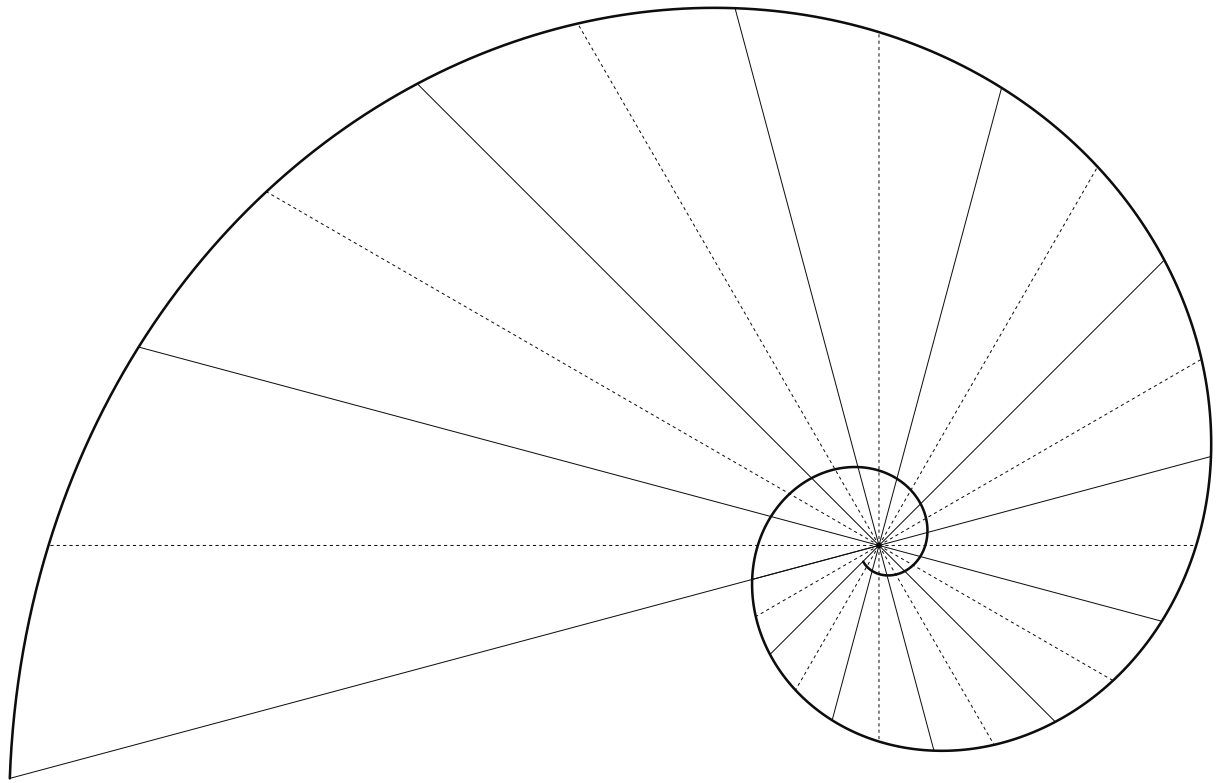
Spira Mirabilis

Carlos Luna Mota



mmaca

Les matemàtiques són útils...

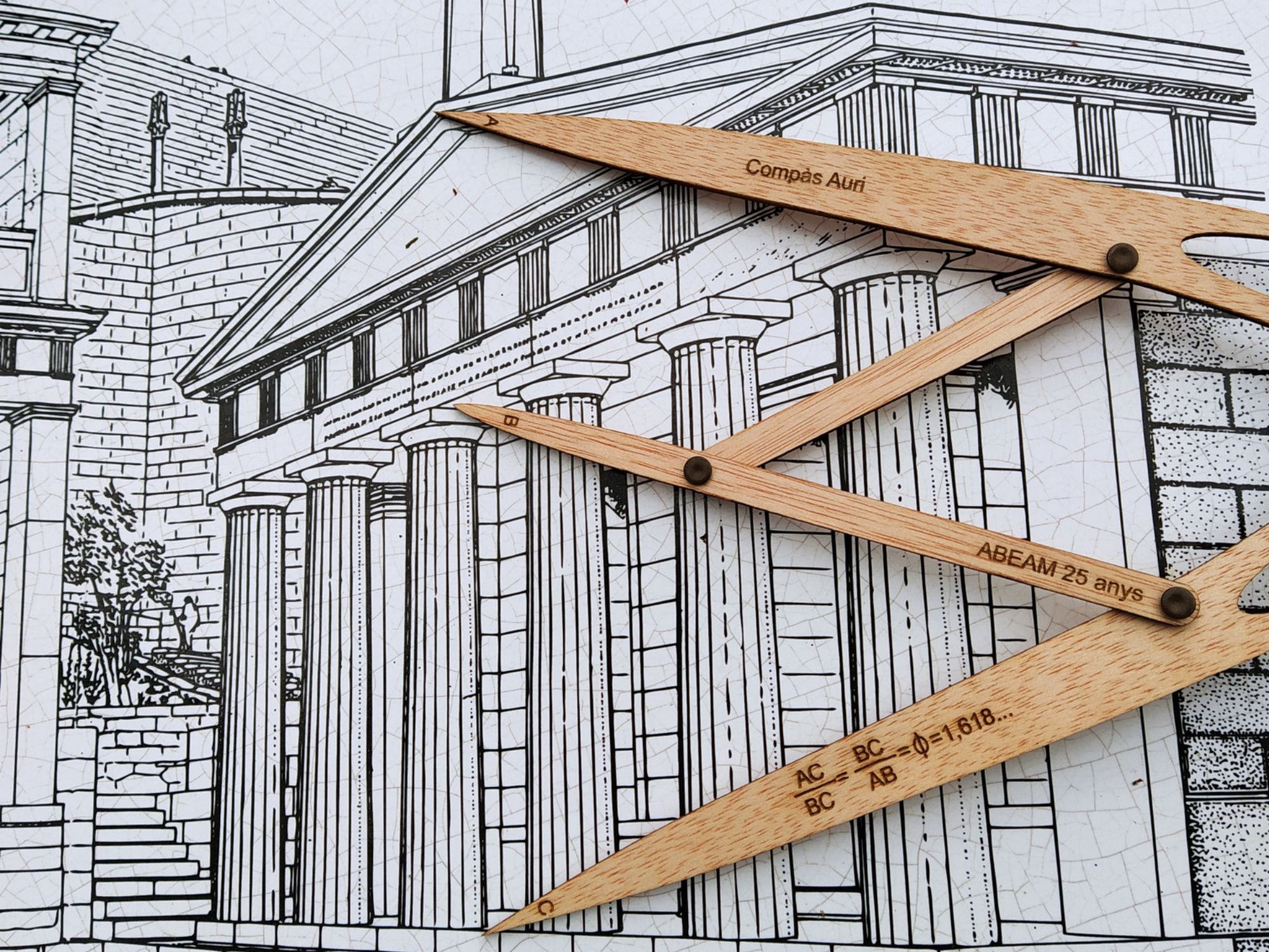
I què?

Sorpresa $\Rightarrow$ **Intriga** $\Rightarrow$ **Satisfacció**

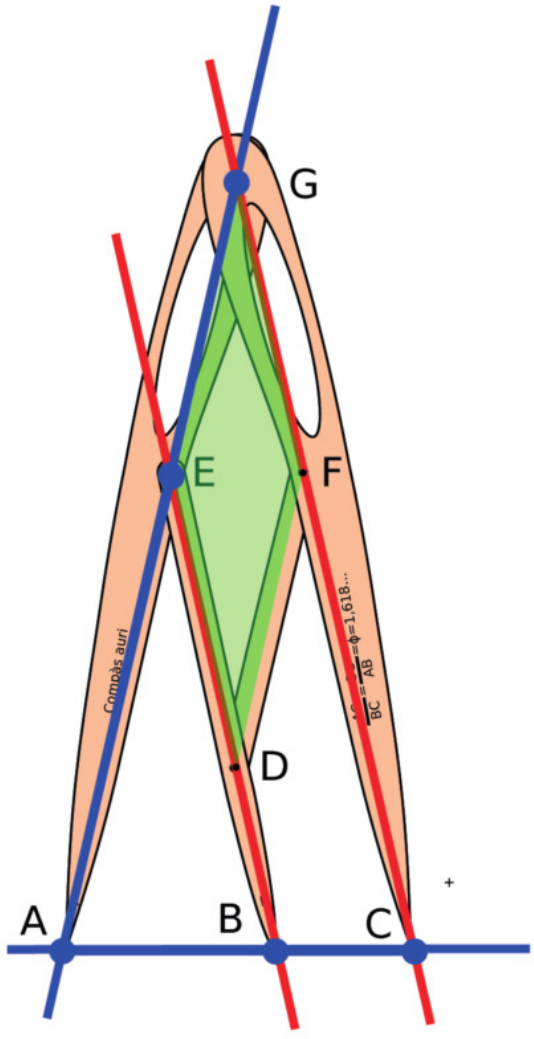
Les matemàtiques són emocionants!


