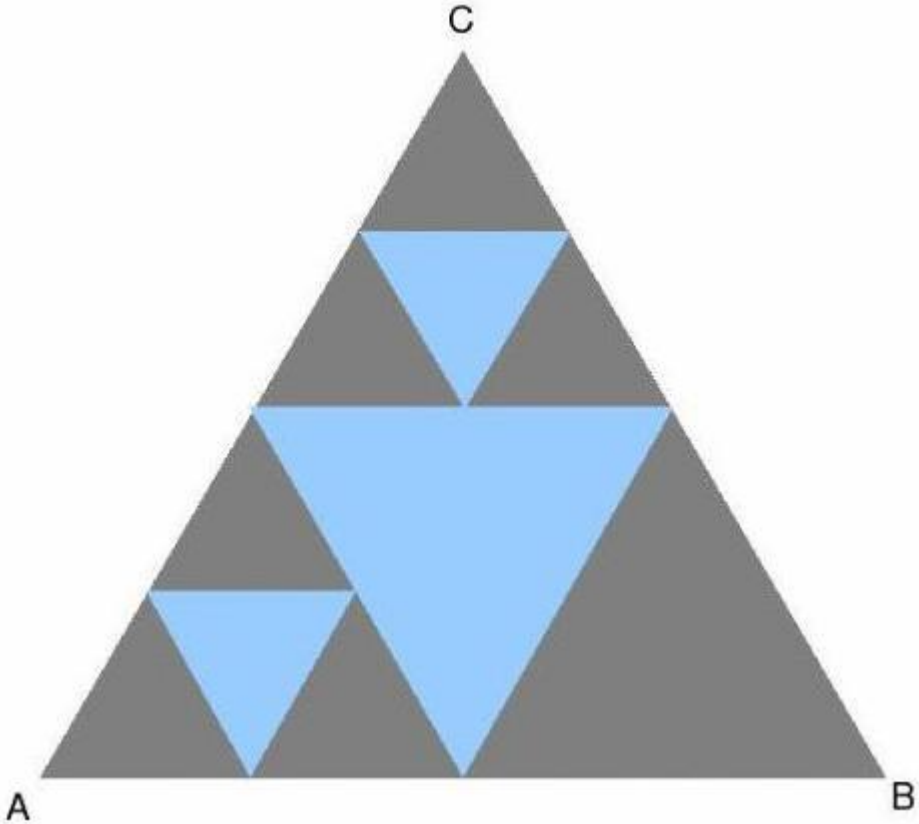
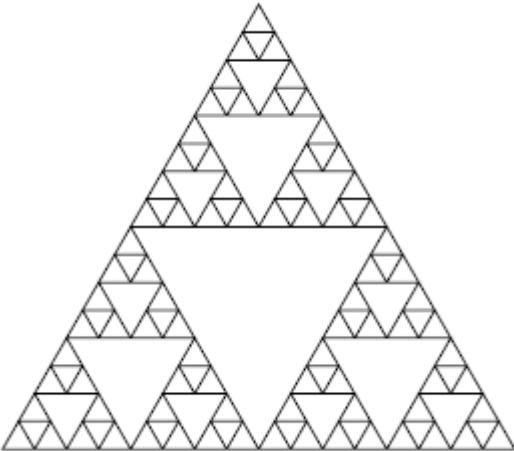
Konstrukcja trójkąta Sierpińskiego



Konstrukcja trójkąta Sierpińskiego

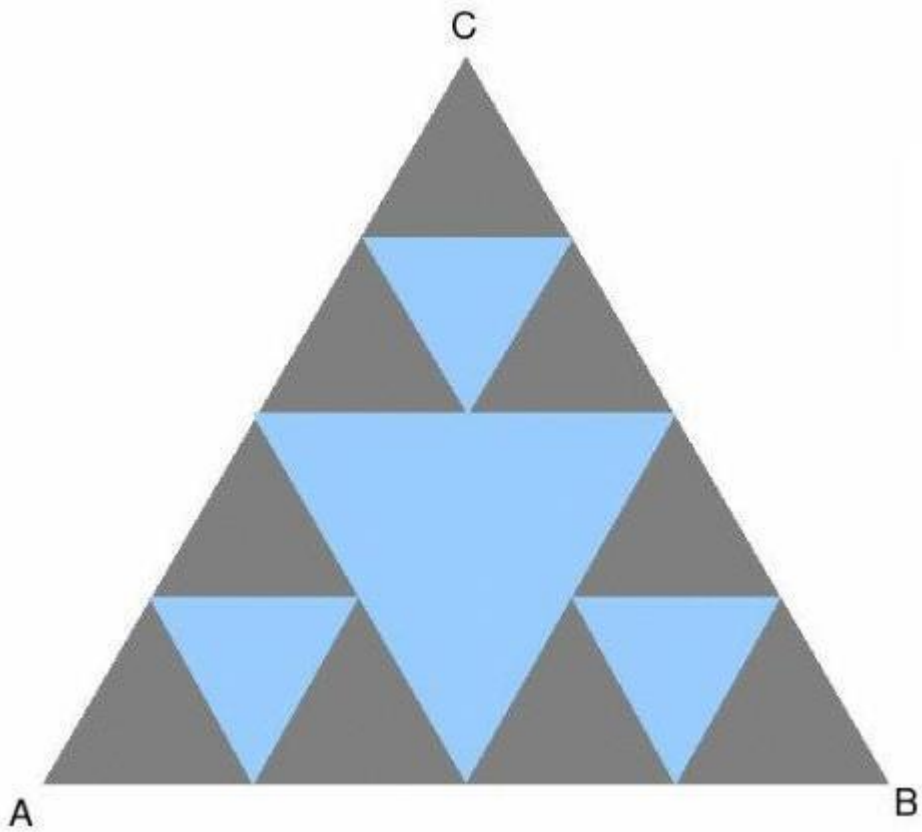
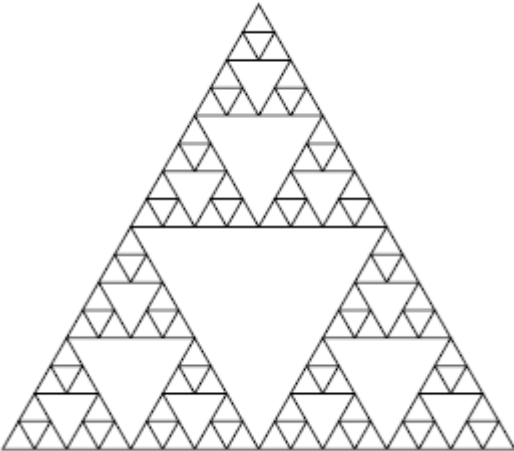


Konstrukcja trójkąta Sierpińskiego

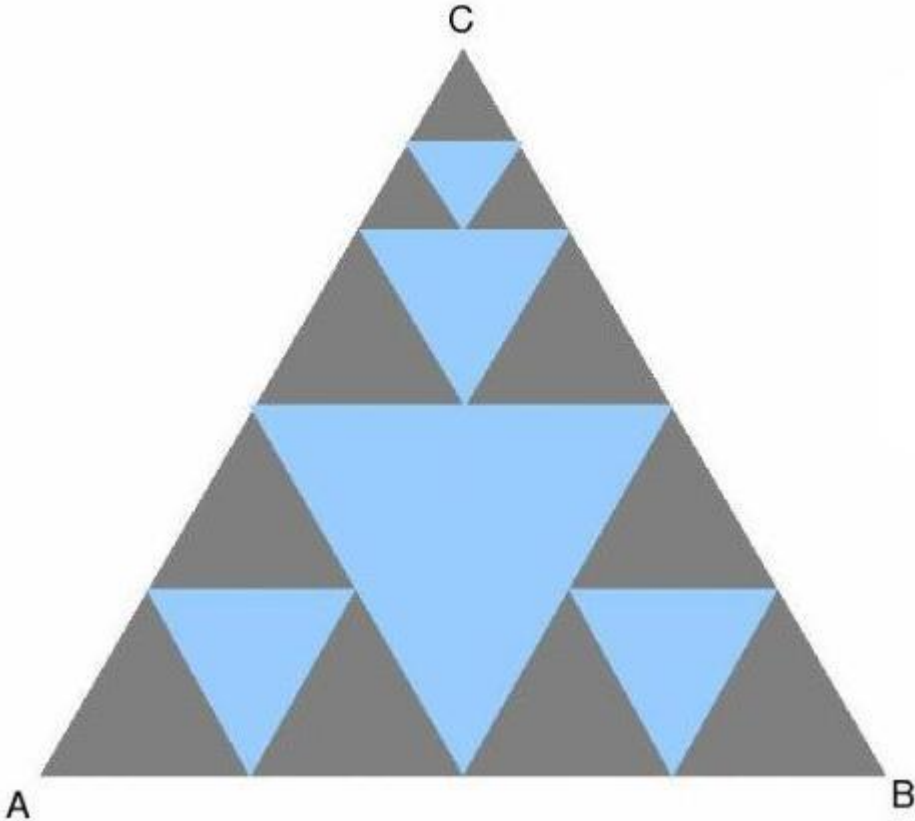
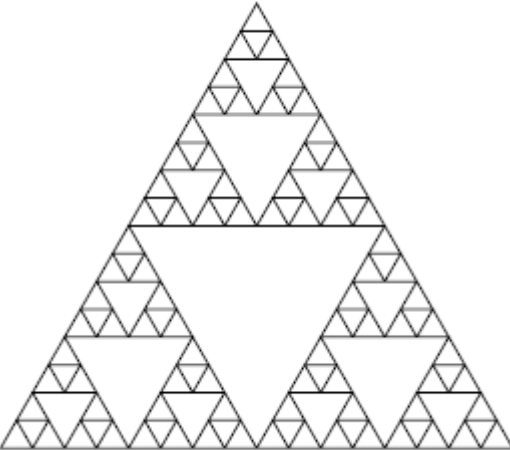




