

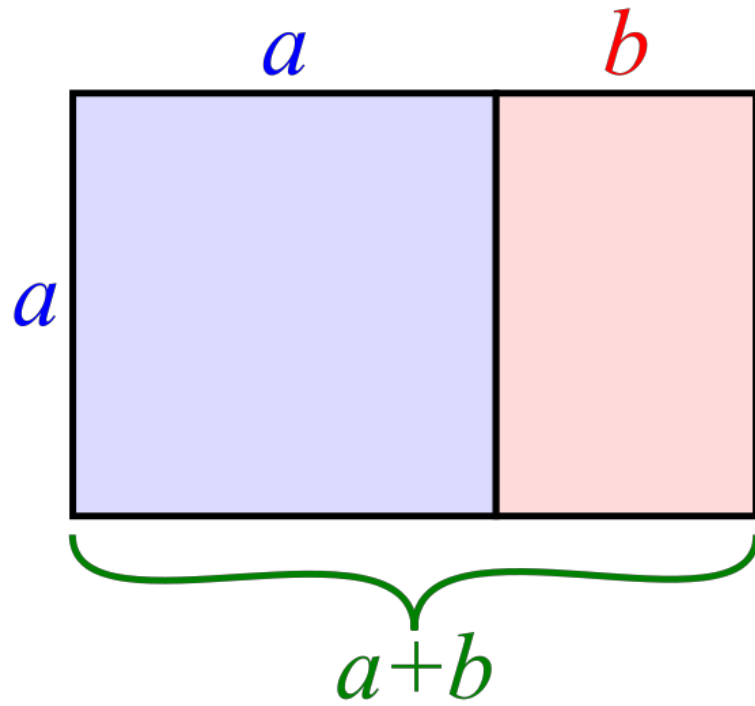
# Phi: Beautiful Geometry

**Accompanies Episode 5  
The Numbers Show Starring Zero  
and The Digits  
Released January 6, 2019**

**Geometry** (from the Ancient Greek:

γεωμετρία; geo- "earth", -metron "measurement") is a branch of mathematics concerned with questions of shape, size, relative position of figures, and the properties of space.