A
Compàs Auri
B
ABEAM 25 anys
C
$\frac{AC}{BC} = \frac{BC}{AB} = \phi = 1{,}618...$


A
B
C


A
Compàs Auri
B
ABEAM 25 anys
C
$\frac{AC}{BC} = \frac{BC}{AB} = \phi = 1{,}618...$

El projecte STEAM perfecte!



Ciència ✓

Tecnologia ✓

Enginyeria ✓

Art ✓

Matemàtiques ✓

En massa projectes STEAM... I'M és muda!

Però...

A

B

C

CatSalut

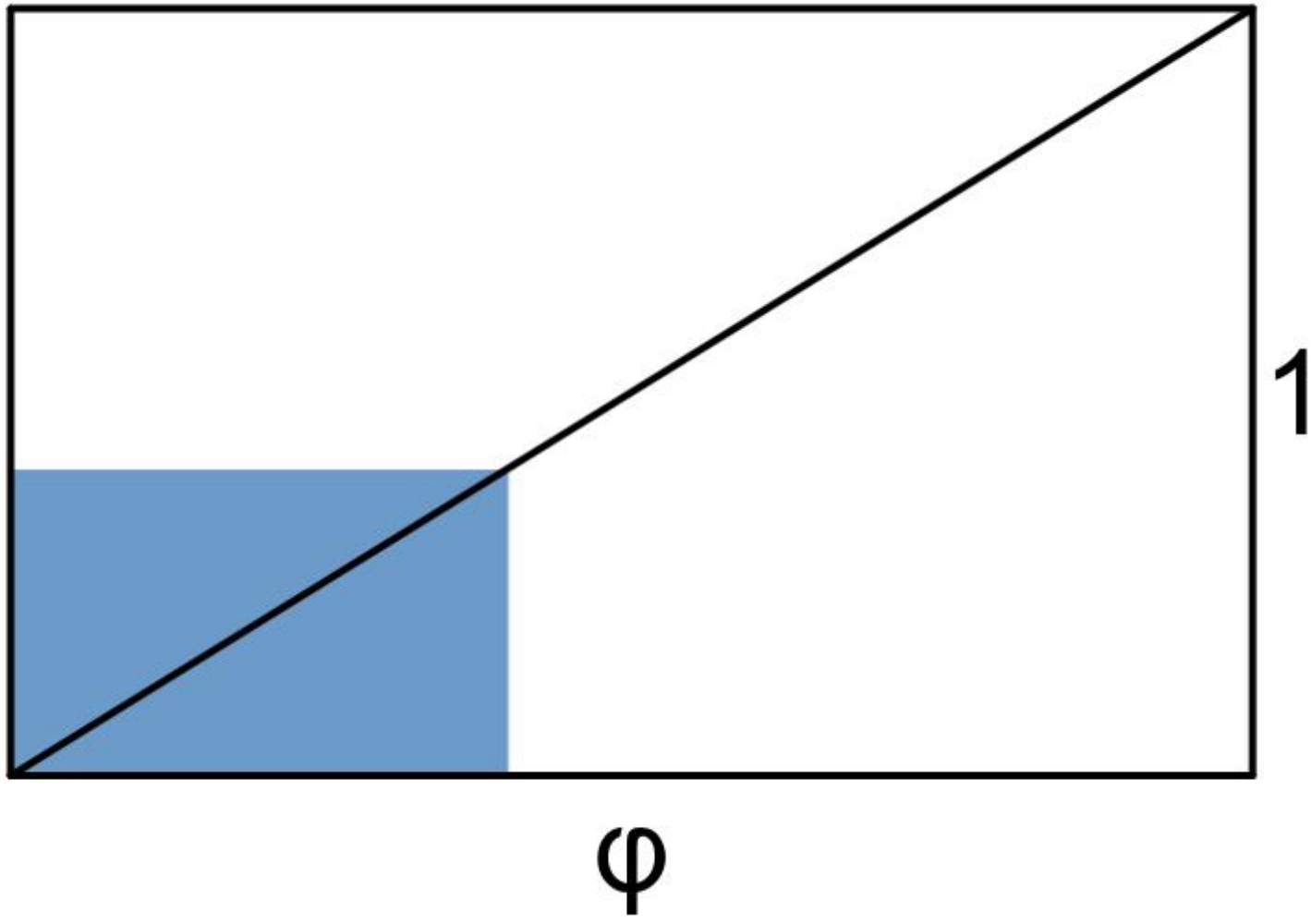
Servei Català de la Salut

Generalitat de Catalunya

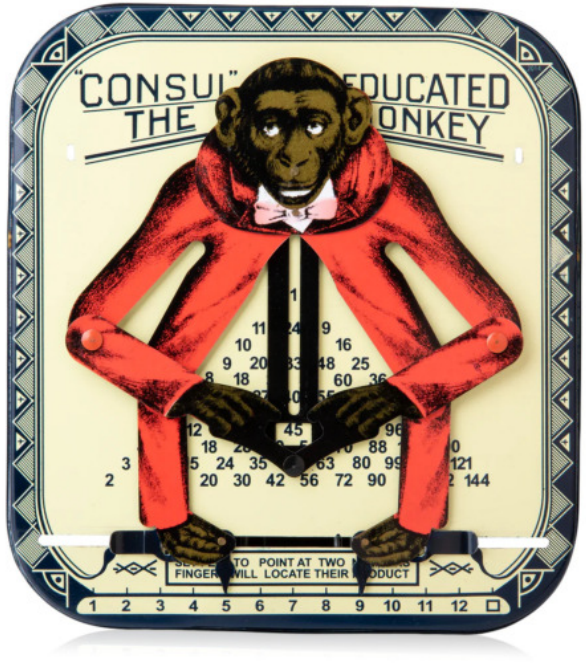
Departament de Salut

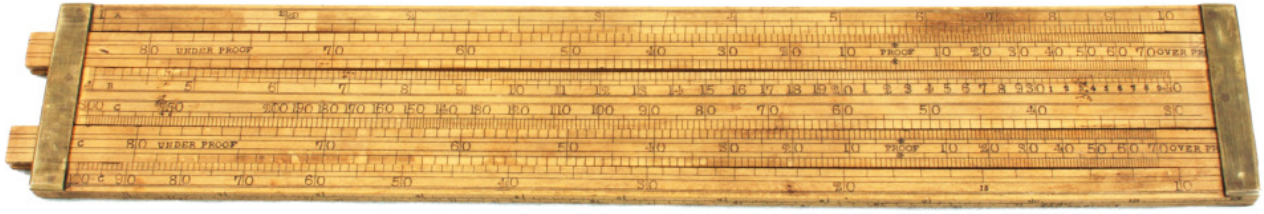
VISA

La solució que no va emocionar ningú...

