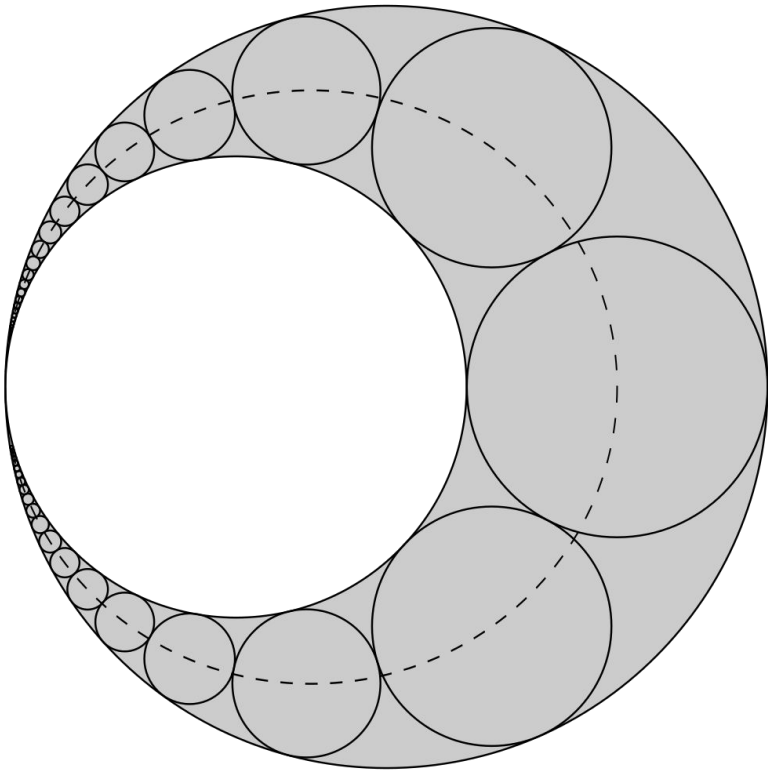