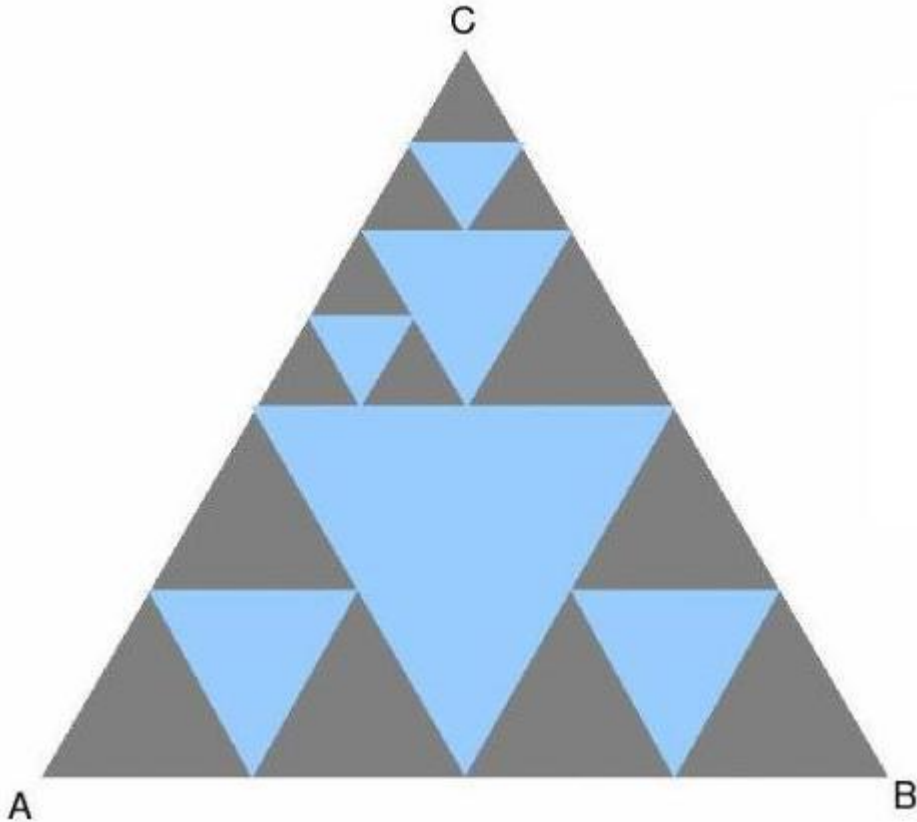
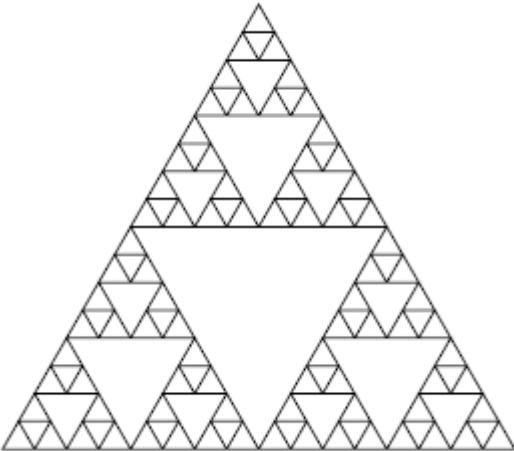
Konstrukcja trójkąta Sierpińskiego



Konstrukcja trójkąta Sierpińskiego

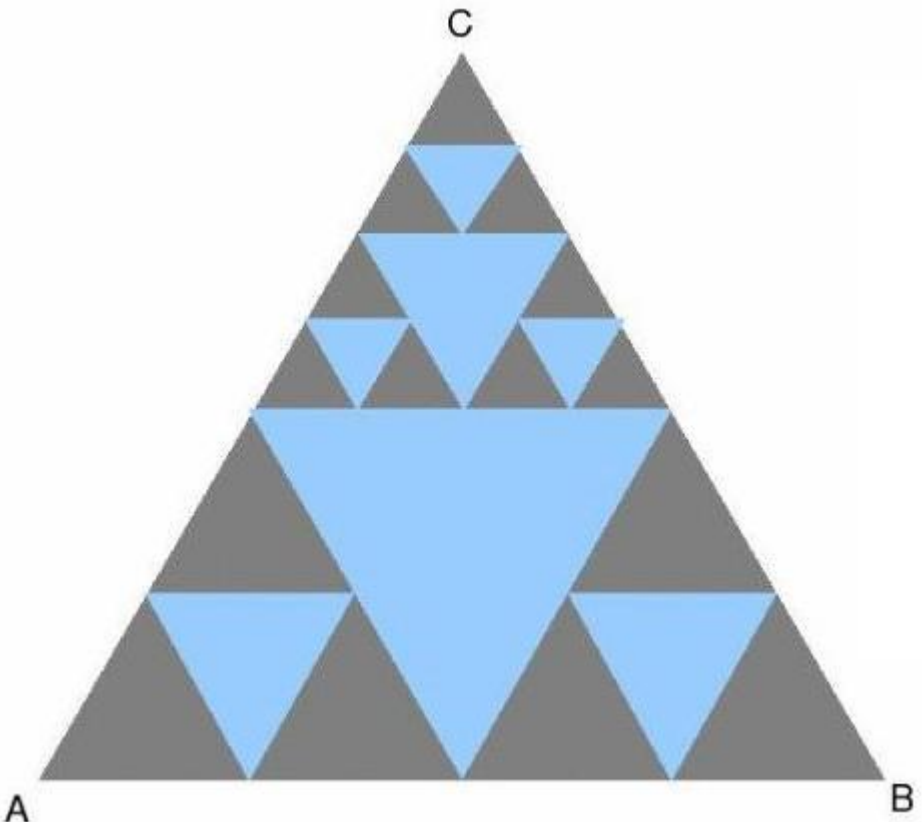
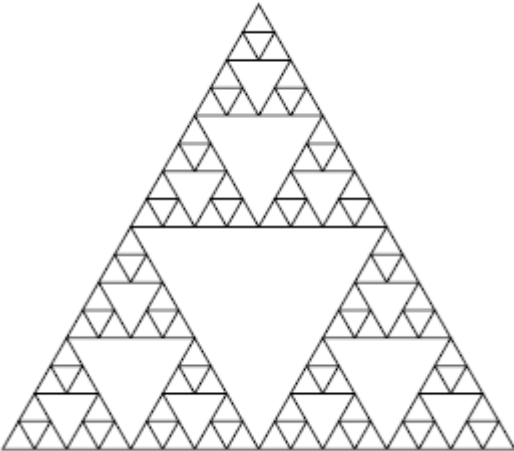


