
Proportional systems

The Golden Mean

- The Golden Mean is a ratio which has fascinated generation after generation, and culture after culture.
- Also known as:
 - The Golden Ratio
 - The Golden Section
 - The Golden Rectangle
 - The Golden Number
 - The Golden Spiral
 - Or the Divine Proportion

The Golden Mean

- The **golden ratio** is 1:1.618034
- It is often represented by a Greek letter **Phi** Φ .

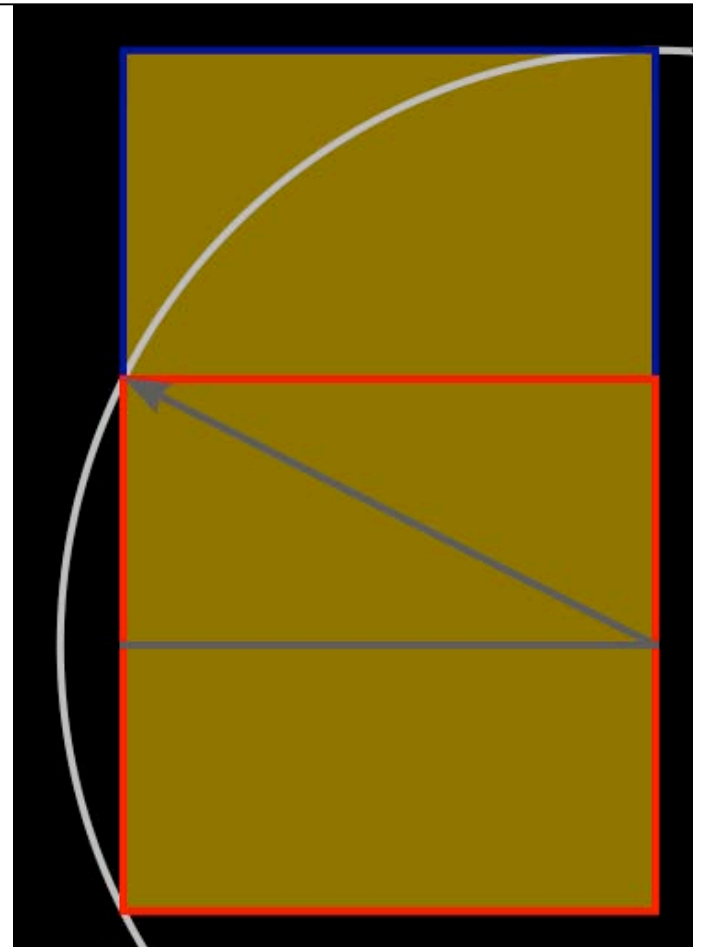
The Fibonacci numbers

- **0, 1, 1, 2, 3, 5, 8, 13, ...**
- (add the last two to get the next)

- follow golden ratio

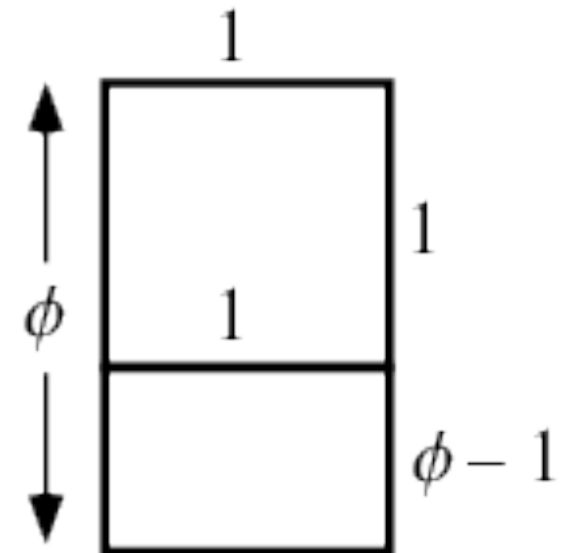
Construction

1. Construct a simple square
2. Draw a line from the midpoint of one side of the square to an opposite corner
3. Use that line as the radius to draw an arc that defines the height of the rectangle
4. Complete the golden rectangle

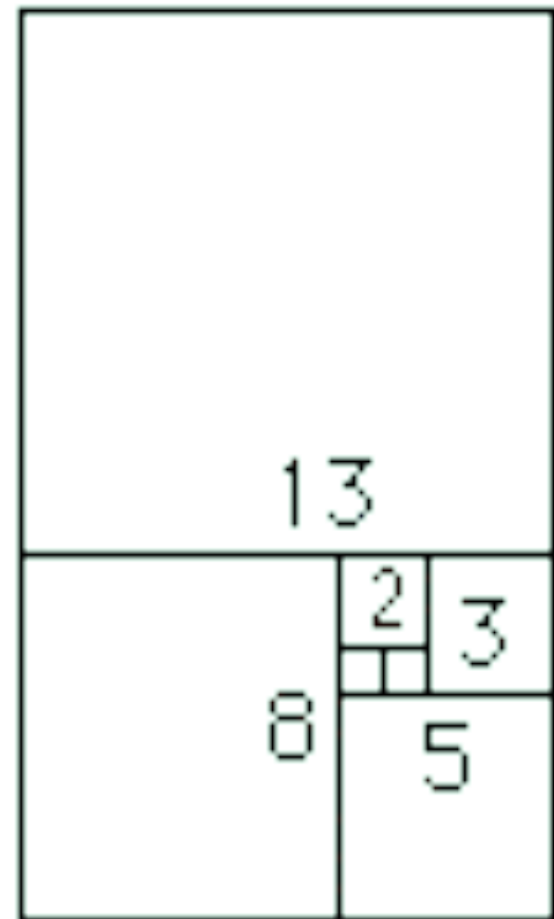


A distinctive feature of this shape is that

- when a square section is removed,
- the remainder is another golden rectangle;
- that is, with the same proportions as the first.

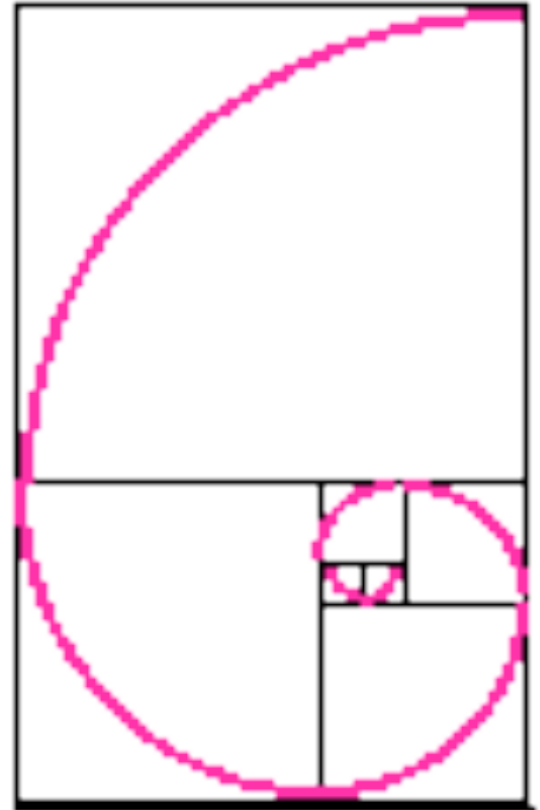
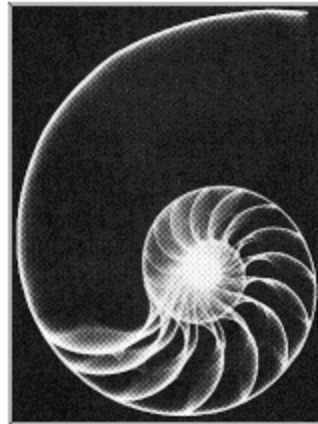


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- Each new square has a side which is as long as the sum of the latest two square's sides.
 - Fibonacci series

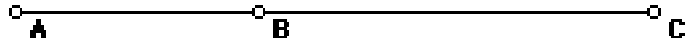


Golden spiral

- Square removal can be repeated infinitely
- corresponding corners of the squares form an infinite sequence of points on the golden spiral