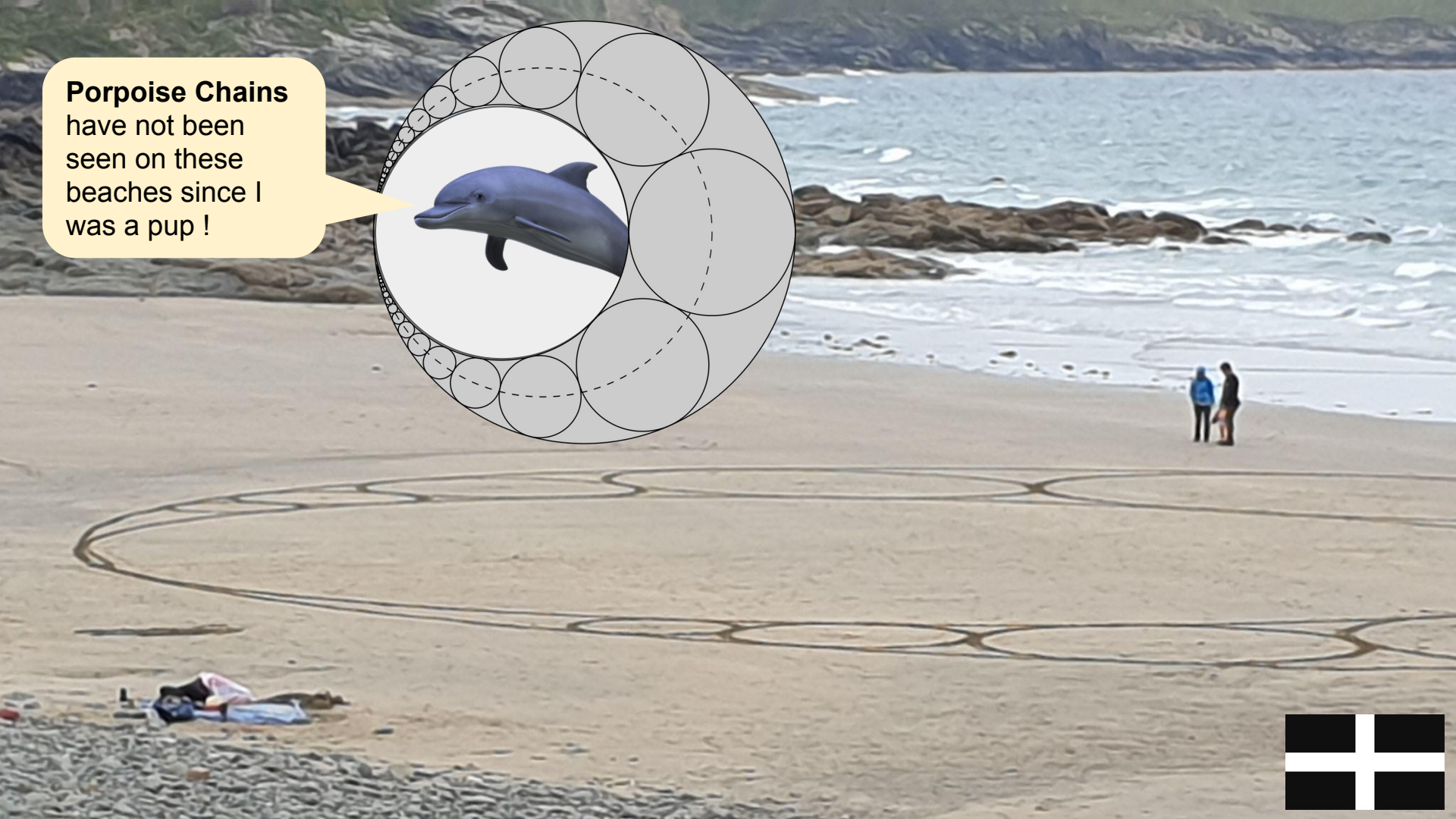