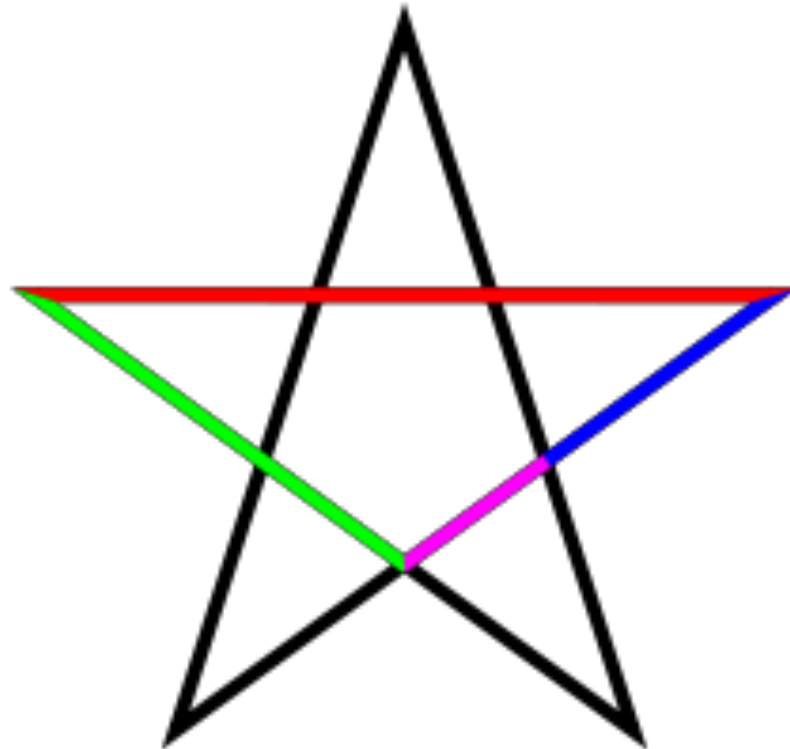
# Phi: The Golden Mean



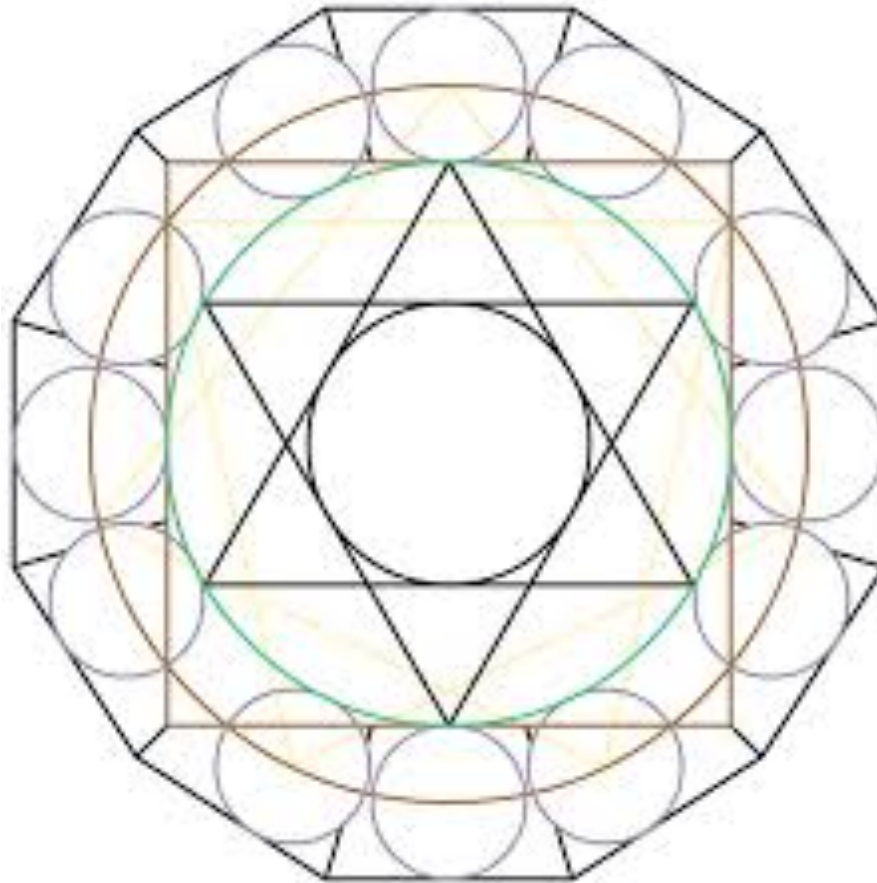
$$\frac{a+b}{a} = \frac{a}{b} \stackrel{\text{def}}{=} \varphi,$$

$$\varphi = \frac{1 + \sqrt{5}}{2} = 1.6180339887\dots$$

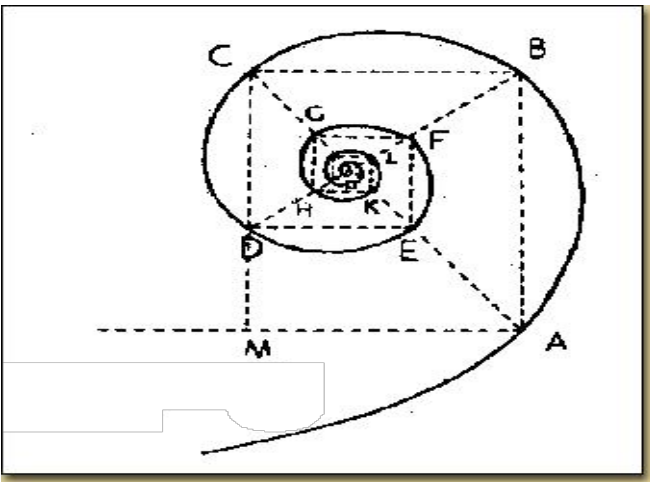
# Pentagram:



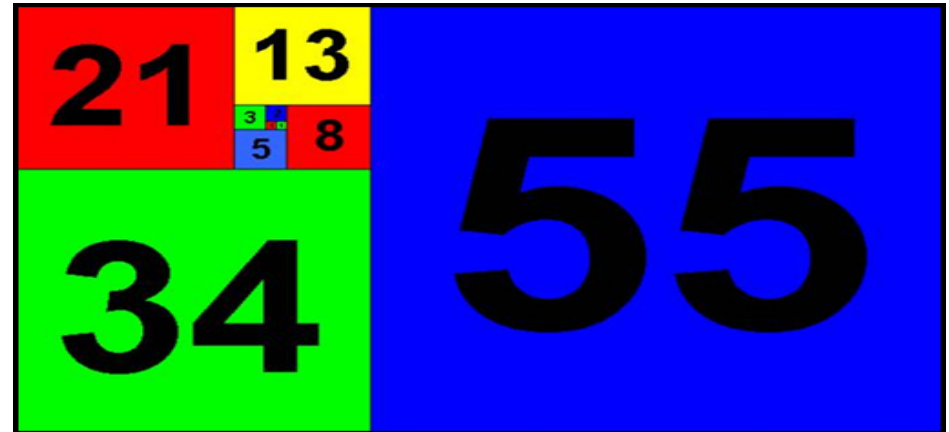
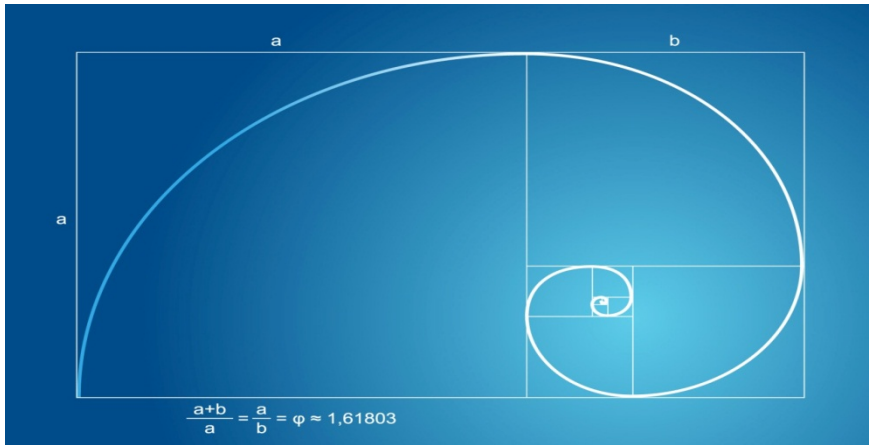
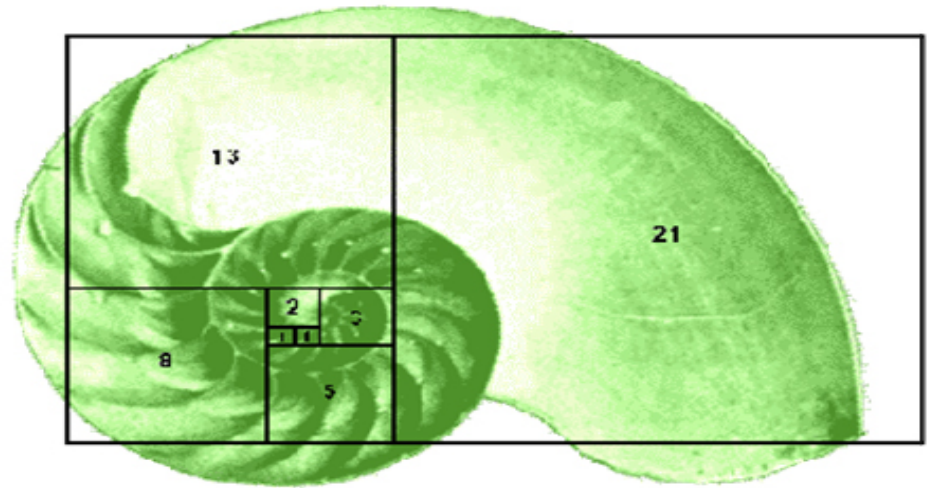
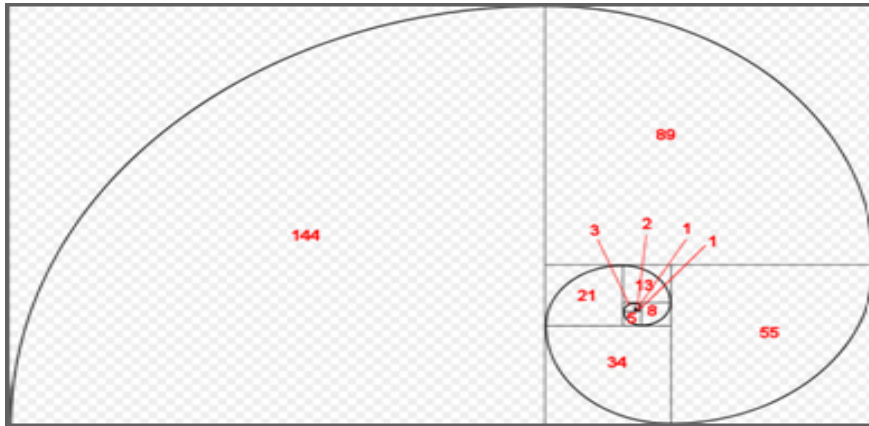
$$\frac{\text{red}}{\text{green}} = \frac{\text{green}}{\text{blue}} = \frac{\text{blue}}{\text{magenta}} = \varphi.$$