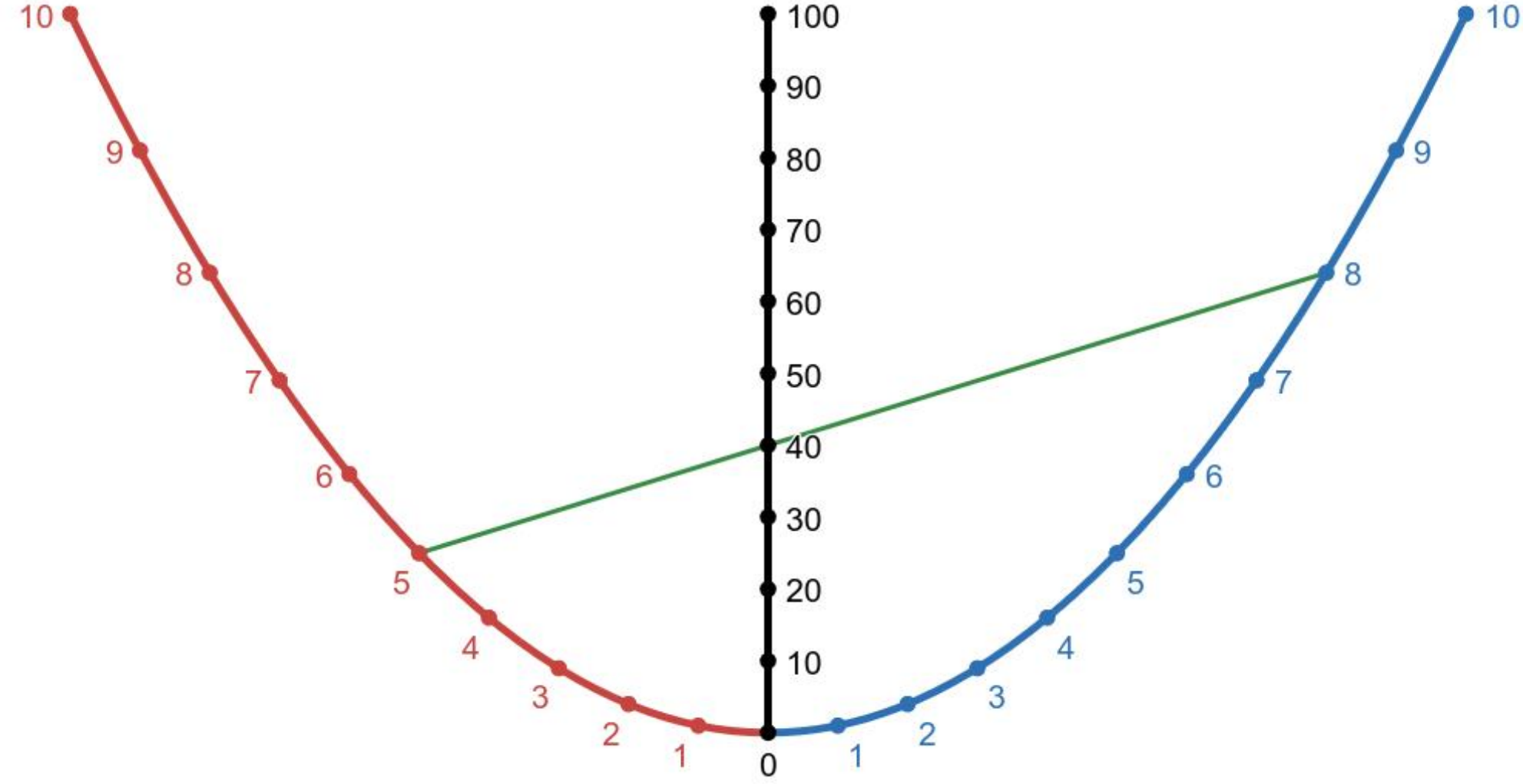


Instruments de càlcul analògics



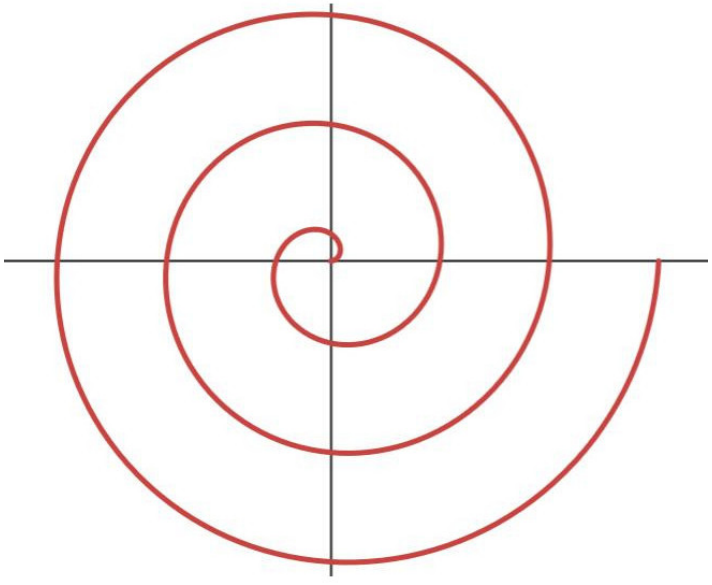


Nomogrames



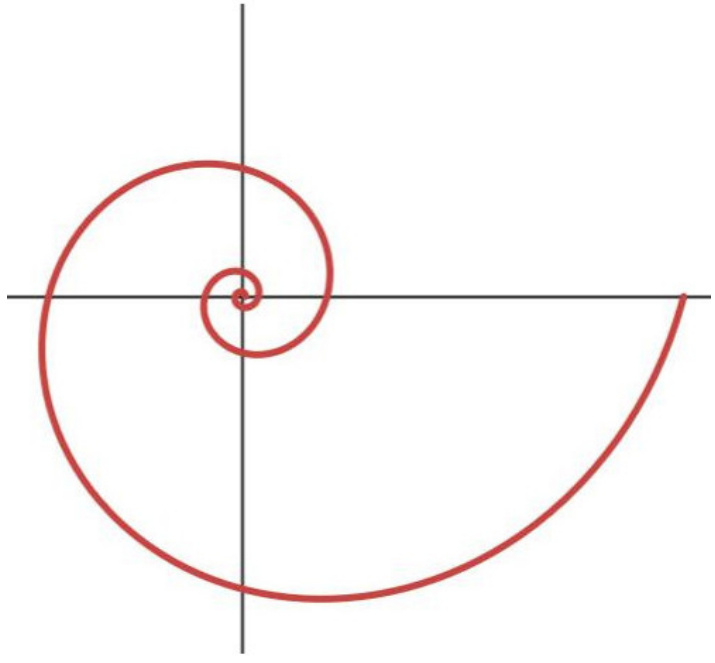
Dues espirals que calculen

D'Arquimedes



$$r = \lambda \cdot \alpha$$

Logarítmica



$$r = \lambda^{\alpha}$$

Dues espirals que calculen

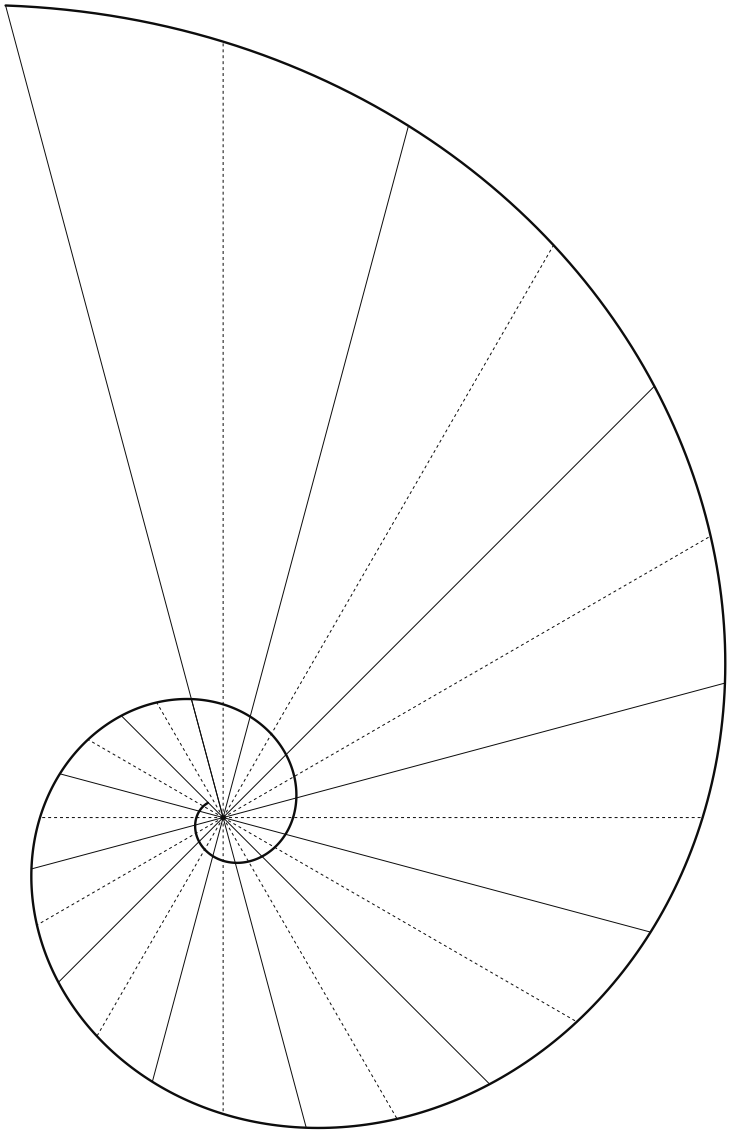
D'Arquimedes

$$r = \lambda \cdot \alpha$$

Logarítmica

$$r = \lambda^{\alpha}$$