OFF AIR


Absurd Proofs

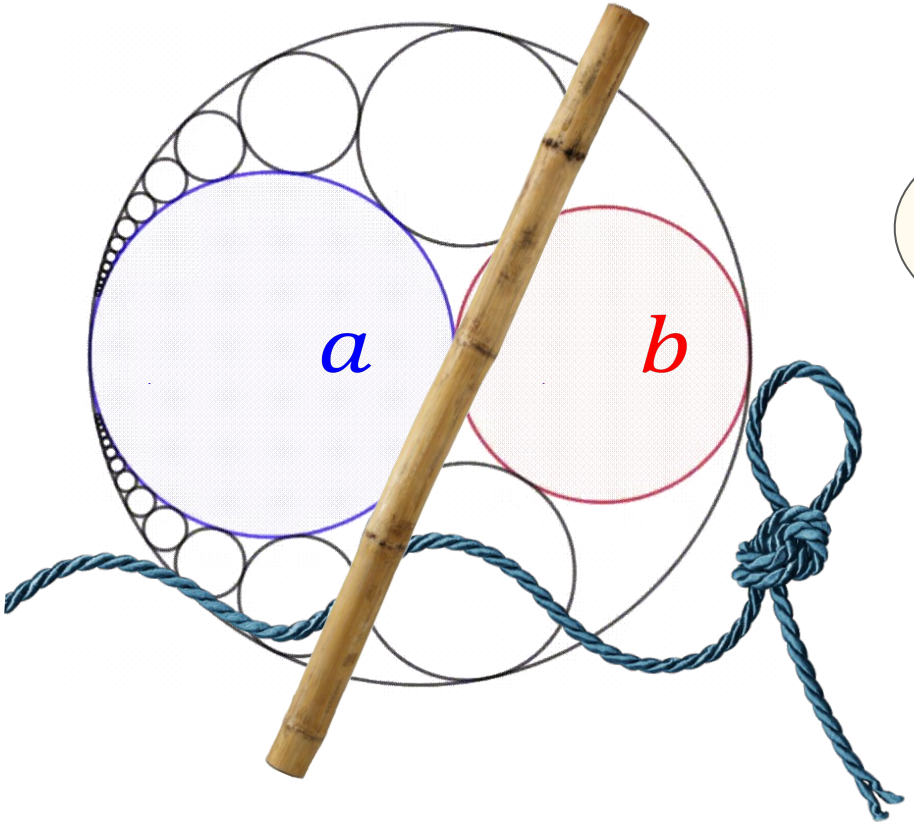
Papus Chains

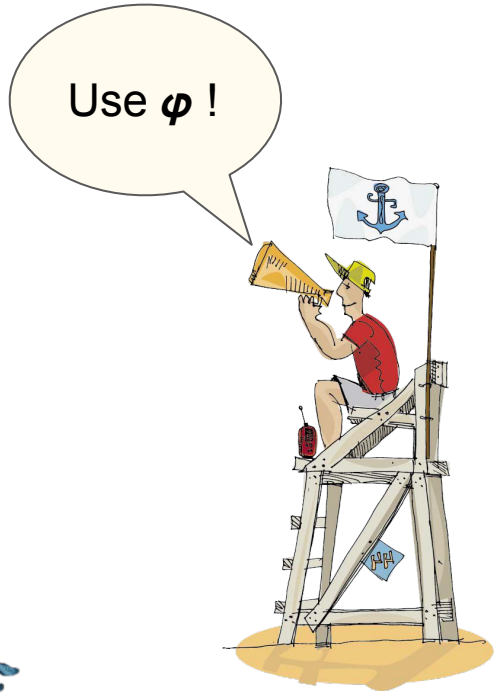



Porpoise Chains have not been seen on these beaches since I was a pup !

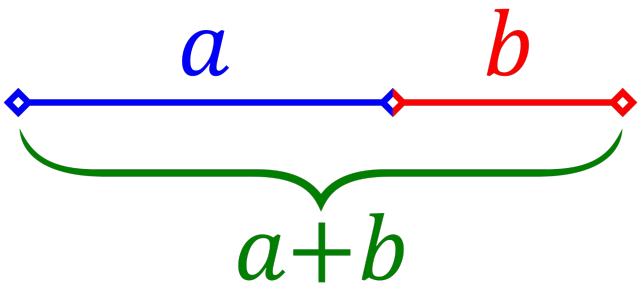
Choose a Ratio

$a : b$?