Golden line



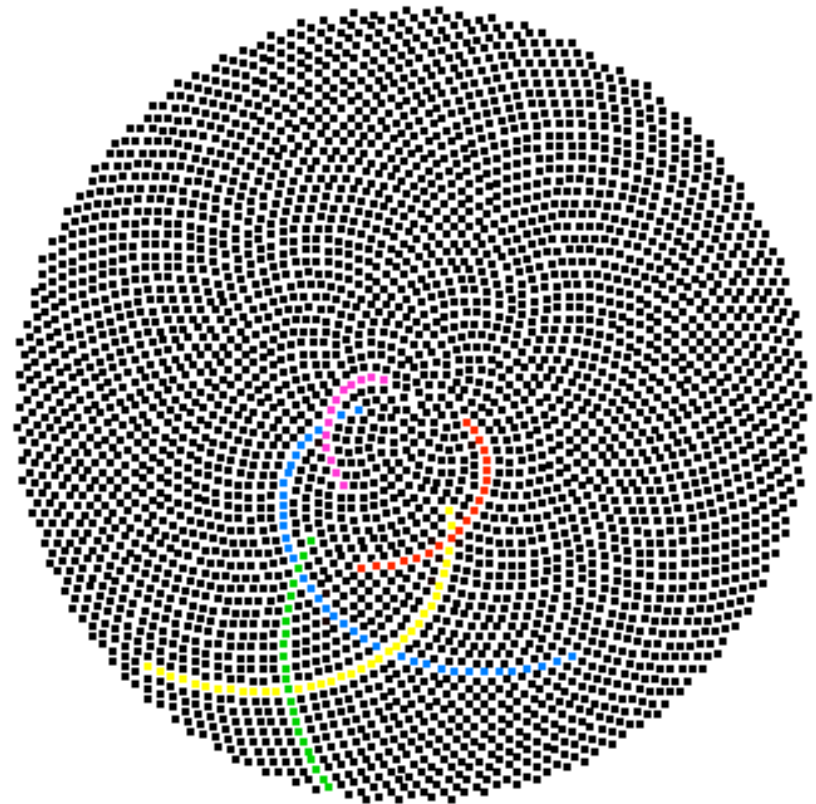
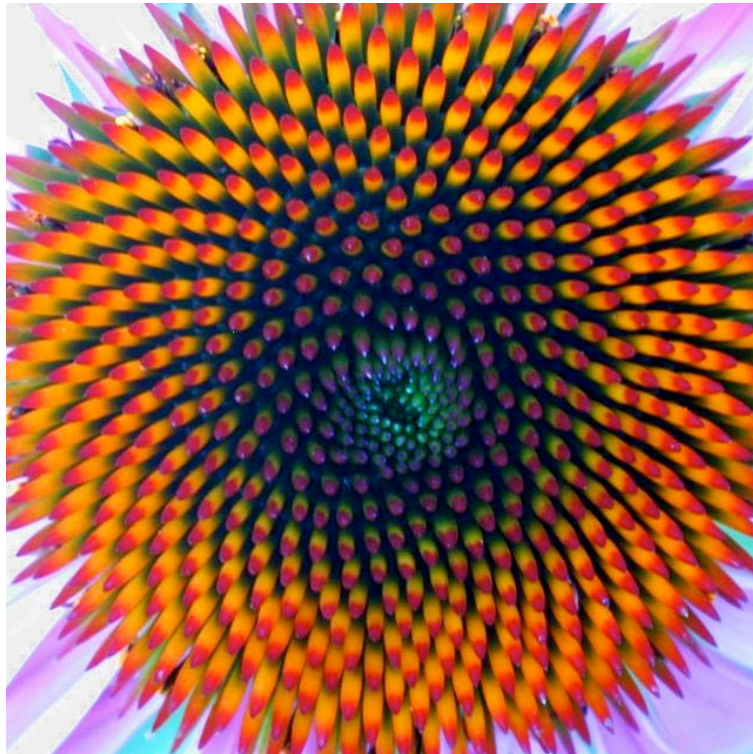
- The line AC is divided at point B so that:
- the ratio of the two parts, the smaller AB to the larger BC is the same as
- the ratio of the larger part BC to the whole AC.

The golden ratio and Fibonacci numbers

- sea shell shapes,
- branching plants,
- flower petals and seeds,
- leaves and petal arrangements

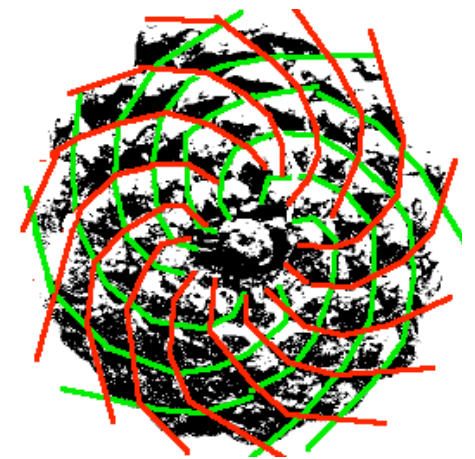


The Golden Spiral can be seen in the arrangement of seeds on flower heads.



Pine cones show the Fibonacci Spirals clearly.

Here is a picture of an ordinary pinecone seen from its base where the stalk connects it to the tree.







Pentagon Pattern

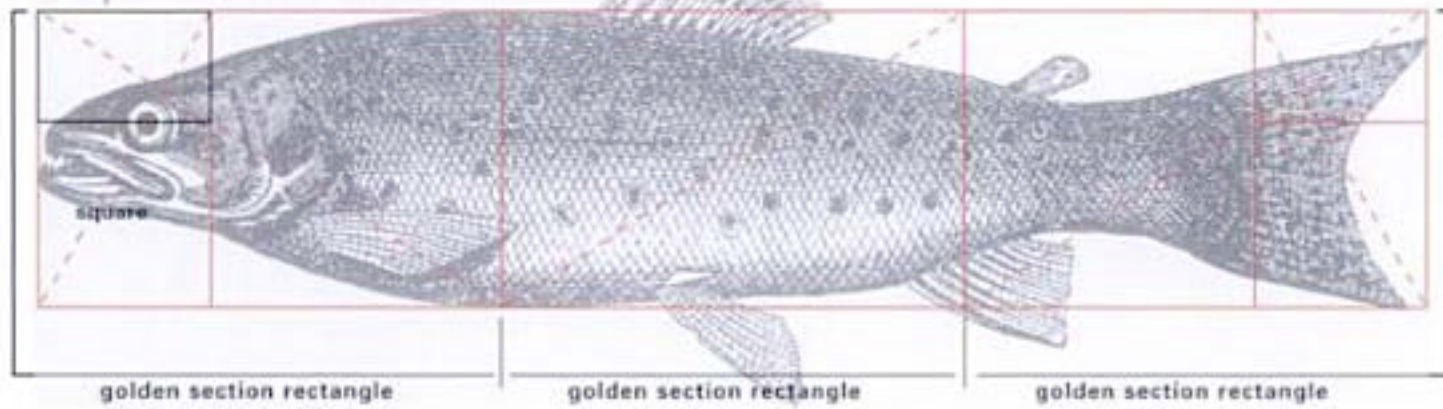
The pentagon and star pentagram have golden section proportions, as the ratios of the sides of the triangles in a star pentagram is 1:1.618. The same pentagon/pentagram relationships can be found in the sand dollar and in snowflakes.



**Comparison of Tibia Shell Spiral
Growth Pattern and Golden Section
Proportion**

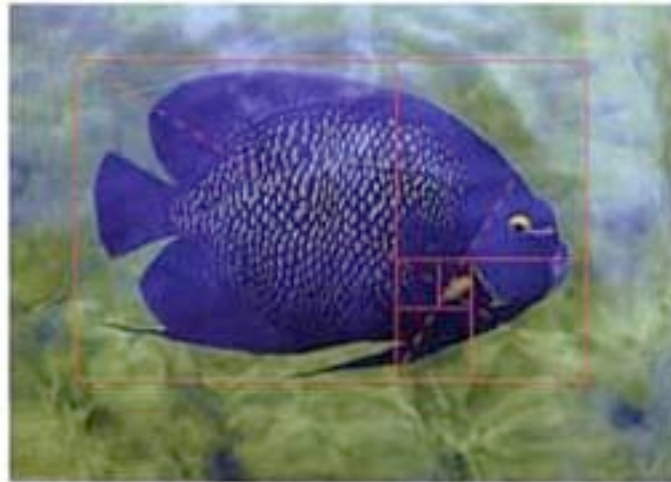


reciprocal golden section rectangle



**Golden Section Analysis
of a Blue Angle Fish**

The entire body of the fish fits into a golden section rectangle. The mouth and gill position is at the reciprocal golden section rectangle.



On many plants, the number of petals is a Fibonacci number:

- buttercups have 5 petals;
- lilies and iris have 3 petals;
- some delphiniums have 8;
- corn marigolds have 13
- some asters have 21
- daisies can be found with 34, 55 or even 89 petals.



The Golden Mean and Aesthetics

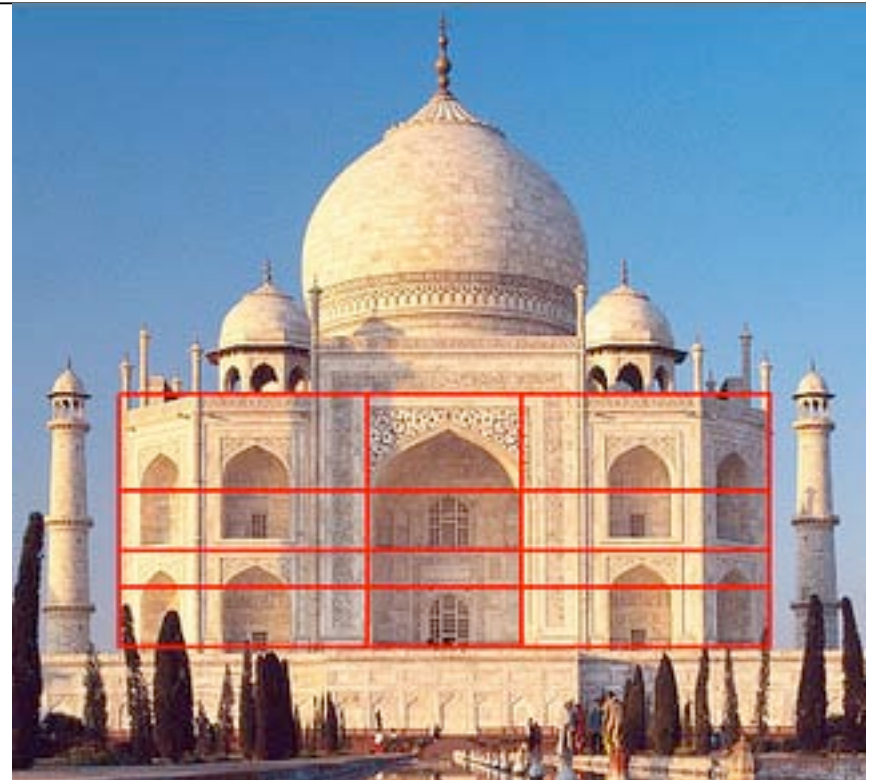
- Throughout history, the ratio for length to width of rectangles of 1.61803 39887 49894 84820 has been considered the most pleasing to the eye.
- Artists use the Golden Mean in the creation of great works.