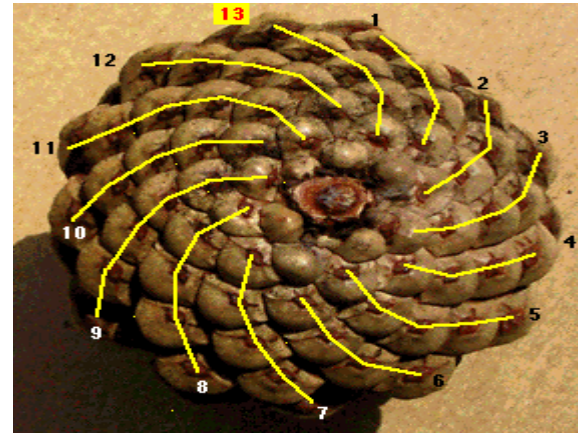
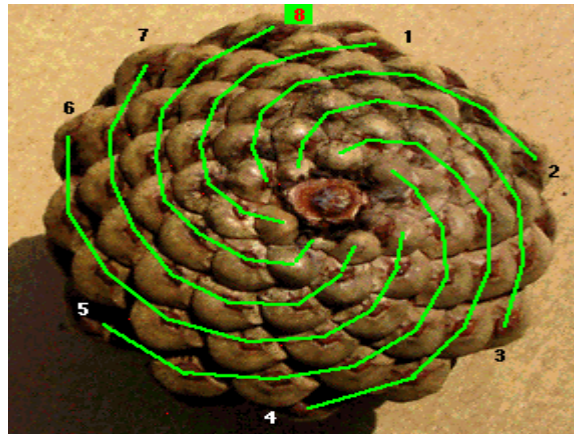
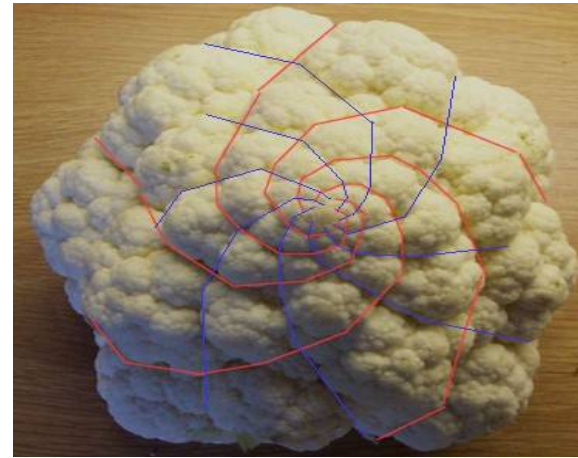
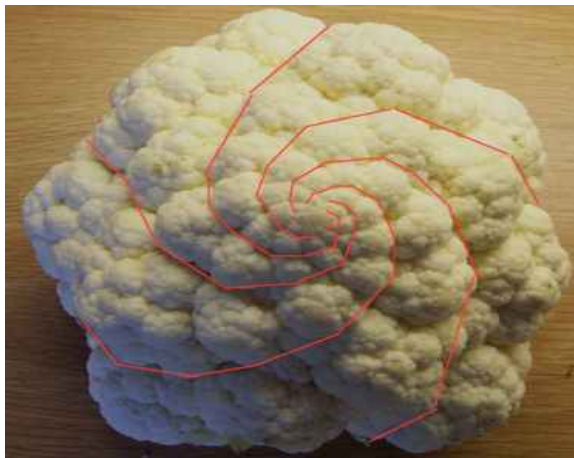
Pentagram and phi in a  
design



