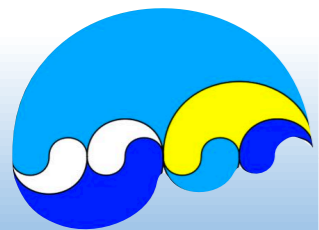


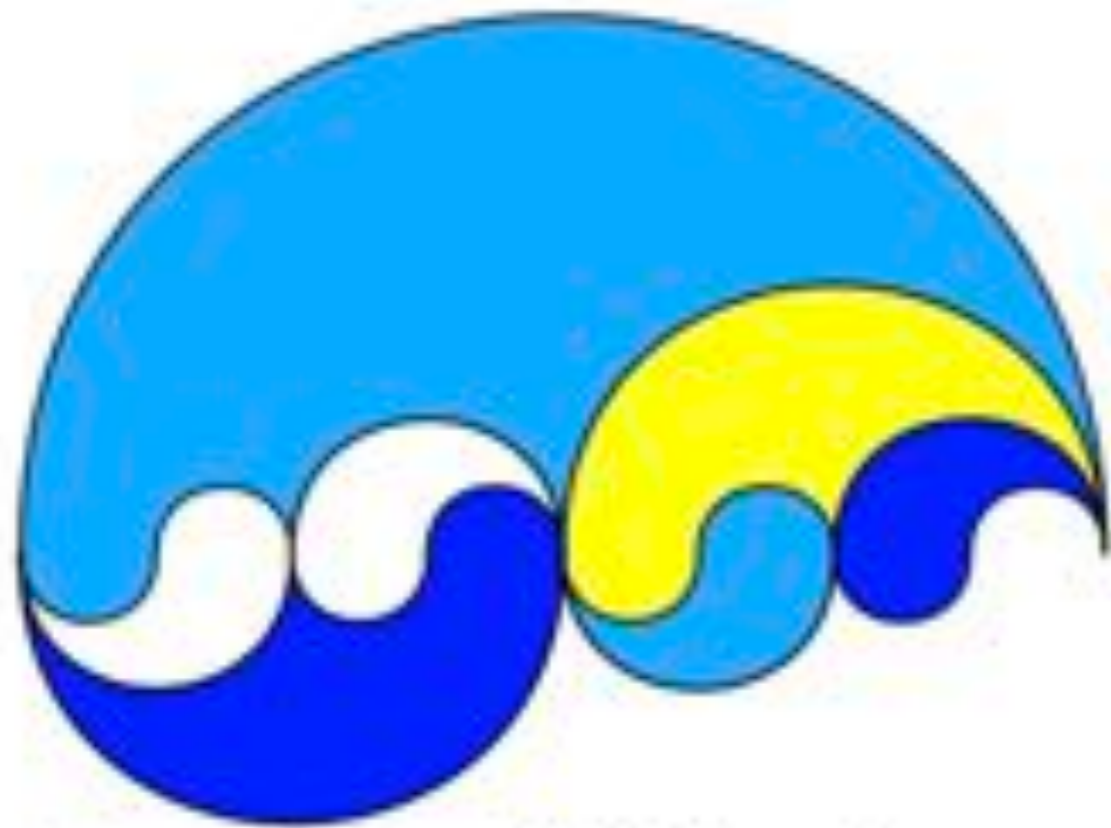
Abacaba!

Utrolige mønstre, utrolige sammenhenger



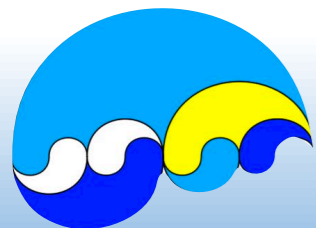
mikeNaylor





Matematikkbølgen

Gerd Åsta Bones
og
Mike Naylor



Matematikkbølgen



matematikkbolgen.com

Like oss på Facebook!



1. Our learning products...

Factor Hunt

Preschool discovery packs – space, farm, castle

The Factor Game

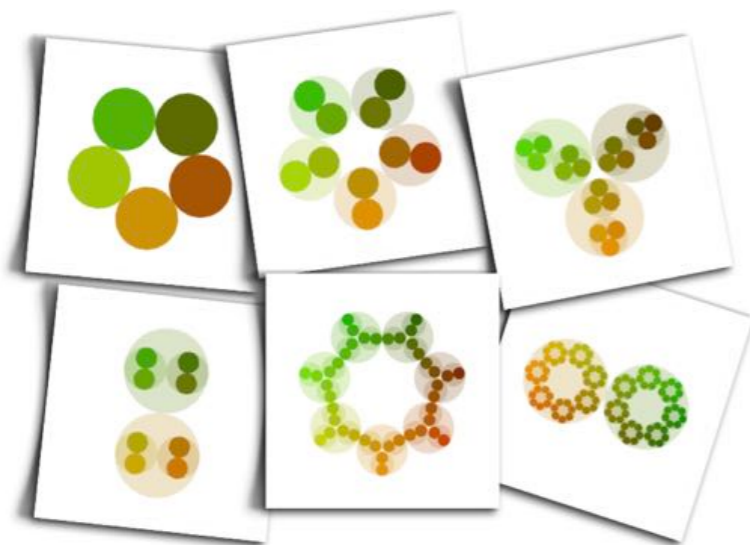
Fraction Battle

Shape It!

Math art puzzle posters

Pythagoras knowledge bricks

Tactile hundred board



2. Our furniture for math rooms

Number bureau

Tangram cupboard

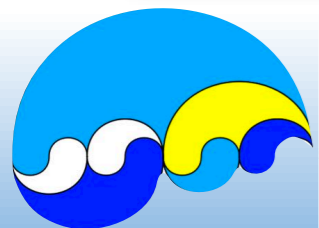
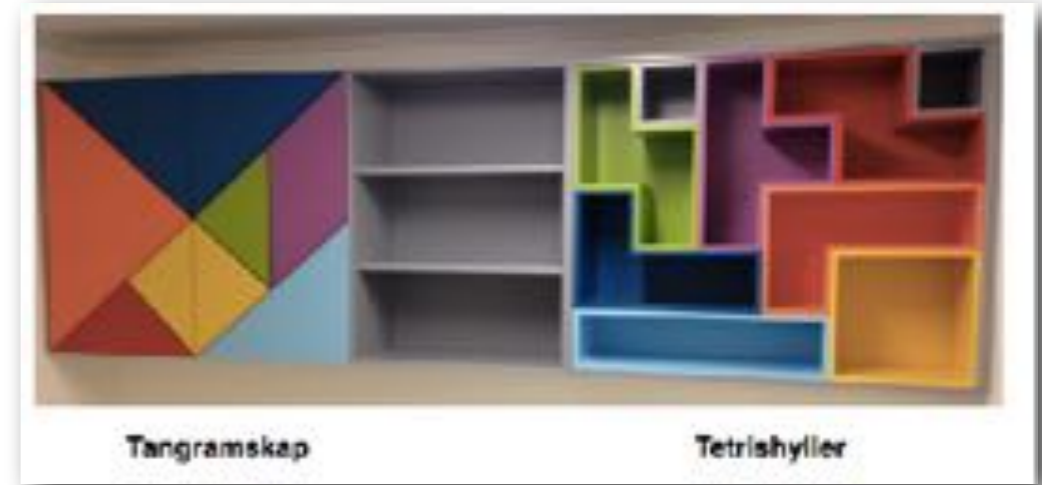
Tetris shelving

Fractal sorting tree

“Goat mountain”

Adventure boat / jigsaw puzzle table

Sensory boards



Matematikkbølgen

3. Our playground equipment

Octaclimb climbing network structure

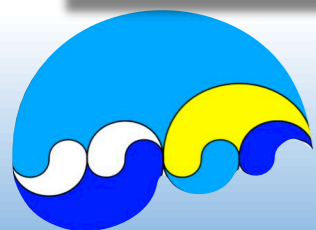
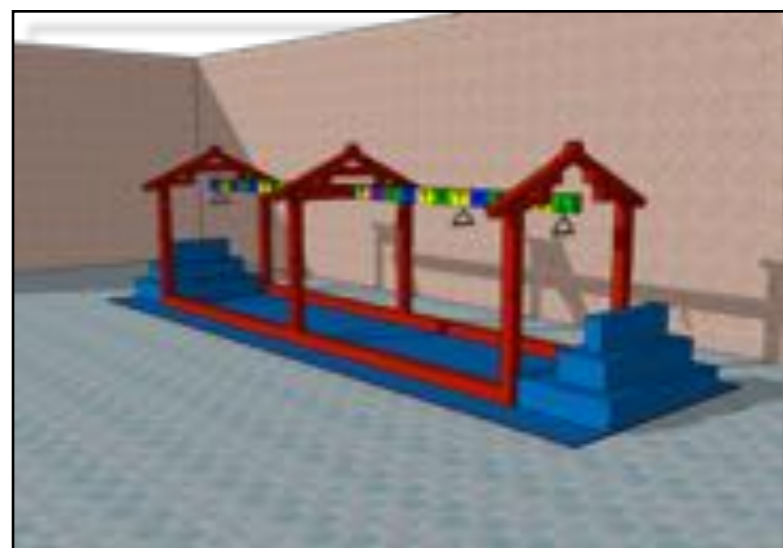
Mathematical slides

Fraction see-saw

Hanging weight structure

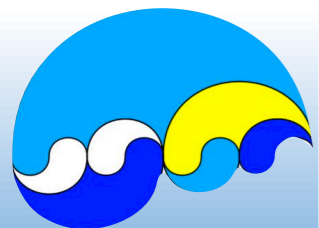
Harmonic motion sand swing

Hundred board





Vi utvikler vår egen matematikk
kreativitet- og kompetansesenter
på Amborneset i Vanvikan, Norge.

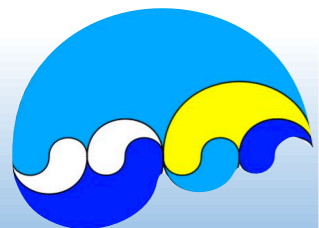


Matematikkbølgen

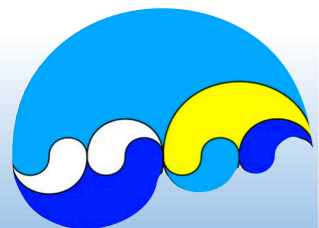
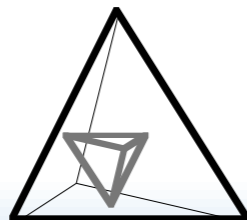
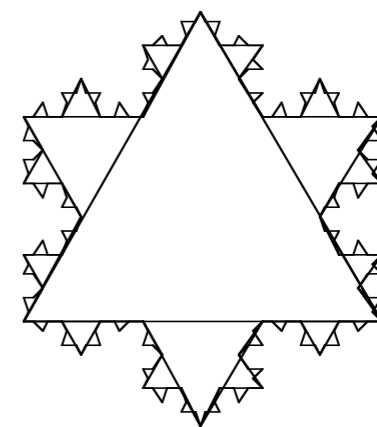
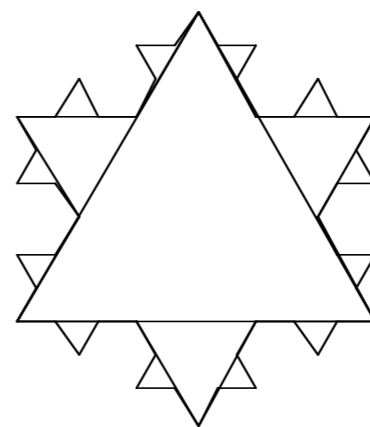
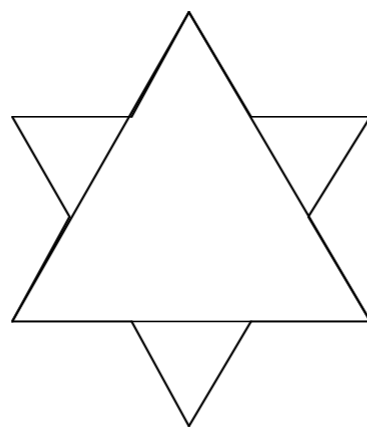
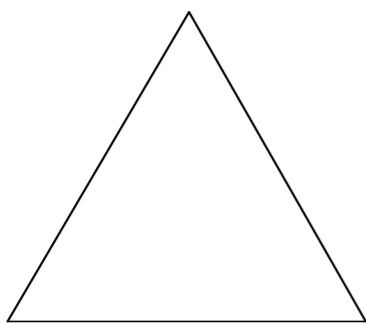
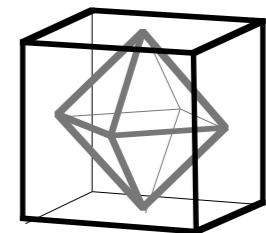
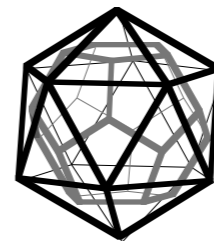
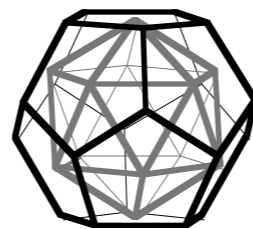
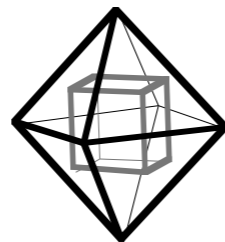
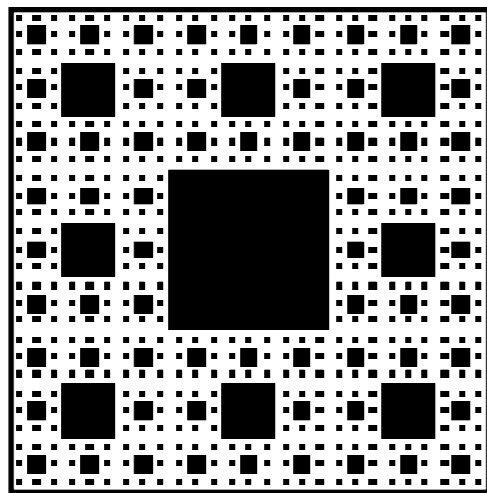


Matematikk er vitenskapen om mønster

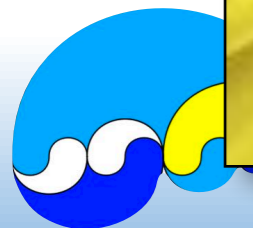
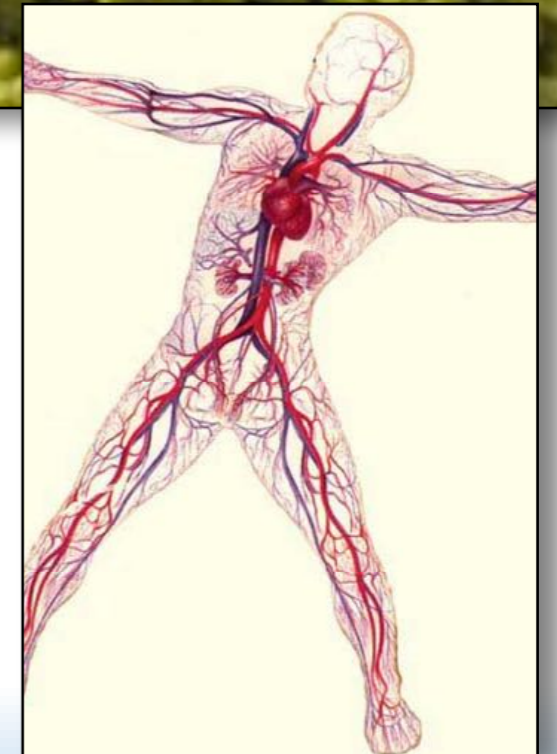
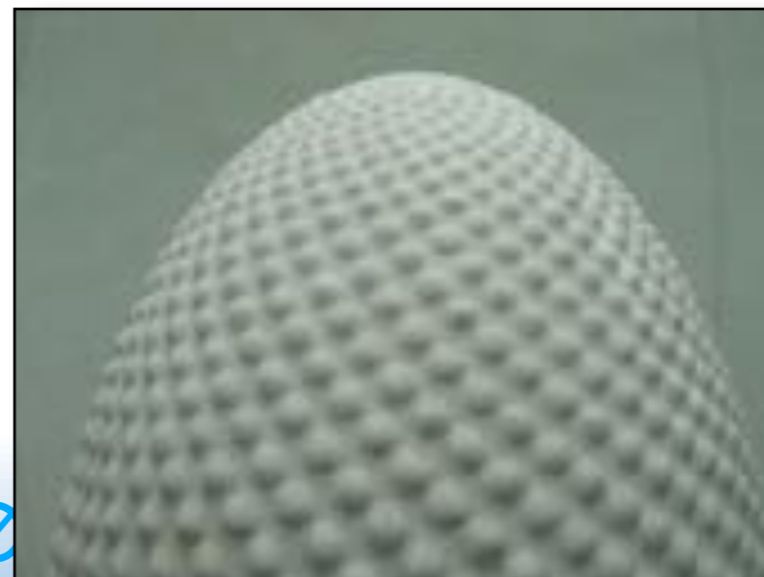
1	$1/2$	0001
4	$3/4$	0010
9	$7/8$	0011
16	$15/16$	0100
25	$31/32$	0101
36	$63/64$	0110
49	$127/128$	0111
64	1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...	1000



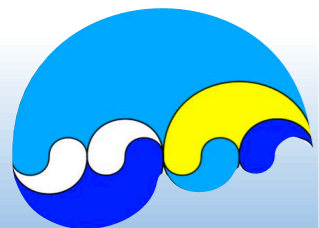
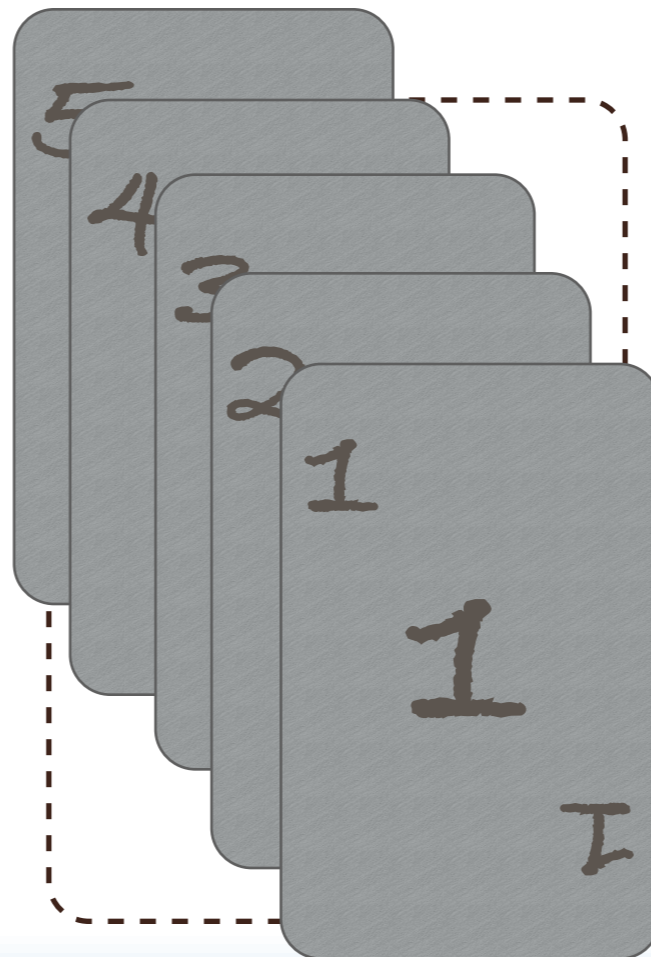
Matematikk er vitenskapen om mønster



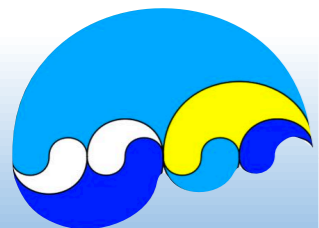
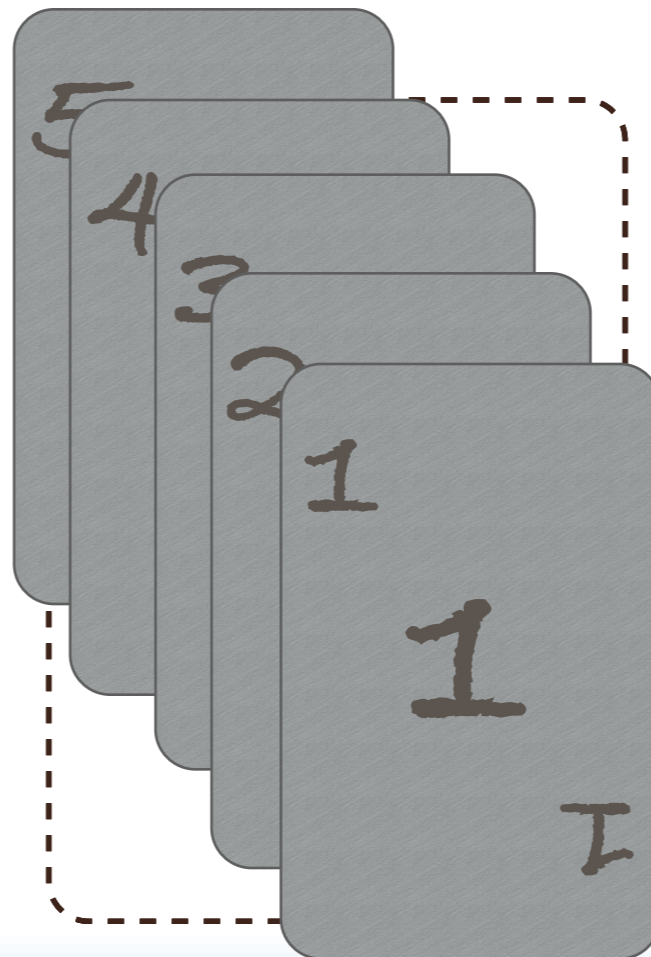
Matematikk er vitenskapen om mønster

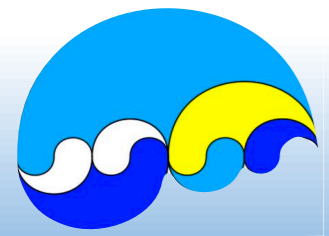
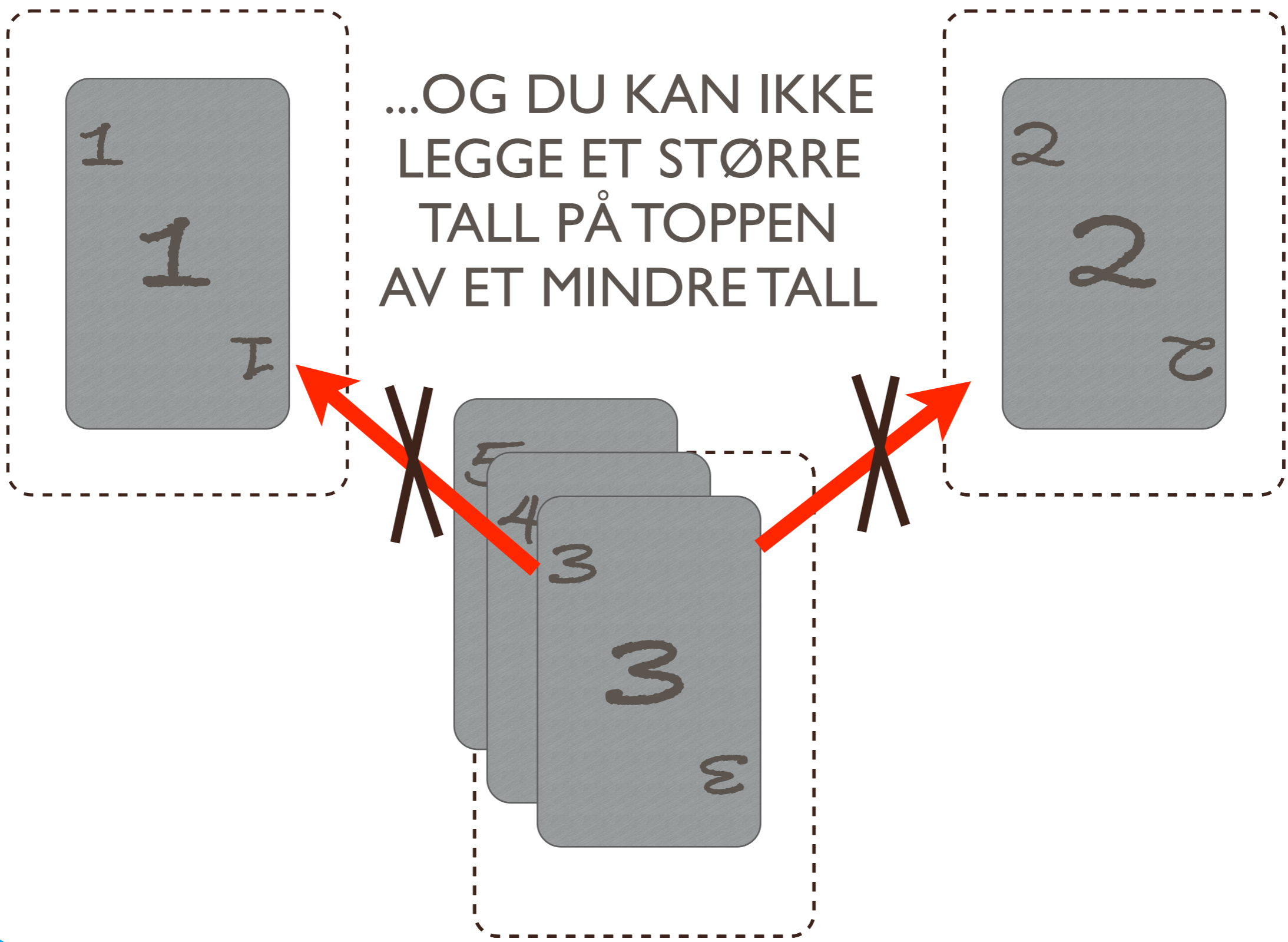