The Parthenon

- “Phi” was named for the Greek sculptor Phidias.
- The exterior dimensions of the Parthenon in Athens, built in about 440BC, form a perfect golden rectangle.

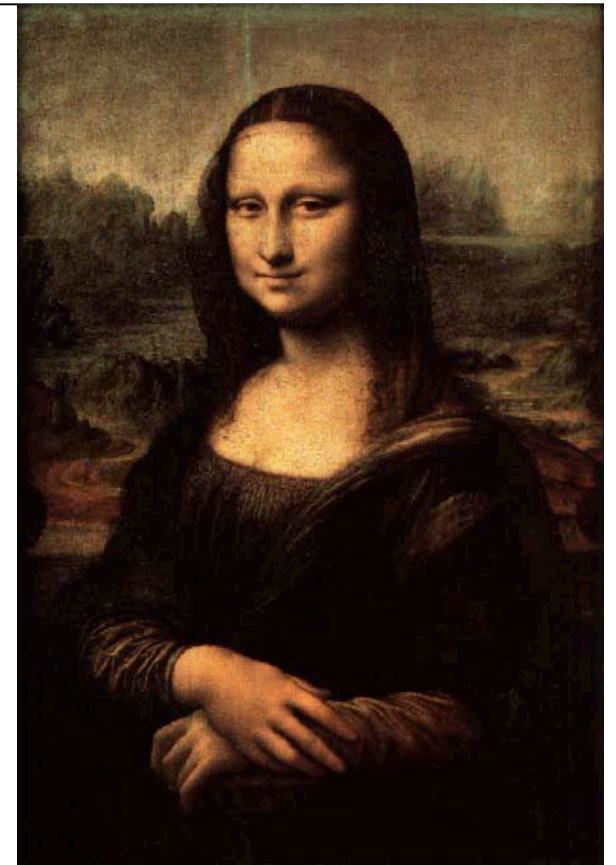


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- Tahjmahal



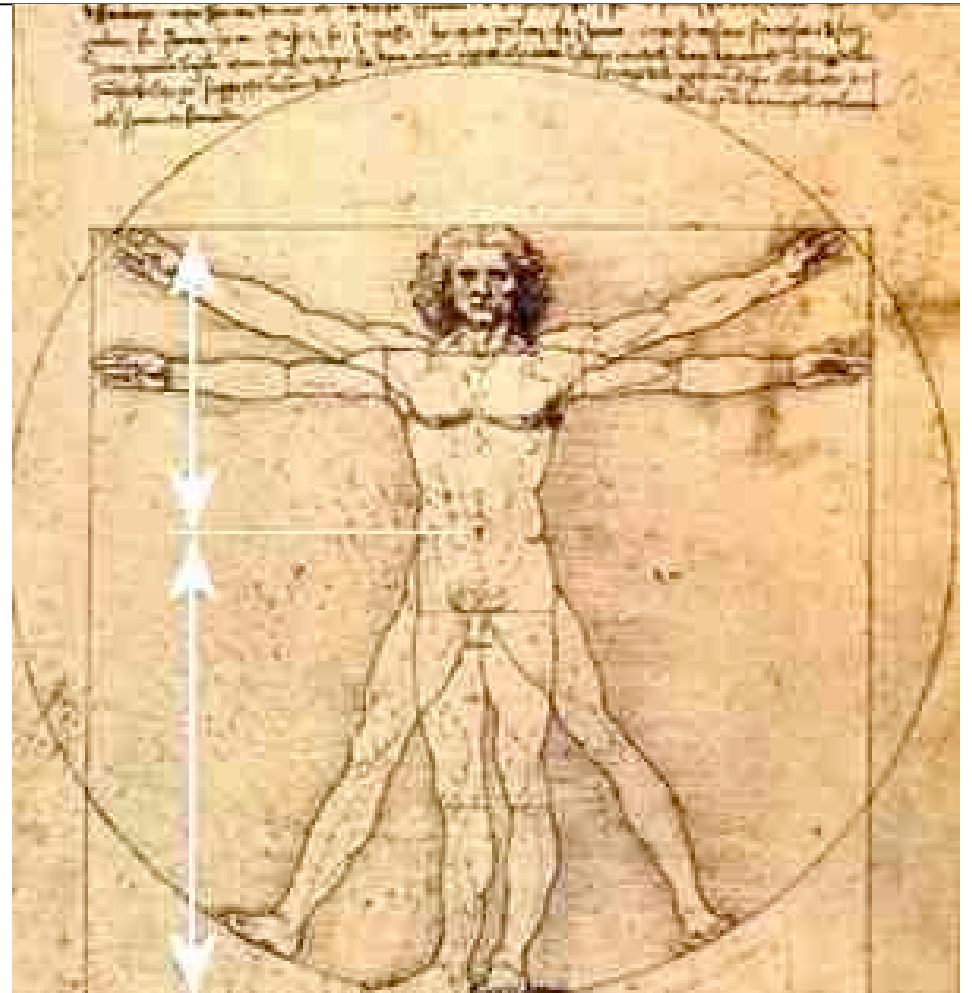
Leonardo Da Vinci

- Leonardo Da Vinci called it the "divine proportion" and featured it in many of his paintings, for example in the famous "Mona Lisa".
- Try drawing a rectangle around her face. Are the measurements in a golden proportion?
- You can further explore this by subdividing the rectangle formed by using her eyes as a horizontal divider.

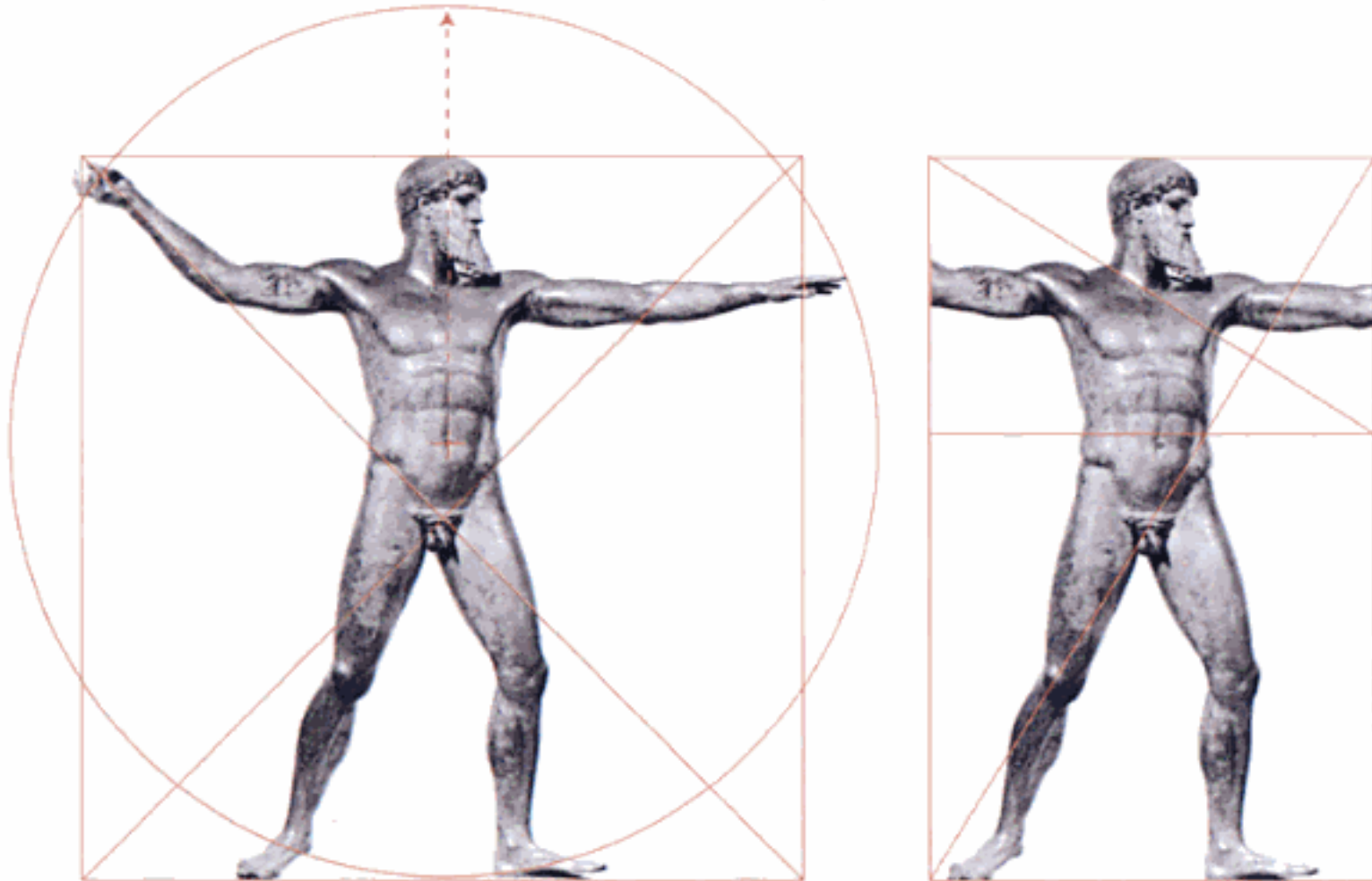


The “Vitruvian Man”

- Leonardo did an entire exploration of the human body and the ratios of the lengths of various body parts.
- “Vitruvian Man” illustrates that the human body is proportioned according to the Golden Ratio.