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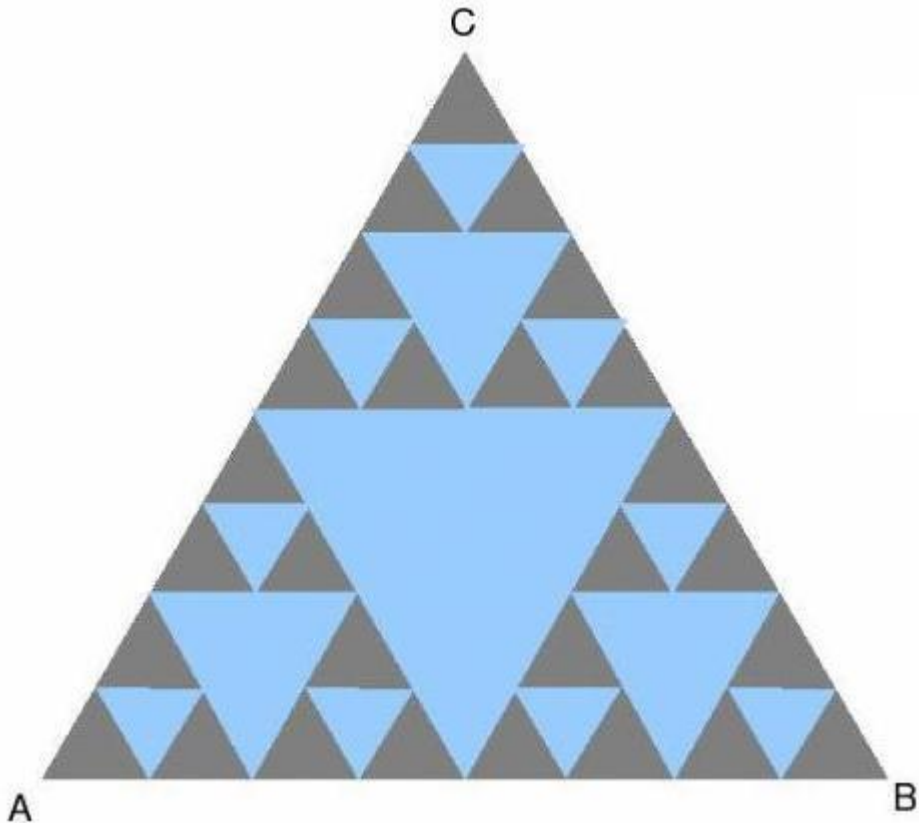
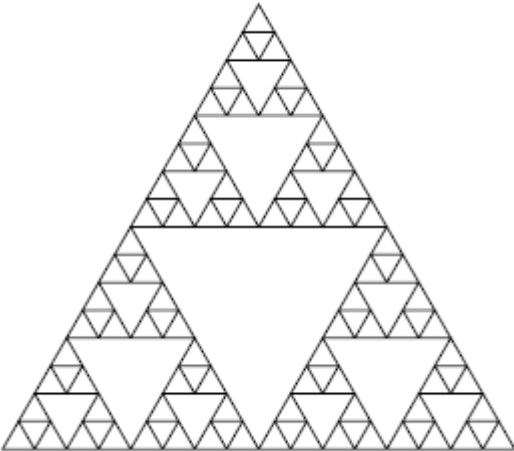




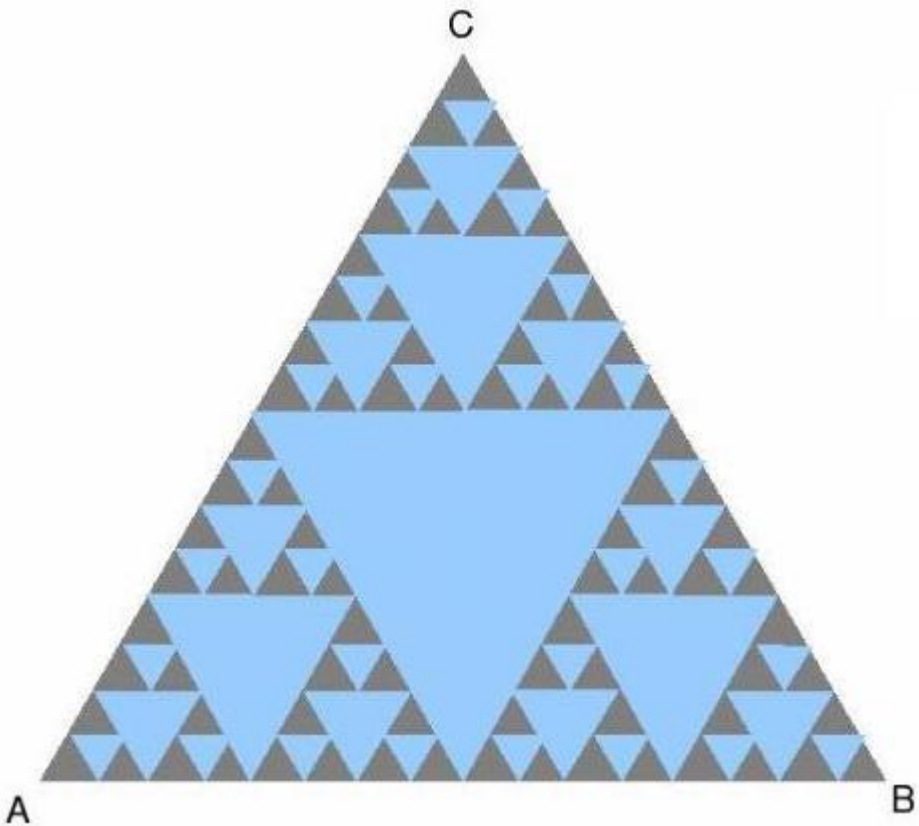
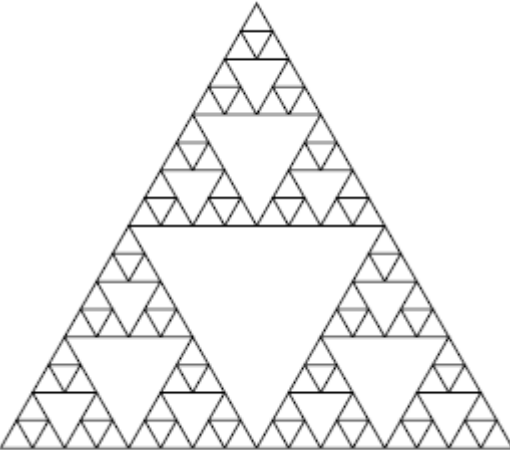
Konstrukcja trójkąta Sierpińskiego



Konstrukcja trójkąta Sierpińskiego

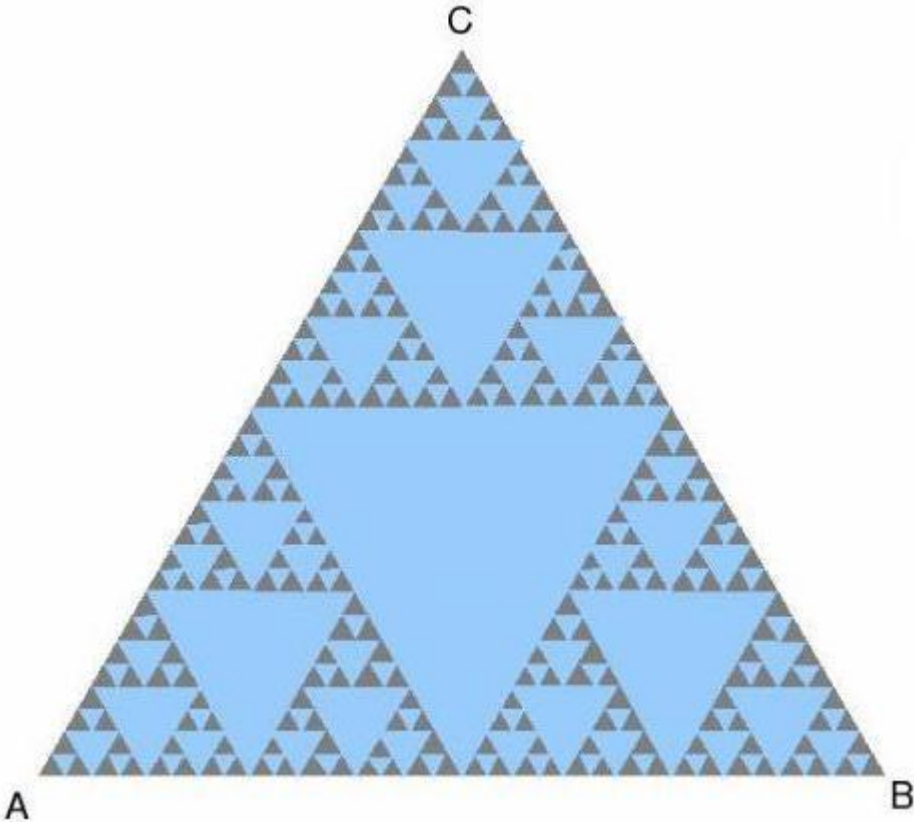
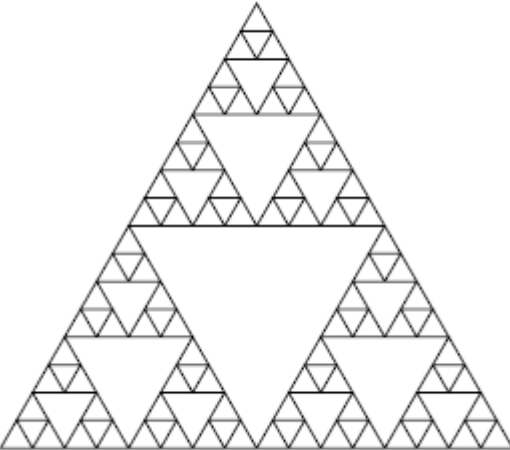