MÅL: FLYTT HAUGEN
FRA STARTPOSISJON
TIL EN AV DE ANDRE
PLASSENE



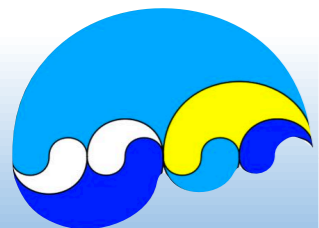
MEN – DU KAN BARE
FLYTTE ET KORT
OM GANGEN





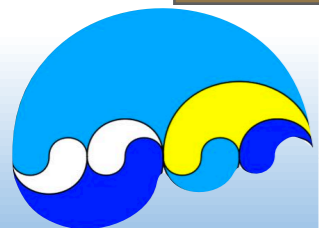
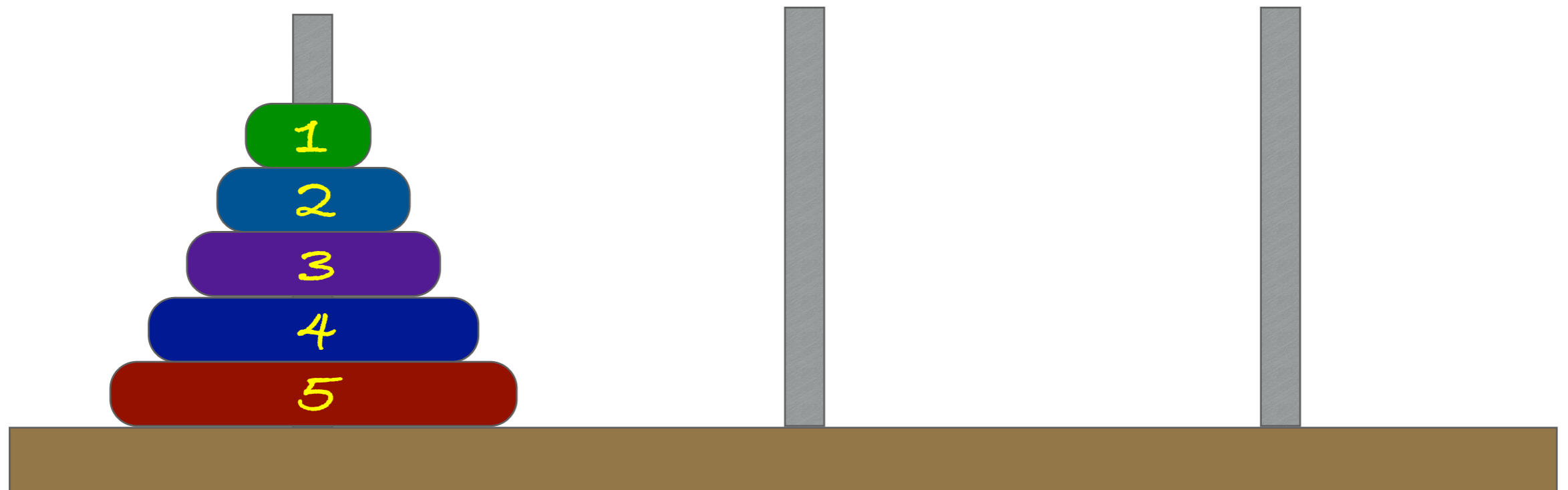
SPØRSMÅL:

1. HVOR MANGE TREKK TAR DET Å FLYTTE ALLE 5 KORTENE?
2. FINN EN MÅTE Å SKRIVE ALLE TREKKENE.
3. BESKRIV MØNSTRE DU FINNER.
4. HVOR MANGE TREKK TAR DET HVIS DU GJØR DET MED 29 KORT?



1 2 1 3 1 2 1 4 1 2 1 3 1 2 1 5 1 2 1 3 1 2 1 4 1 2 1 3 1 2 1

Hanois Tårn

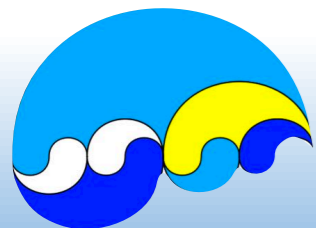


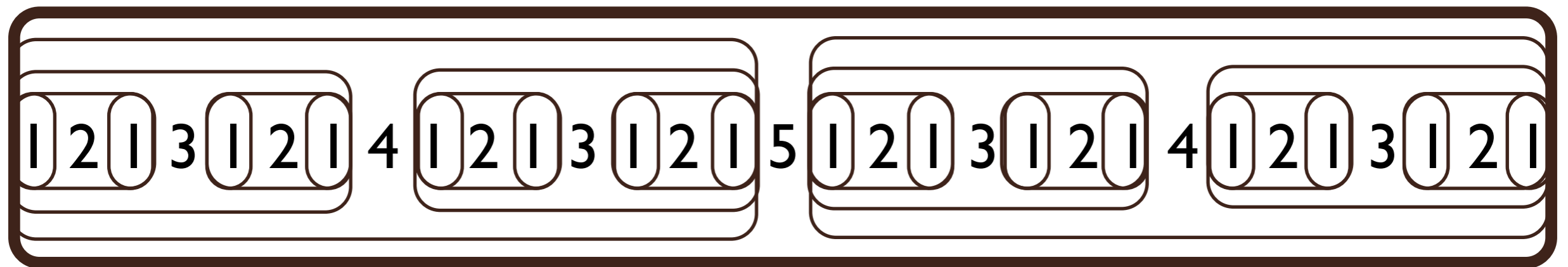
1 2 1 3 1 2 1 4 1 2 1 3 1 2 1 5 1 2 1 3 1 2 1 4 1 2 1 3 1 2 1

31 TREKK

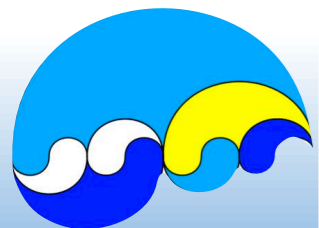
SPØRSMÅL:

1. HVOR MANGE TREKK TAR DET Å FLYTTE ALLE 5 KORTENE?
2. FINN EN MÅTE Å SKRIVE ALLE TREKKENE.
3. BESKRIV MØNSTRE DU FINNER.
4. HVOR MANGE TREKK TAR DET HVIS DU GJØR DET MED 26 KORT?

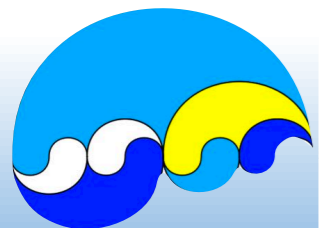




16 enere, 8 toere, 4 treere, 2 firere, 1 femmer



HVOR MANGE TREKK TAR
DET HVIS DU GJØR DET
MED 26 KORT?



Kort	Trekk
1	1
2	3
3	7
4	15
5	31

$\times 2 + 1$

$\times 2 + 1$

$\times 2 + 1$

$\times 2 + 1$

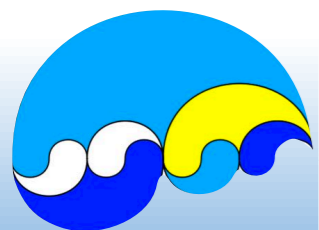
HVORFOR?

1

121

1213121

121312141213121



Cards	Moves
1	1
2	3
3	7
4	15
5	31



+2

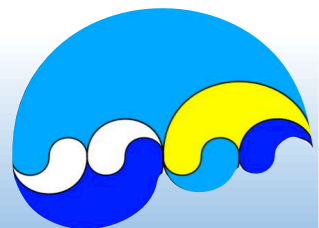
+4

+8

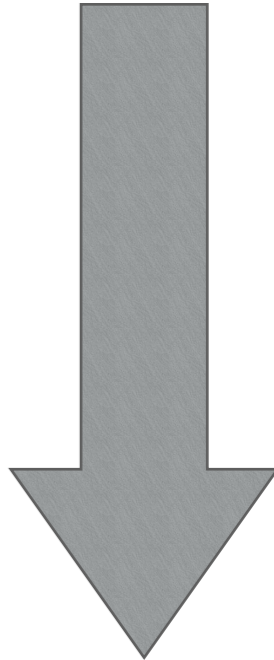
+16

HVORFOR?

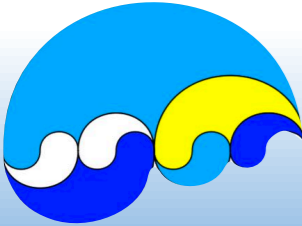
1 ener
1 toer, 2 enere
1 treere, 2 toere, 4 enere
1 firer, 2 treere, 4 toere, 8 enere
1 femmer, 2 firere, 4 treere, 8 toere, 16 enere



Kort	Trekk
1	1
2	3
3	7
4	15
5	31
6	63
7	127
8	255
9	511
10	1023
11	2047
12	4095
13	8191
14	16383
15	32767



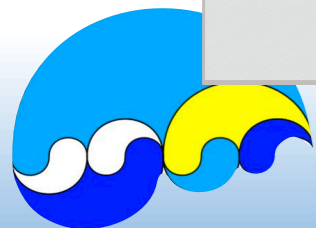
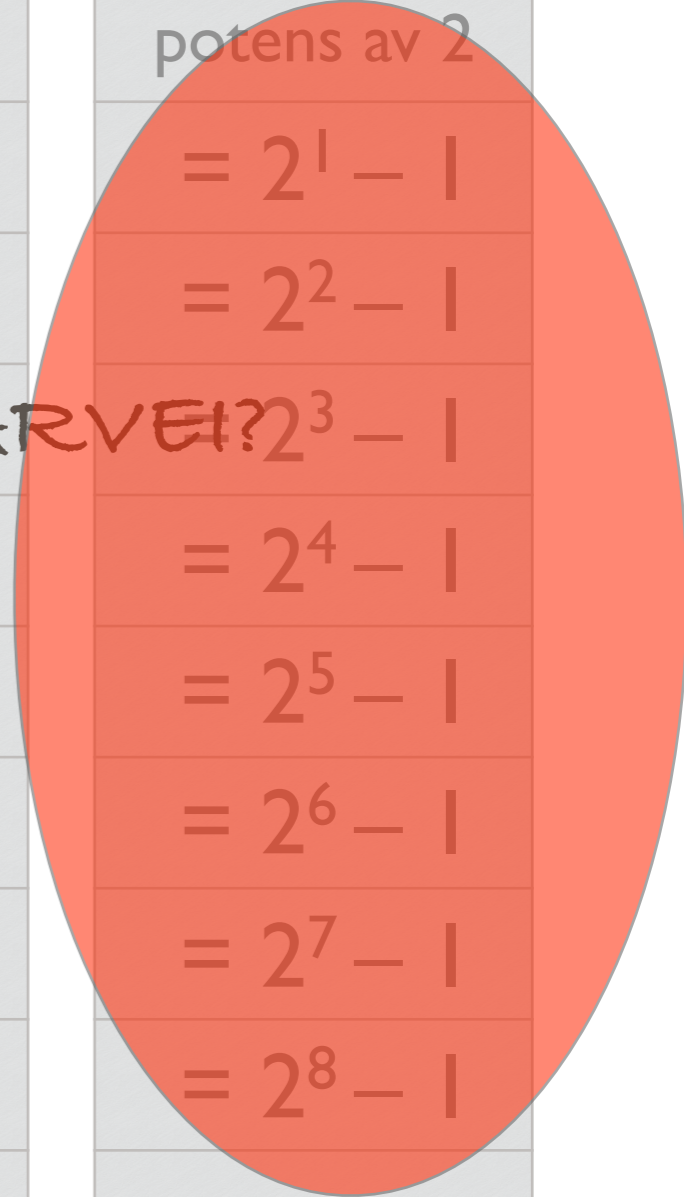
!



Kort	Trekk
1	1
2	3
3	7
4	15
5	31
6	63
7	127
8	255
...	...
n	$2^n - 1$
26	→ 63 108 863

trekk + 1
+1 = 2
+1 = 4
+1 = 8
+1 = 16
+1 = 32
+1 = 64
+1 = 128
+1 = 256
...

potens av 2
$= 2^1 - 1$
$= 2^2 - 1$
$= 2^3 - 1$
$= 2^4 - 1$
$= 2^5 - 1$
$= 2^6 - 1$
$= 2^7 - 1$
$= 2^8 - 1$
...
$= 2^n - 1$
...
$= 2^{26} - 1$



HVOR LANG TID TAR DET MED 26 KORT?

1 TREKK = 1 SEKUND

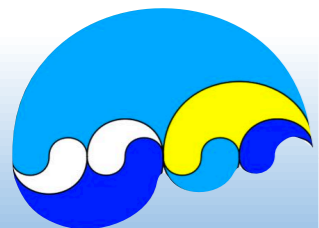
67 108 863 SEKUND : 60 = 1 118 481 MINUTTER

1 118 481 MINUTTER : 60 = 18 641 TIMER

18 641 TIMER : 24 = 777 DAGER

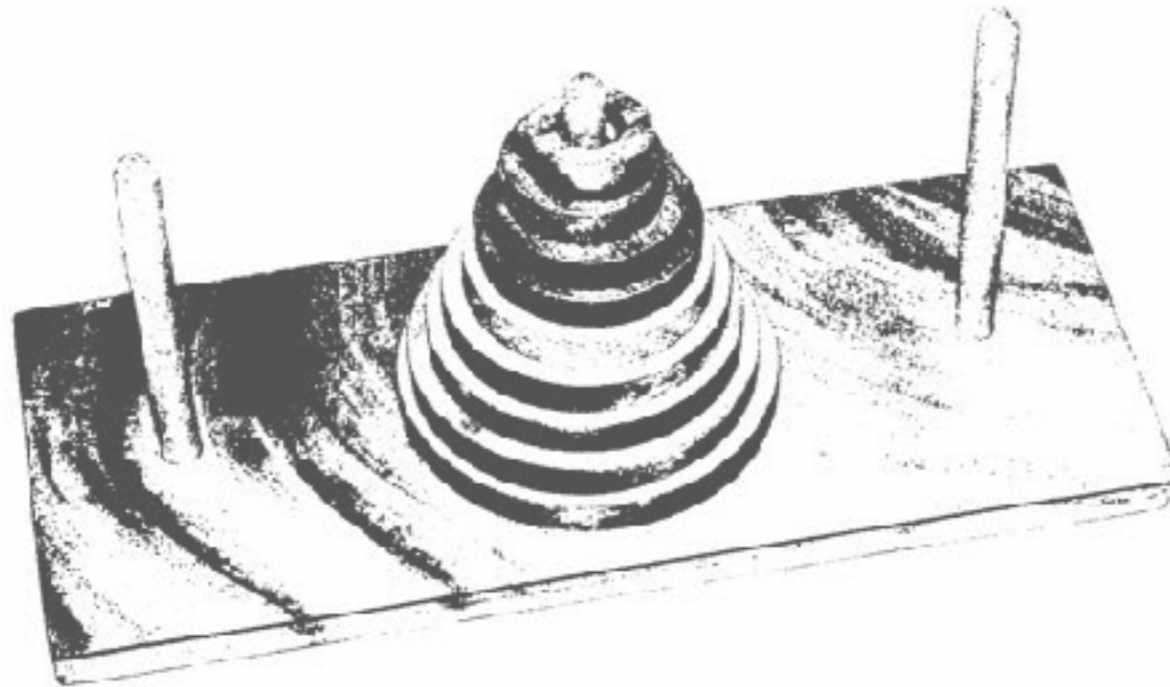
777 DAGER : 365 = 2 ÅR + 1.5 MÅNEDER

(NON-STOP)



Matematikkbølgen

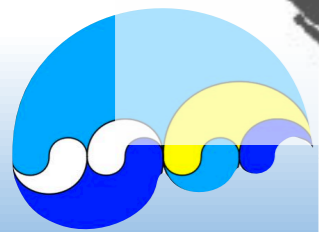
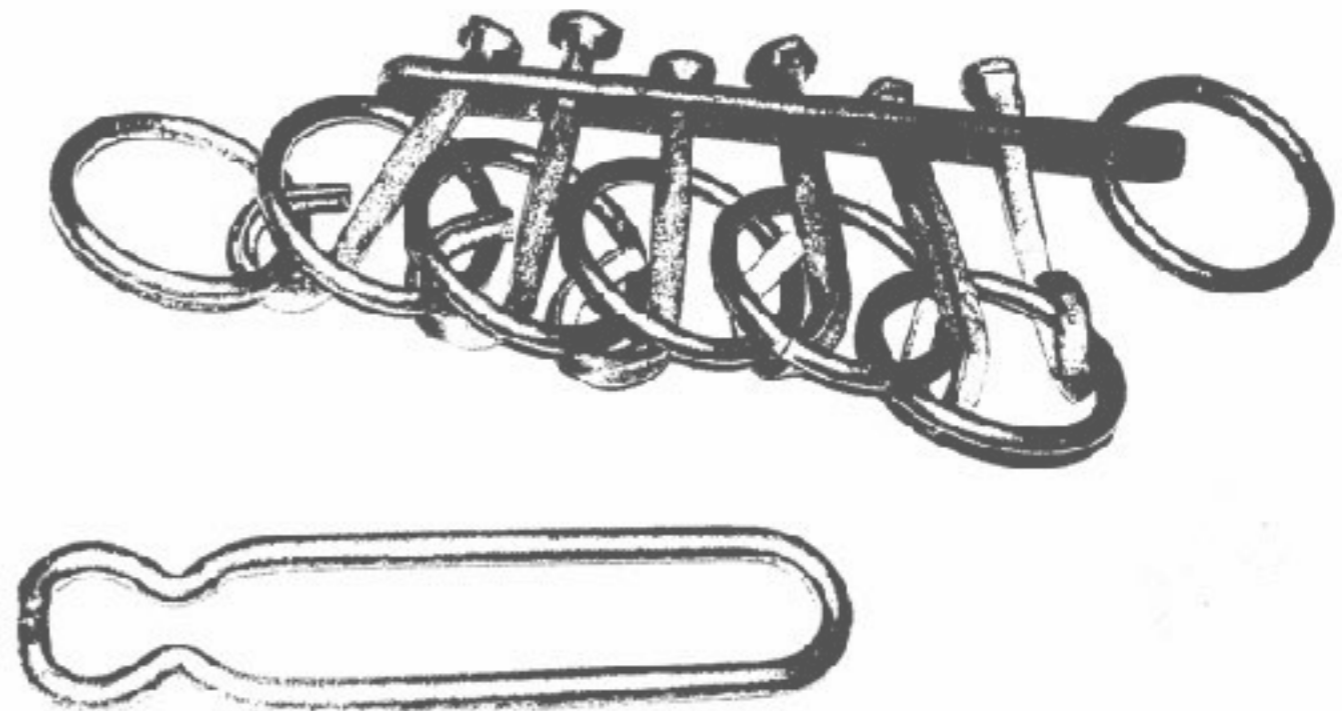
HANOIS TÅRN

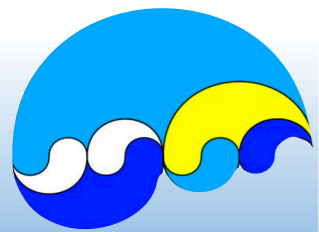
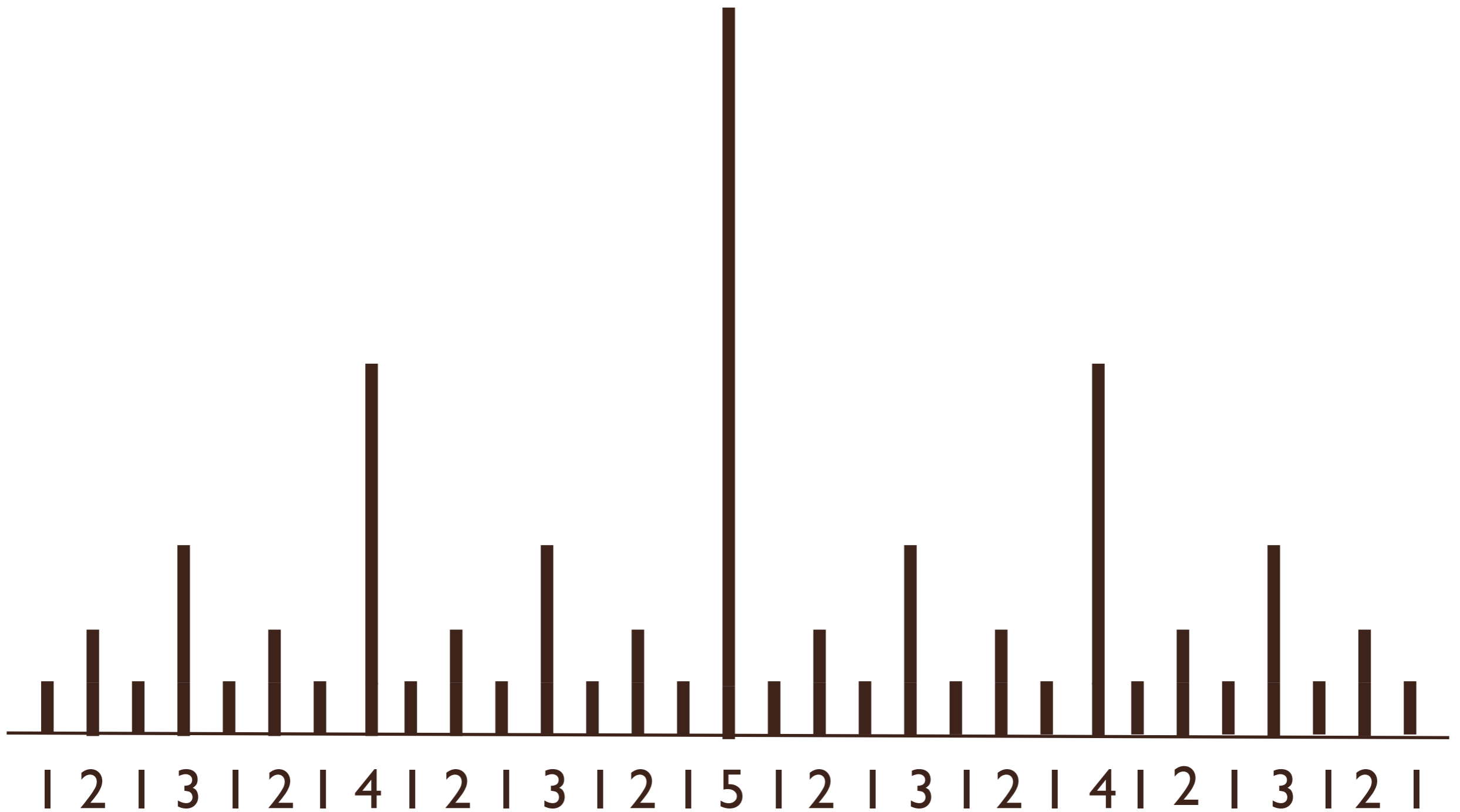


"THE BRAIN"