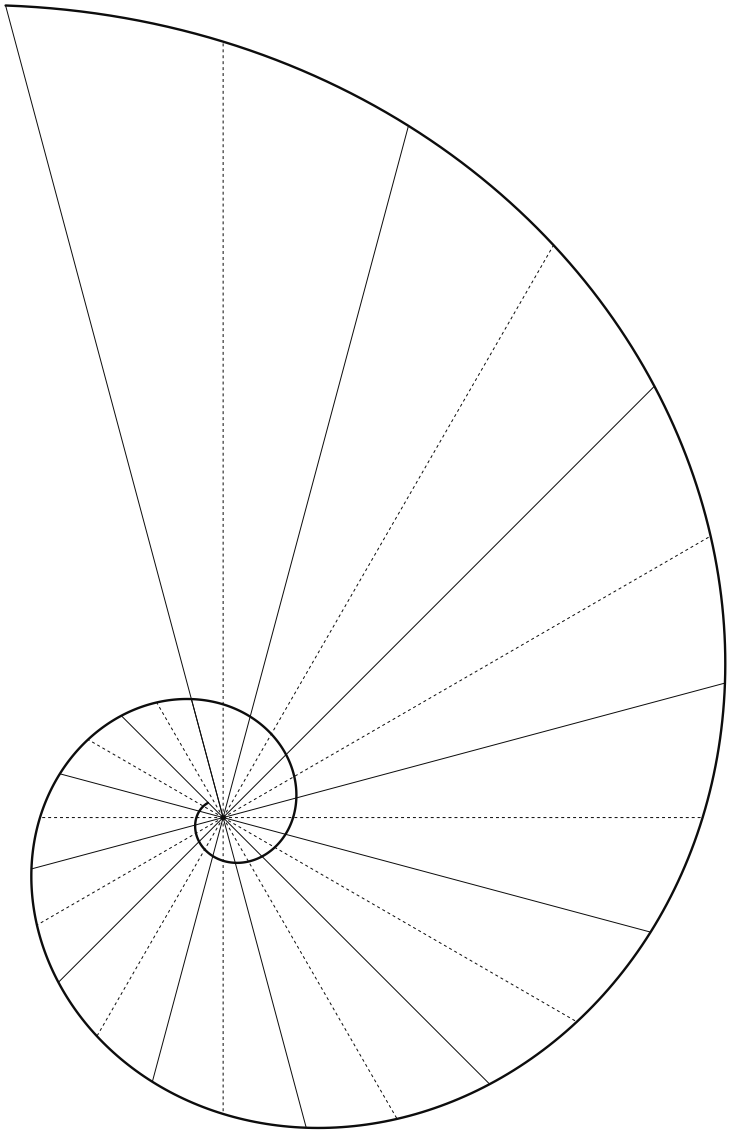
Spira Mirabilis!



Història:

- Descrita per **Albrecht Dürer** (1525)
- Estudiada per **René Descartes** (1638)
- Batejada com *Spira Mirabilis* per **Jakob Bernoulli** (1692)

Spira Mirabilis!



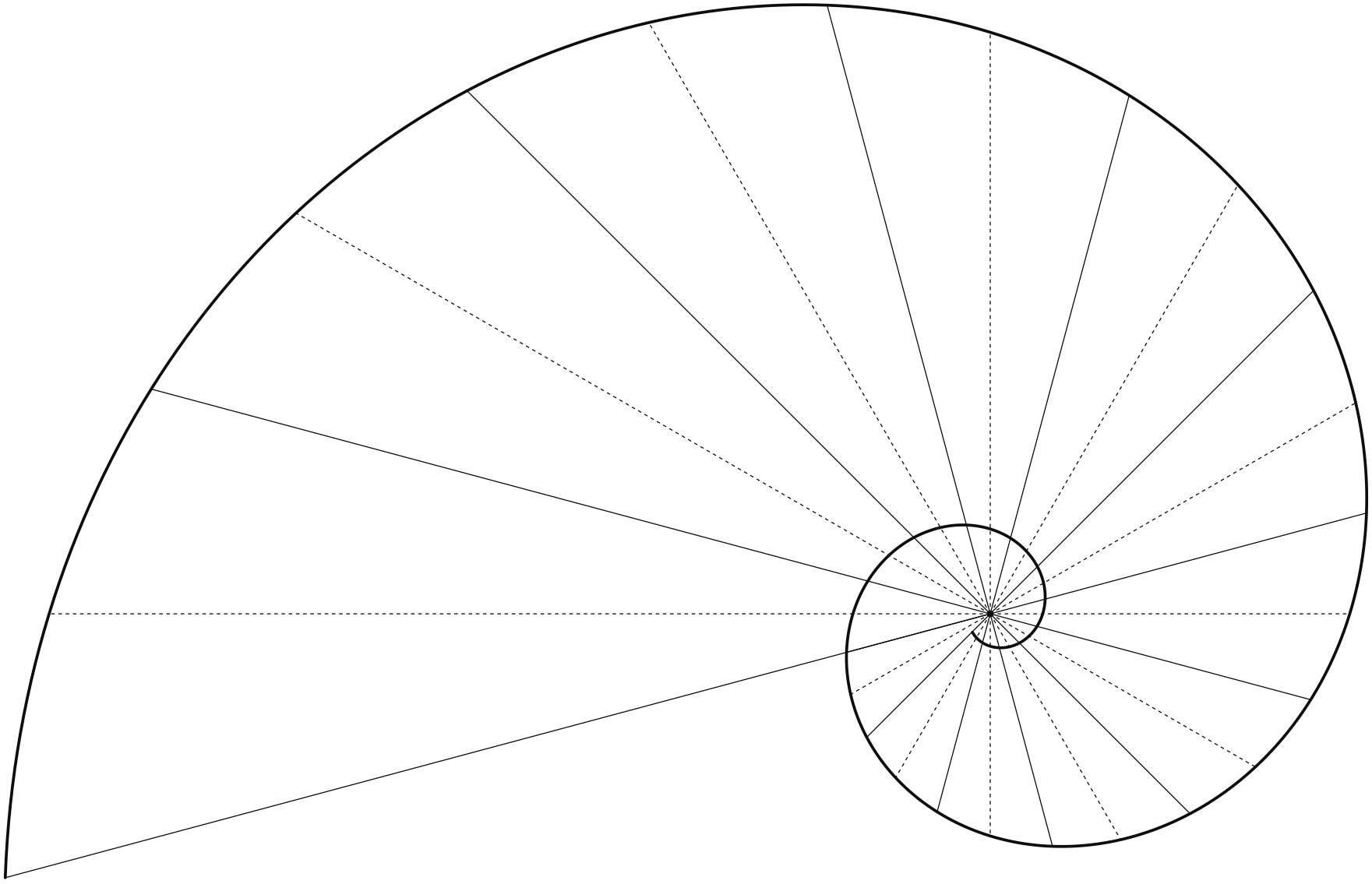
Propietats:

- Té un **centre**,
  però no hi arriba mai!
- **Angle constant**
  entre tangents i radis
- **Rotació** $=$ **Semblança**