Natural and architectural  
Golden Spirals



Phi and the Golden Spiral  
 created by the growth of the  
 Chambered Nautilus



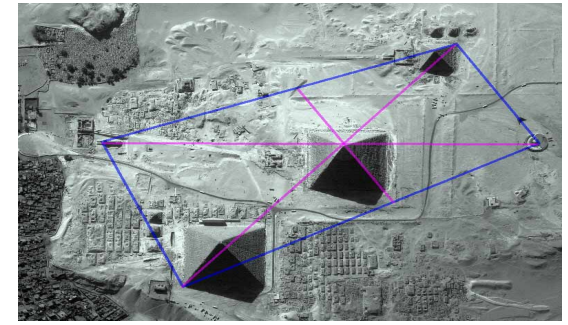
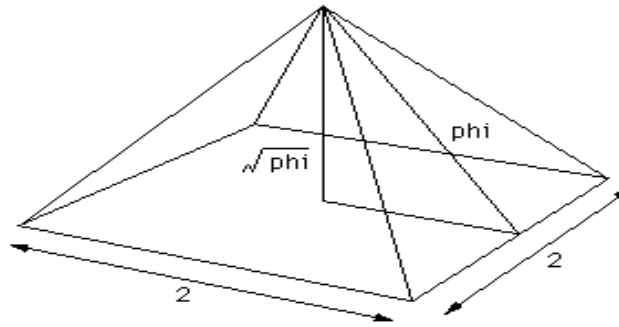
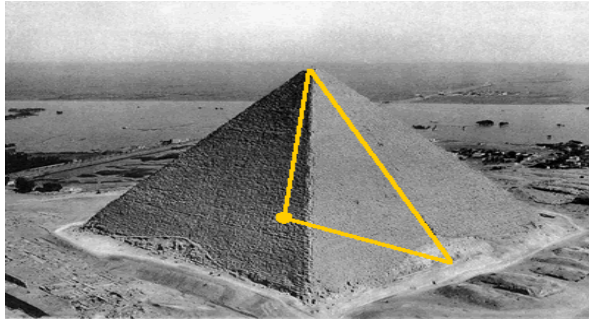
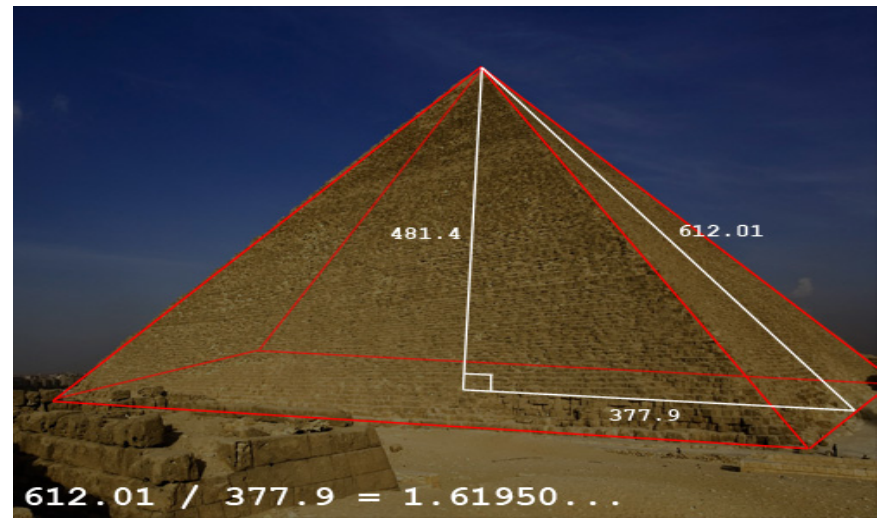
Golden Spiral in growth of  
pinecone seeds and  
cauliflower heads