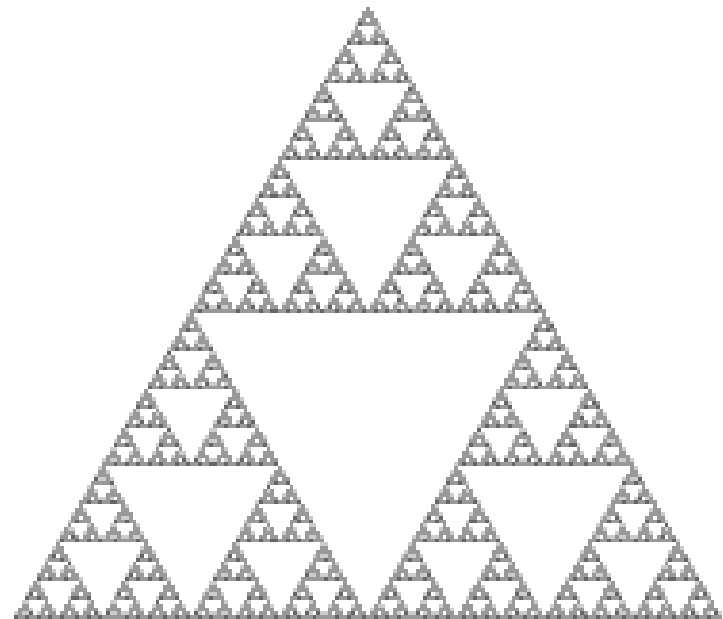
Konstrukcja trójkąta Sierpińskiego

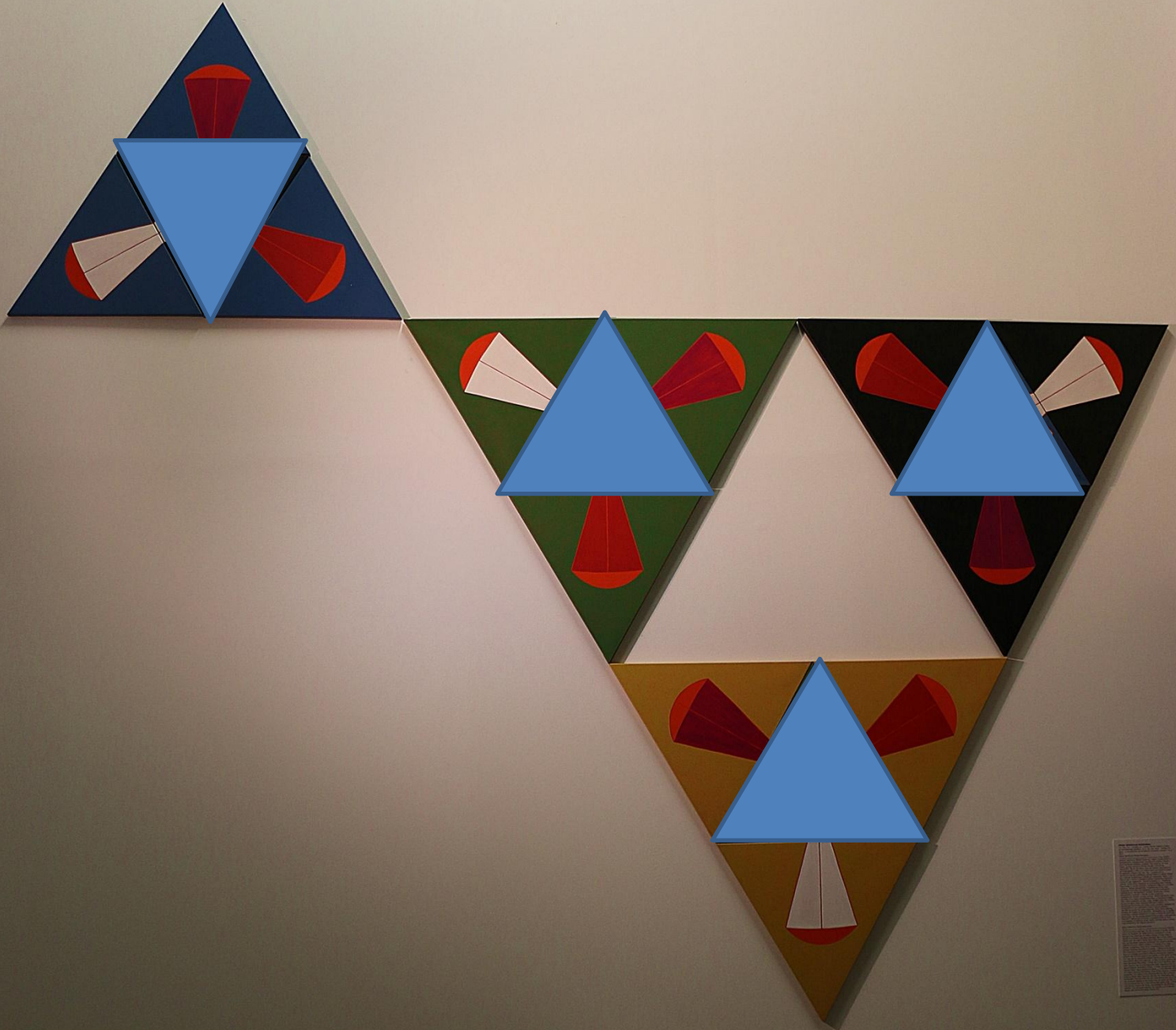




Konstrukcja trójkąta Sierpińskiego







Small text block, likely a caption or artist information, located in the bottom right corner of the artwork.