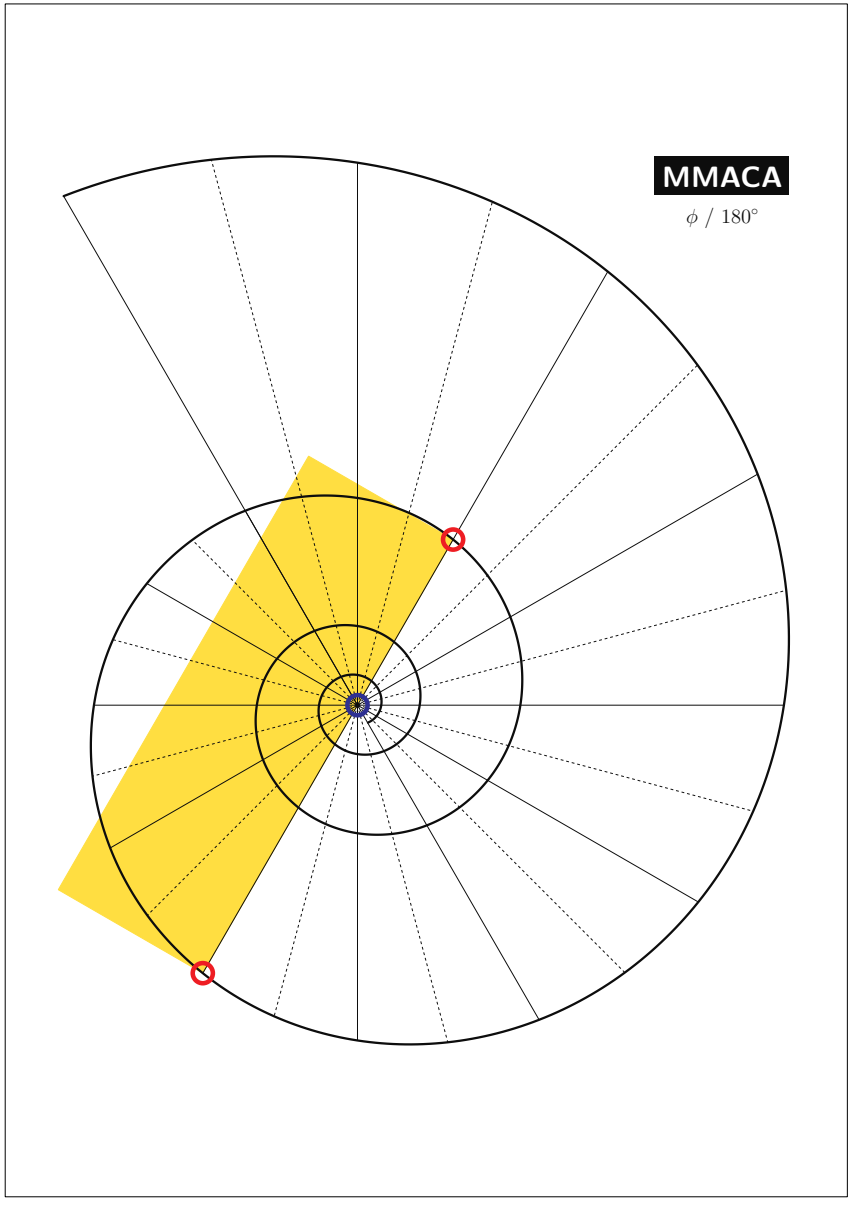

C. S.
IACOBUS BERNOULLI
MATHEMATICUS INCOMPARABILIS
ACAD. BASIL.
VLTRA XVIII. ANNOS PROF.
ACADEM. ITEM REGIÆ PARIS. ET BEROLIN.
SOCIUS
EDITIS LUCUBRAT. INLUSTRIS.
MORBO CHRONICO
MENTE AD EXTREMUM INTEGRA
ANNO SAL. CIↃIↃCCV. D. XVI AUGUSTI
ÆTATIS L.M.VII.
EXTINCTUS
RESURRECT. PIOR. HIC PRÆSTOLATUR
IUDITHA STUPANA
XX ANNOR. VXOR
CUM DUOBUS LIBERIS
MARITO ET PARENTI
EHEU DESIDERATISS.
H. M. P.
RESURGO EADEM MUTATA

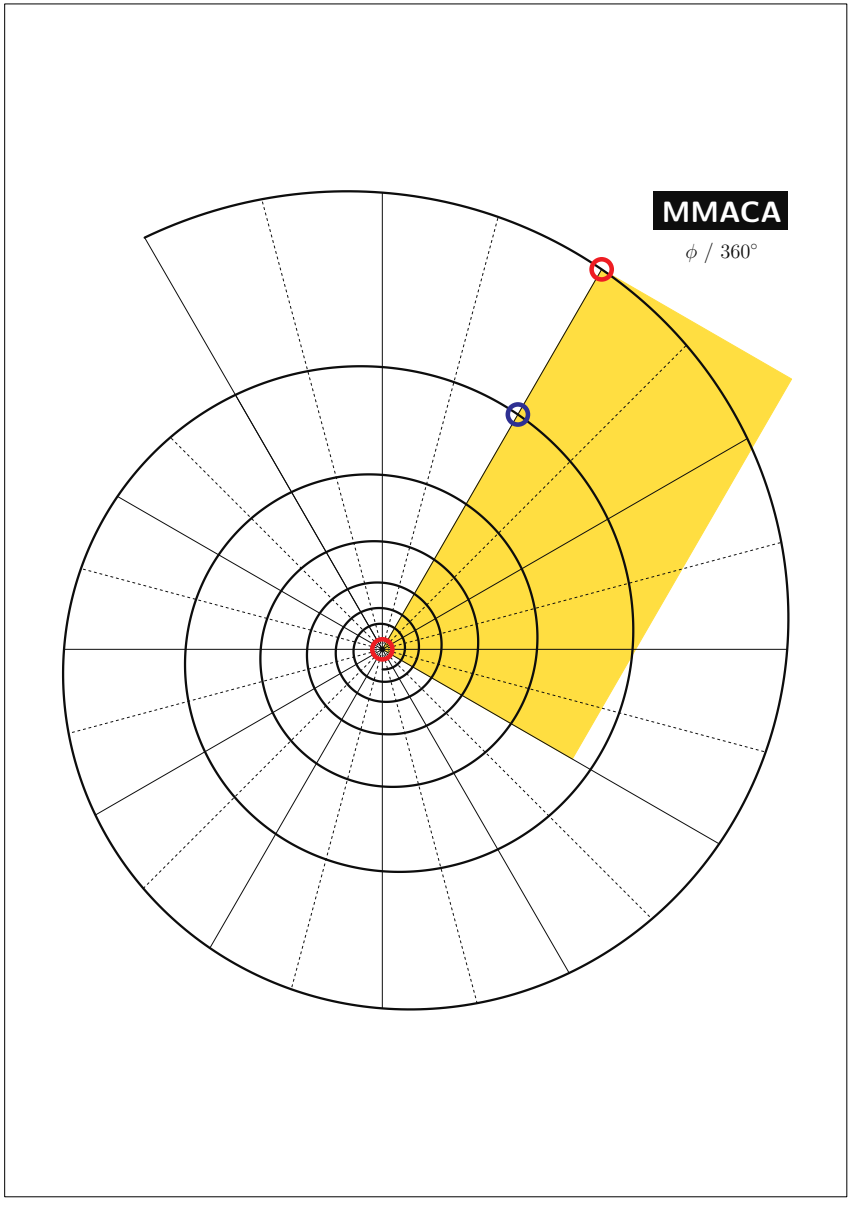

RESURGO EADEM MUTATA

Spira Mirabilis!