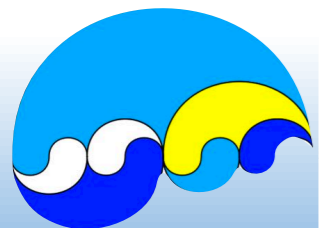
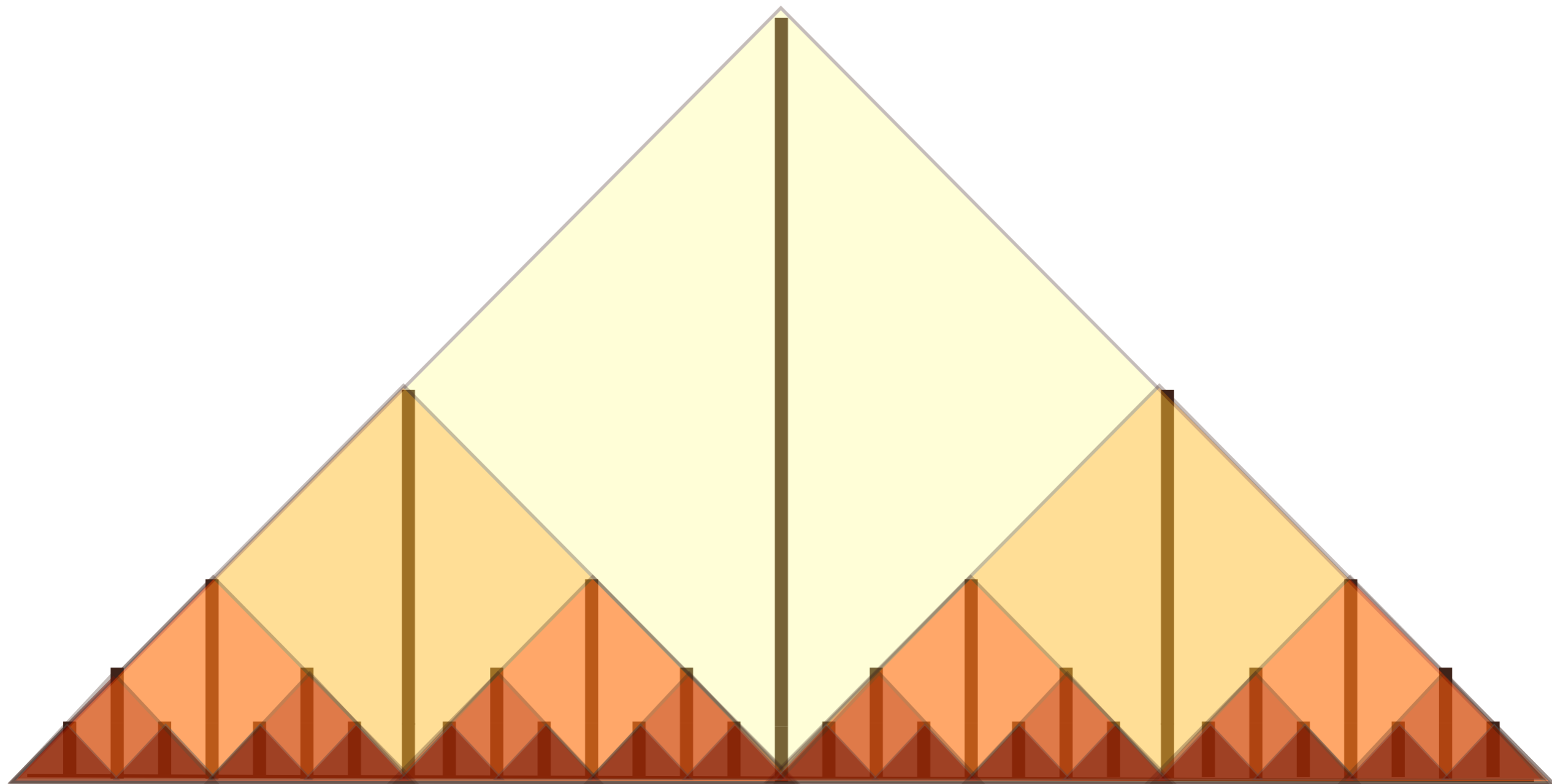


DE KINESISKE RINGENE



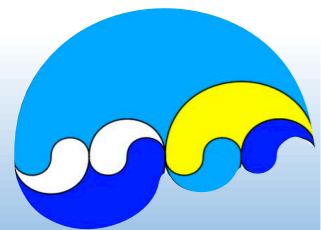


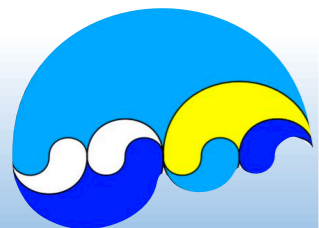
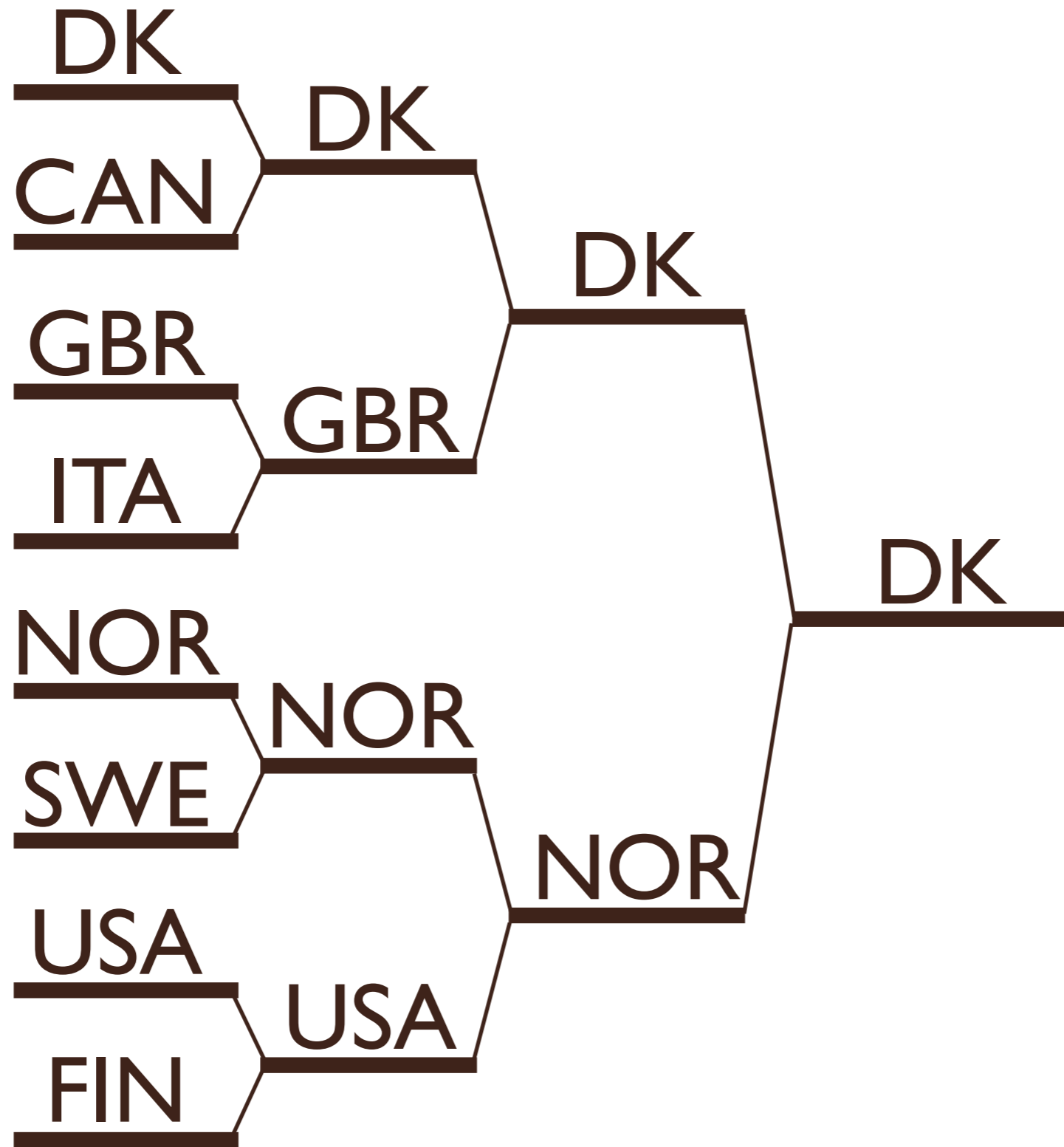
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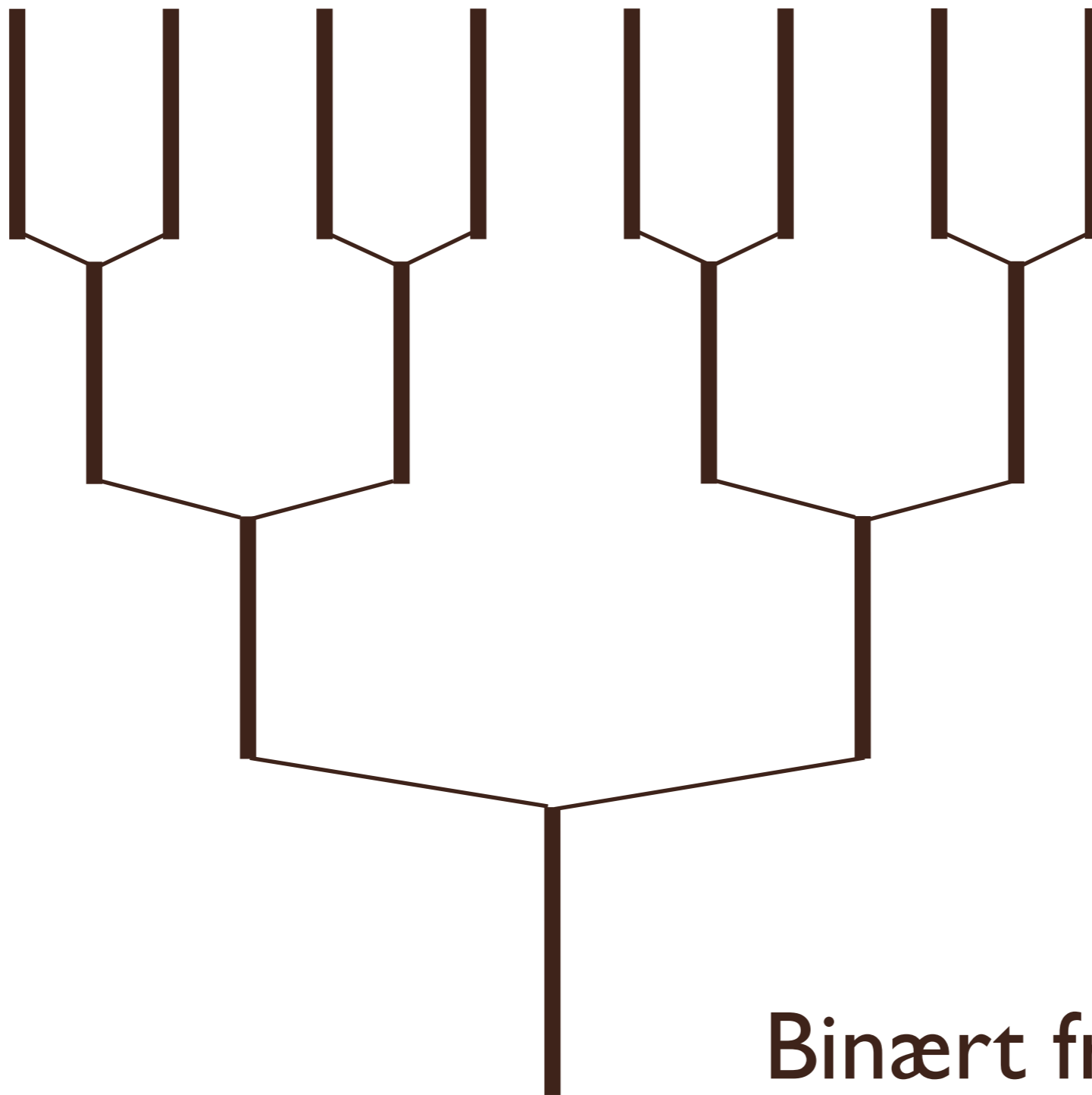


Matematikkbølgen

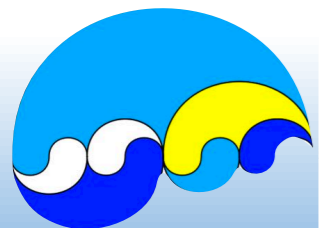
Engelsk linjal

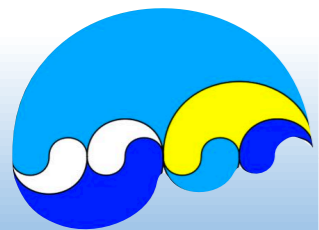
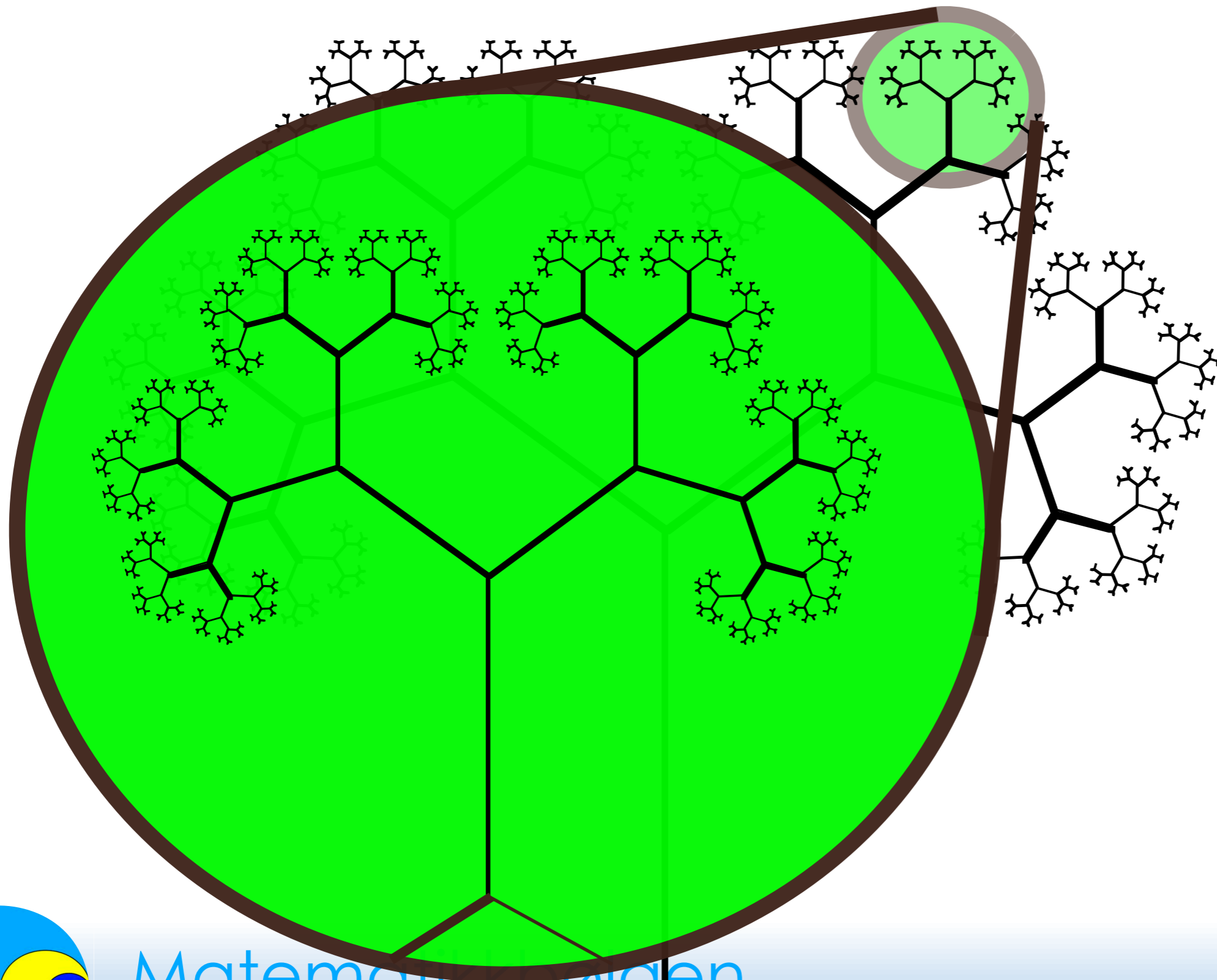






Binært fraktal tre

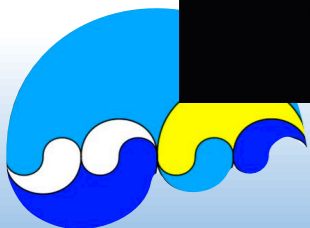
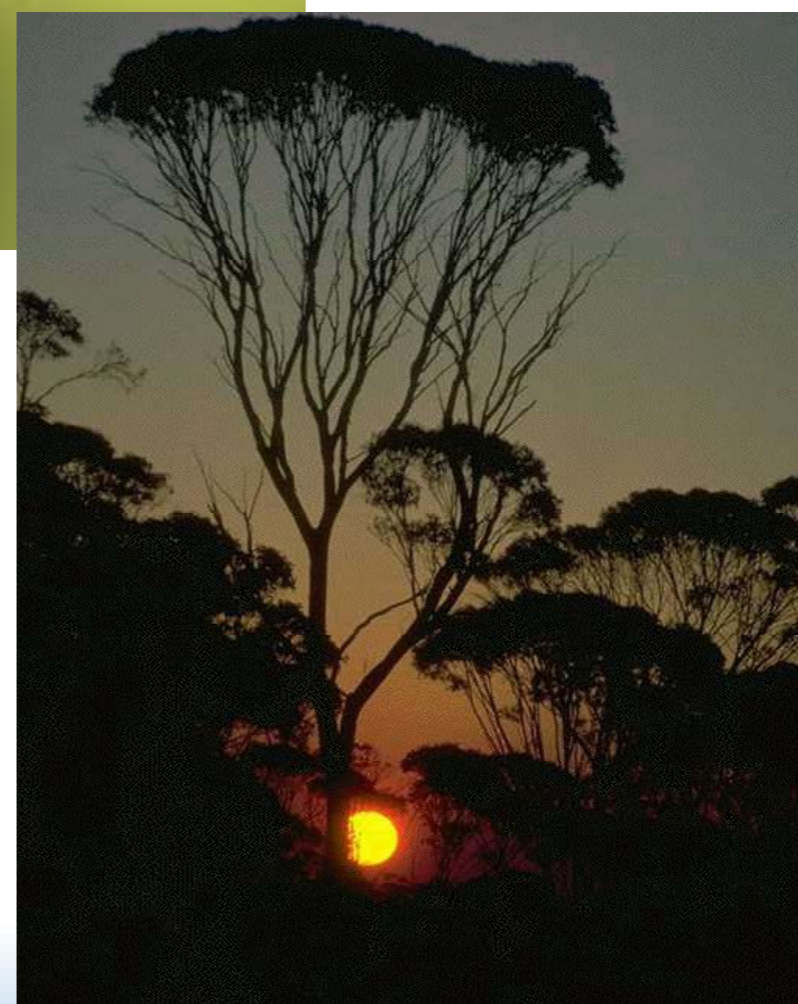




Matematikkøigen



i naturen

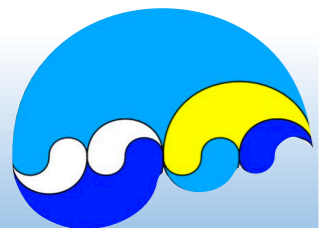


Matematikkølgen

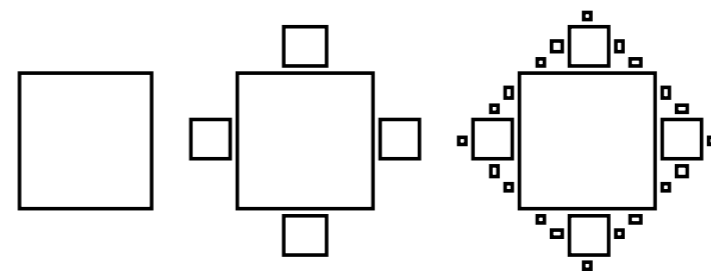
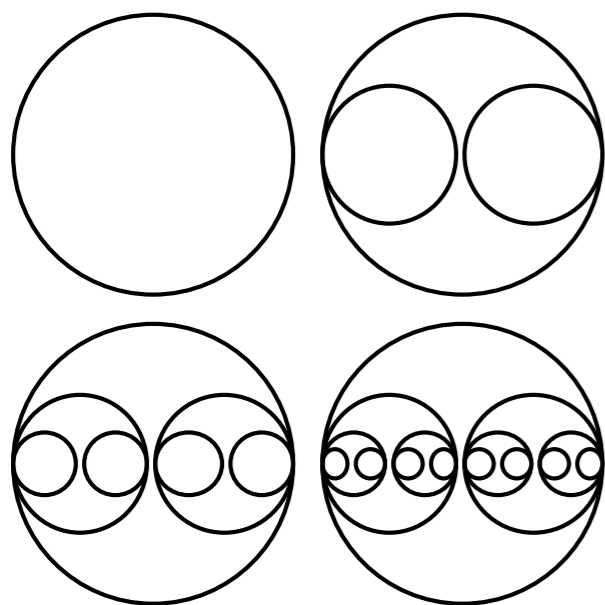
i kroppen



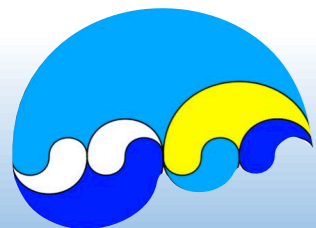
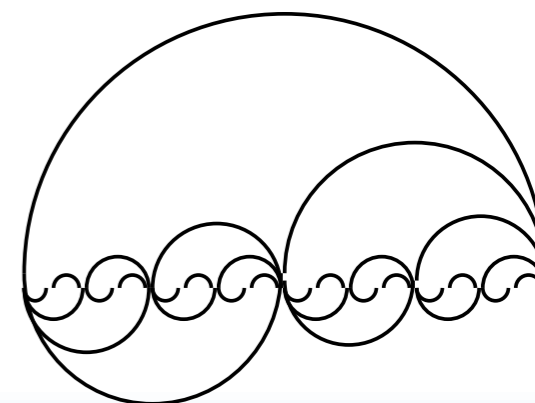
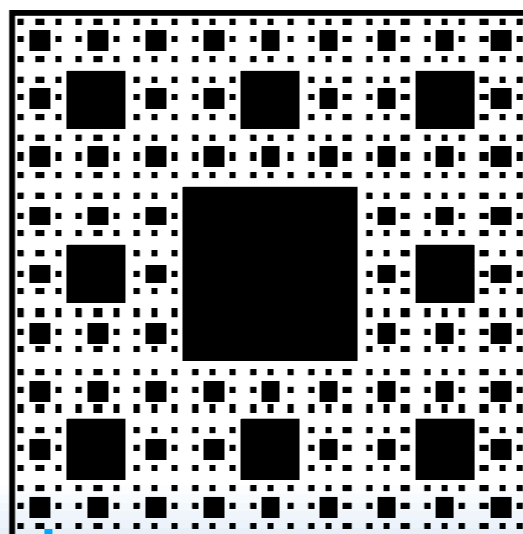
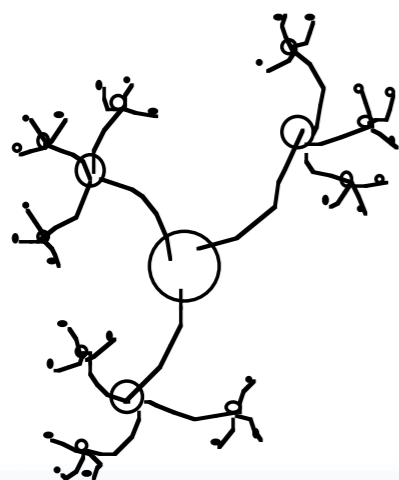
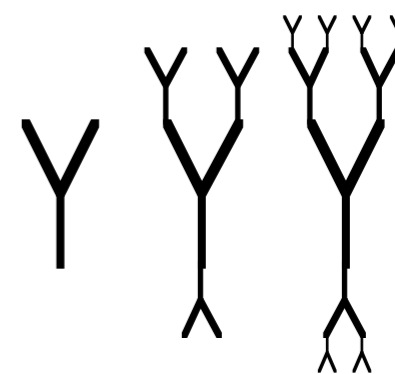
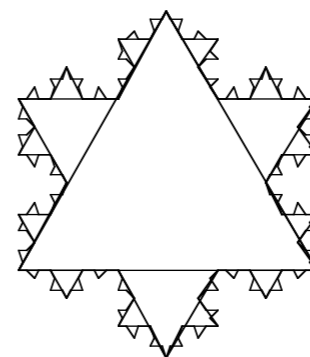
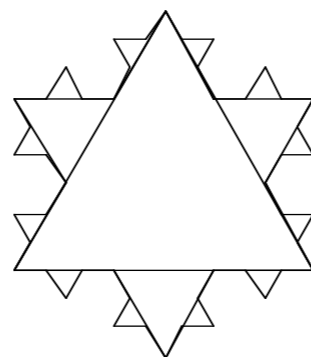
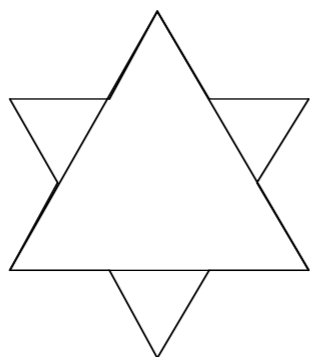
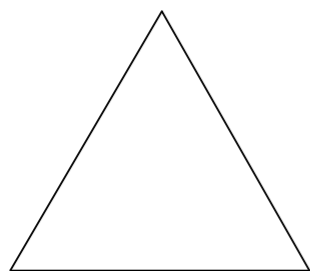
i familietreet