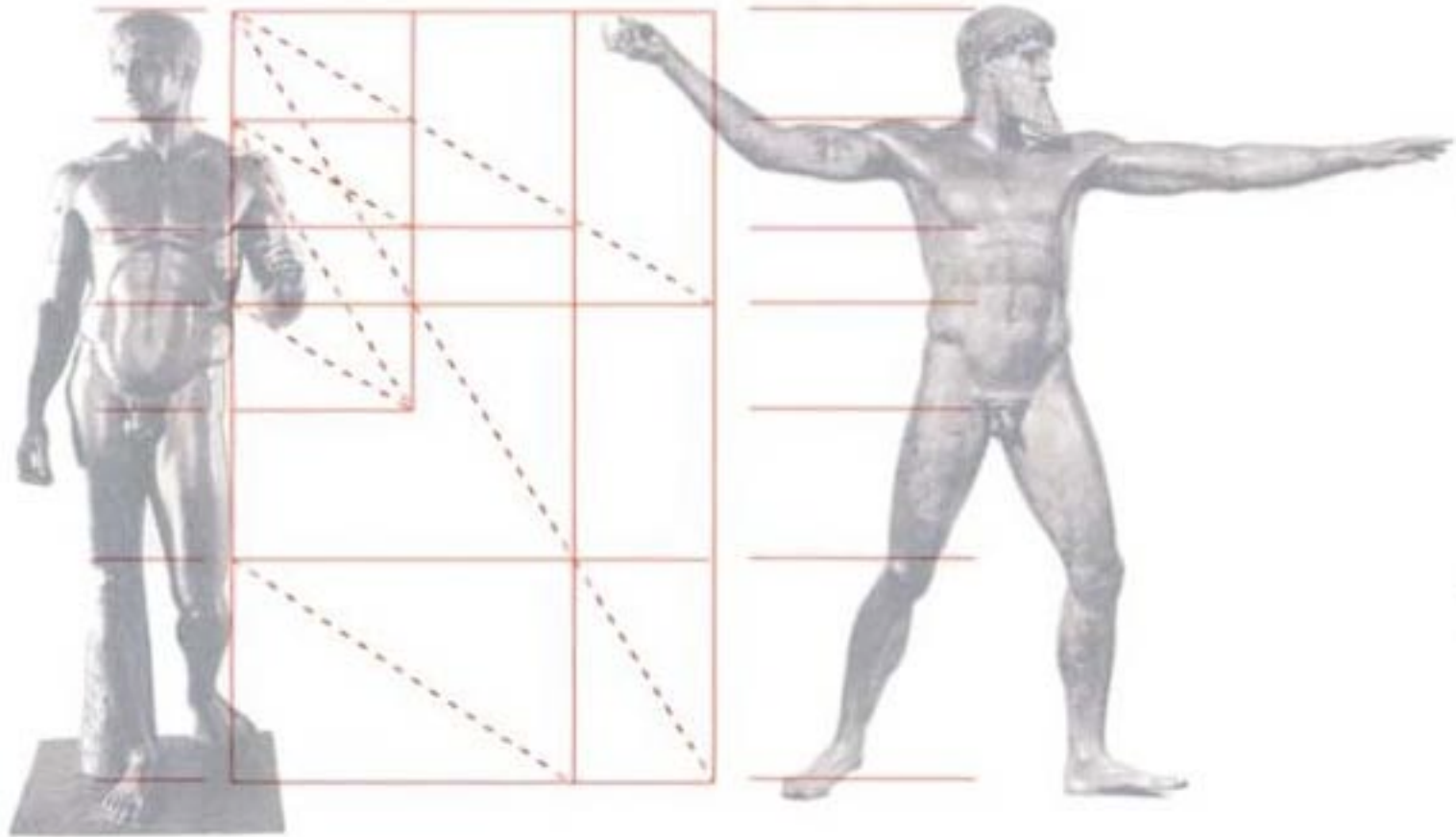


based on the canon of Vitruvius and the analysis of the proportions used is almost identical.



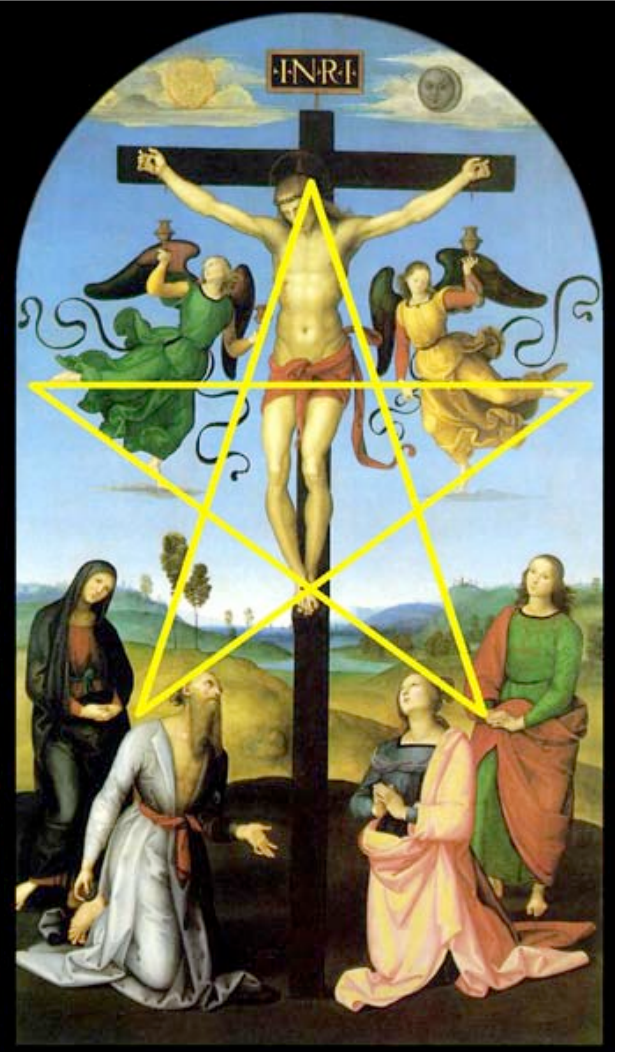
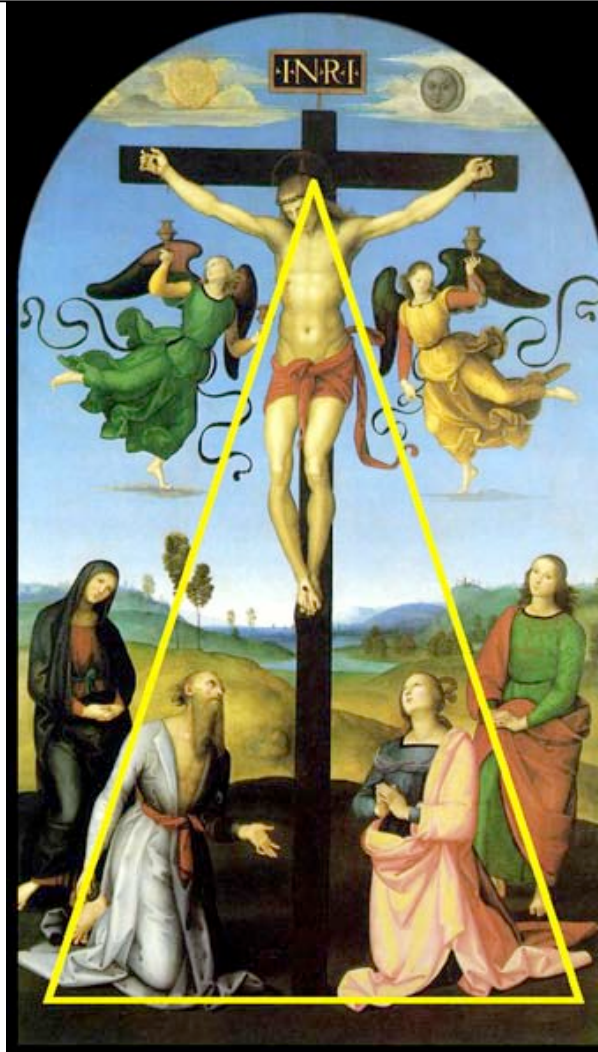
Zeus Analyzed According to the Vitruvius' Canon

A square encloses the body while the hands and feet touch a circle with the navel as center. The figure is divided in half at the groin, and (far right) by the golden section at the navel.