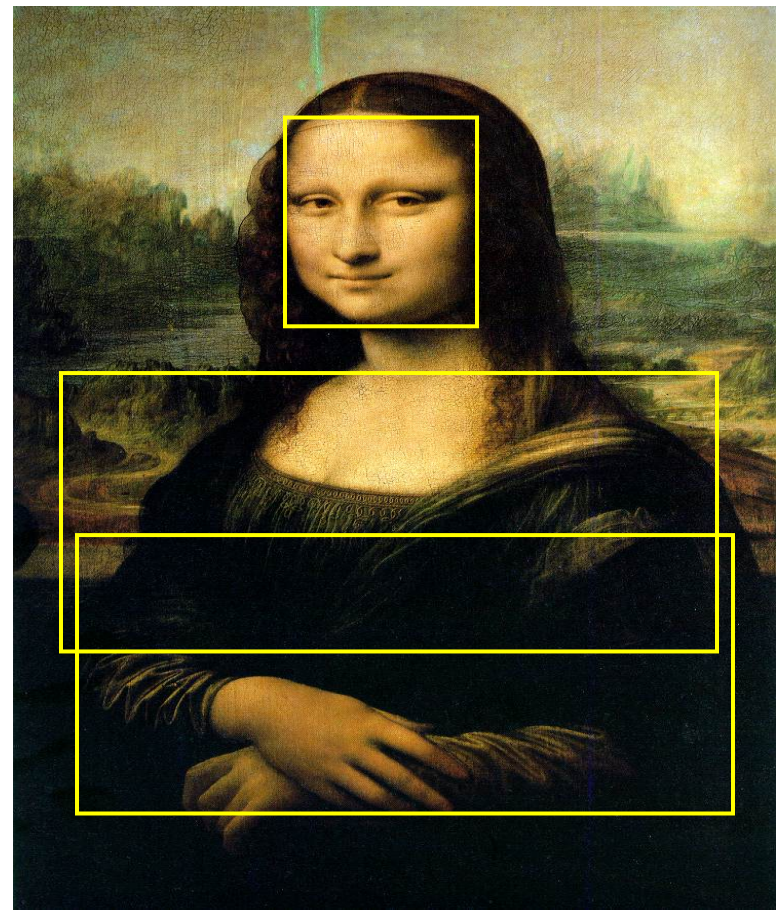
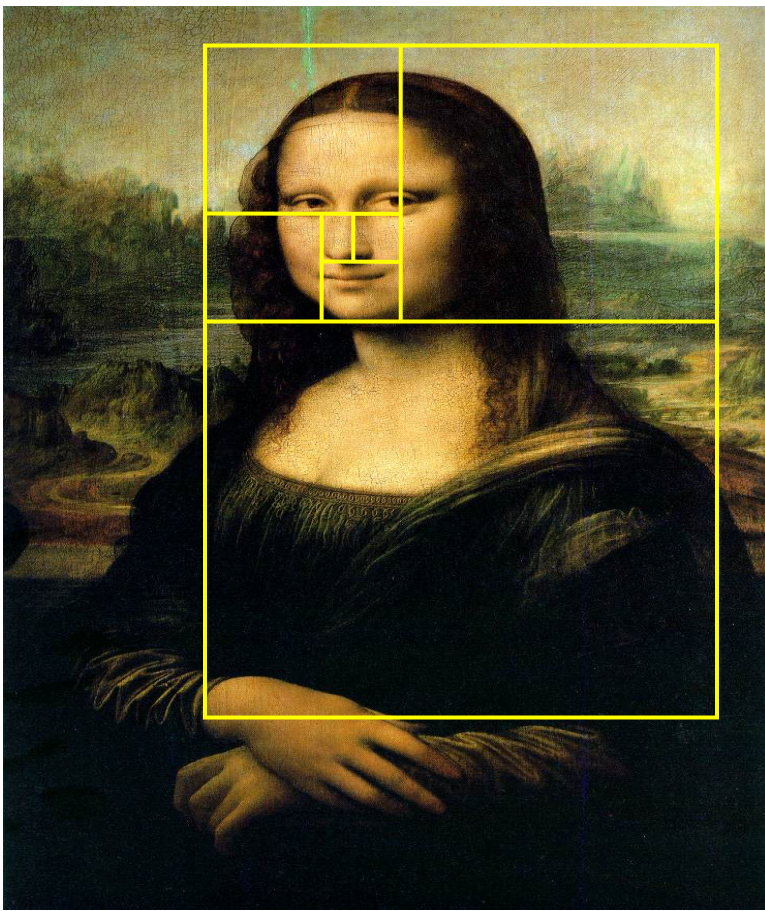


*The proportion of this Daisy is pentagonal. To find the central area of yellow we have placed four pentagonal stars to approach the twenty-one petals.*