Matematikkbølgen

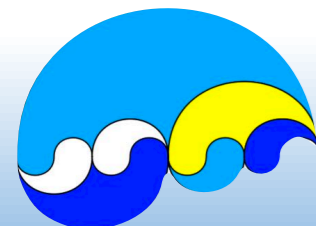
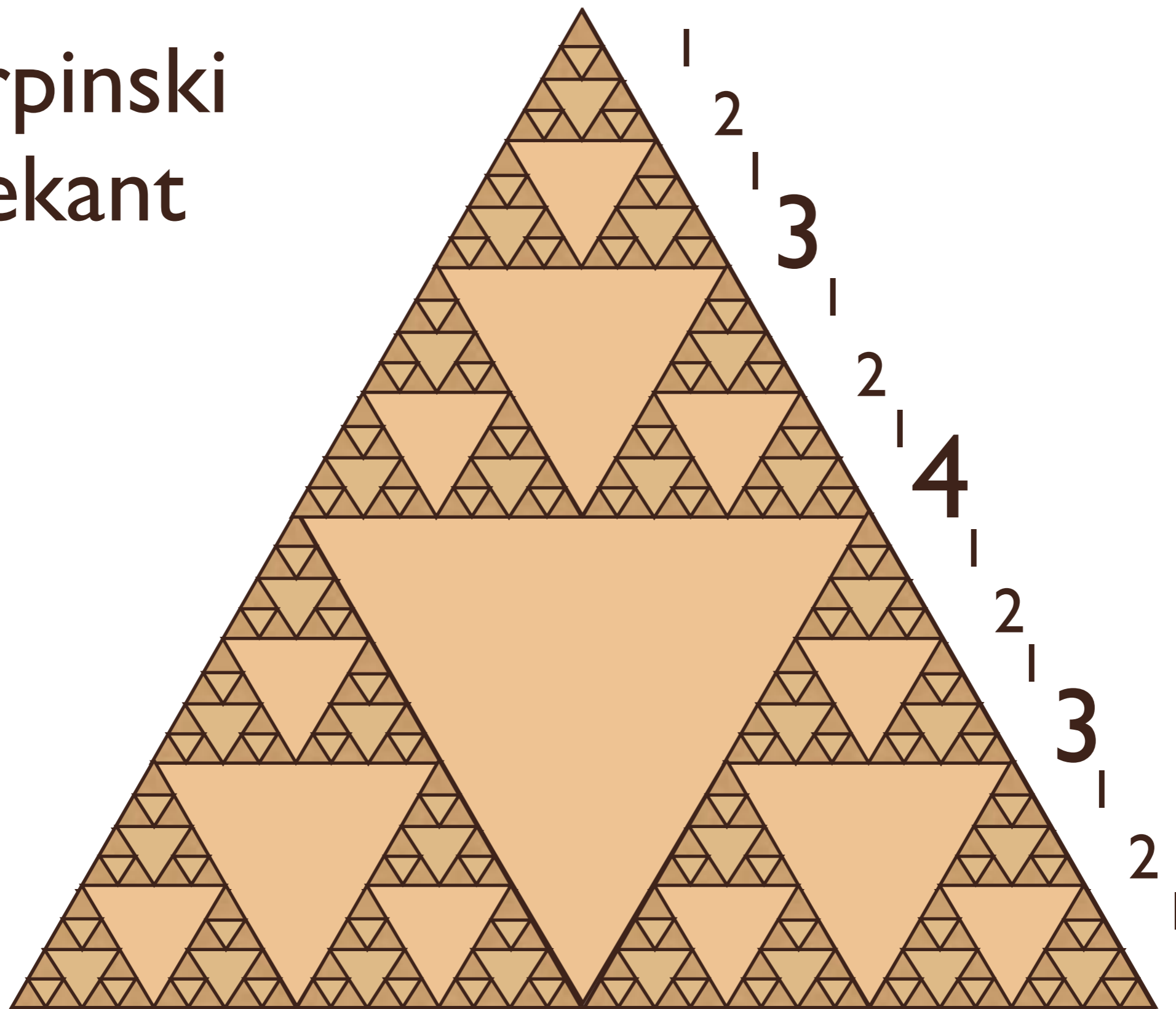


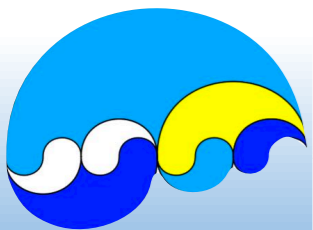
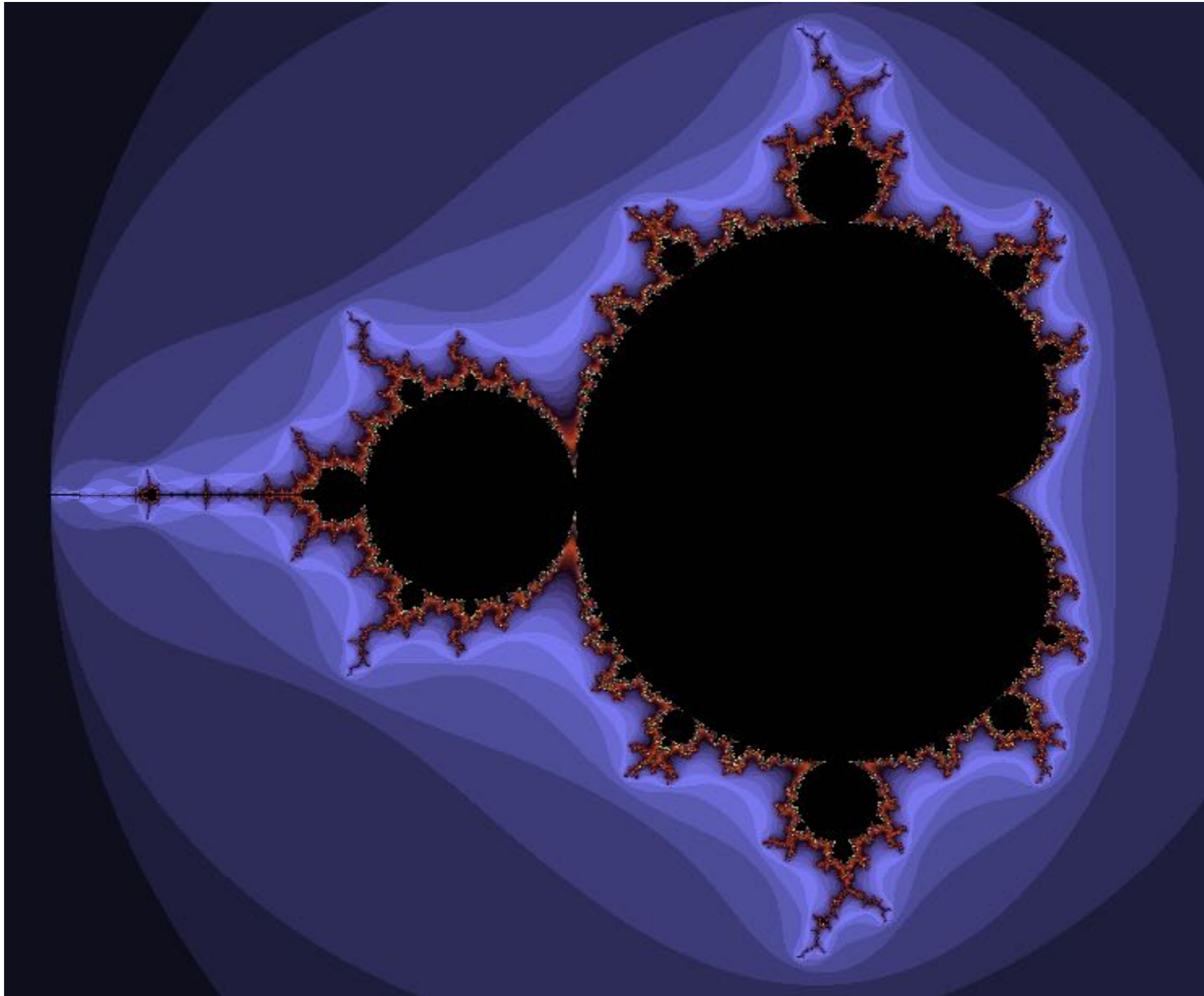
i mange geometriske fraktaler



Matematikkølgen

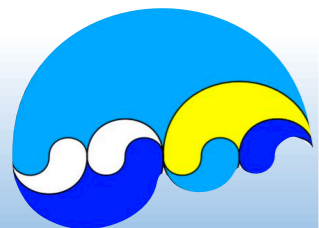
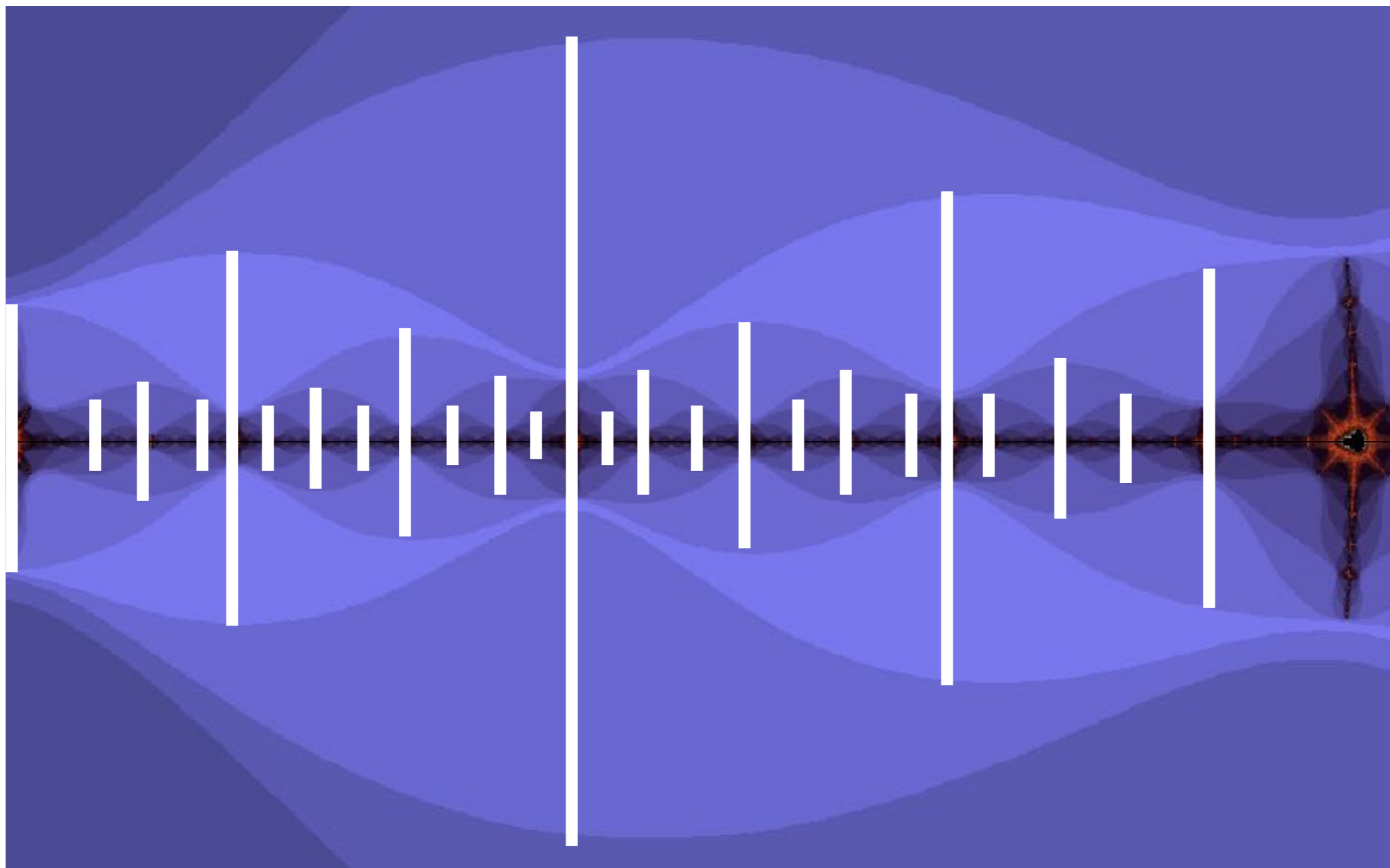
Sierpinski trekant



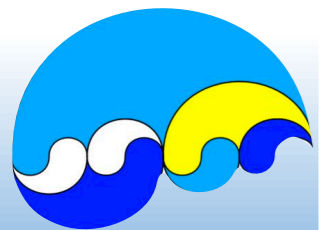


The Mandelbrot Set

Matematikkbølgen



Matematikkbølgen



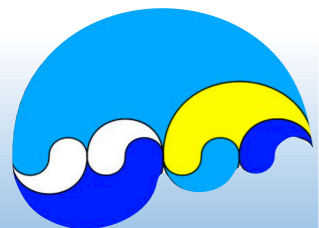
Abacaba blir stor. Veldig stor.

A

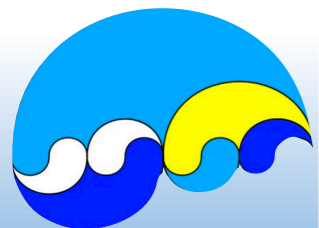
ABA

ABACABA

ABACABADABACABA

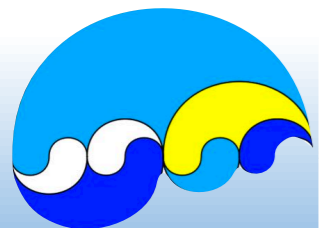


ABACABADABACABA E ABACABADABACABA

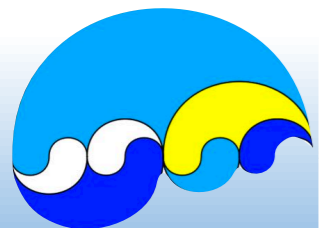


Matematikkbølgen

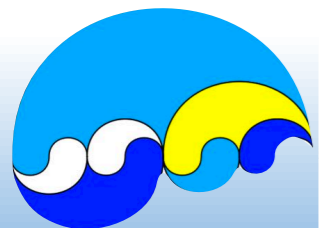
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EABACABADABACABA
FABACABADABACABA
EABACABADABACABA



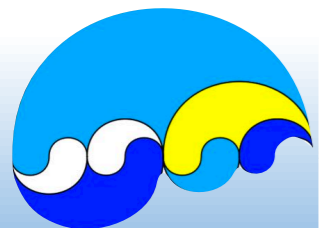
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EABACABADABACABA
FABACABADABACABA
EABACABADABACABA



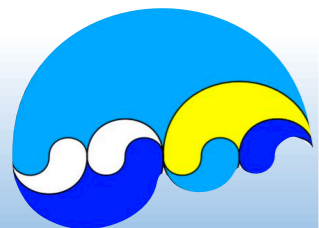
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FABACABADABACABA
EABACABADABACABA



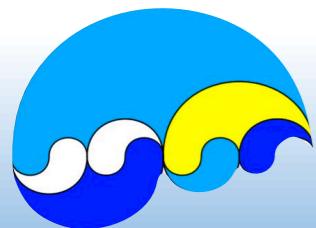
ABACABADABACABA
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FABACABADABACABA
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EABACABADABACABA
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ABACABADABACABA

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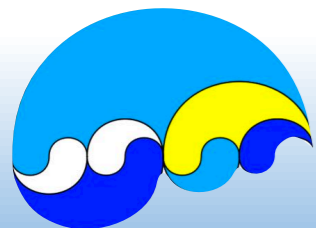
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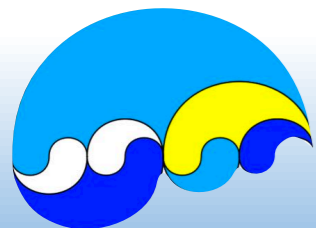
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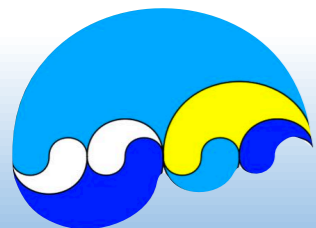
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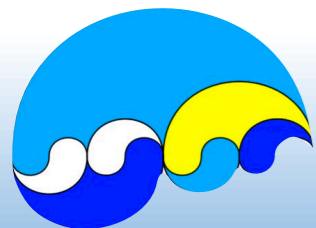
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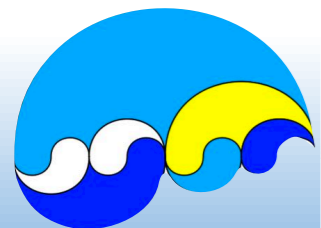
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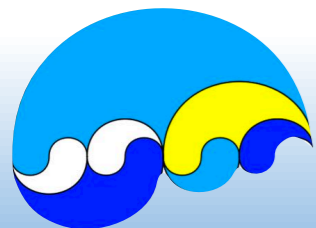
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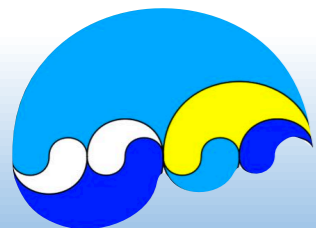
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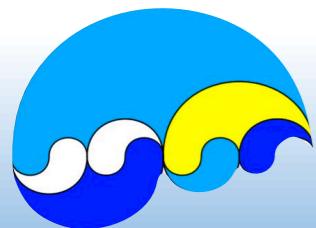
ABACABADABACABA
EABACABADABACABA
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FABACABADABACABA
EABACABADABACABA



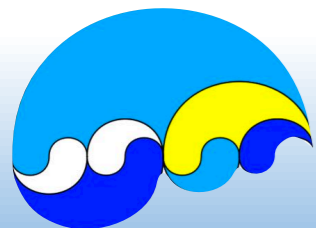
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EABACABADABACABA



ABACABADABACABA
EABACABADABACABA
FABACABADABACABA
EABACABADABACABA
GABACABADABACABA
EABACABADABACABA
FABACABADABACABA
EABACABADABACABA



Hvor mange bokstaver i
Abacaba...Å...abacaba?



Antall bokstaver?

A

1

ABA

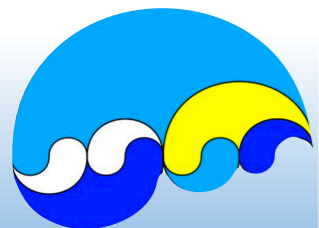
3

ABACABA

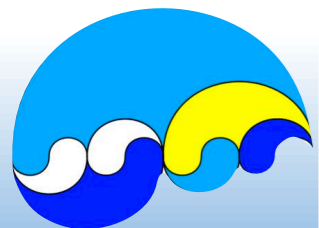
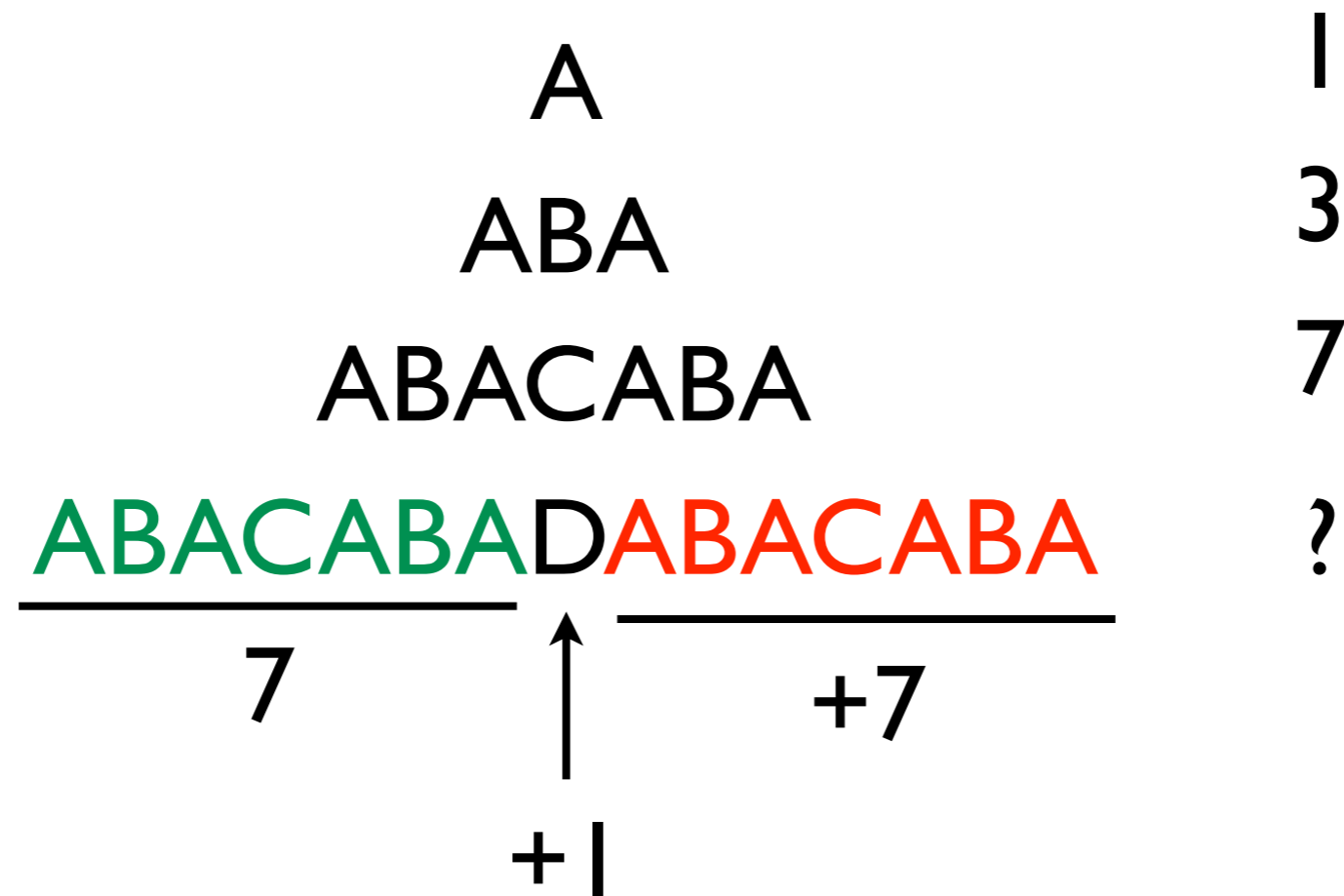
7

ABACABADABACABA

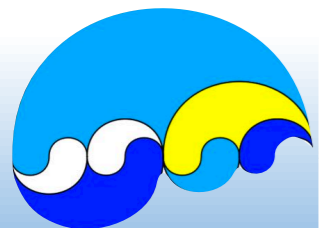
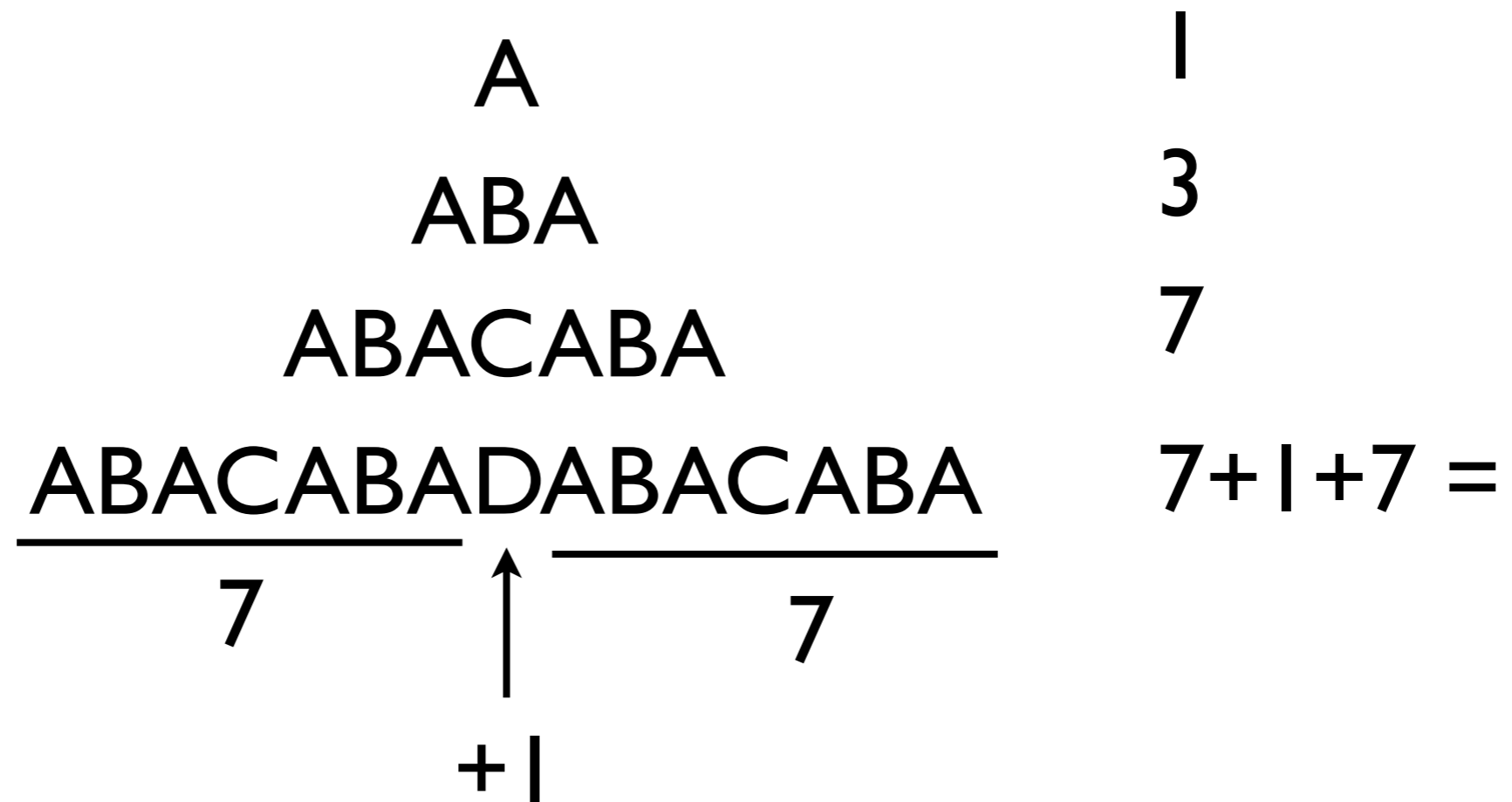
?