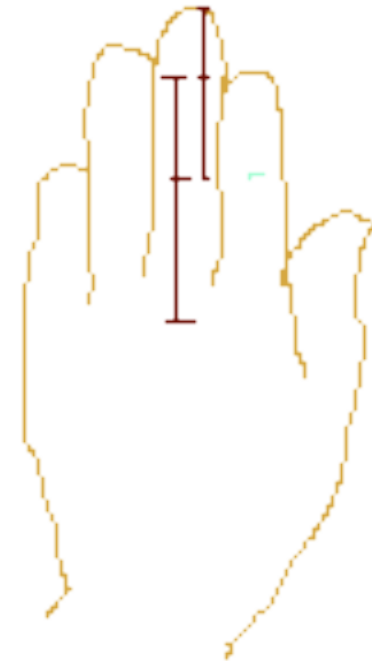


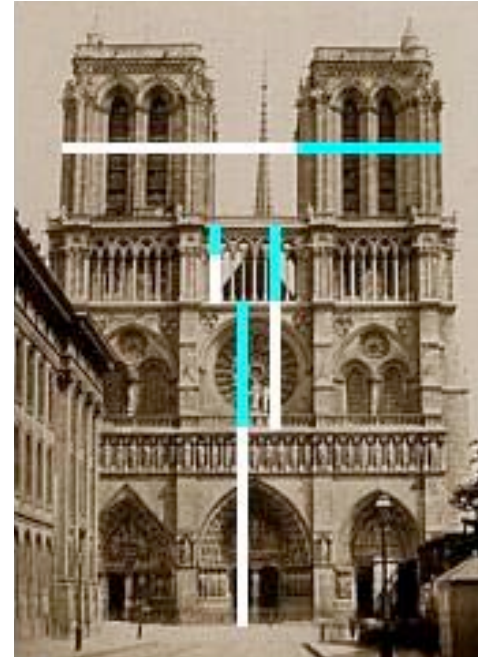


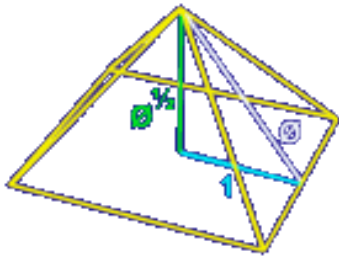
Look at your own hand:

You have ...

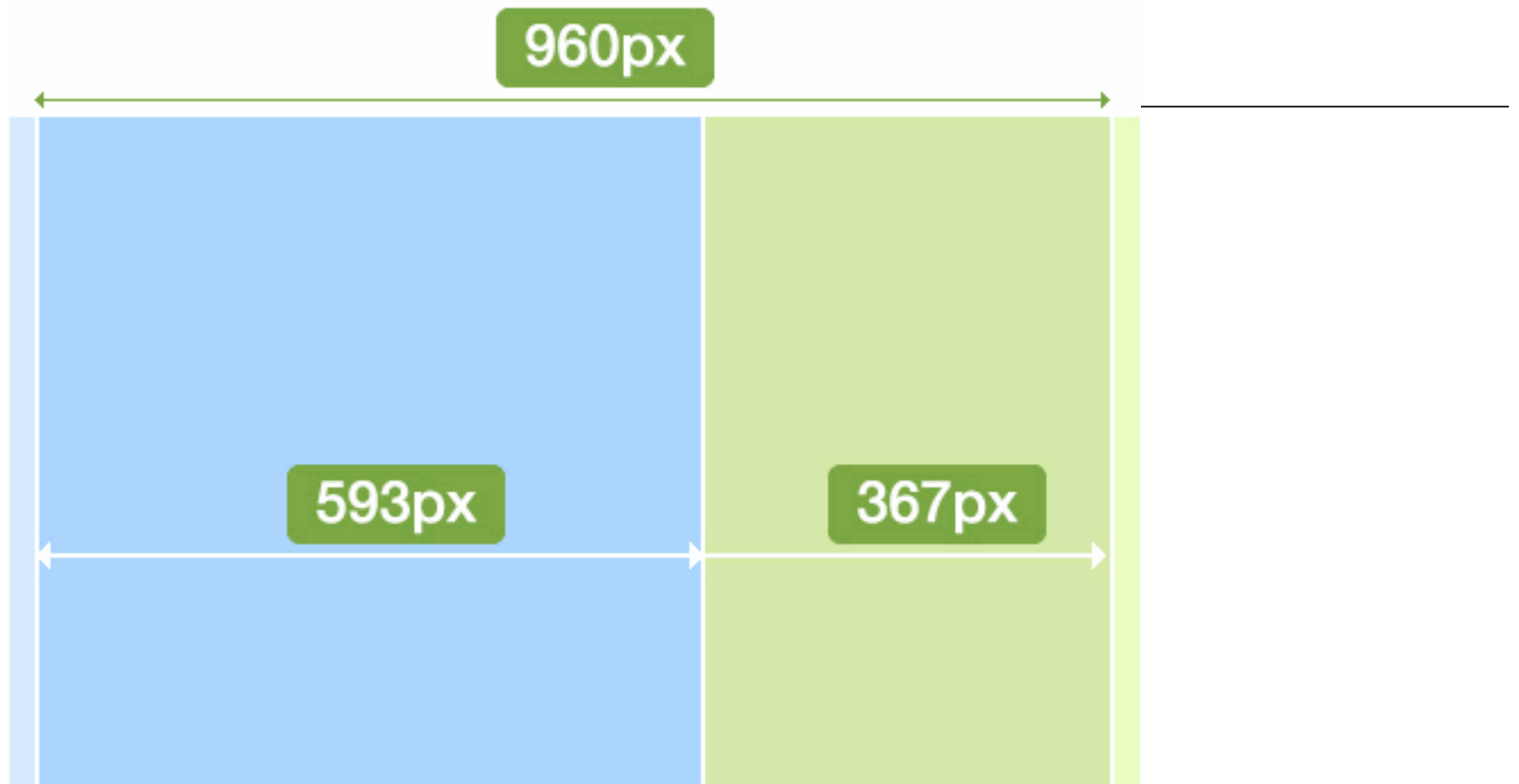
- **2** hands each of which has ...
- **5** fingers, each of which has ...
- **3** parts separated by ...
- **2** knuckles







Divine Proportion: 1.618



$$960\text{px} : 1.618 = 593\text{px}$$
$$960\text{px} - 593\text{px} = 367\text{px}$$



STICKY FEATURED ARTICLE



Wednesday May 7, 2008

Welcome to 404.

by Jared Christensen

Yeah, we're at it again.

404UXD, formerly **The Geniant Blog**, is the new home of our Dallas-based user experience group. For those of you following along at home, you'll know that in the latest episode of our little teleoviera we (**Geniant**) were acquired by **EMC** last July. And prior to that, in 2006, Geniant acquired **Bright Corner**, which company was more or less the humble genesis of our UX group.

[Continue reading...](#)

[10 responses](#) Article posted by Jared Christensen in Culture, Design · [Comments \(1\)](#)

Tuesday May 27, 2008

Virtual Cable™ Car Navigation →

This is too cool: a thin red "cable" sits above the road, in your peripheral vision, tracing the route to your destination. It shows you the path you need to take far ahead of you, even in the dark. What a great visualization idea!

[10 responses](#) Link posted to Jared Christensen in Interface, Visualization · [Comments \(1\)](#)

Friday May 23, 2008

Retro Cosmic



404 UXD is a team of user experience professionals working in Room 404 (literally) of our Dallas, TX office. We are part of EMC's User Experience Design competency.



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Jun 23, 2008: An Event Apart at Boston Marriott Copley

In late 2005, two internationally recognized web authorities—web standards godfather Jeffrey Zeldm...

Aug 12, 2008: User Experience Week 2008 at The Palace Hotel

UX Week is the premier user experience conference, and in 2008 we consider what 4 times to create g...