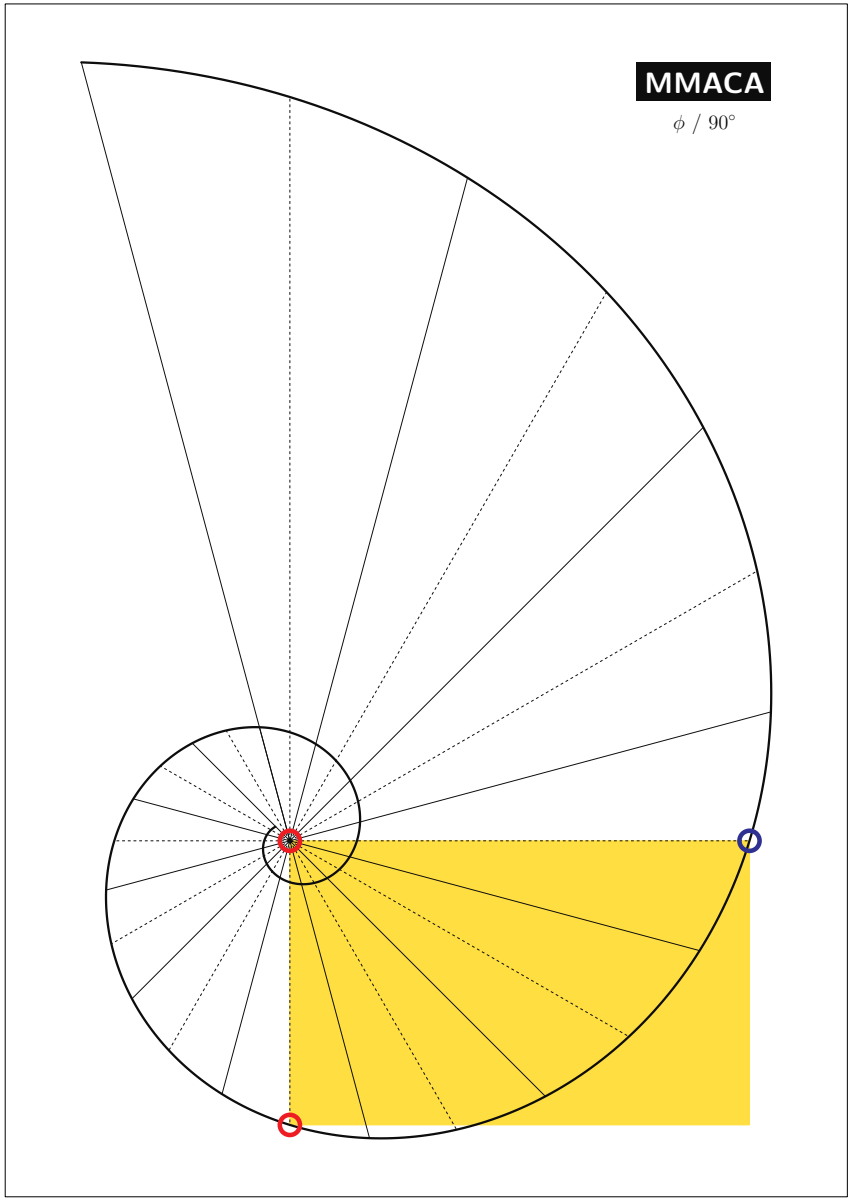


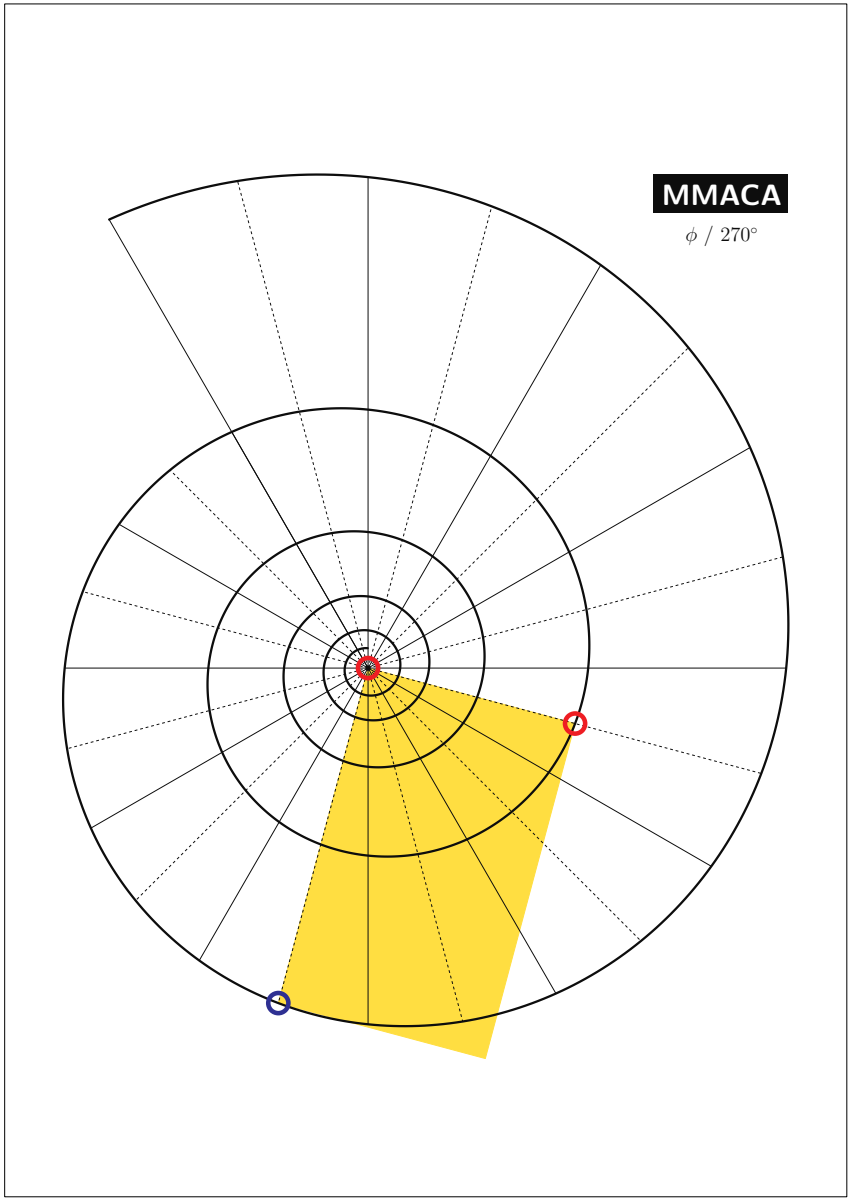
Espirals ϕ / 180° i ϕ / 360°



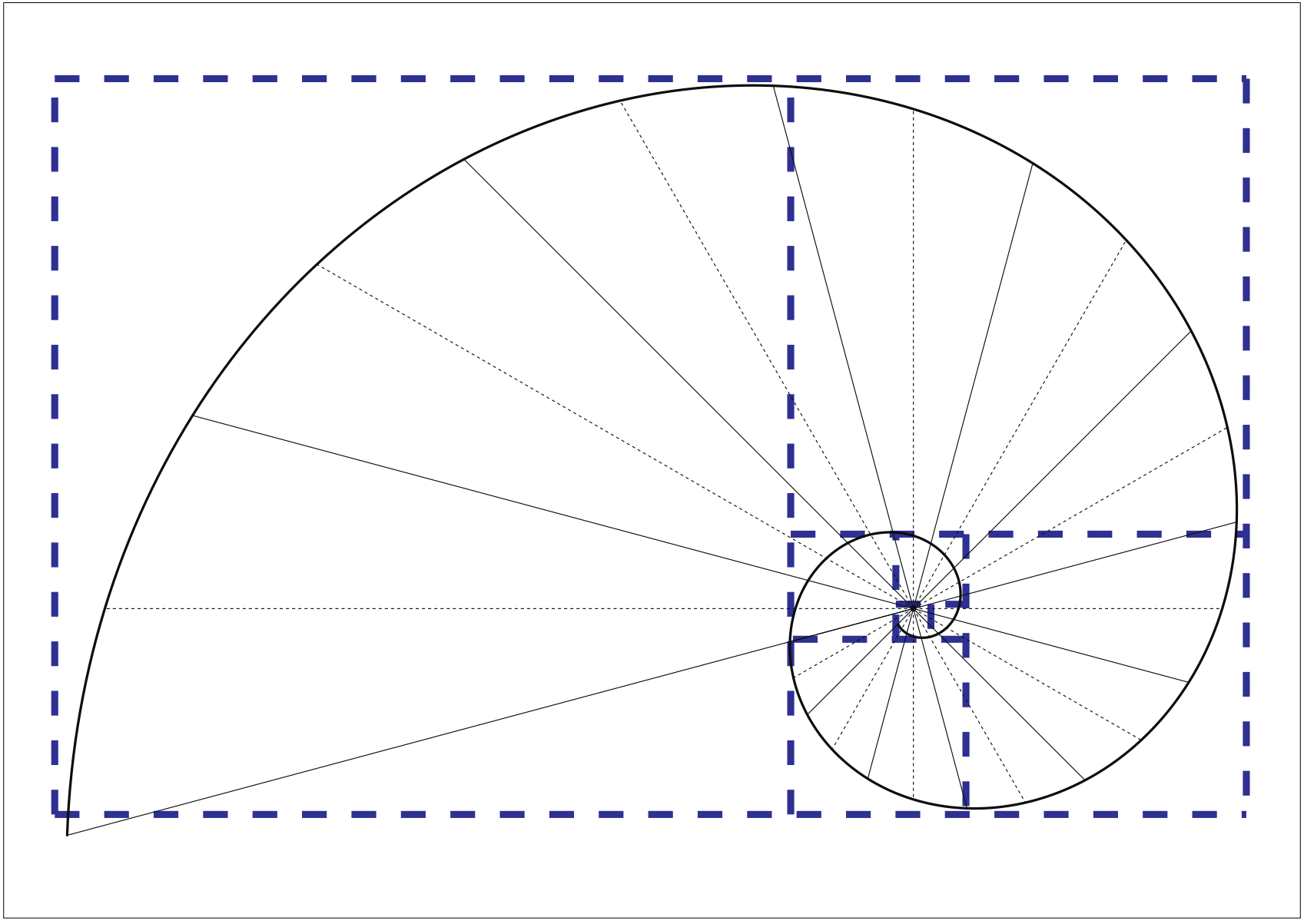


Espirals ϕ / 90° i ϕ / 270°

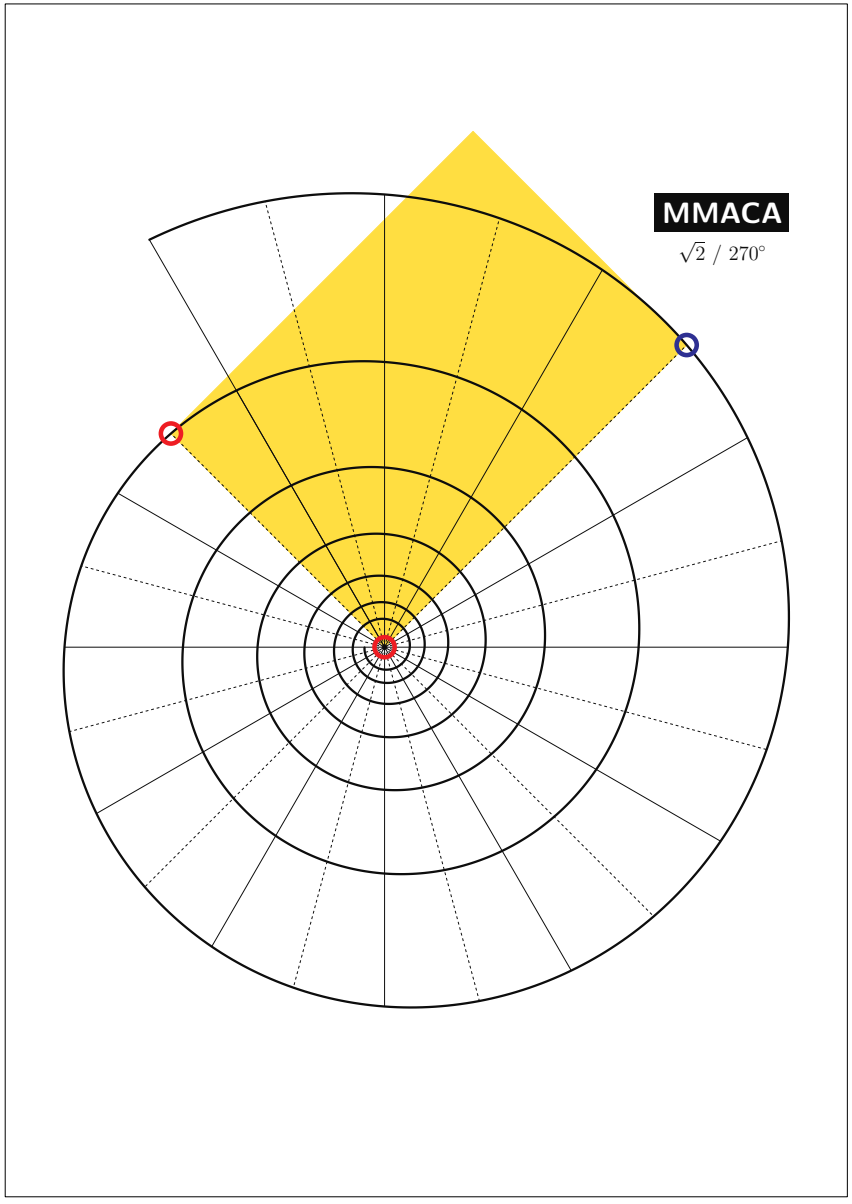