Antall bokstaver?



Antall bokstaver?



Antall bokstaver?

A

1

ABA

3

ABACABA

7

ABACABADABACABA

15

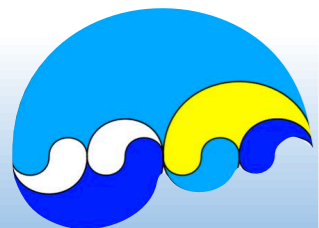
ABACABADABACABAEABACABADABACABA

15



15

+1



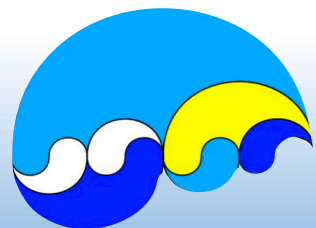
A	A	1	O	32767	O
B	ABA	3	P	65,535	P
C	ABACABA	7	Q	131,071	Q
D	ABA...D...ABA	15	R	262,143	R
E	ABA...E...ABA	31	S	524,287	S
F	ABA...F...ABA	63	T	1,048,575	T
G	...G...	127	U	2,097,151	U
H	...H...	255	V	4,194,303	V
I	...I...	511	W	8,388,607	W
J	...J...	1,023	X	16,777,215	X
K	K	2,047	Y	33,554,431	Y
L	L	4,095	Z	67,108,863	Z
M	M	8,191	Æ	134,217,727	Æ
N	N	16,383	∅	268,435,455	∅
		32,767	ABA...Å...ABA	536,870,911	Å

Abacaba unabridged

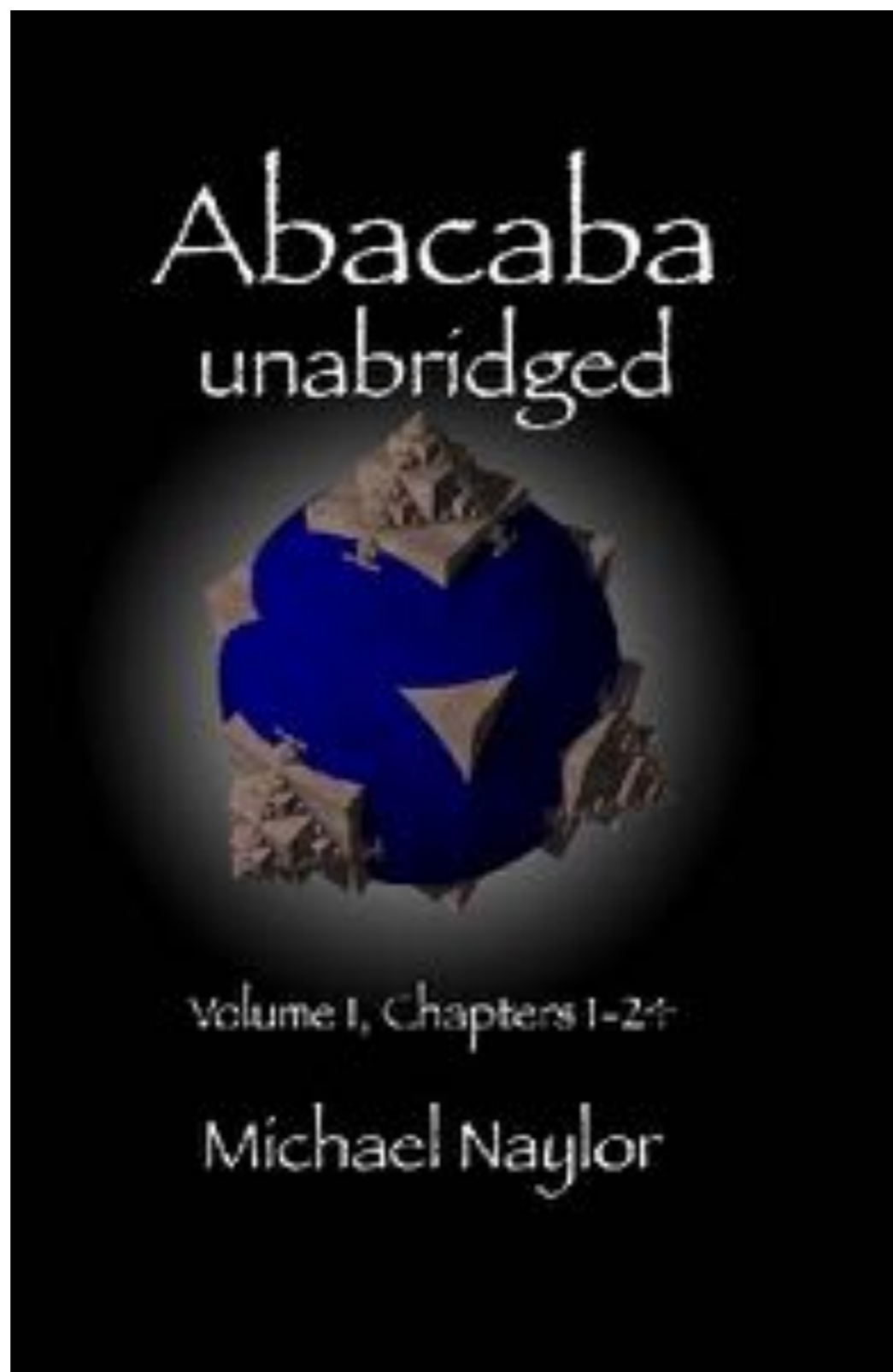


Volume 1, Chapters 1-24

Michael Naylor



Matematikkbølgen

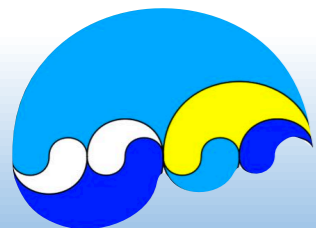


Volum I
Kapittel 1-24

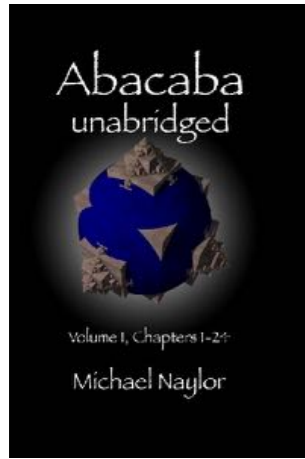
416 sider

A4

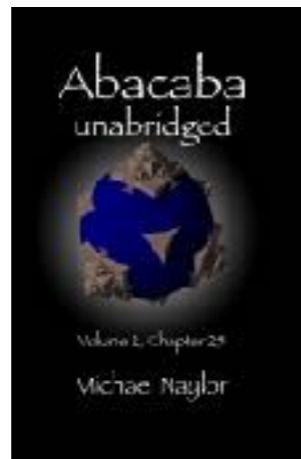
4-point font



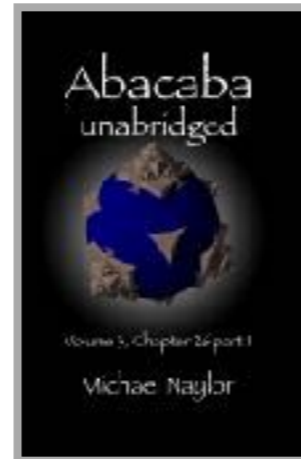
Matematikkbølgen



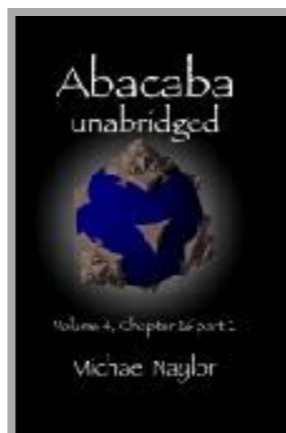
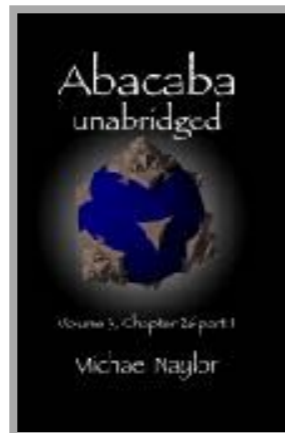
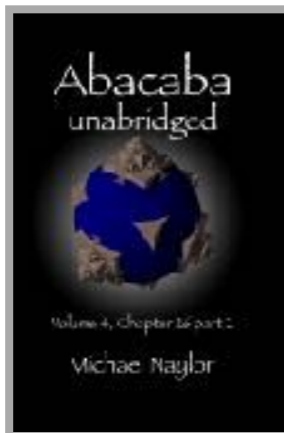
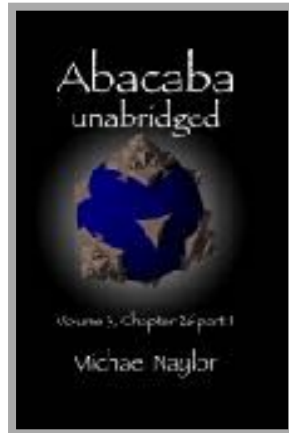
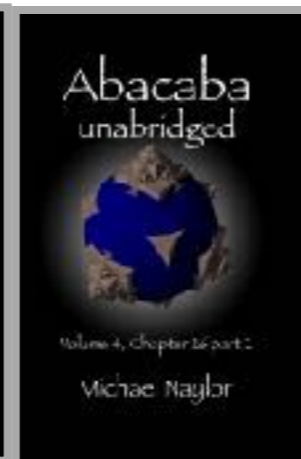
1-24



25

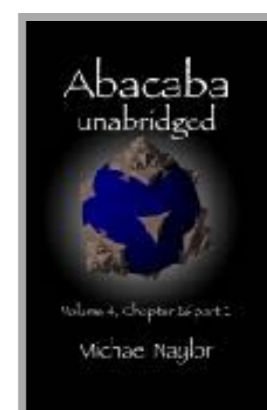
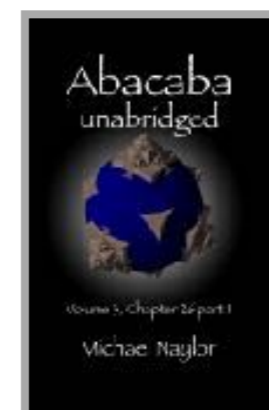
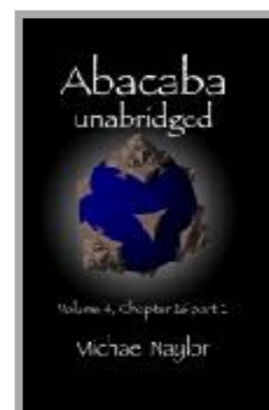
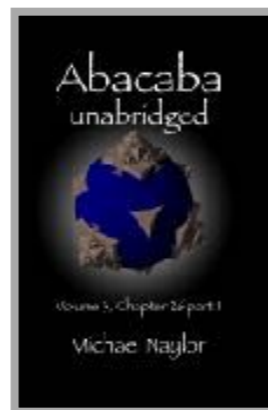
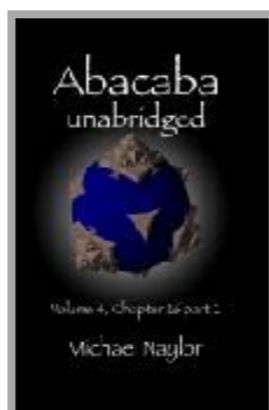
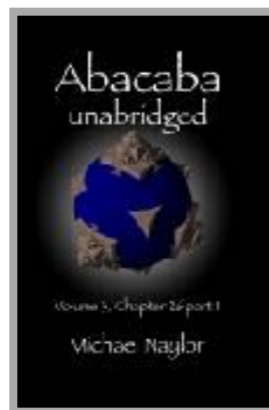
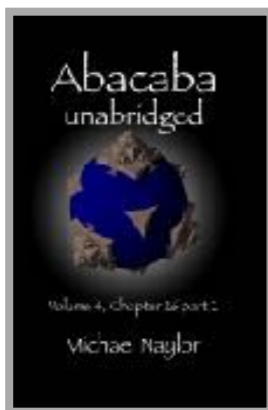
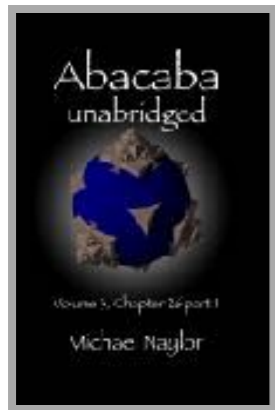


26

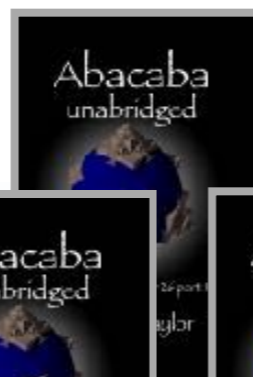


27

32 bøker
13000 sider



28



29



Hvor lang tid tar det å si Abacaba...Å...abacaba?

Hvis det tar 1 sekund til å si “dabacaba”...

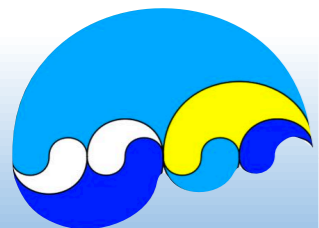
$536\,870\,911 : 8 = 67\,108\,863$ sekunder

$67\,108\,863$ sekunder $: 60 = 1\,118\,481$ minutter

$1\,118\,481$ minutter $: 60 = 18\,641$ timer

$18\,641$ timer $: 24 = 777$ dager

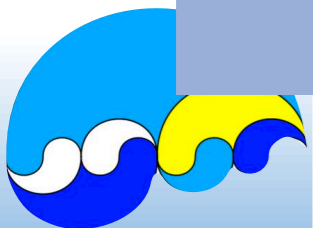
(non-stop!)



Maggie and the Abacaba Genies



Michael Naylor



Matematikkølgen

Maggie looked at the strange words. She knew

"Hooat Pooat Ploobooat Crookoo,"
"Aie Pooat Pooat De whishes,"
"Hooat Chooop-o."

and about twenty more.



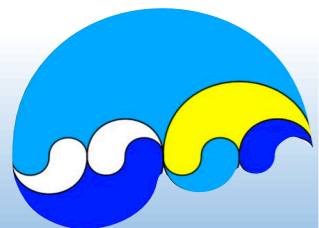
The words in the bottle started with the Poo, and the a.



It looked a little like the famous word "Abracadabra," but it was different... and strange. It was the most magical thing Maggie had ever seen. Something so amazing must hold amazing power. "This is a genie bottle, and this is the magic word to release the genie," she remembered.

Maggie knew that magic words had to be said just right, or they wouldn't work. So very carefully she pronounced,

"A-B-a-C-A-B-a-D-A-B-a-C-A-B-a."



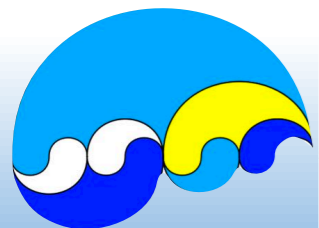


She must have said it so loudly

with a splash and a splash and a SPLASH – a woman
appeared floating over the water. Her skin shone as blue as the sea
and her long green hair flowed in rhythm with the waves.

"The water" smiled at Maggie and bowed her head. "Hello," she
said in a voice like an ocean breeze. "My name is Abacabo-
Dabacabo. I am the queen of the bottle, master of the fourth
dimension, goddess of the Empire."

"I know it!" Maggie shrieked in
excitement. "They come in a g' in
manner. Maggie bowed in return.
"Hello, my name is Maggie. Pleased to
meet you!"



Genies, Maggie knew, granted wishes, and she could hardly wait.



"Do I get to make three wishes?" she asked at once. "Can I wish for a sailing ship? And a dolphin? And a magical garden?"

The genie smiled and shook her head. "My powers are not yet so great. There is another whom you must call. His name begins and ends with nine, but there is a letter 'E' in the middle. I'll spell it for you."

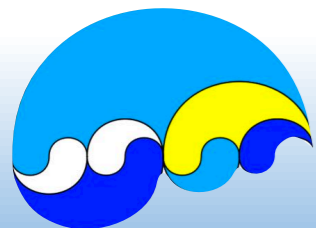


The genie wiggled her fingers and there in the sand appeared the longest word Maggie had ever seen: ABACADABACABA ABACADABACABA ABACADABACABA. "Good luck," whispered the genie as she evaporated back into the bottle.



Maggie carefully recited the name.

"Abacaba-Dabacaba-E-abacaba-Dabacaba."



She must have said the word correctly.



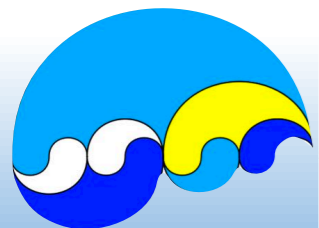
With a crash and a bang and a CRAWL—
suddenly there appeared another gnom. He
towered like a mountain, his skin as rough and
gray as stone. His shoulders were piled
onto his shoulders like a landslide.

"Hello," his voice rumbled, deep and cavernous. "My name is
Abundant. I am the lord of the mountain, the master of the
dimension, guardian of Earth. How may I help you?"

"To be, my name is Stiggy,"
she said, trying to remember to be
calm, sure. She spoke in a very
excited, "Could you please get
me these seeds?"



"May I wish for a herd of elephants?" And a treasure chest full
of a horse? And an overgrown red horse?"





She must have said the word correctly.

With a flash and a fizzle and a "BOOM" - there appeared another genie. Her skin glowed red as burning embers and her wild hair swirled and roared like a hurricane.

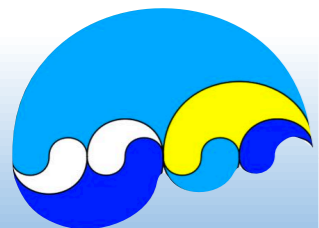
"Hello," she whispered warningly. "My name is

Abacabacabocabo - C-abacabodabacabo -
Tabocobocabocobo - D-abocobocabocobo
owner of 1 or sixth of owner, guardian of Fire."

"I pleased to meet you," Myppo smiled. "Your name is very long, is that what your mother calls you now?"

"Of course it is!" the genie laughed, her eyes shining like
ice chips. "However," she whispered, "Some people just call me The
genie who lives at letter F."

Myppo nodded. "My name is Myppo, but most people call me
Wagge."





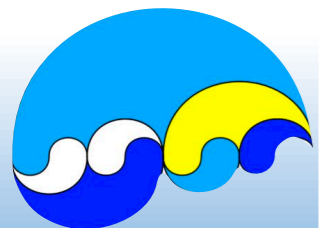
she must have said the word correctly.

With a hush and a rush and a
whooooo! - there appeared
another genie. His skin shimmered
like crisp night air and his white hair
swirled like an arctic wind.



"Greetings!" The genie's voice
rivered like the open sky. He bowed
deeply. "I am the one they call The
Genie Who I Live at the Center of the
Universe, guardian of
the stars and planets. Please do not
speak my name. I am honored to meet
you as a guest here!"

"Thank you," Maggie grinned at the compliment. "Do you
know how to get out of here?" she asked. "I would like a flying carpet
and a cloud palace! And a helicopter!"



The genie's laugh rumbled like summer thunder. "I'm sure you know that the next genie, the master of the eighth dimension, lives at the letter 't'."

Veggie nodded. "And her name is twice as long as your name, plus an extra letter 't' in the middle."

"Right you are," said the genie. "The genie who lives at the letter 't' has a name twice as long as yours."

Mathematical problems in the story included calculating about the number of genies in the eighth dimension, the number of genies who live at the letter 't', and the number of genies who live at the letter 't'.

Mathematical problems in the story included calculating about the number of genies in the eighth dimension, the number of genies who live at the letter 't', and the number of genies who live at the letter 't'.



"How many genies are there altogether?" Veggie asked.



The genie smiled then bowed his head and disappeared.

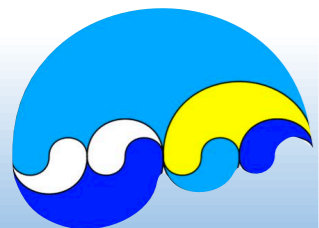
"So you're the way to 't'?"

"It is the longest name in the whole universe," the genie said, his eyes glowing like tornadoes. "If you call her by name, she will not even realize you're there."

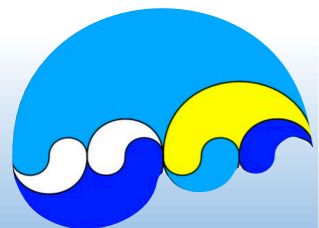
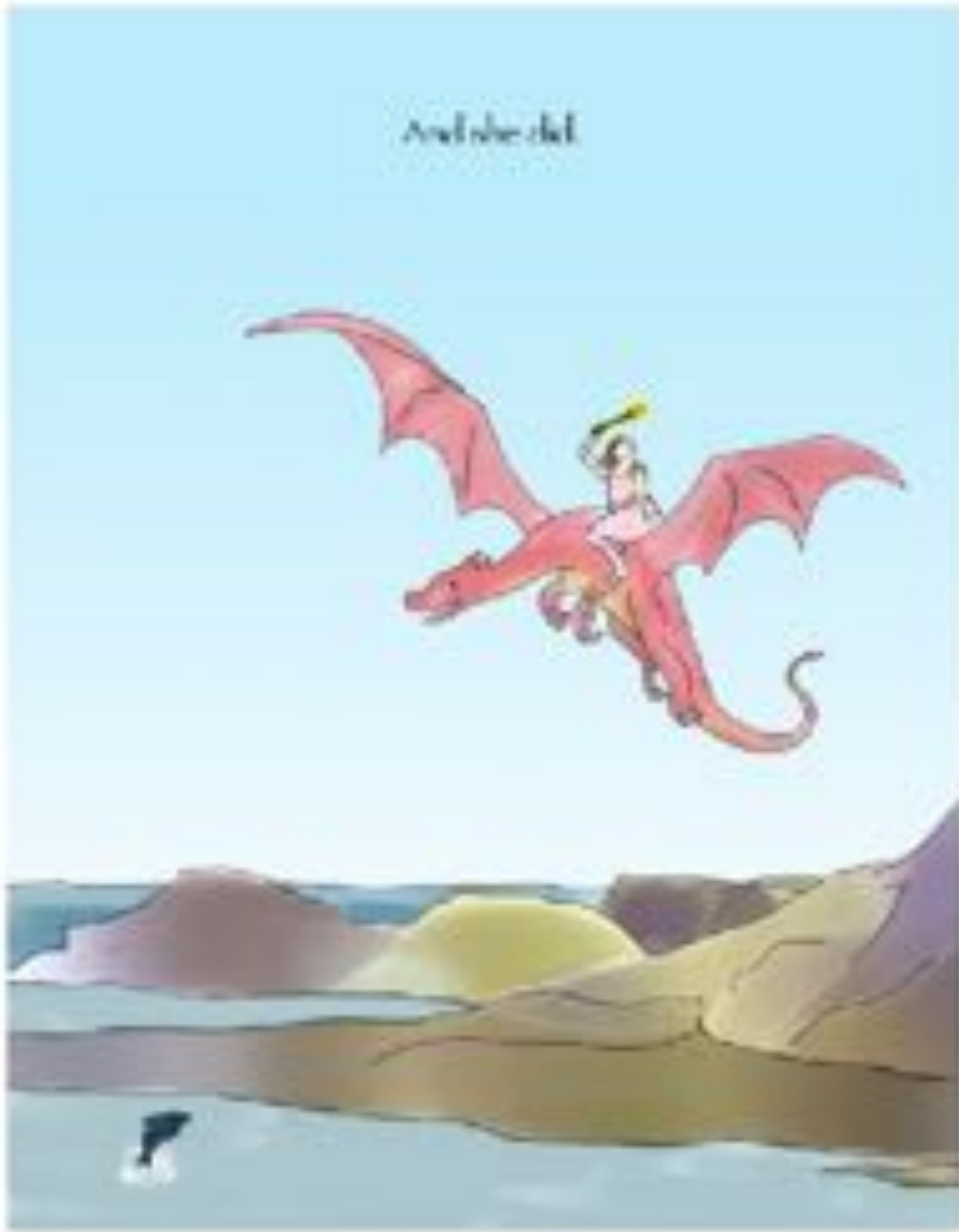
not one,

not three,

but twenty-six wishes!"



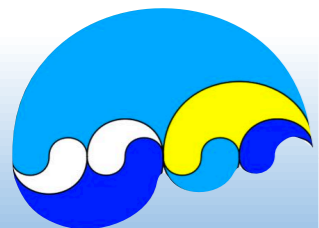
Andstedet

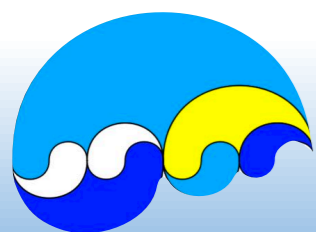


Musikk...