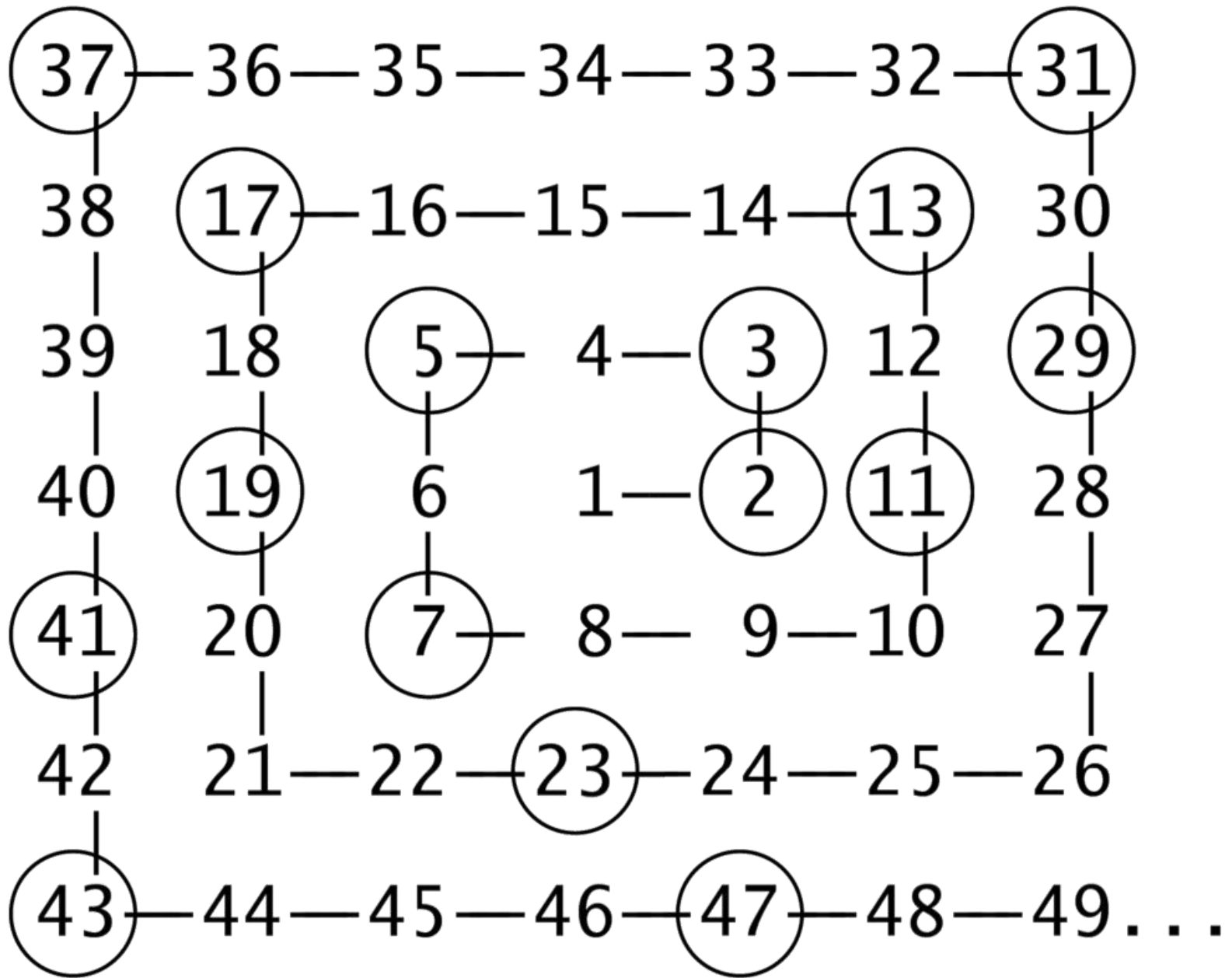


# Miški - Zdziśki

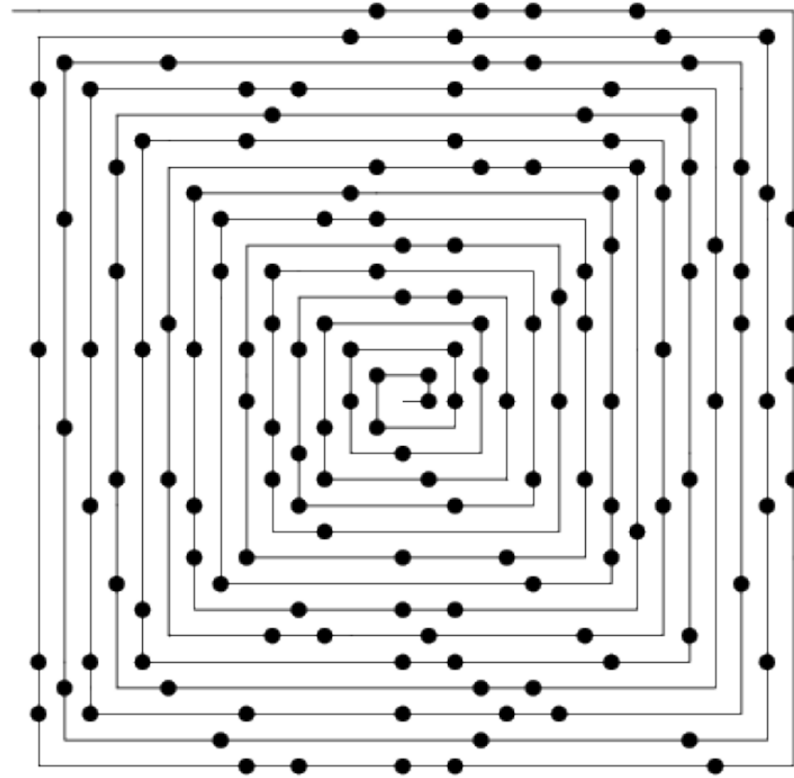


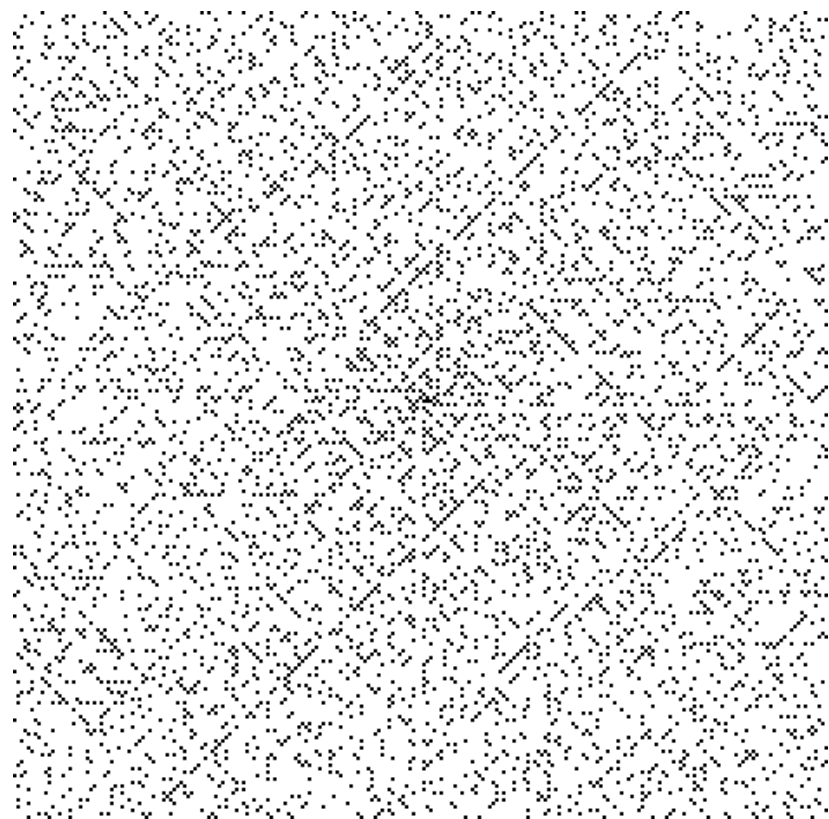
# Spirala Ulama

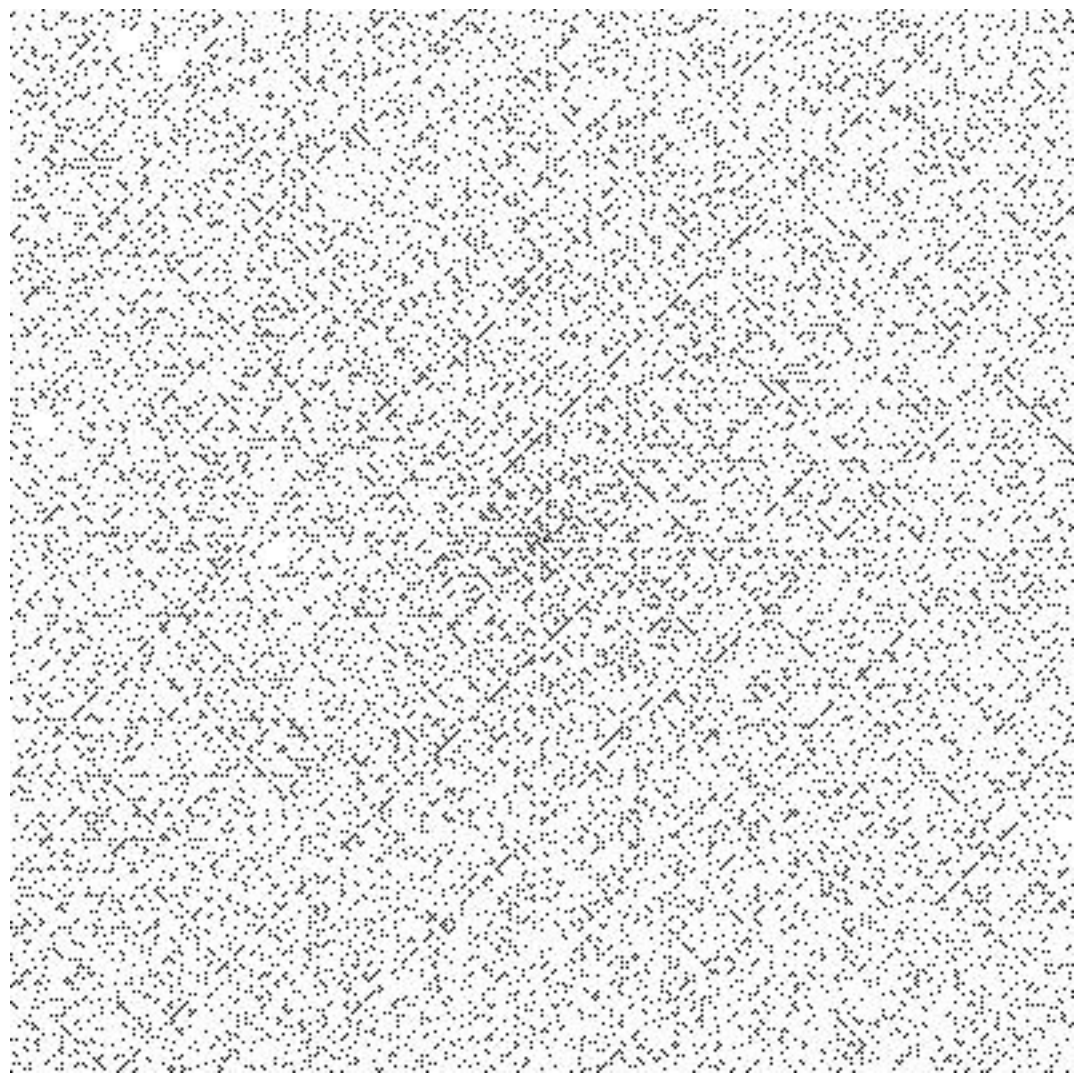
37—36—35—34—33—32—31  
|  
38 17—16—15—14—13 30  
| |  
39 18 5—4—3 12 29  
| | |  
40 19 6 1—2 11 28  
| | |  
41 20 7—8—9—10 27  
| |  
42 21—22—23—24—25—26  
|  
43—44—45—46—47—48—49...