-31

FEATURED ARTICLE



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Jun 23
Boston

330px

While 2008 has many important deadlines with... [authorities—web standards gofather Jeffrey Zeldin.](#)

Aug 12, 2008: User Experience Week 2008 at The Palace Hotel

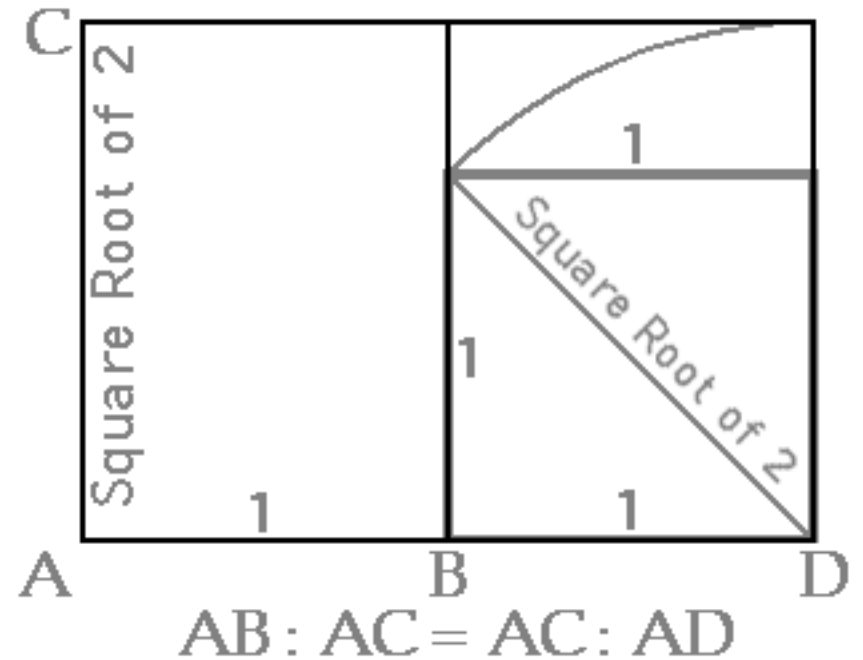
UX Week is the premier user experience conference, and in 2008 we consider what it takes to create g...

630px

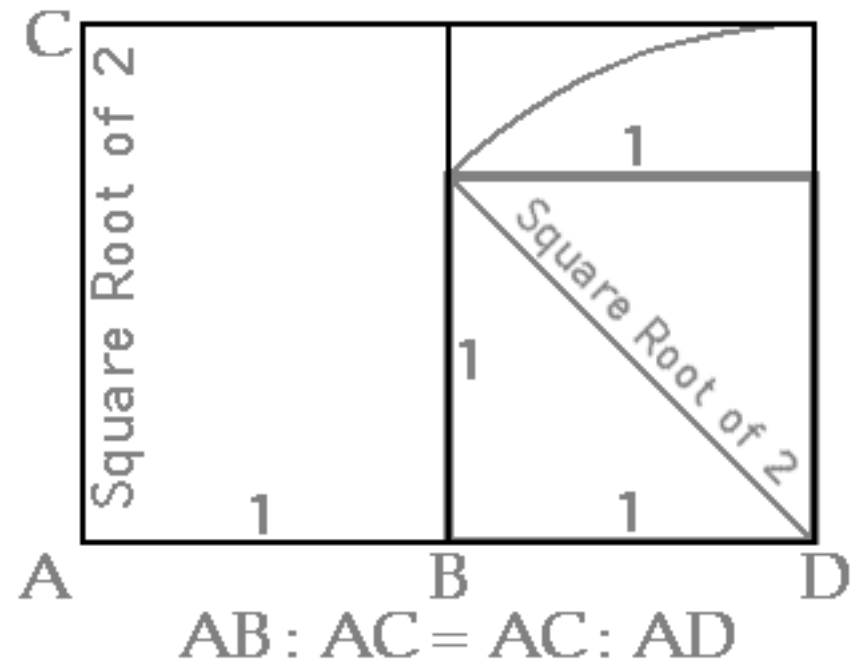
593px

Square root of 2

- Another proportioning system is the ratio of (Square root of 2) : 1
- Approximately 1:1.4142

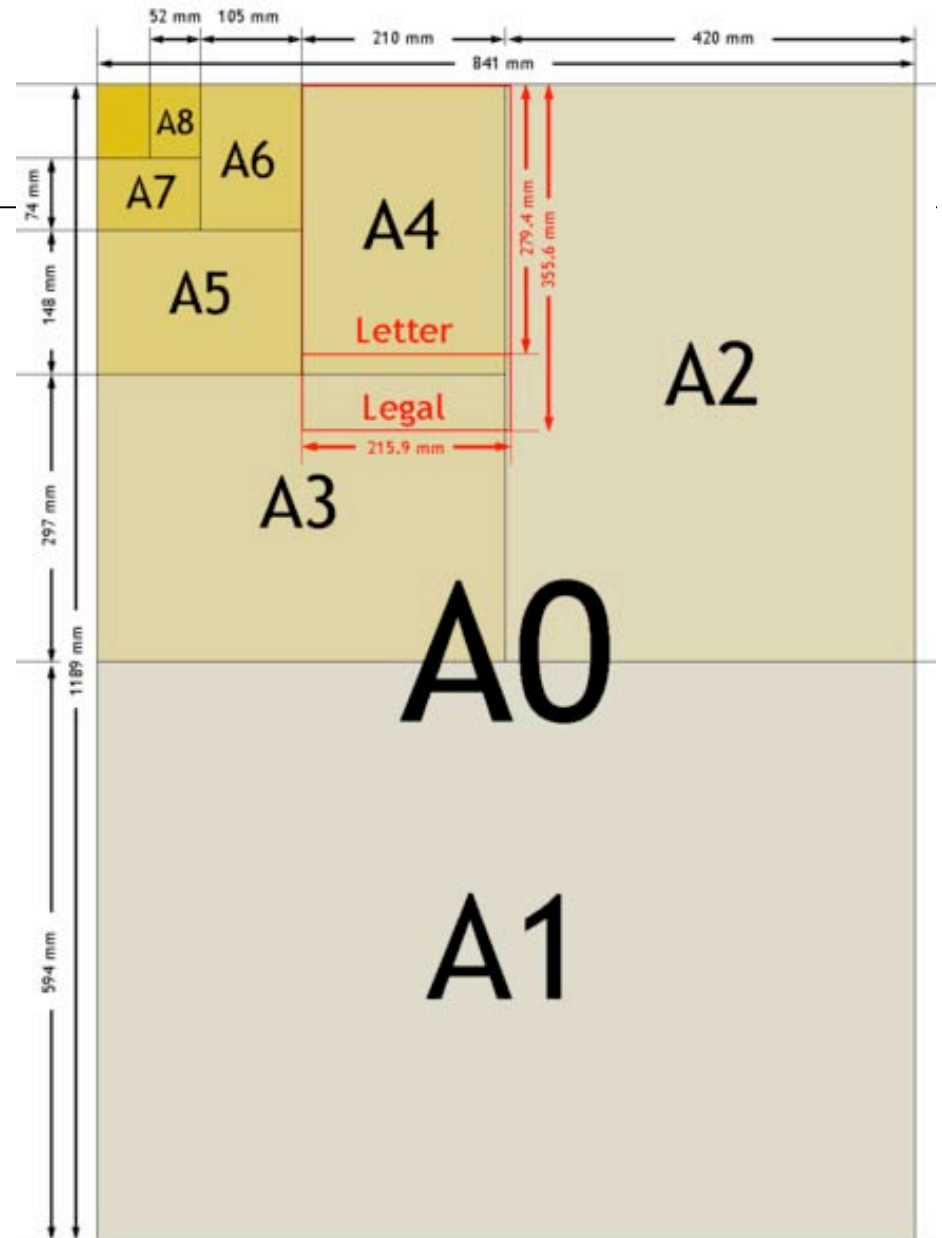


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- You can divide a square root of 2 rectangle in half and get 2 rectangles of square root of 2 rectangle proportion