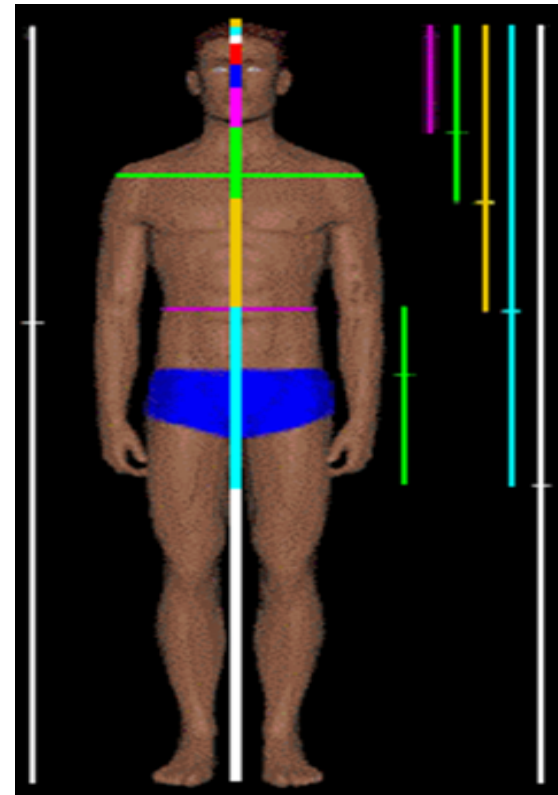
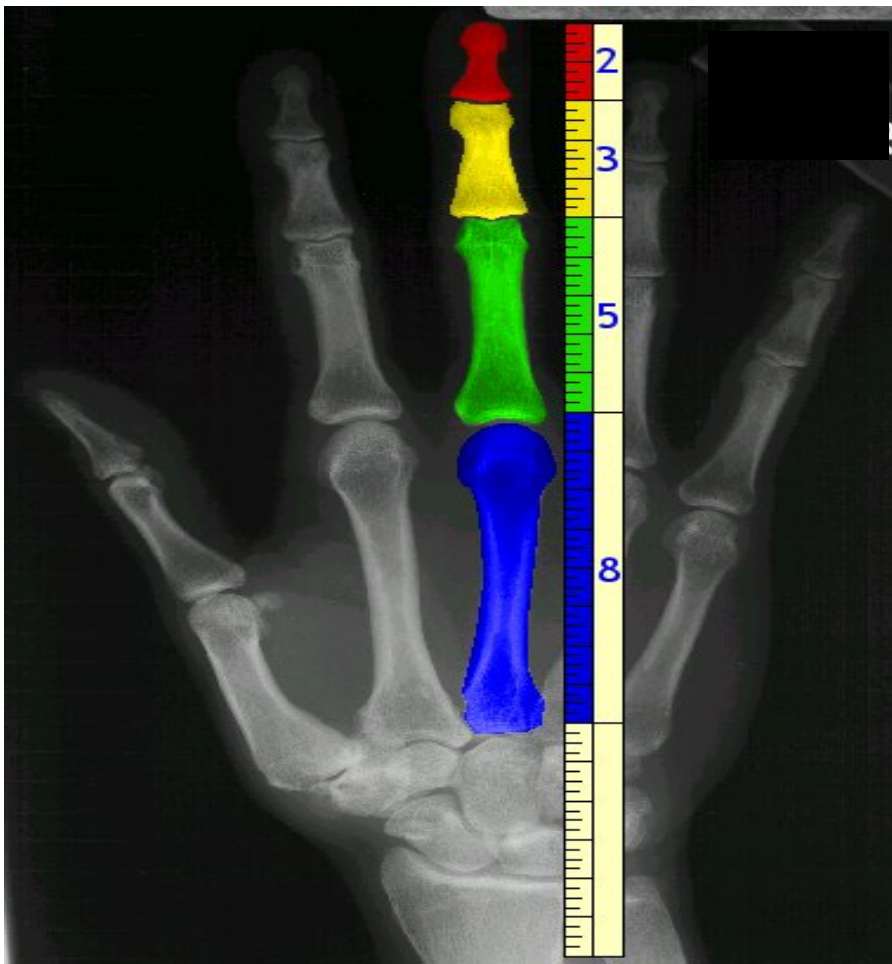
Pentagram and phi in design  
of sunflower petals and



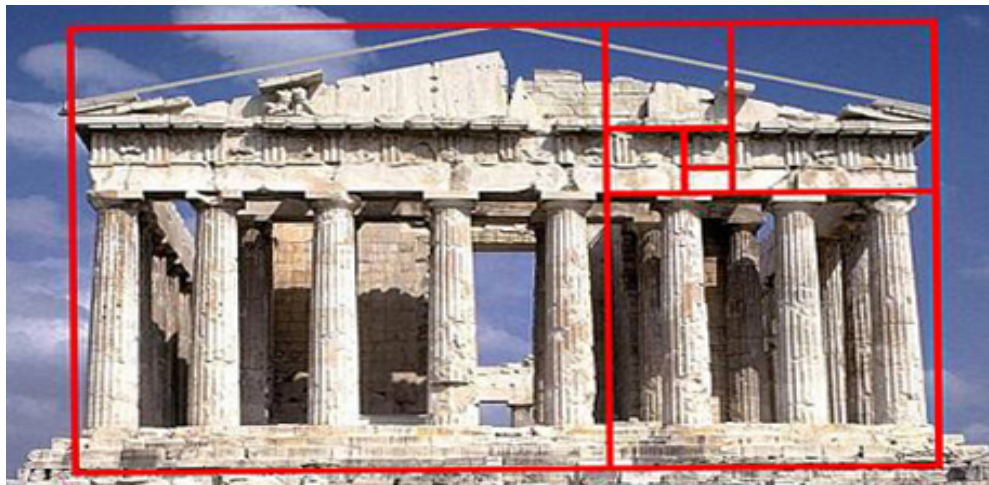
Phi in the relationship  
of the Great Pyramid  
in Giza, Egypt