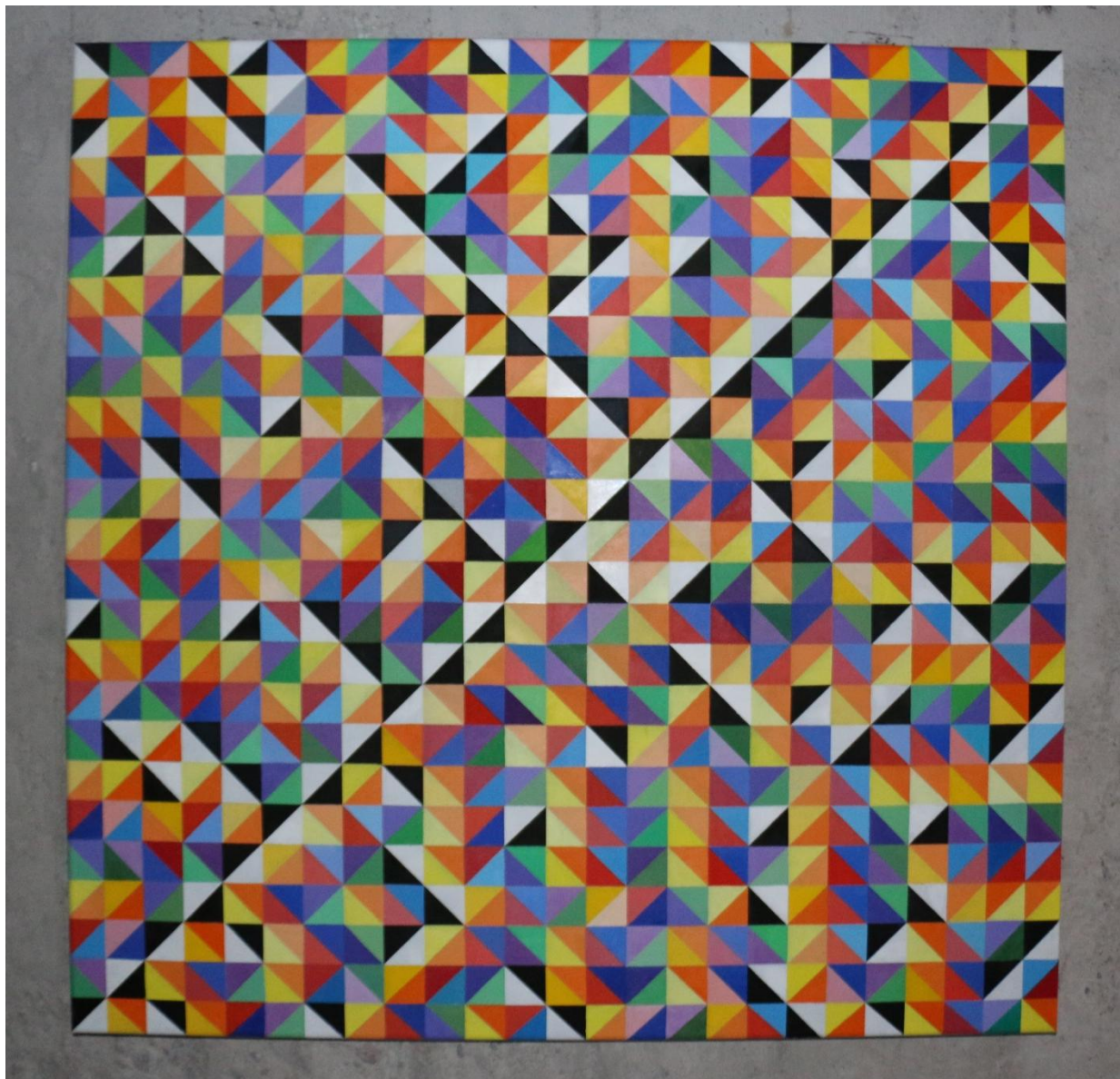




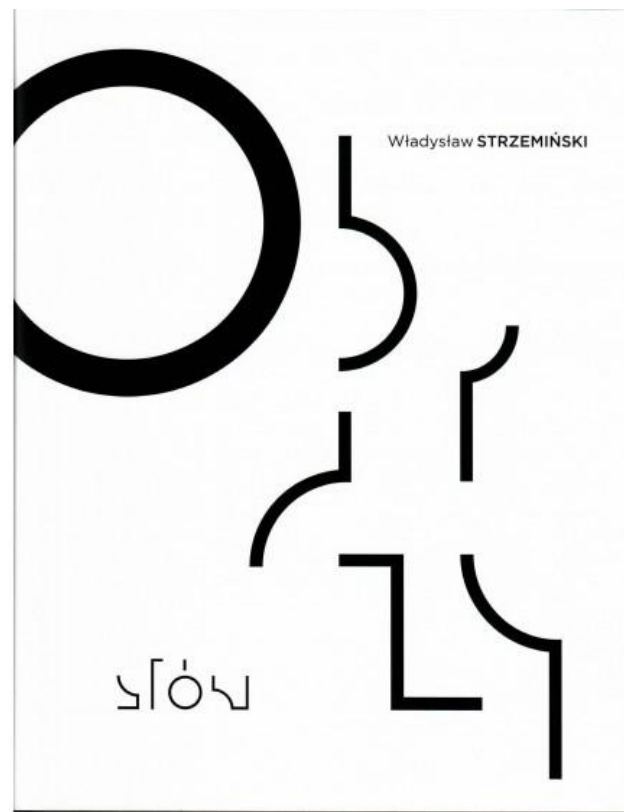
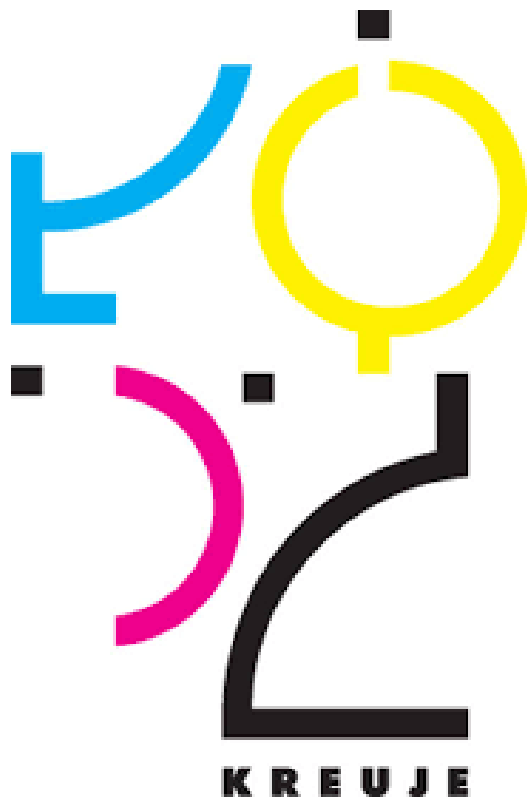