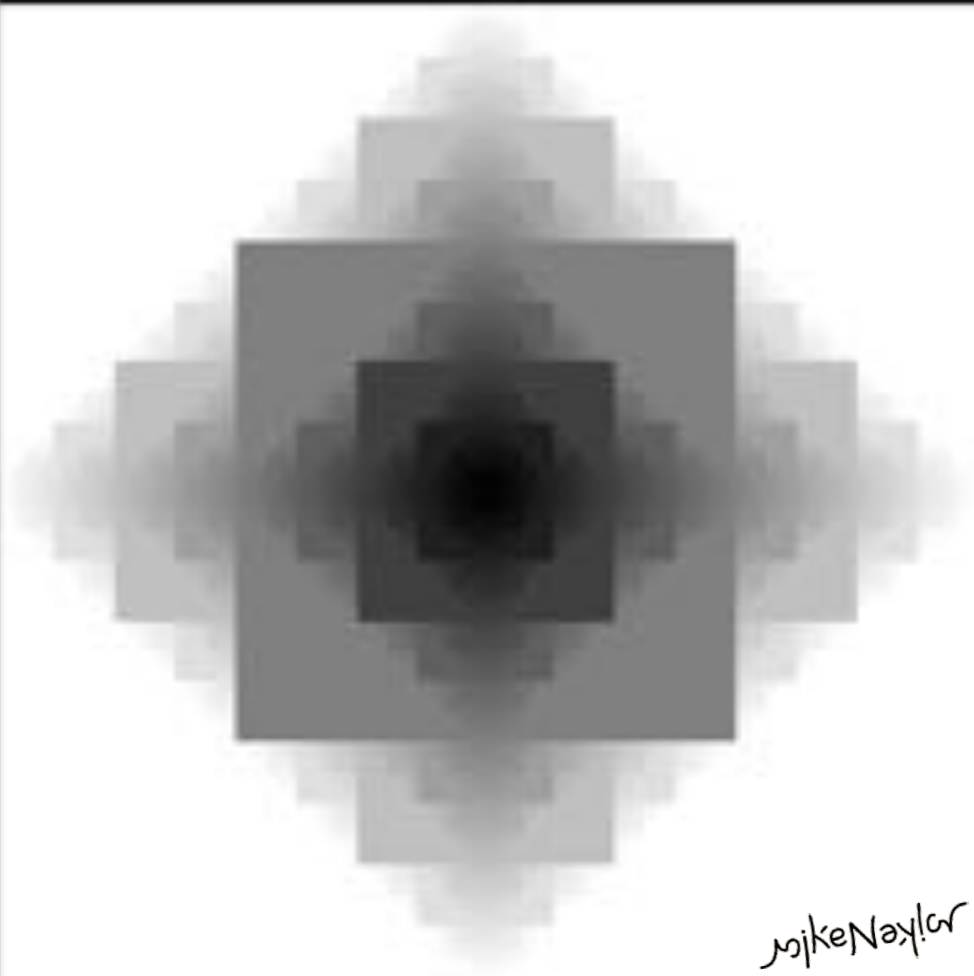
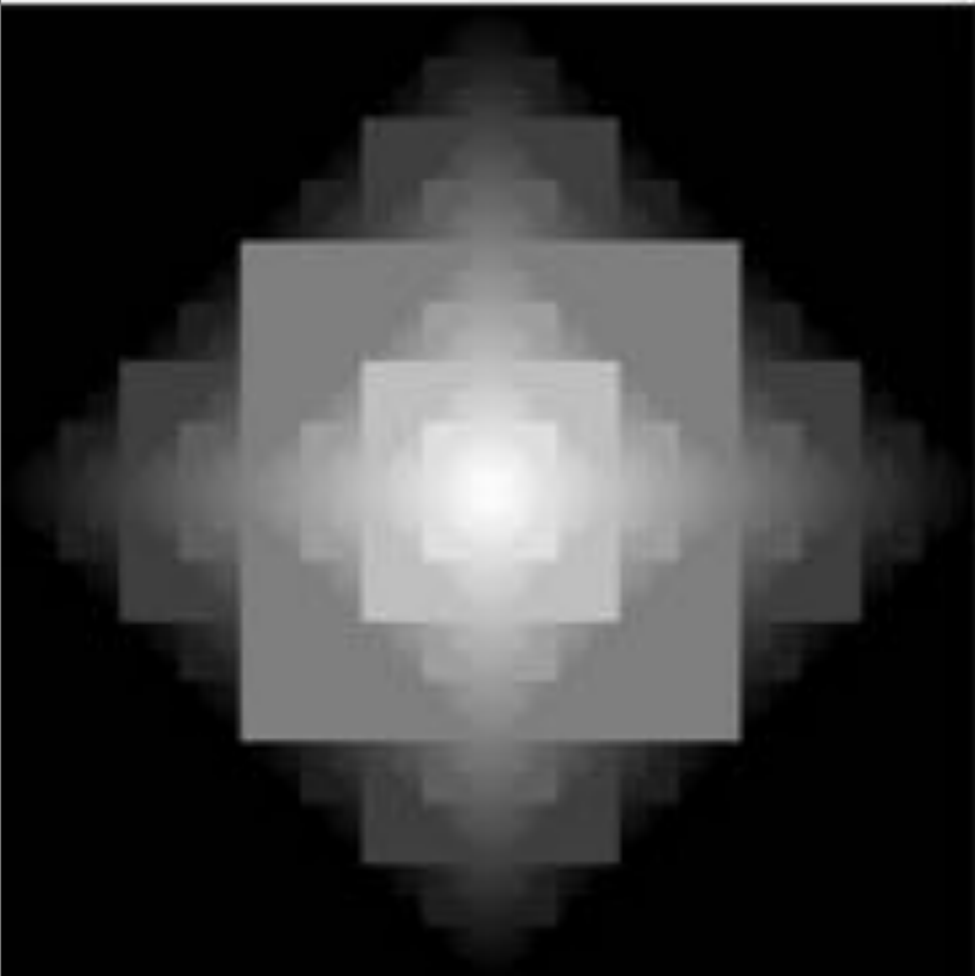
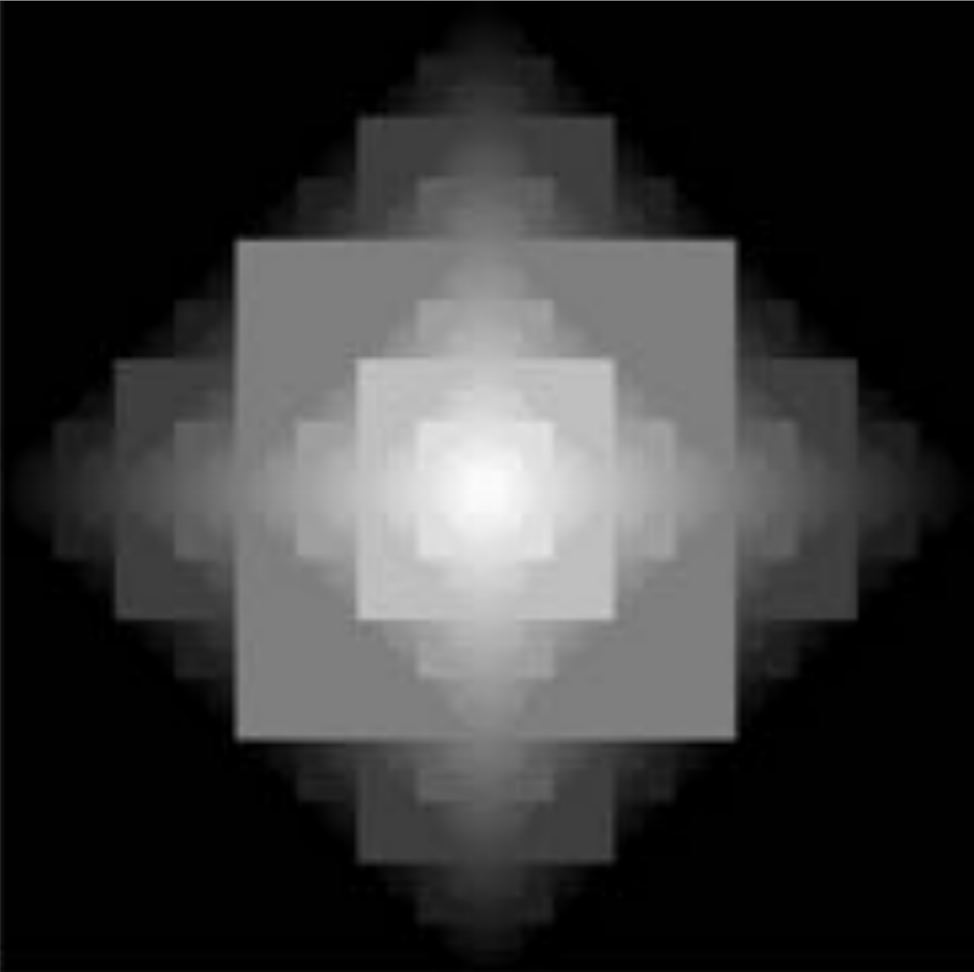
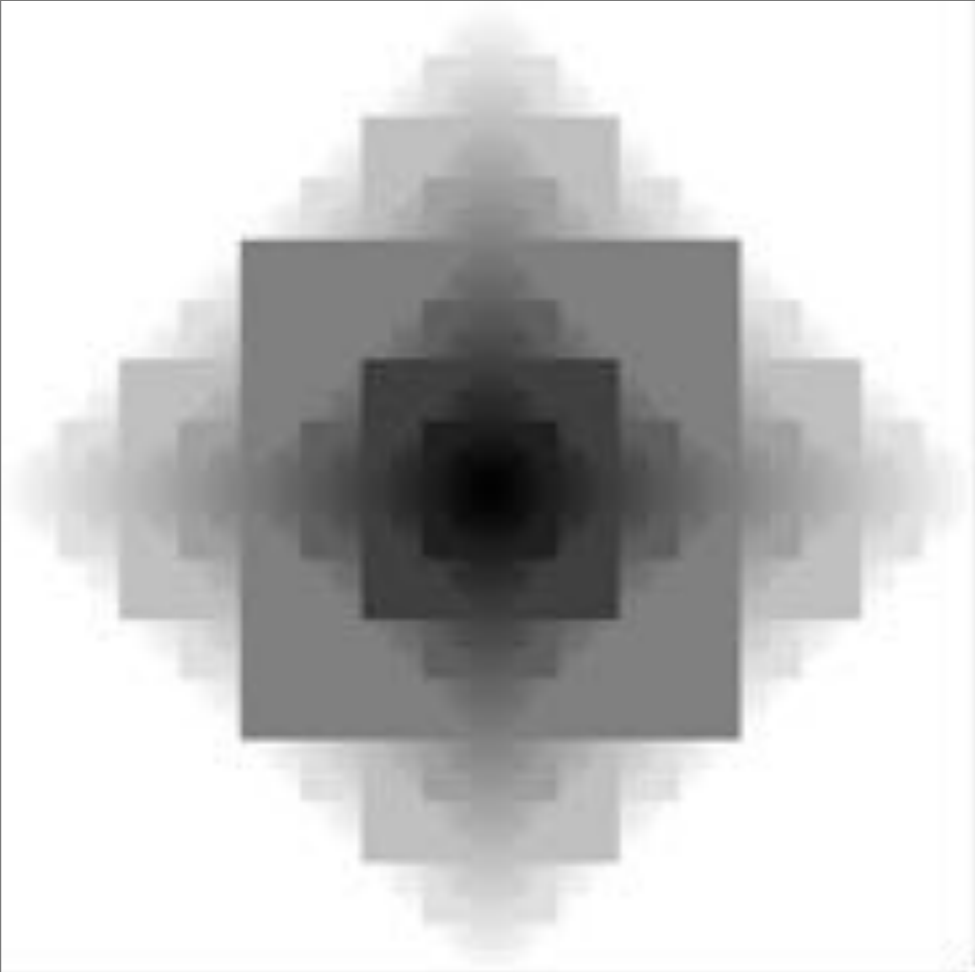
Hvordan høres *abacaba* ut?

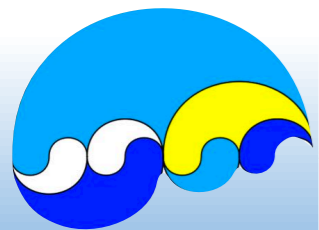




Matematikkbølgen

kunst

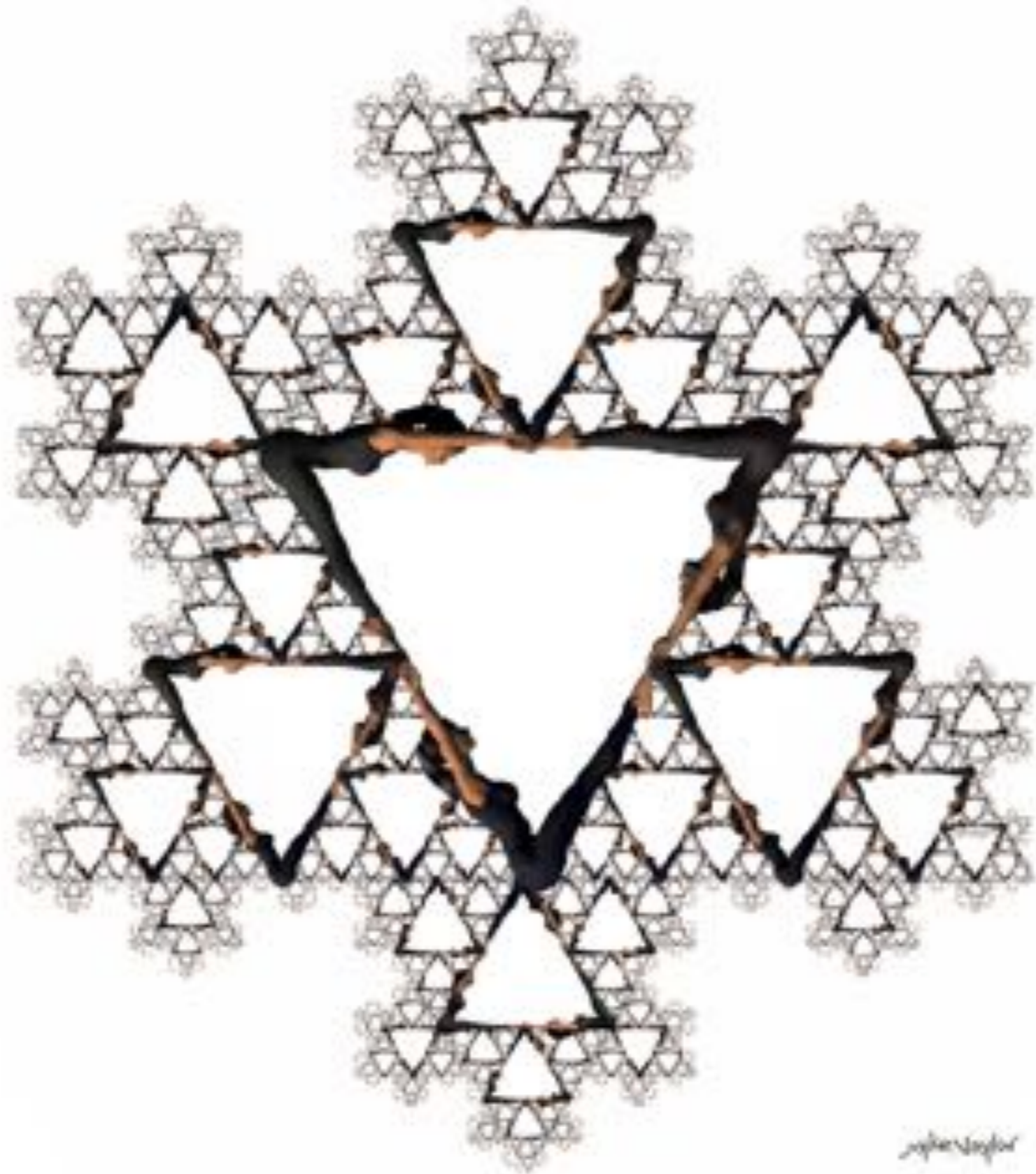




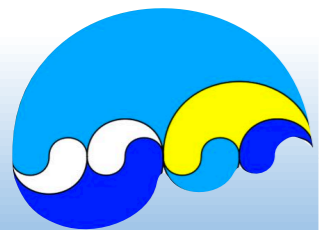
Matematikkbølgen

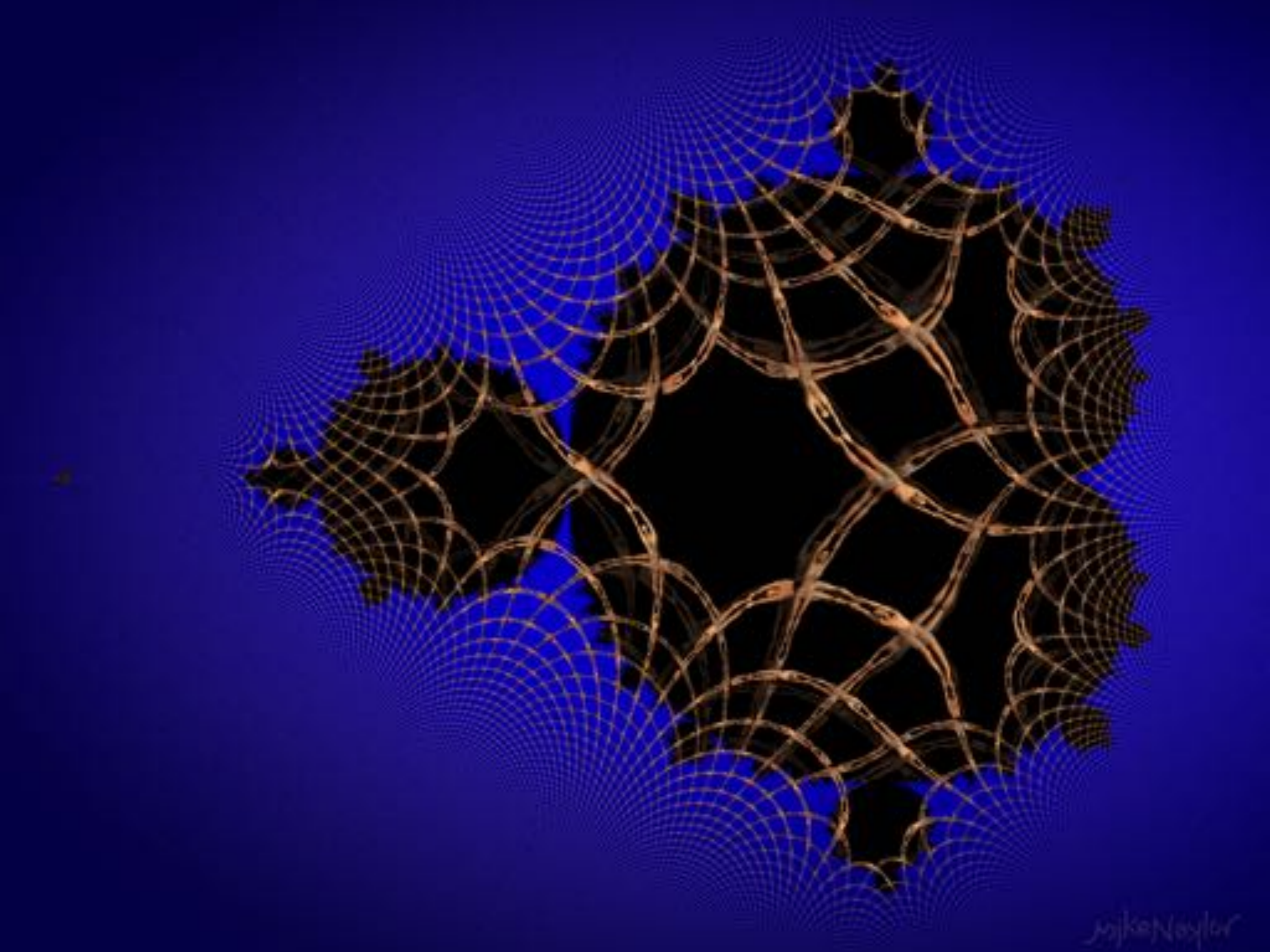


Александр

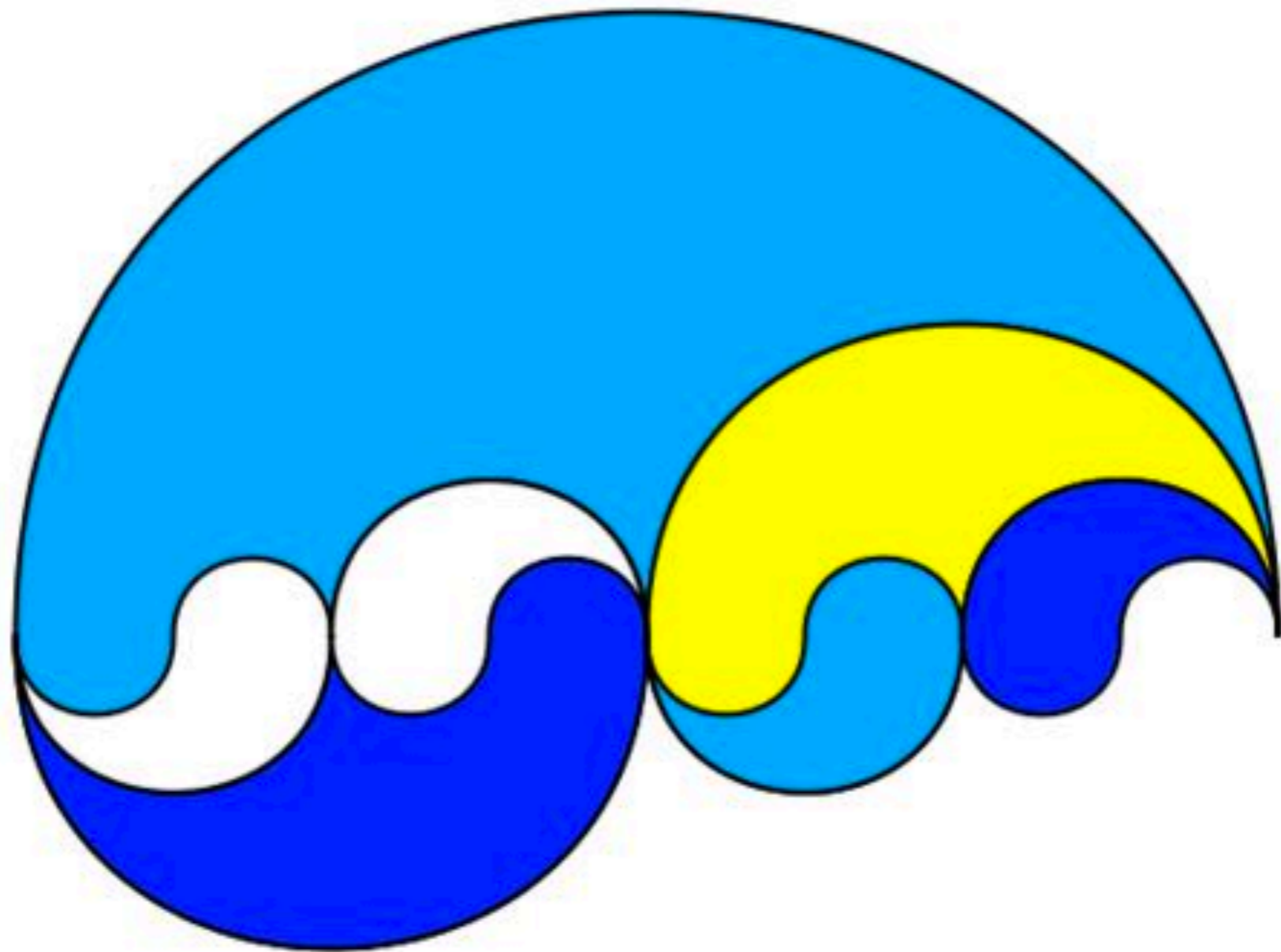


John Taylor

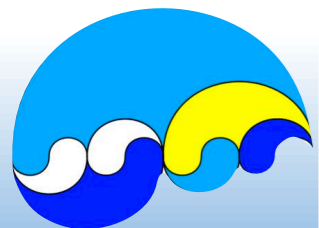




mikenoslar

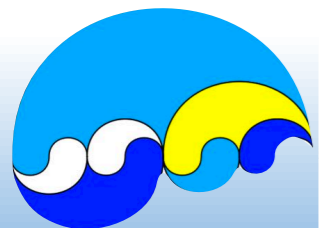


Matematikkbølgen



Matematikkbølgen

ABACABA ER INNE I TALLSYSTEMER



Matematikkbølgen

Ti-tall systemet 3752

1000'ere	100'ere	10'ere	1'ere
3	7	5	2

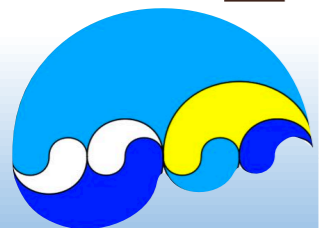
= 3 tusen + 7 hundrede + 5 tiere + 2 enere