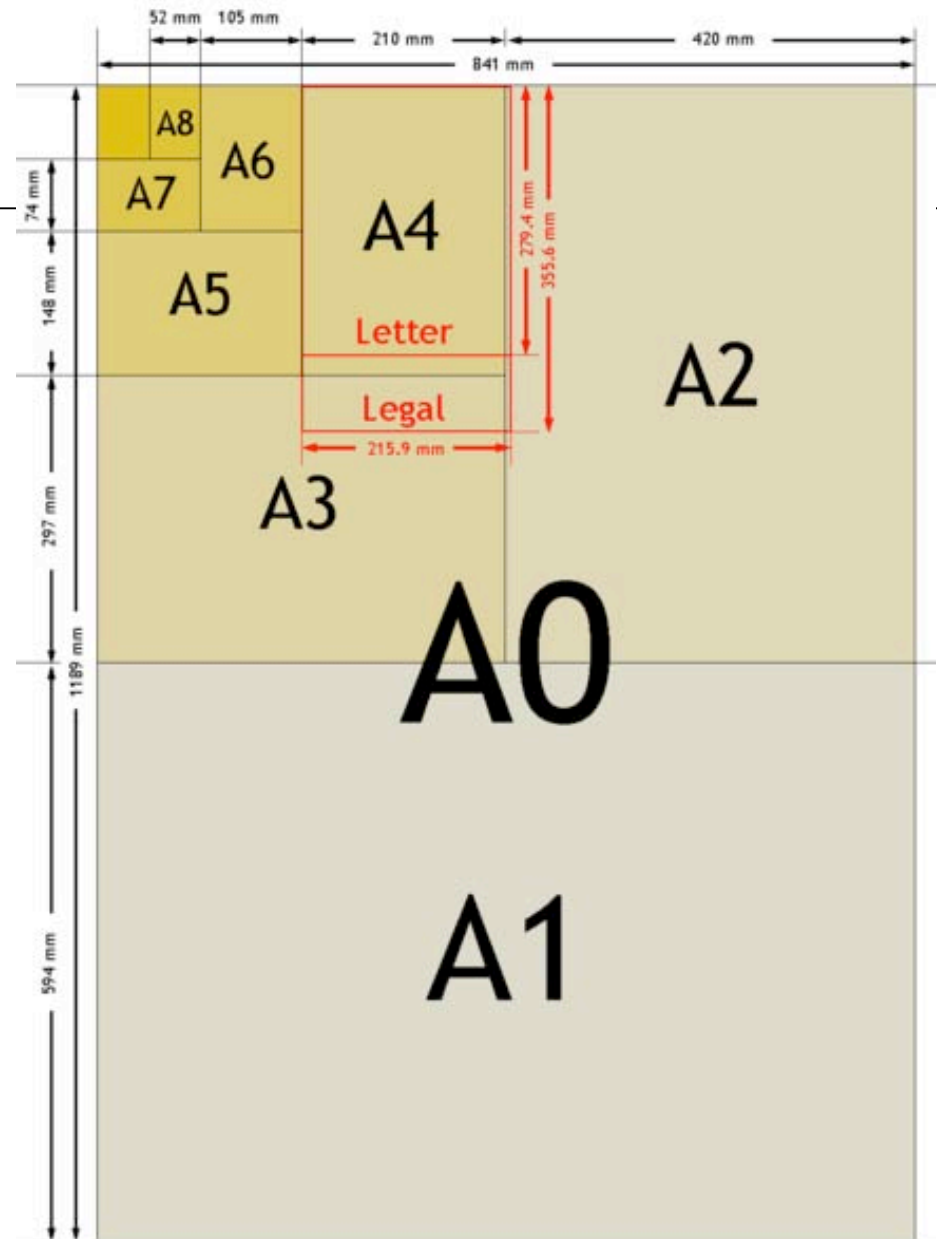


ISO 216

- The international paper size standard, ISO 216, is based on the German DIN 476 standard for paper sizes.
- ISO paper sizes are all based on a single aspect ratio of square root of 2, or approximately 1:1.4142.



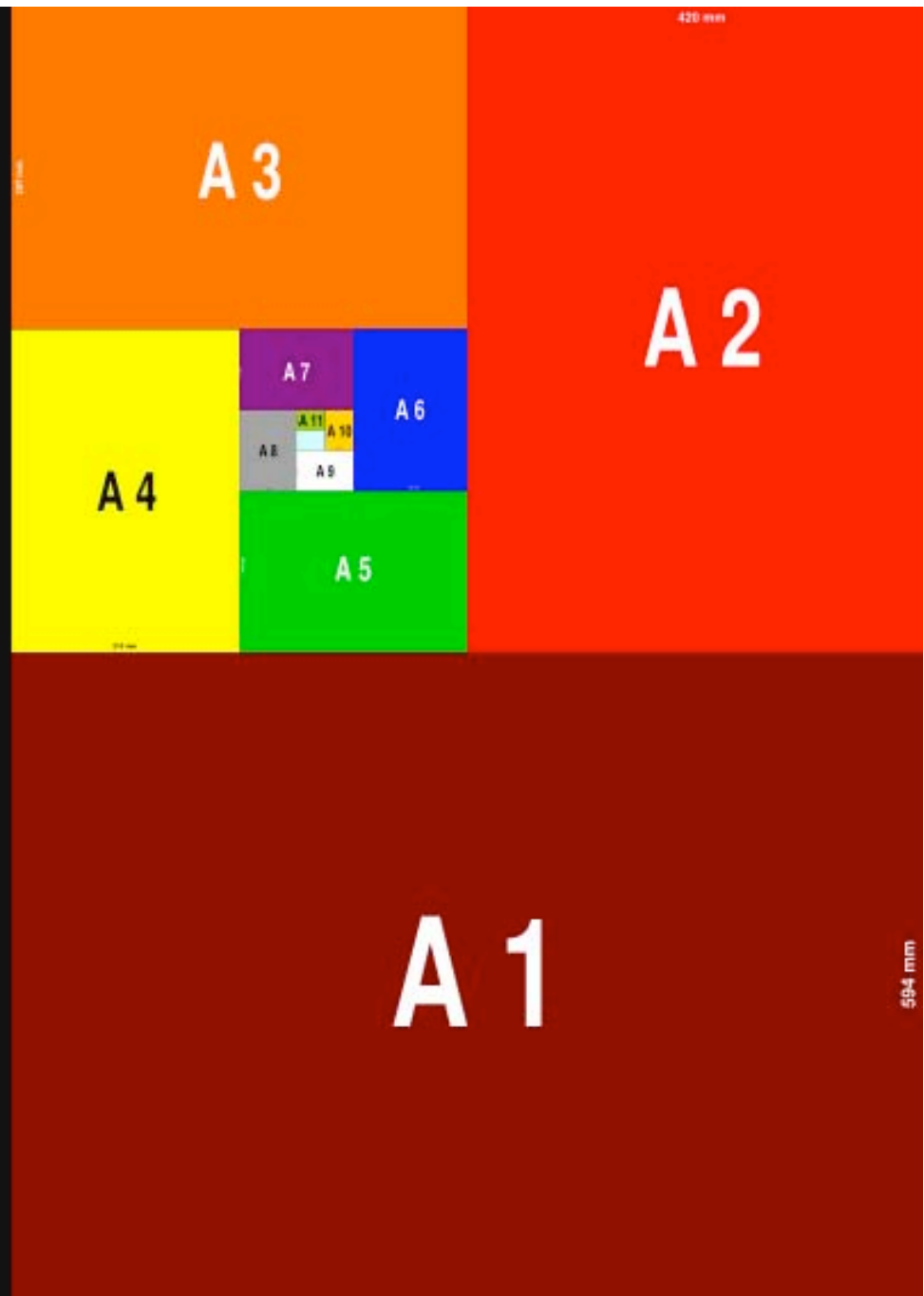
- The base format is a sheet of paper measuring 1 m² in area (A0 paper size).
- Successive paper sizes in the series A1, A2, A3, and so forth, are defined by halving the preceding paper size.
- The most frequently used paper size is A4 (210 × 297 mm).