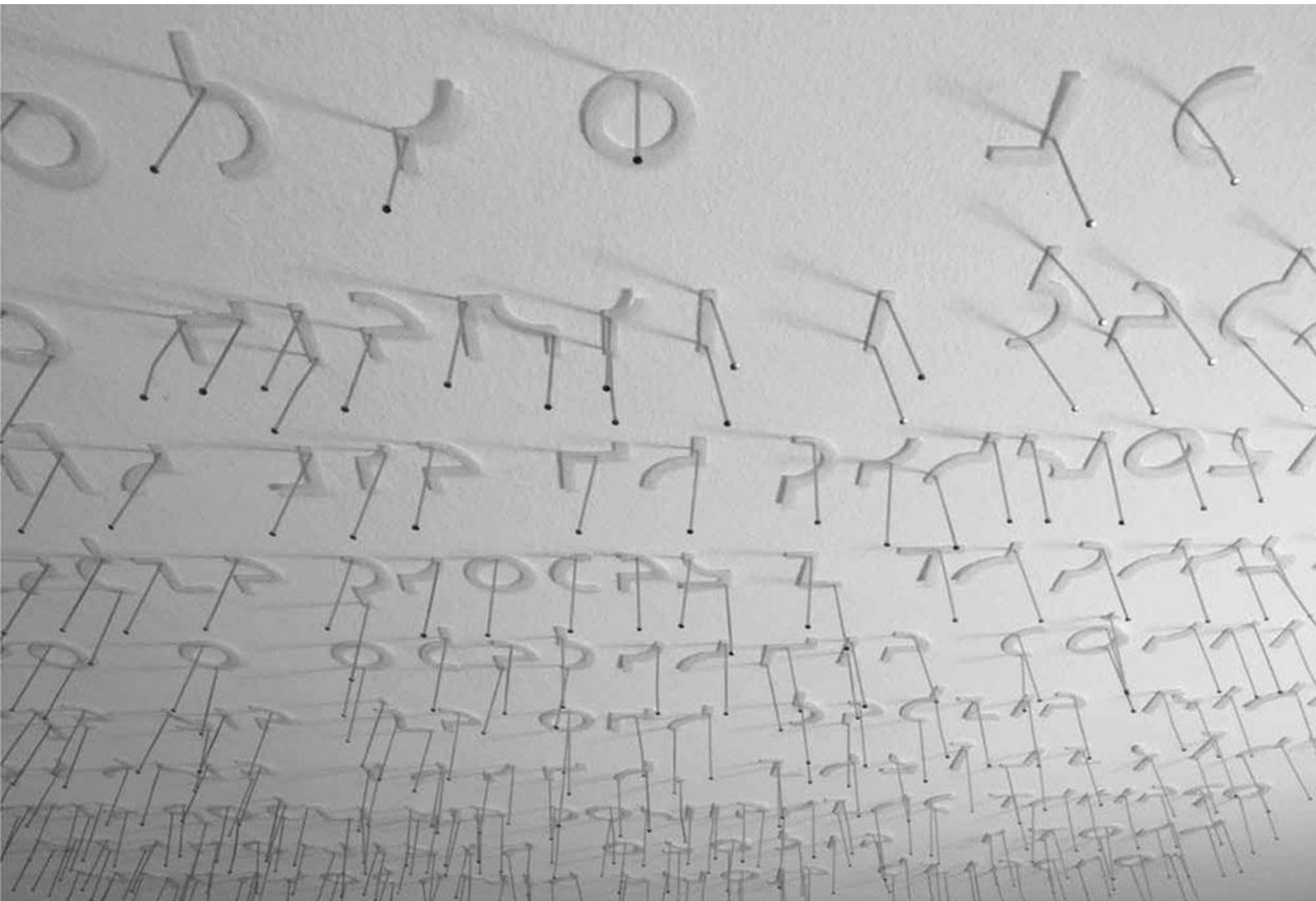


Krzysztof Wróblewski  
**Spirala Ulama**



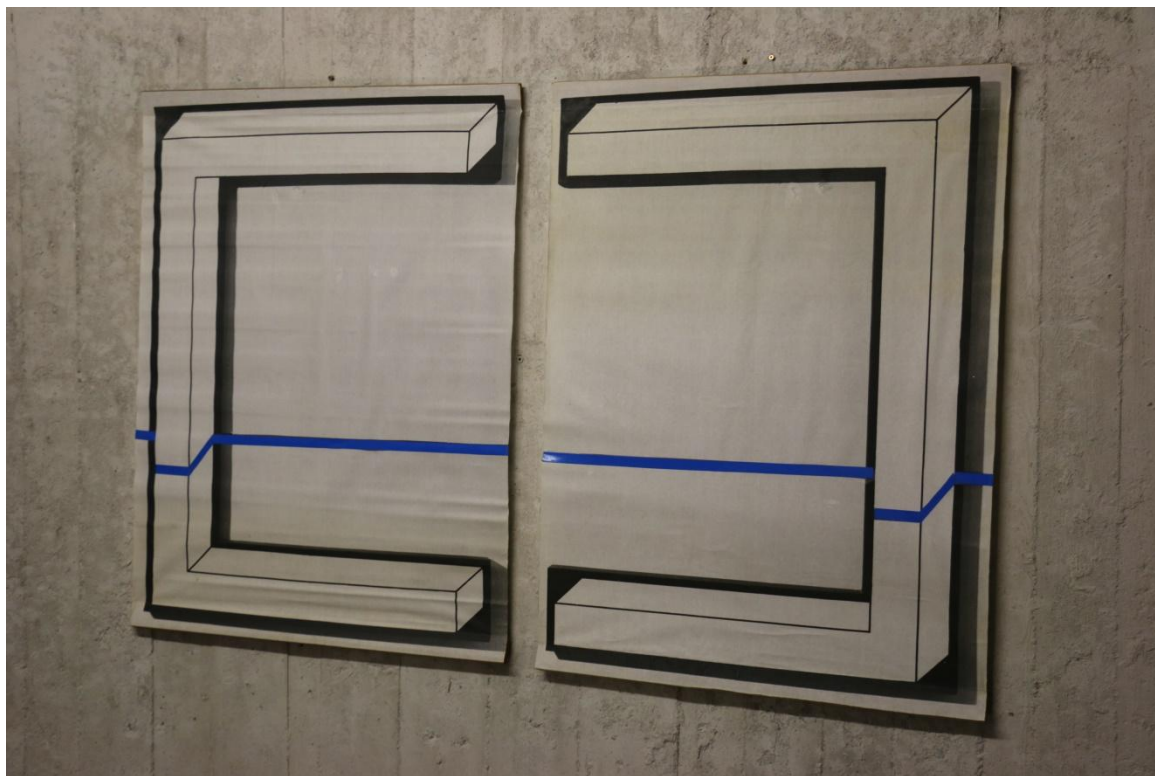
Typografia

STYLAMIŃSKI TO  
PIA CHIŃSKI



AURELIA MANDZIUK-ZAJĄCZKOWSKA, O Katarzynie z cyklu Kody dialogu, 2011-2018

# Motyw nieograniczonej linii

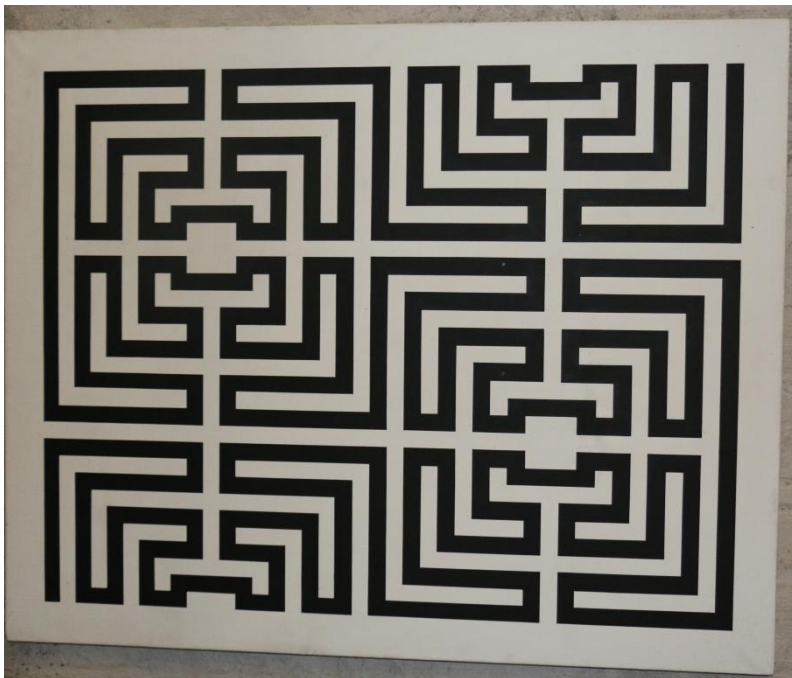


Edward Krasiński  
Blue scotch

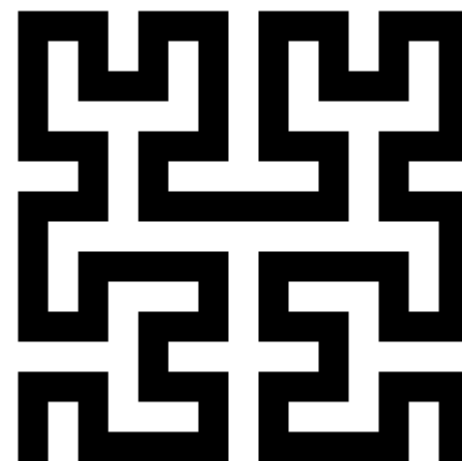
gdzie jest moja niebieska  
linia i z kim mnie łączy?  
może ta linia jest czarna  
a może biała  
i dokąd ta linia prowadzi

Tadeusz Różewicz, *niebieska linia* (fragm.)