To-tall systemet – Binær

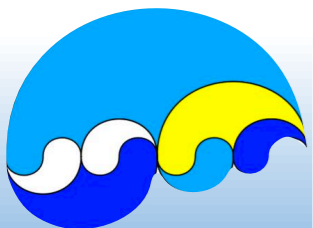
1001

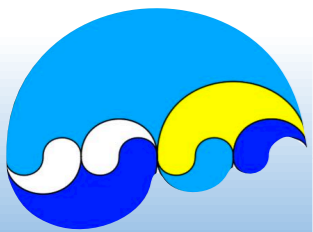
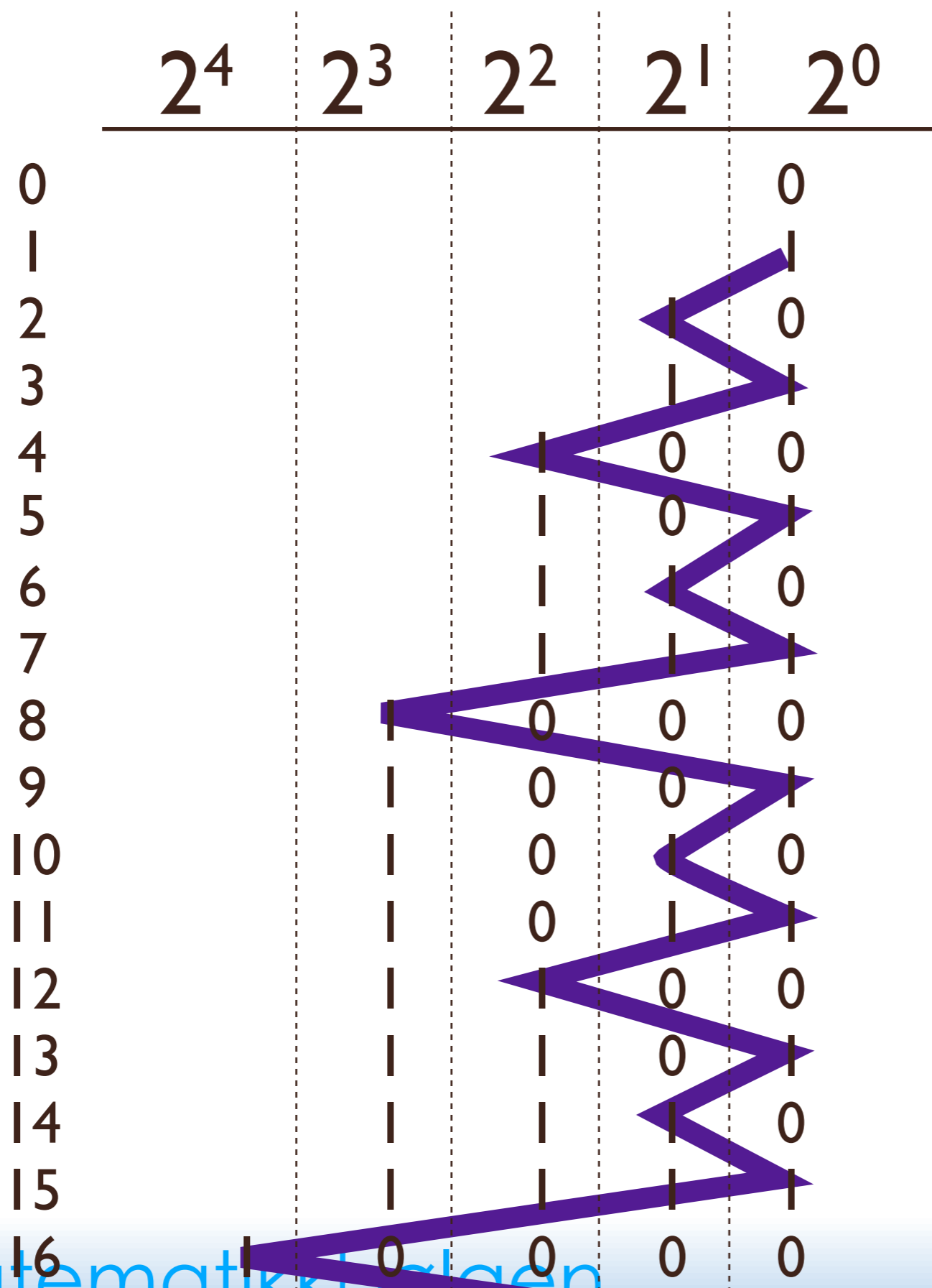
8'ere	4'ere	2'ere	1'ere
1	0	0	1

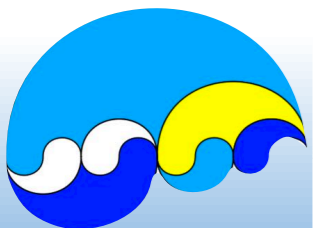
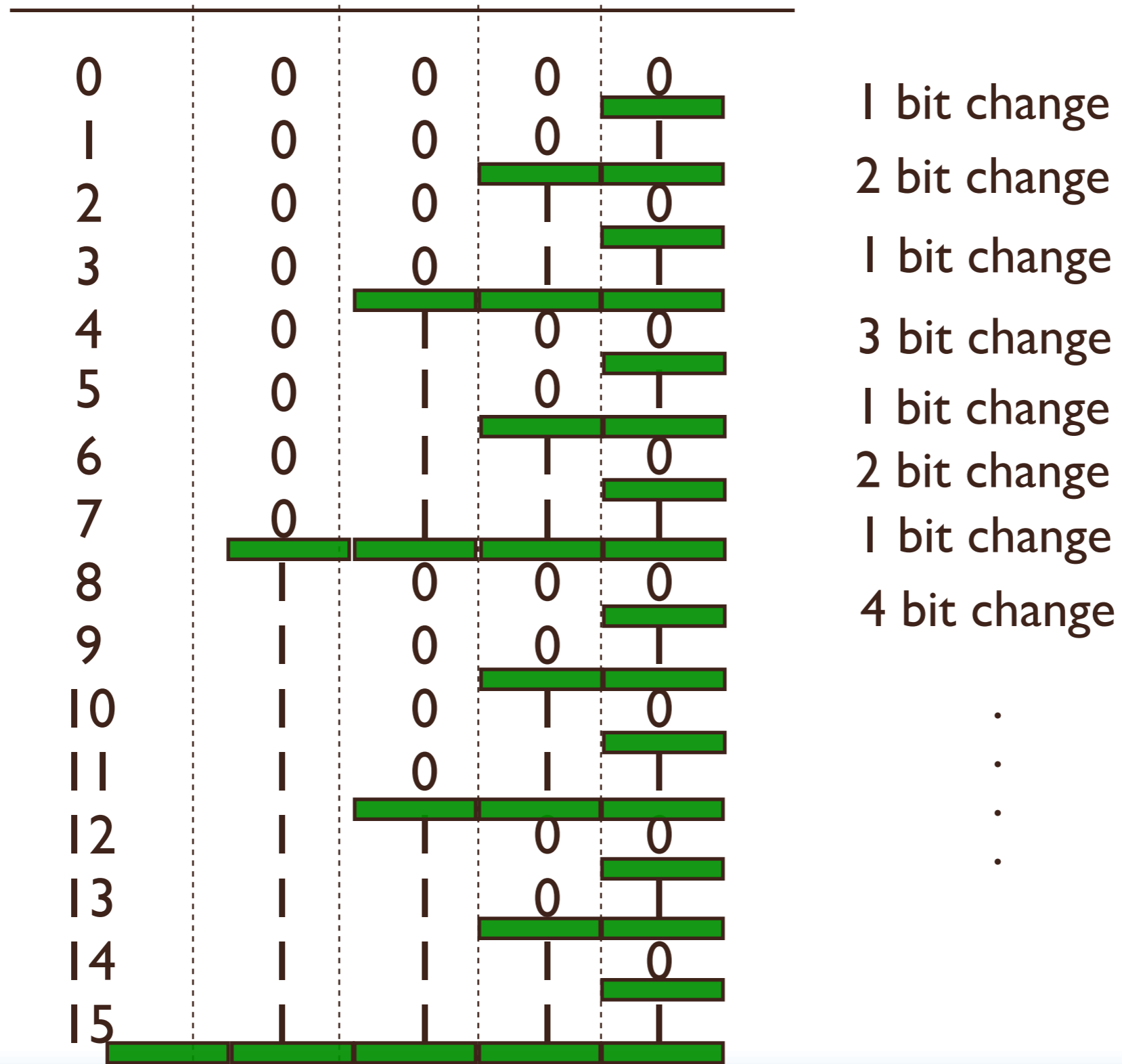
= 1 åtter + 0 firere + 0 toere + 1 ener



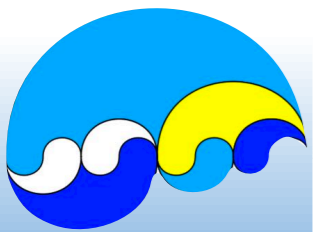
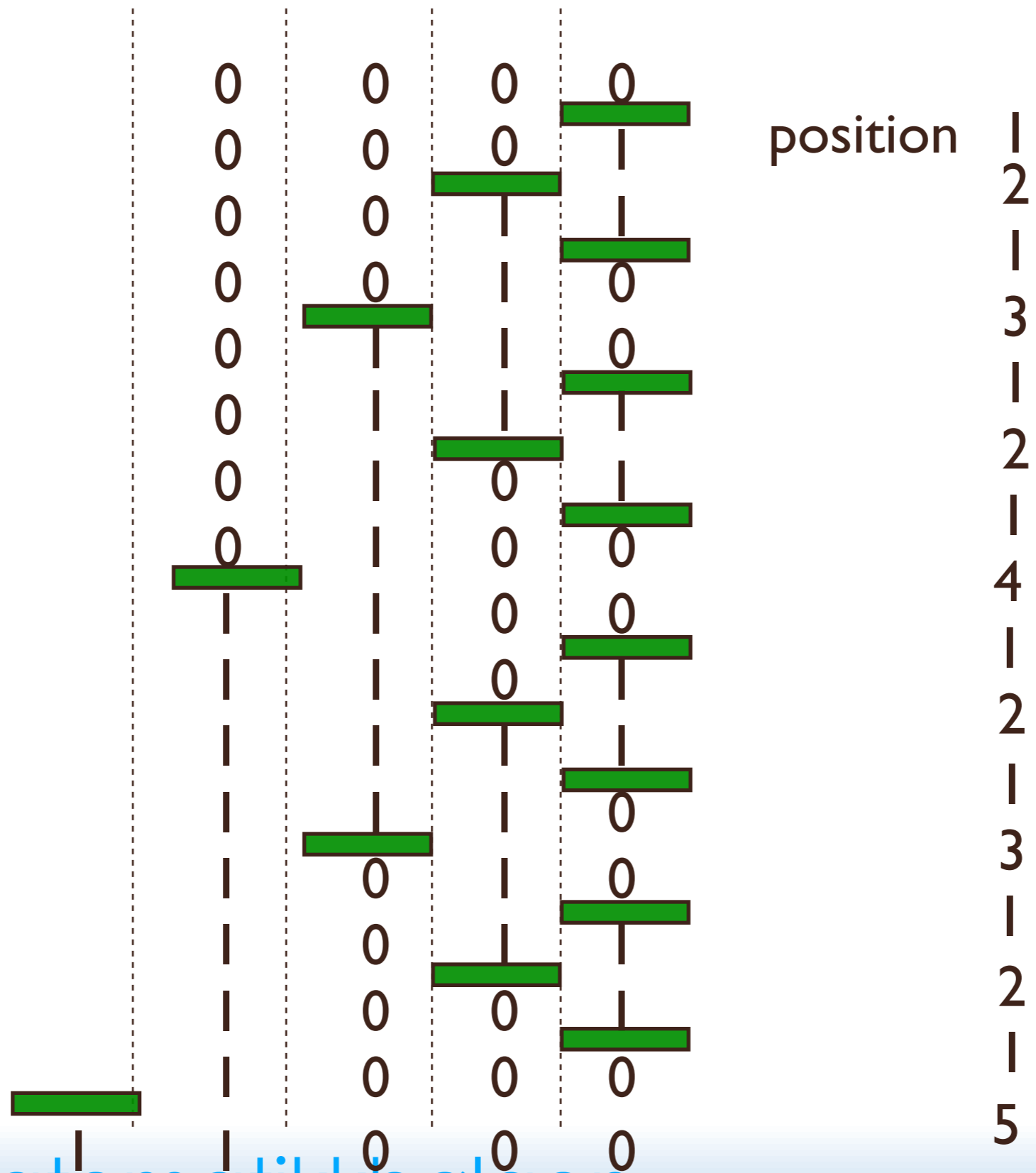
	2^4	2^3	2^2	2^1	2^0	
0					0	
1					1	1
2				1	0	2
3				1	1	2 + 1
4			1	0	0	4
5			1	0	1	4 + 1
6			1	1	0	4 + 2
7			1	1	1	4 + 2 + 1
8		1	0	0	0	8
9		1	0	0	1	8 + 1
10		1	0	1	0	8 + 2
11		1	0	1	1	8 + 2 + 1
12		1	1	0	0	8 + 4
13		1	1	0	1	8 + 4 + 1
14		1	1	1	0	8 + 4 + 2
15		1	1	1	1	8 + 4 + 2 + 1
16	1	0	0	0	0	16





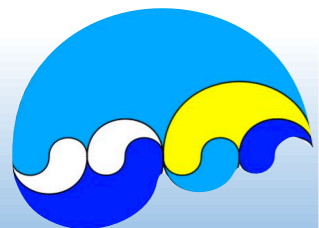


Gray Code

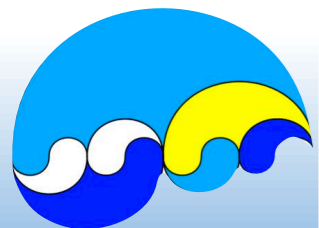
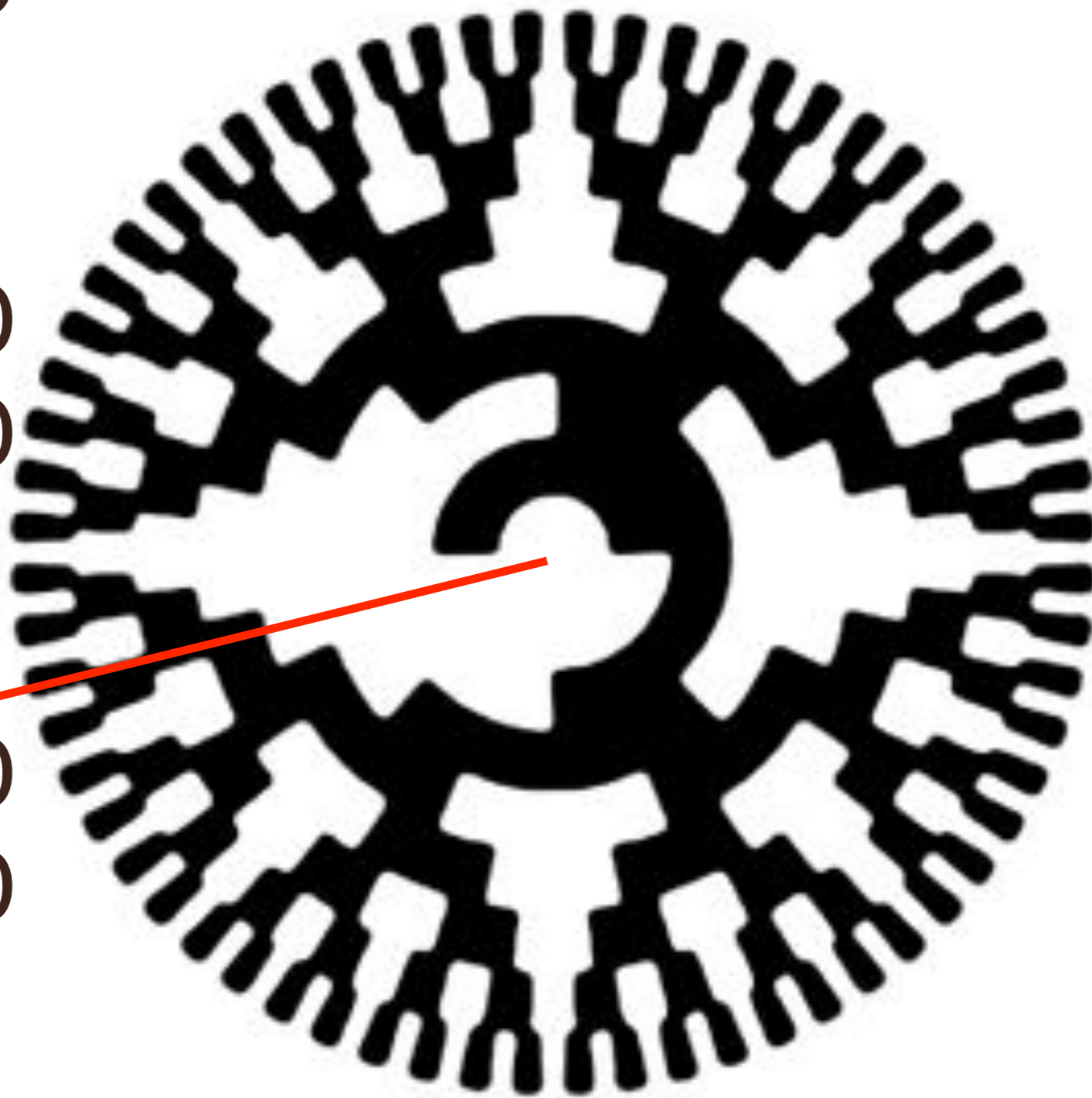


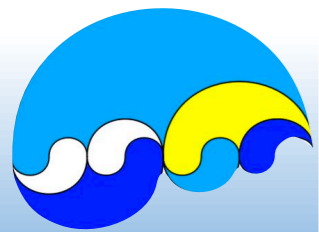
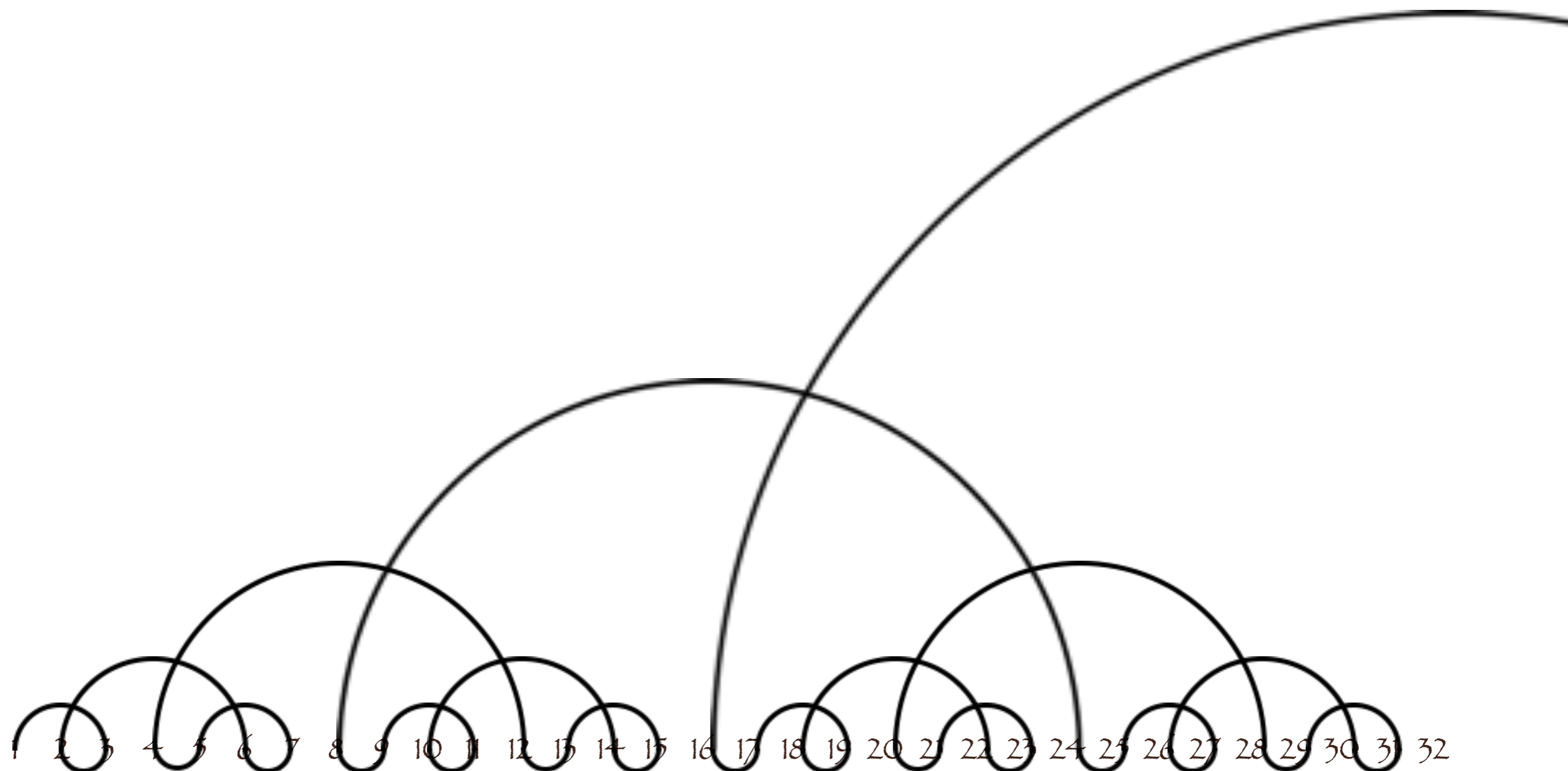
Gray Code

0	0	0	0	= 0
0	0	0	1	1
0	0	1	1	3
0	0	1	0	2
0	1	1	0	6
0	1	1	1	7
0	1	0	1	5
0	1	0	0	4
1	1	0	0	12
1	1	0	1	13
1	1	1	1	15
1	1	1	0	14
1	0	1	0	10
1	0	1	1	11
1	0	0	1	9
1	0	0	0	8
1	0	0	0	24...



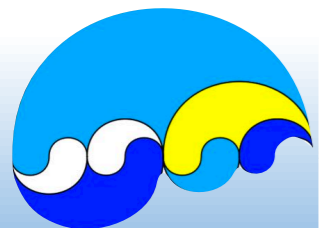
00000000
00000001
00000011
00000010
00000110
00000111
00000101
00000100
00001100
00001101
00001111





Matematikkbølgen

DU KAN BRUKE ABACABA NÅR
DU REISER TIL ANDRE DIMENSJONER...