1189 mm

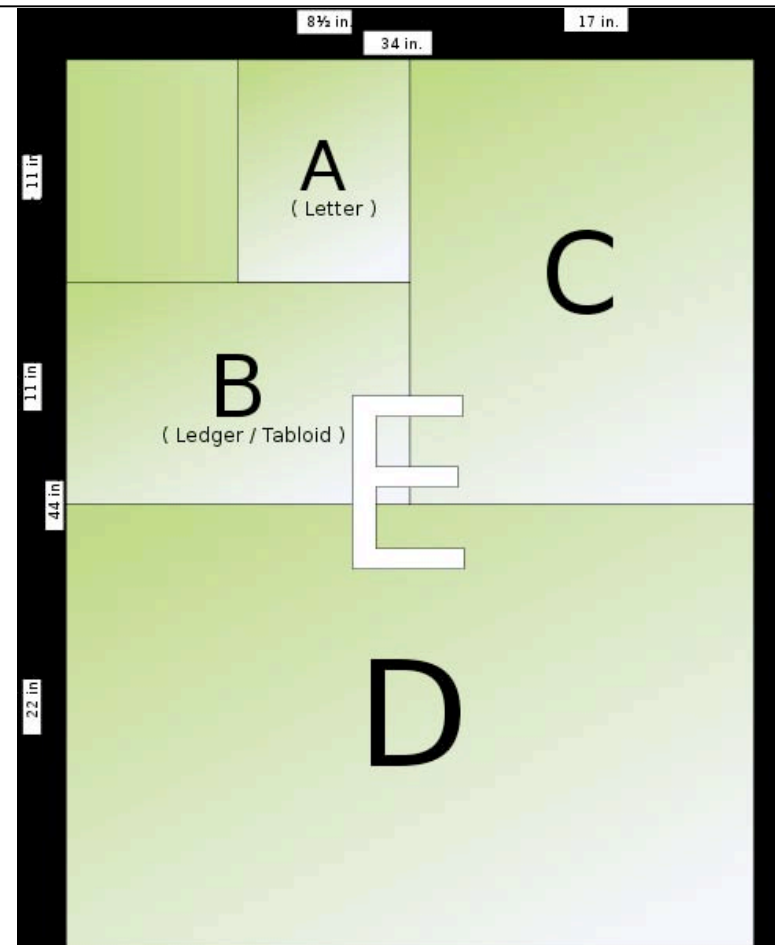
A 0

841 mm

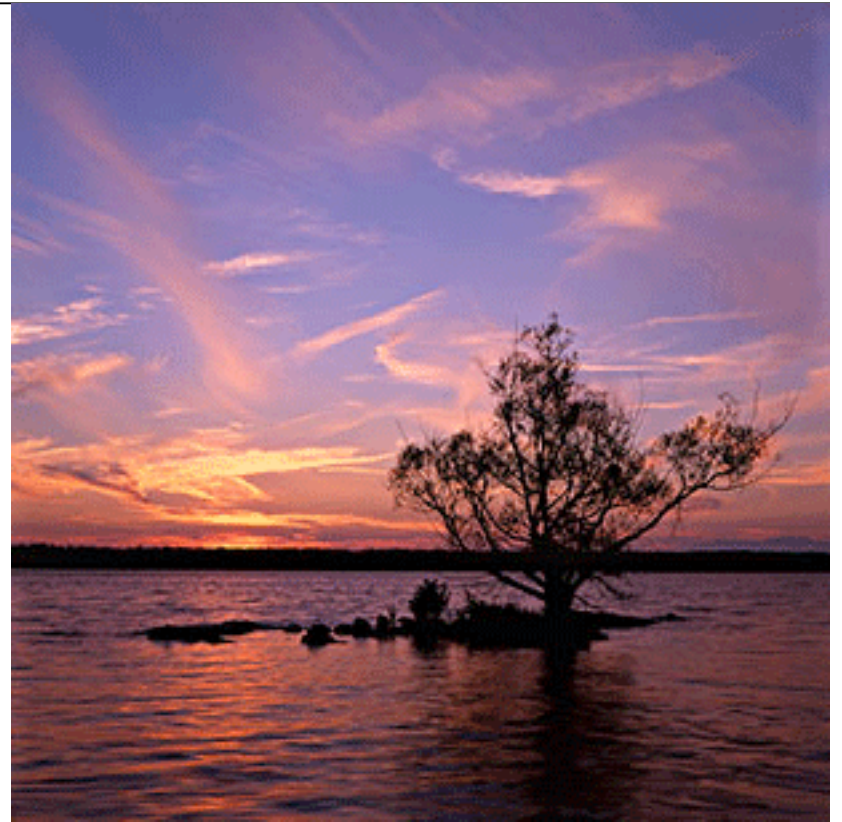


ANSI paper sizes

- In 1995, the American National Standards Institute adopted ANSI/ASME Y14.1 which defined a regular series of paper sizes based upon the de facto standard $8\frac{1}{2}$ in \times 11 in "letter" size which it assigned "ANSI A".
- the arbitrary aspect ratio



Rule of thirds





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eCommerce Content Strategies That Drive Conversion
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"We partnered with Demandware ... to be able to better serve our customers. We can now continually update our site ... and easily handle spikes in traffic."
Michael Horowitz,
Director of eCommerce,
Playmobil

airit

HOUSE OF FRASER

SALLY
BEAUTY SUPPLY

BANDOLINO

BARNETS
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virt.

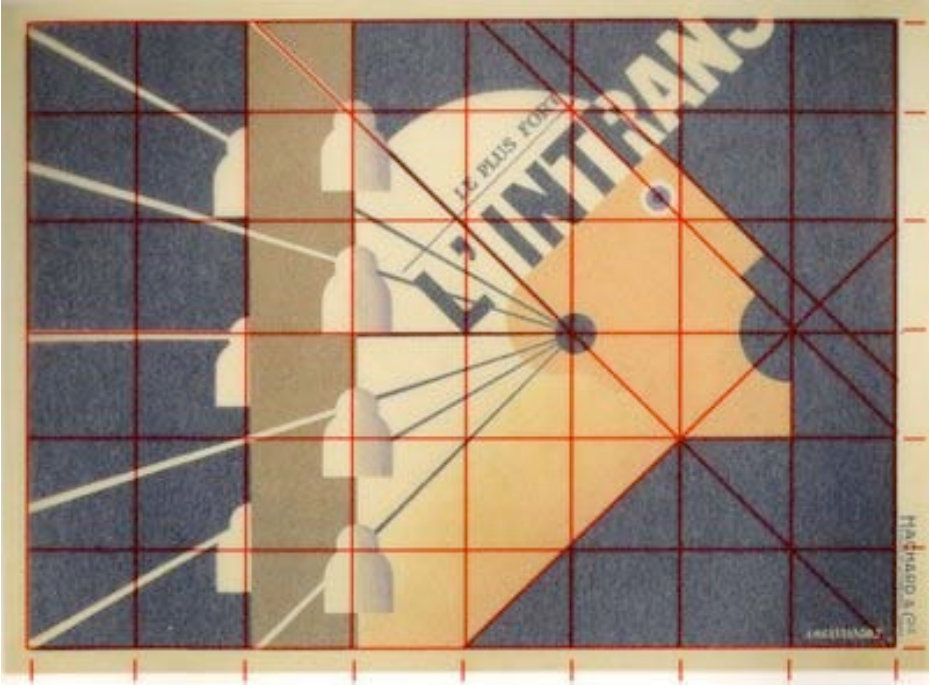
HOUSE OF FRASER

SALLY
SMART SUPPLY

BANDOLINO

BARNETS
NETWORK

playmo



musica viva

musica viva

musica viva

musica viva



musica viva

musica viva

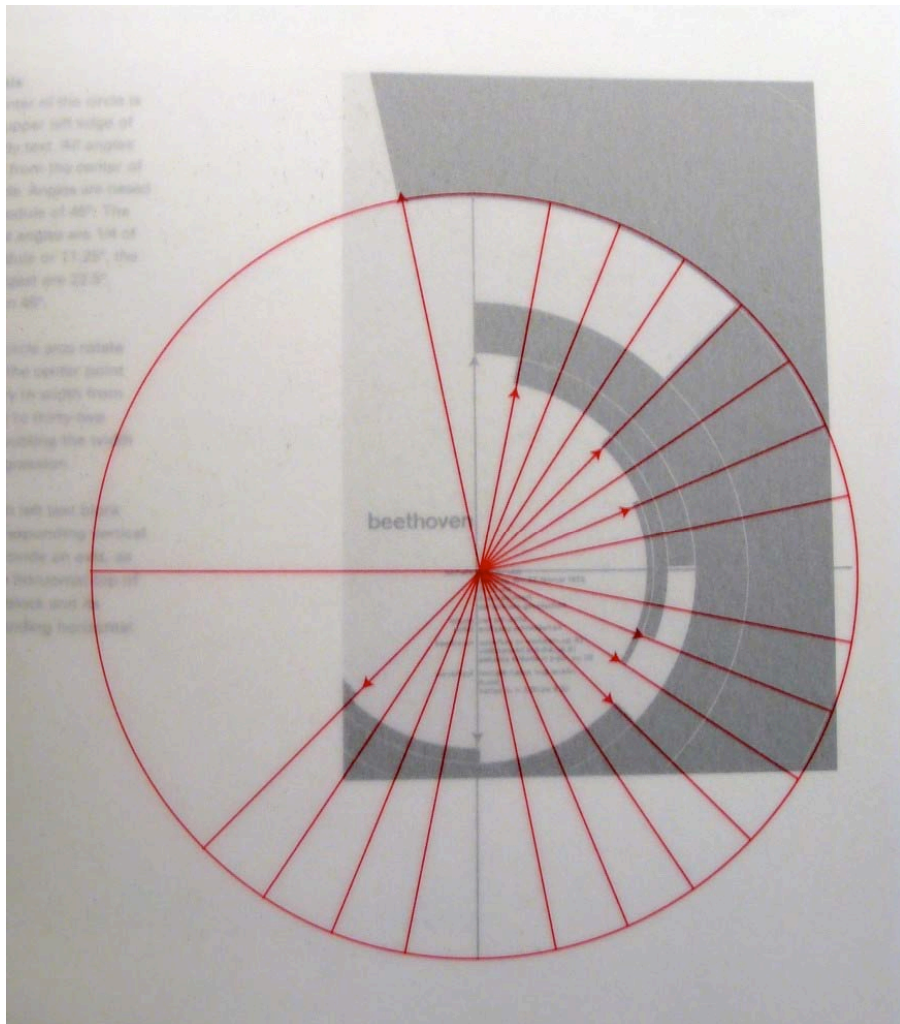
musica viva

musica viva

dienstag, den 7. januar 1958
 20.15 uhr großer tonhallsaal
 12. volkskonzert
 der tonhalle-gesellschaft
 zürich
 als drittes konzert
 im zyklus «musica viva»
 leitung hans rosbaud
 solisten alfred baum klavier
 andré jaunet flöte

schweizerische erstauflührungen
 andré jolivet
 cinque danses rituelles
 ernst krenek
 zweites klavierkonzert
 fulgi nono
 «y su sangre va vienne cantando»
 musik für flöte und kleines orchester
 bernd alloys zimmermann
 sinfonie in einem satz

karten fr. 1.-, 2.- und 3.-
 vorverkauf tonhallekasse hug
 jecklin kuoni
 genossenschaftsbuchhandlung



beethoven

tonhalle grosser saal
dienstag, den 22. februar 1955,
20.15 uhr
4. ekstrakonzert
der tonhalle-gesellschaft

leitung carl schuricht
solist wolfgang schneiderhan

beethoven ouverture zu «coriolan», op. 62
violinkonzert in d-dur, op. 61
siebente sinfonie in a-dur, op. 92

vorverkauf tonhalle-kasse, hug, jecklin,
kuoni
karten zu fr. 3.50 bis 9.50



square. The height of the chair is equal to the length which is equal to the depth, i.e. it fits perfectly into a cube. The rectangles of leather on the cushions are in root 2 rectangle proportion attached to a steel frame. The same rectangles were designed so that when the chair was upholstered they would still be perfect rectangles despite the stress and tension of the upholstery process. The script "X" construction of the legs form an elegant frame and lasting trademark for the chair.