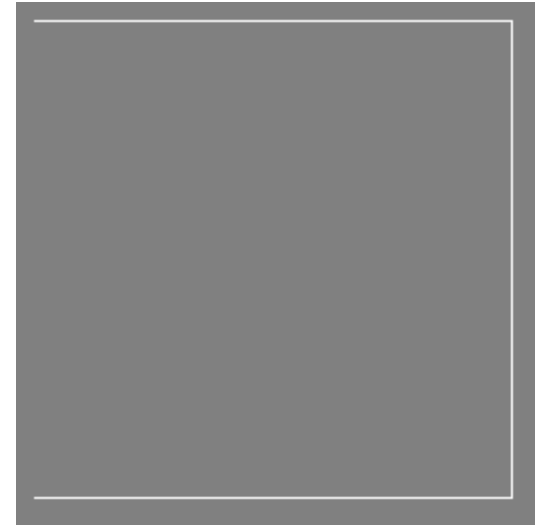
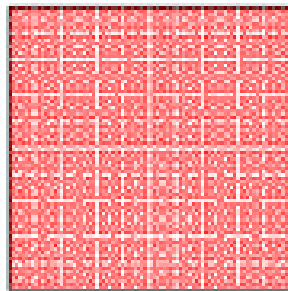
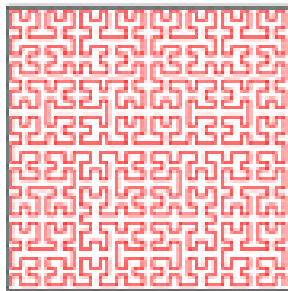
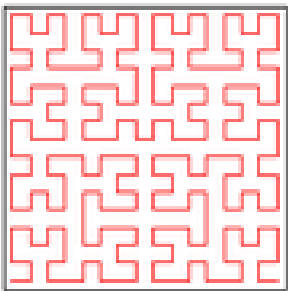
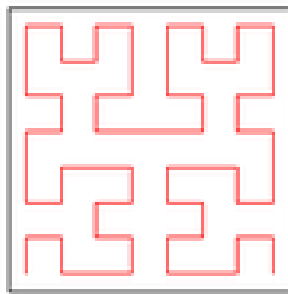
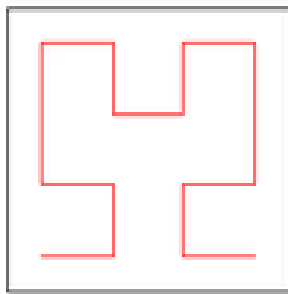
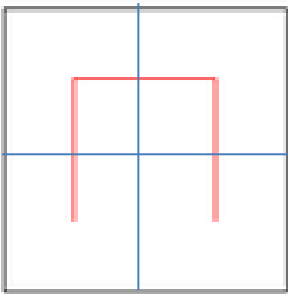


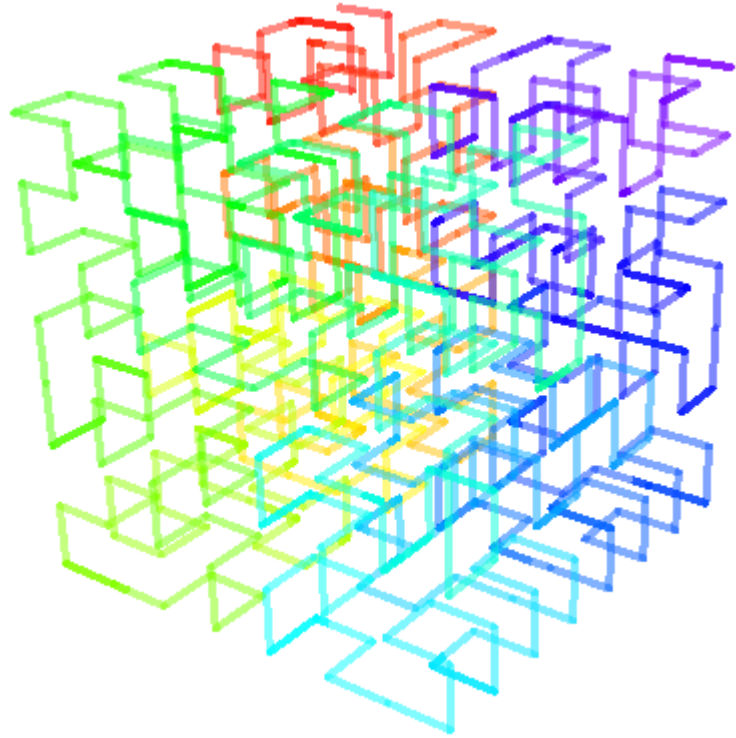
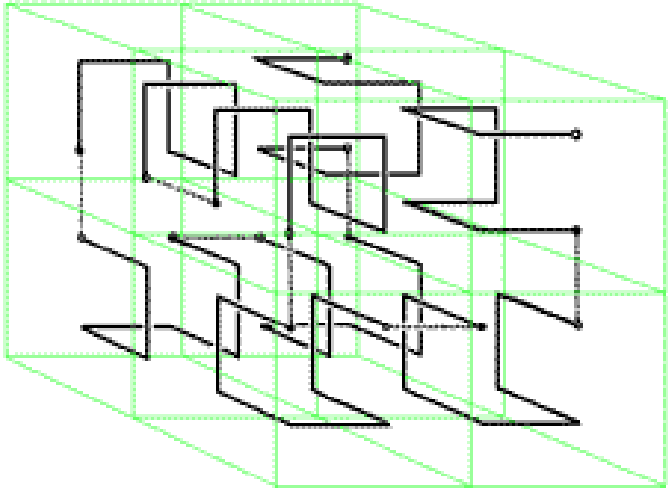


Wacław Szpakowski  
Linie rytmiczne



# Paradoks linii

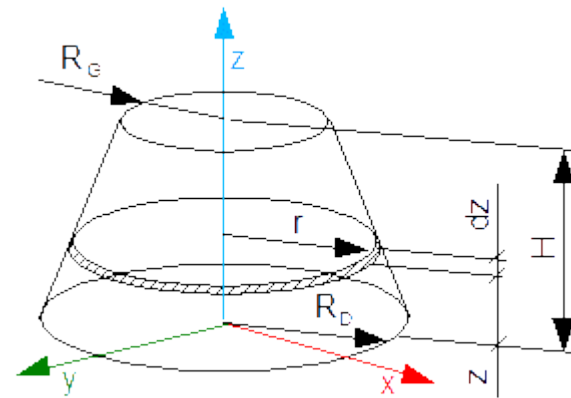
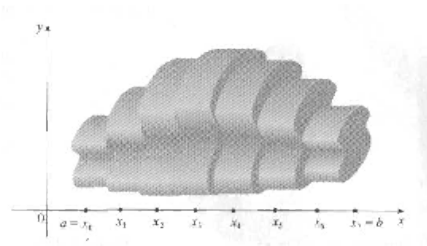
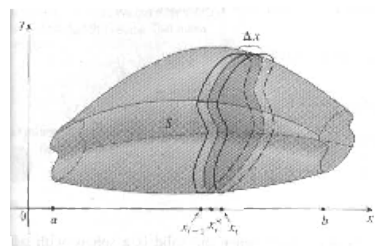
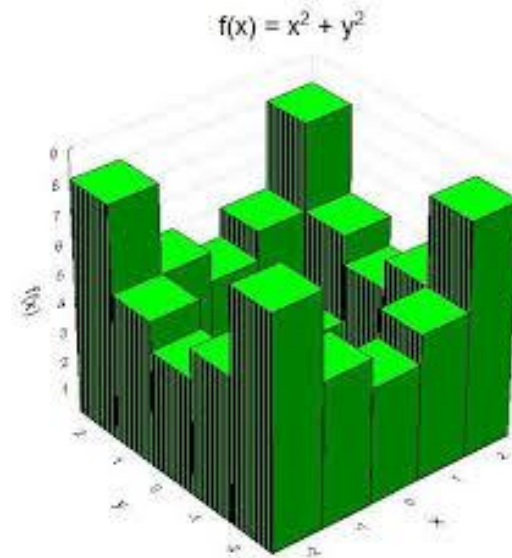
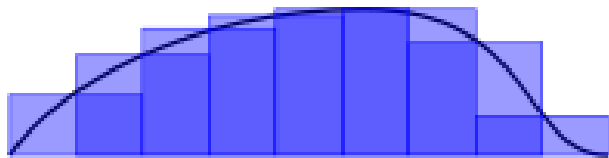




***Jerzy Olek*** Trójwymiar linii









Sylwia Jakubowska, Dom – Schron, 2014-2018