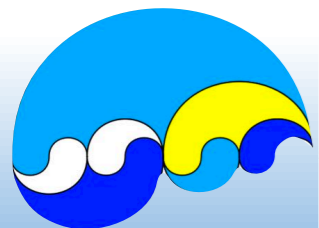


Matematikkbølgen

O-D PUNKT



HØYRE/VENSTRE
"A" RETNING



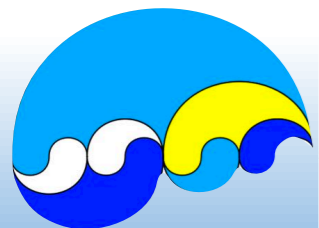
1-D LINJESTREKK



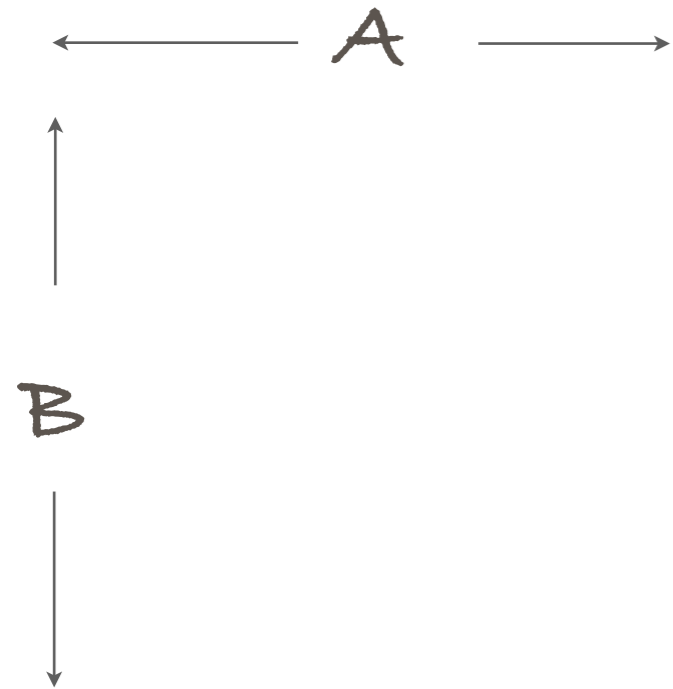
HØYRE/VENSTRE
"A" RETNING



VEIBESKRIVELSE: A

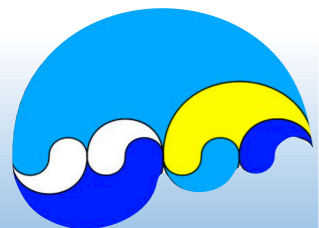
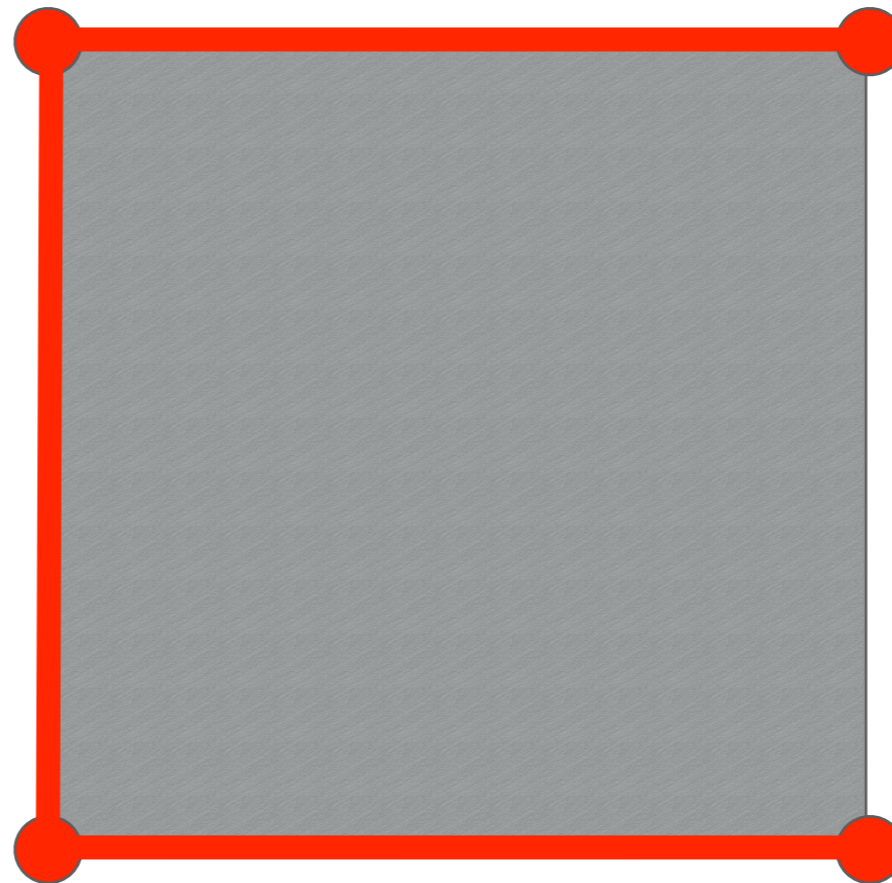


2-D KVADRAT



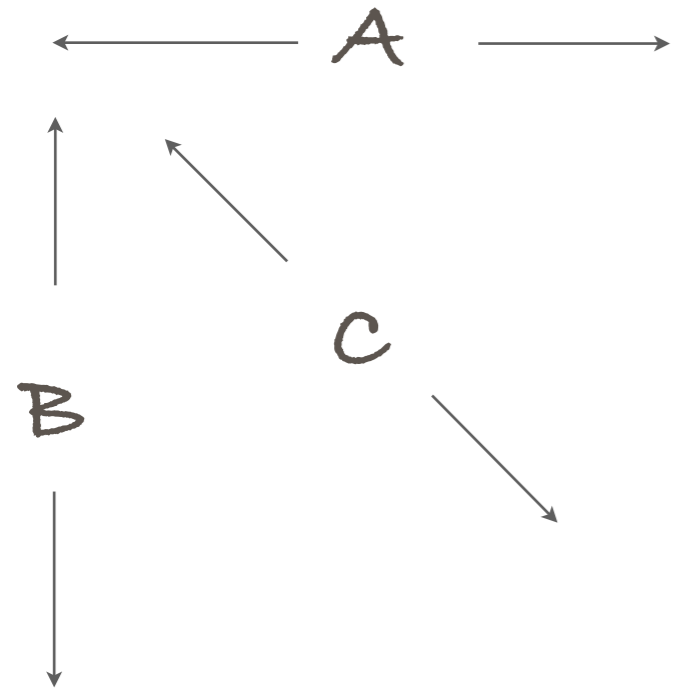
OPP/NED
"B" RETNING

A B A

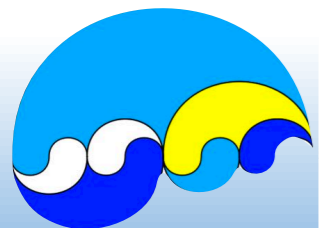
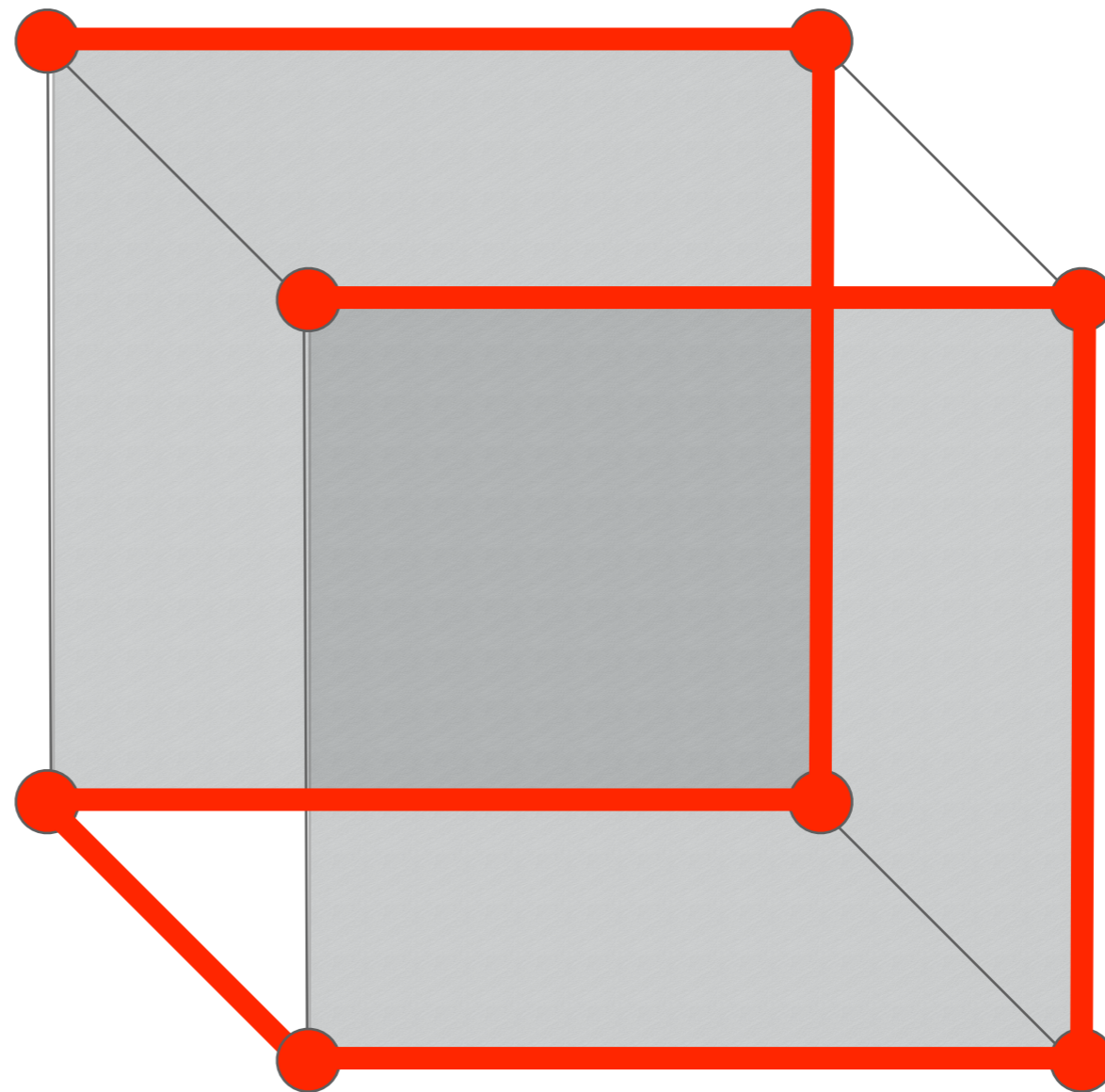


3-D KUBE

A B A C A B A

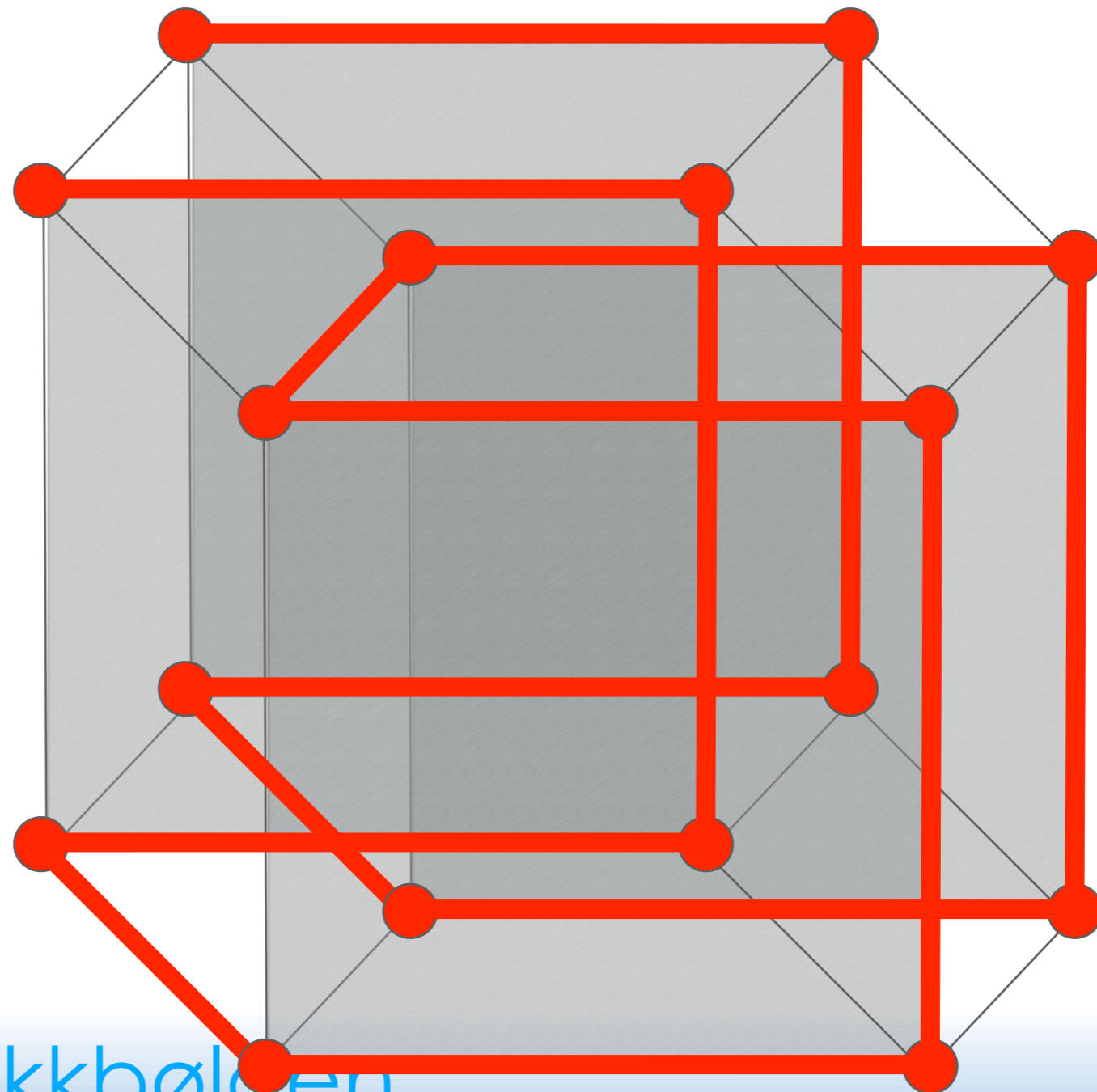
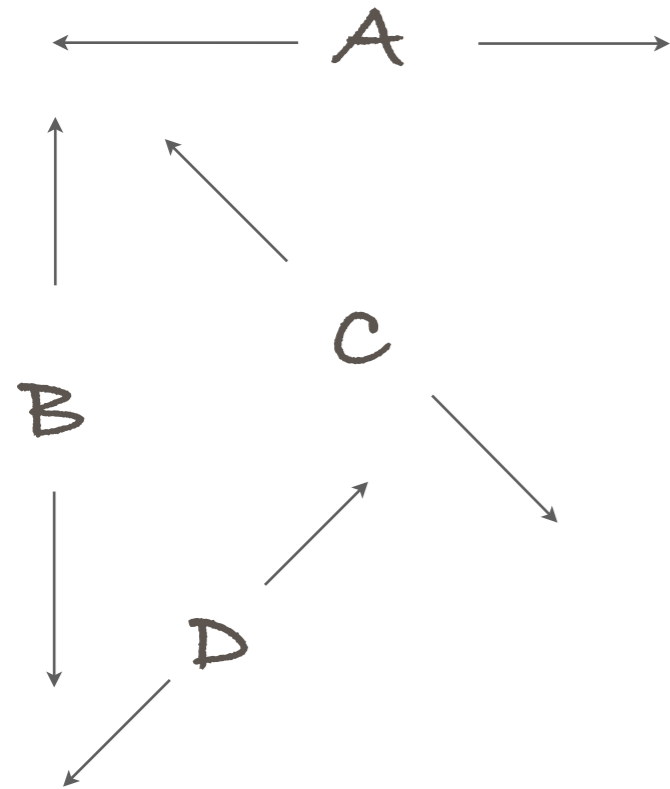


INN/UT
"C" RETNING

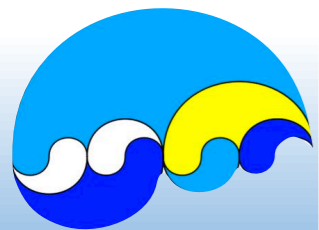


4-D HYPERKUBE

A B A C A B A D A B A C A B A

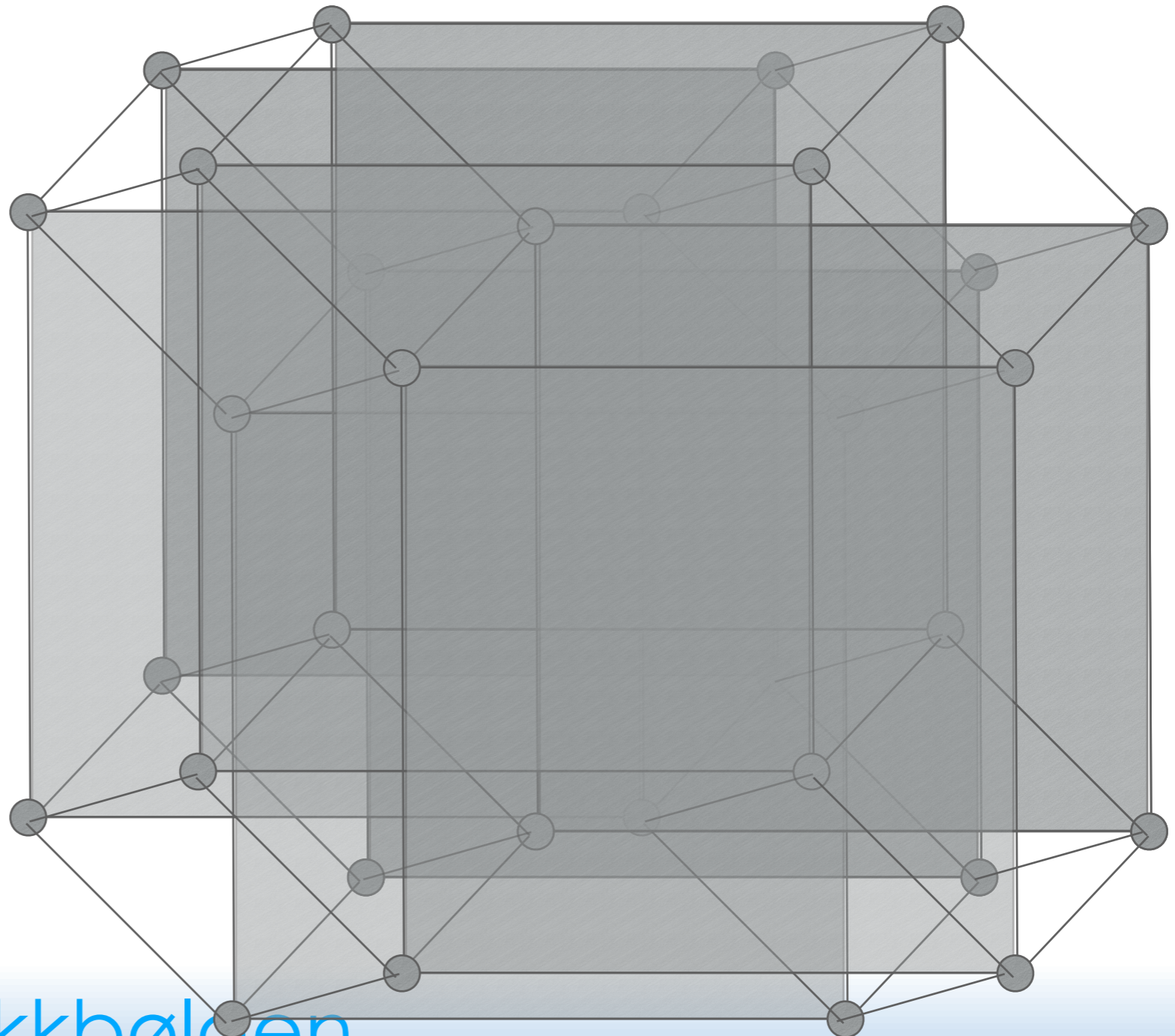
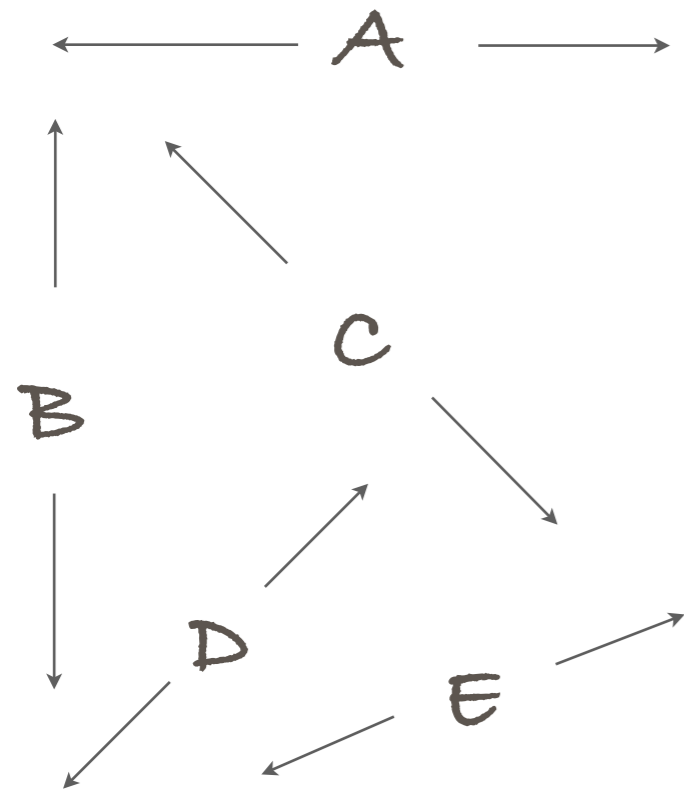


HIT/DIT
"D" RETNING

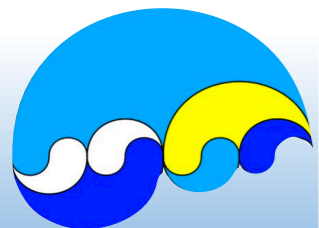


5-D HYPERKUBE

ABACABADABACABAEABACABADABACABA



HER/DER
"E" RETNING



Et mønster kan knyttes til så mange ting!

Leker

Puslespill

Algebra

Magiske ord

Geometri

Fraktaler

Høyere dimensjoner

Natur

Tallsystemer

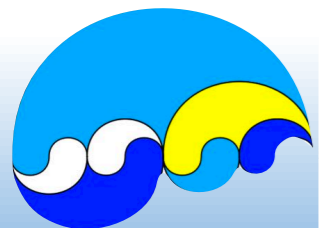
Kunst

Musikk

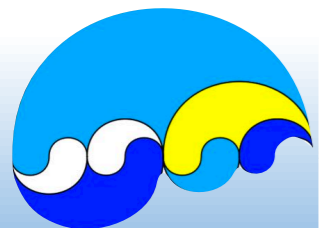
Litteratur

Poesi

Filosofi



Hva kan andre mønstre gjøre?

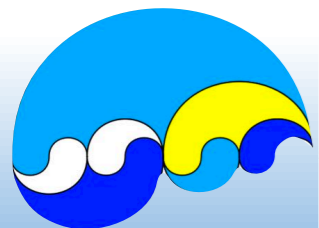


Notater, nedlaster, musikk osv:
www.abacaba.org

mikeNaylor

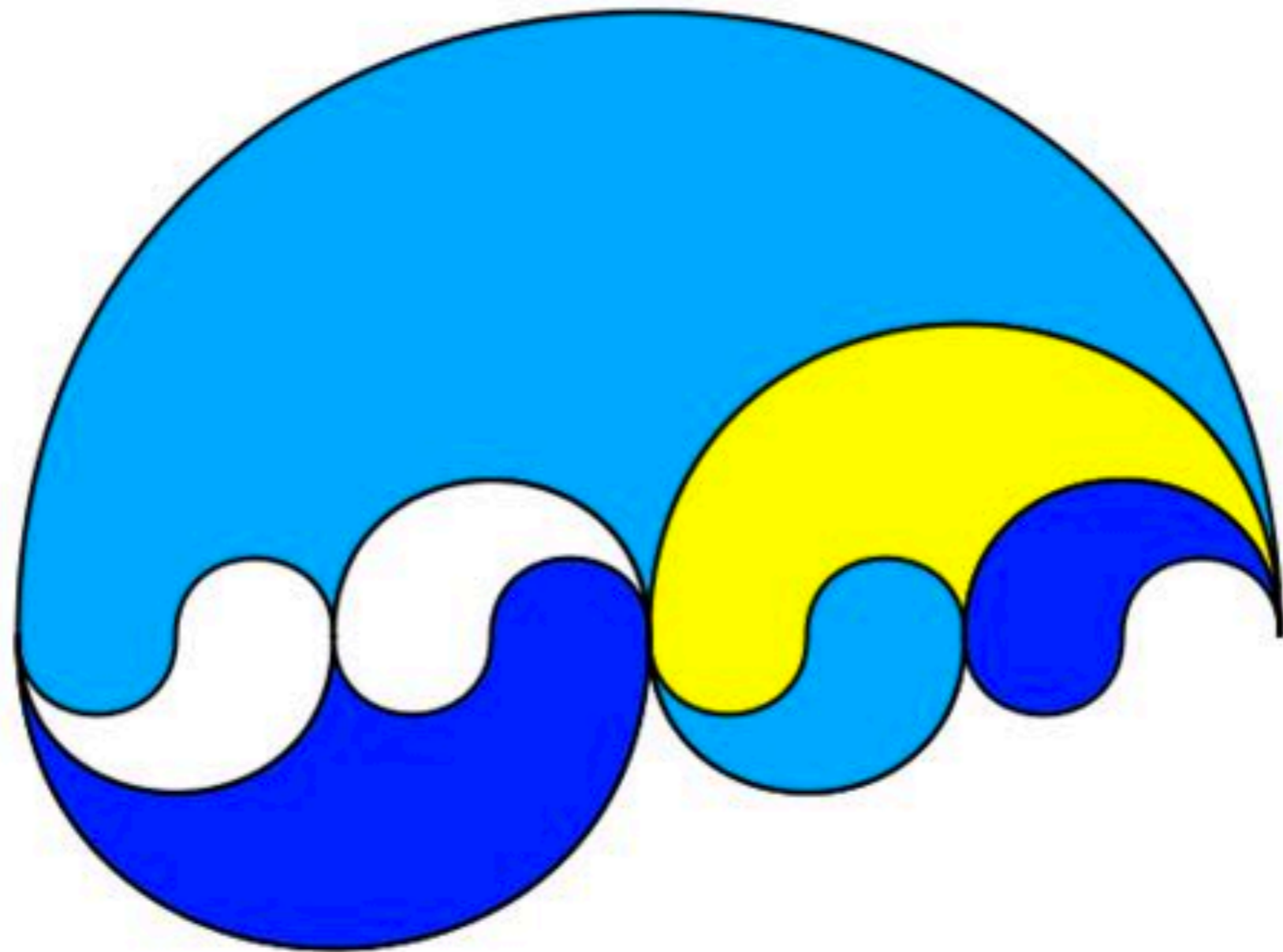
mike@matematikkbolgen.com

Like oss på Facebook!

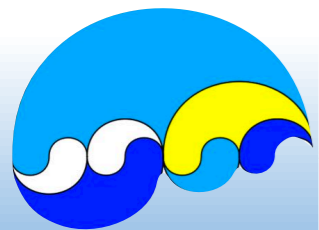


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