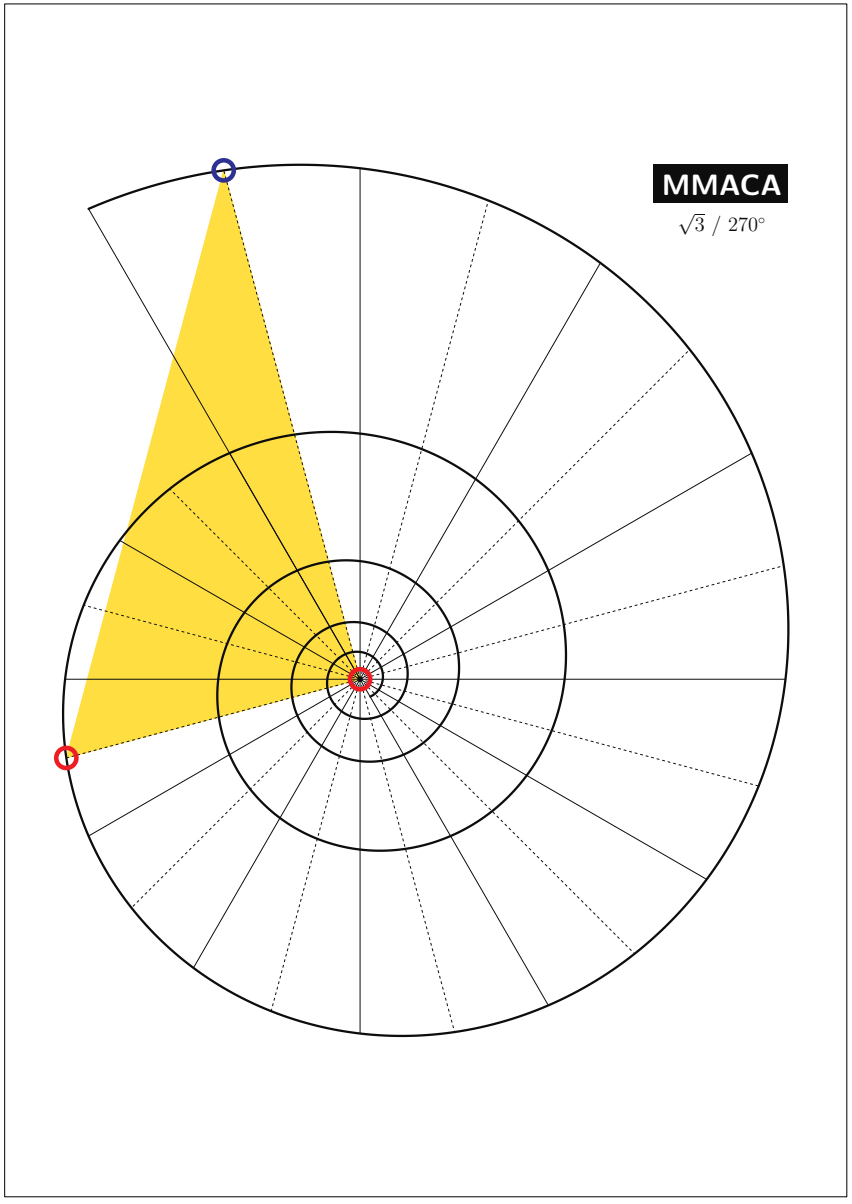


Espiral de Fibonacci $\approx$ Espiral ϕ / 90°

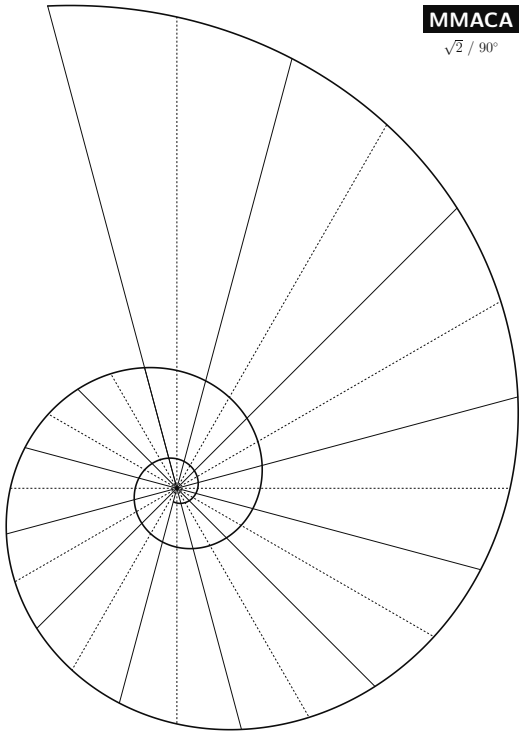


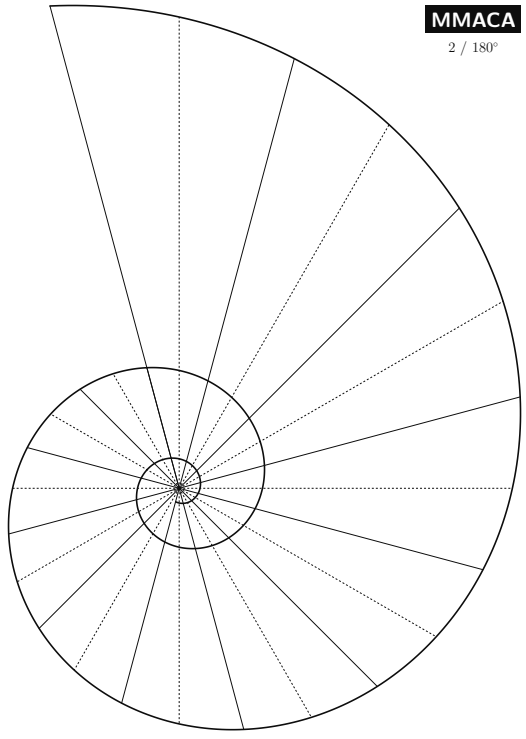
Espiral $\sqrt{2}$ / 270° i $\sqrt{3}$ / 270°