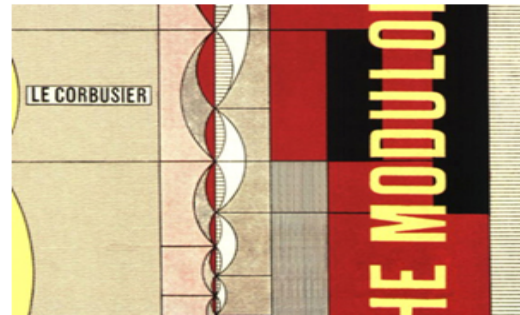
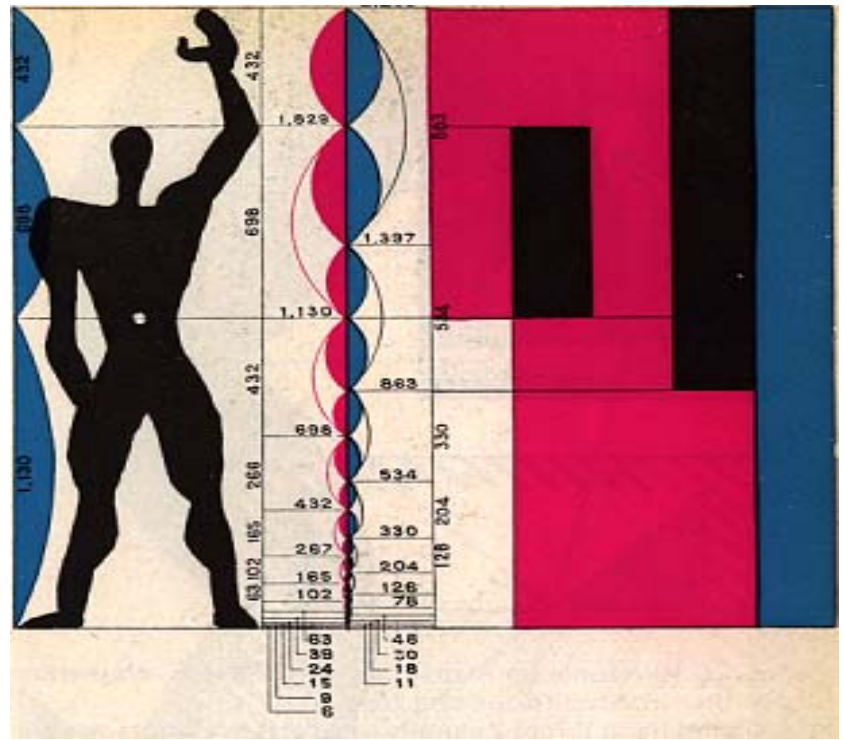
Golden Spiral and Golden Mean  
in the design of the Mona Lisa  
by Leonardo DaVinci



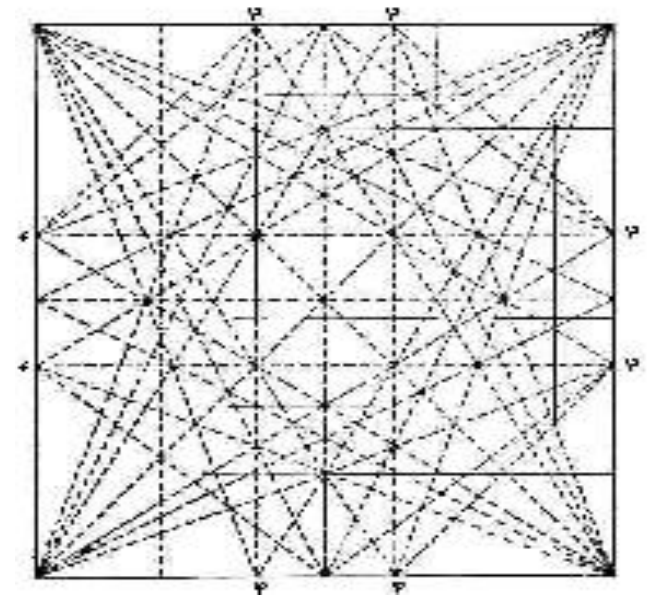
Golden Mean and Fibonnaci  
sequence in human body  
structure



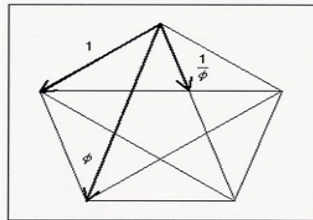
Golden Mean believed by some to be part of the design of the Parthenon. Controversial!



Designs of Corbusier uses  
Fibonacci sequence and phi



Notice use of phi in the design of the picture by Vermeer



The Last Supper by  
Salvador Dalí