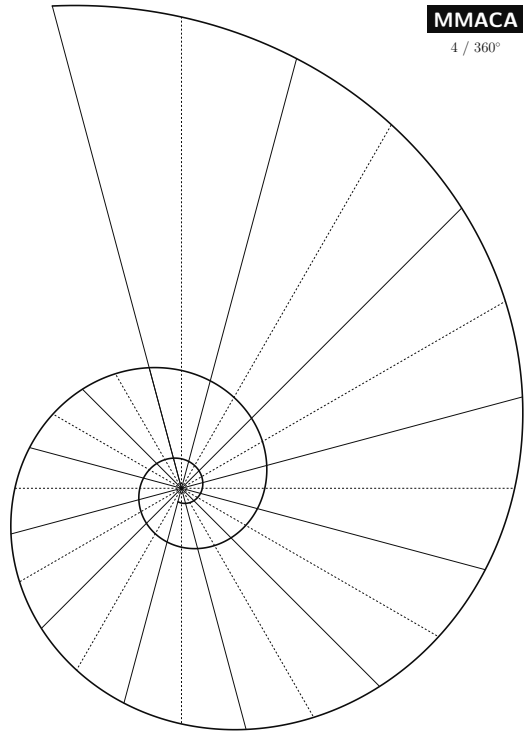




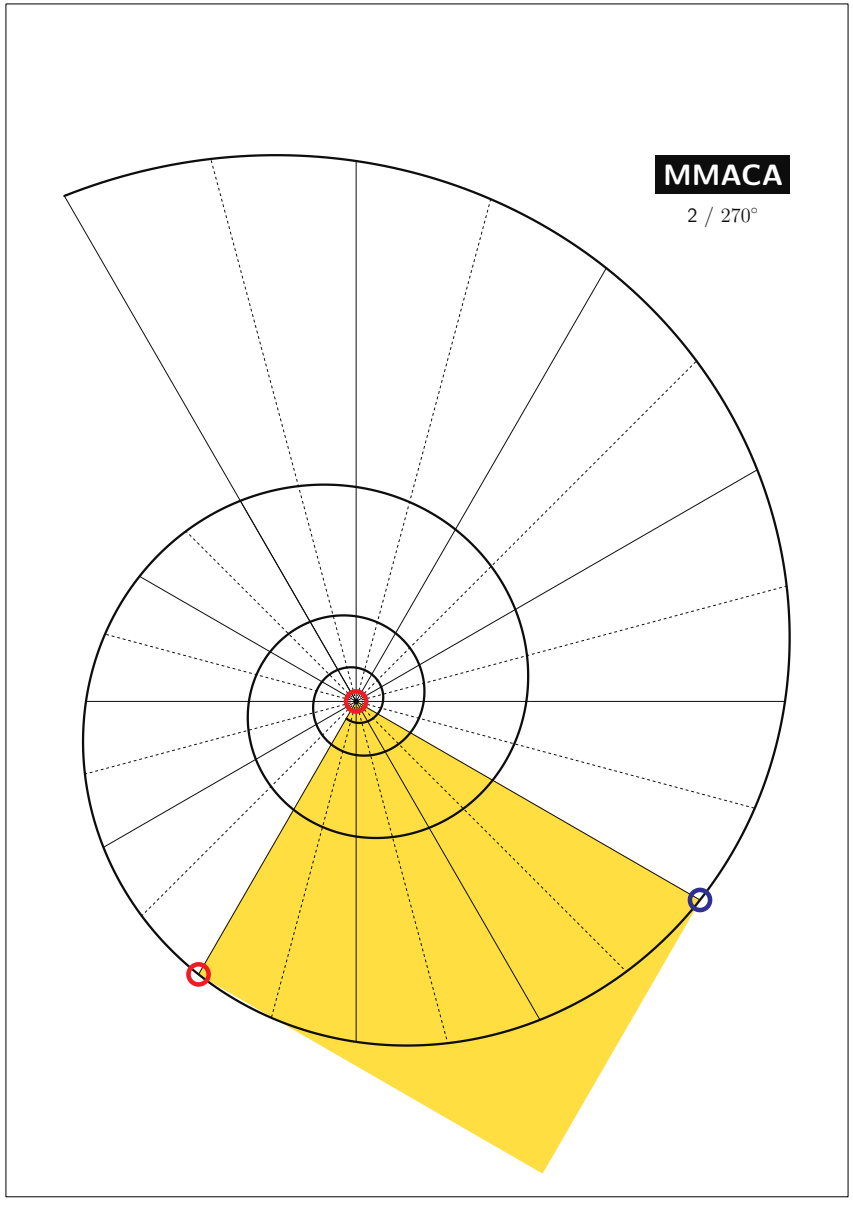
$\sqrt{2}$ / 90° = 2 / 180° = 4 / 360°

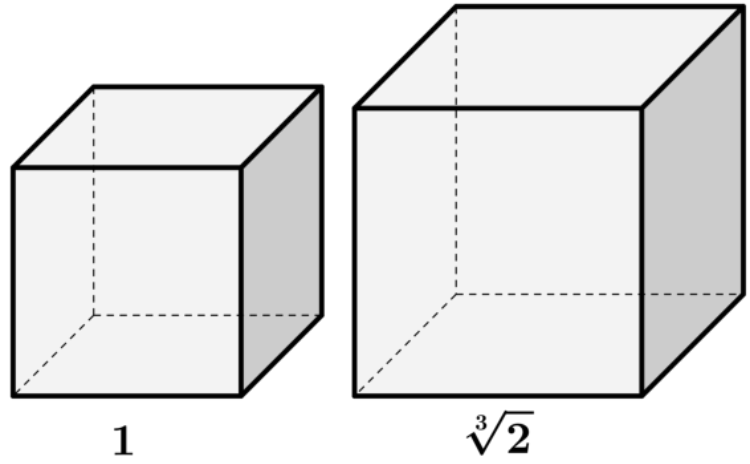






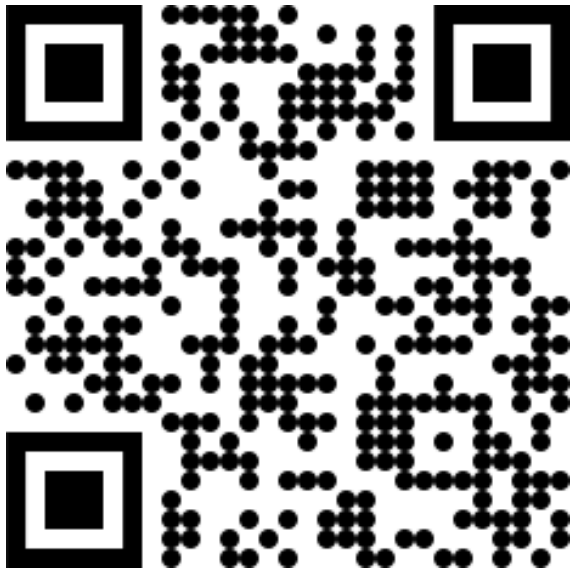
Duplicació del cub amb l'espiral 2 / 270°





Gràcies per la vostra atenció!

Alguna pregunta?



https://github.com/CarlosLunaMota/Spira-Mirabilis