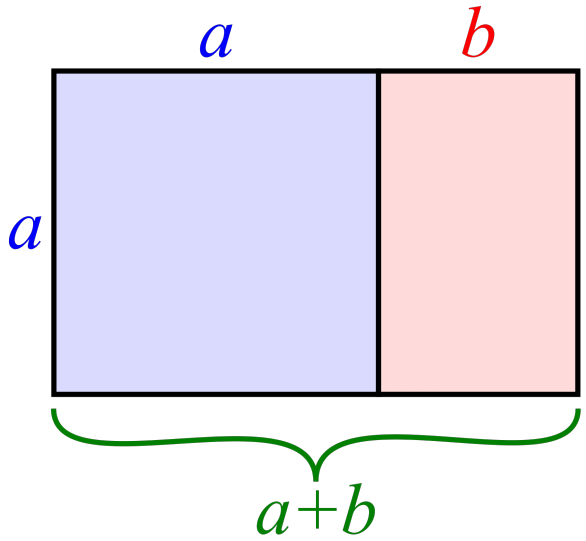




Definition of Φ - The Golden Section



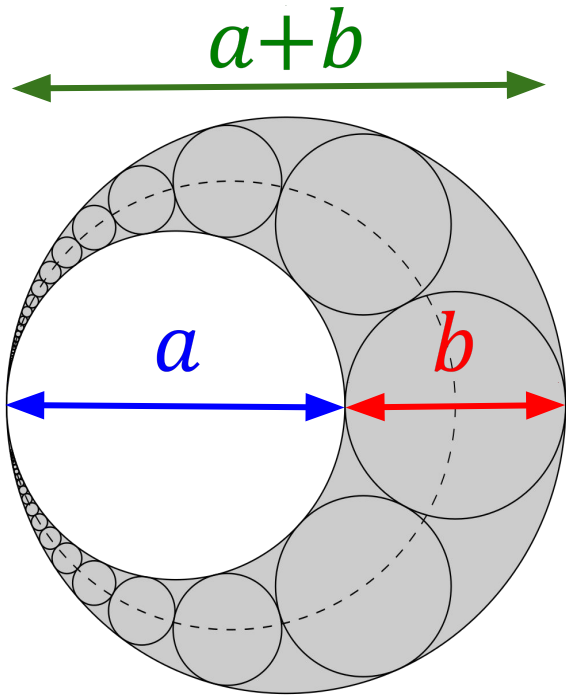
$a+b$ is to a as a is to b

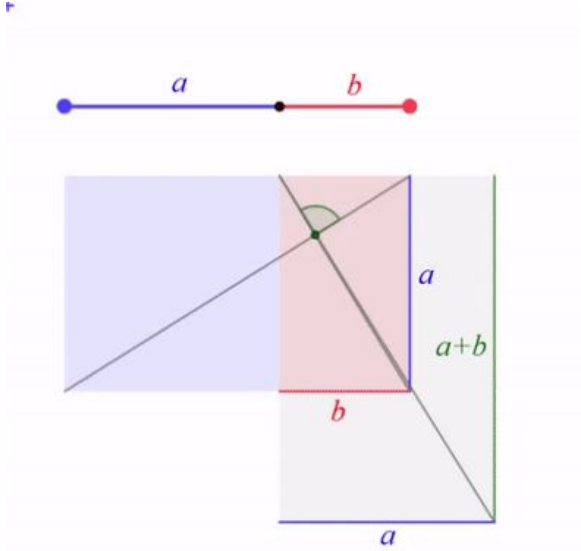


$$\frac{a+b}{a} = \frac{a}{b}$$

Find the Sweet Spot

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

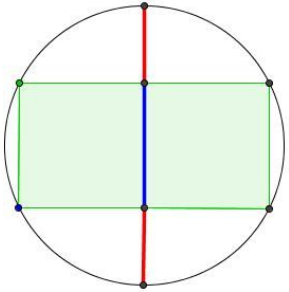


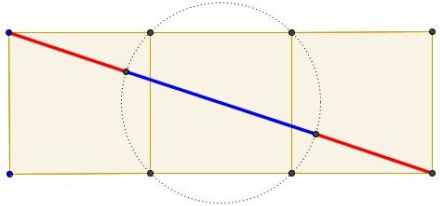


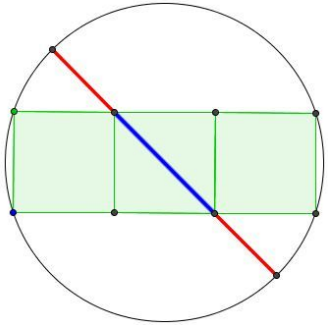
$$\frac{a+b}{a} = 1.6067$$

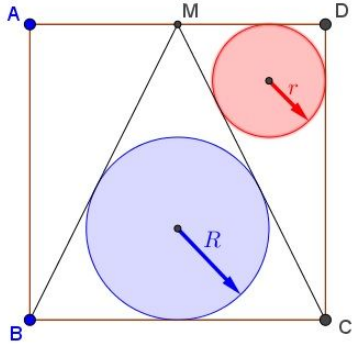
$$\frac{a}{b} = 1.6483$$

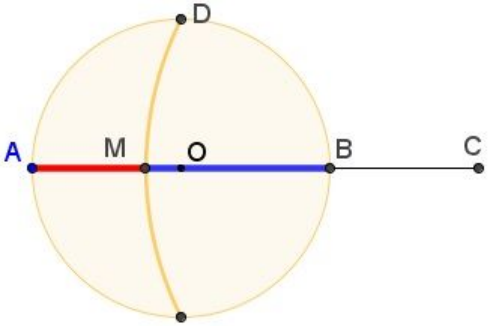
So Many Ways

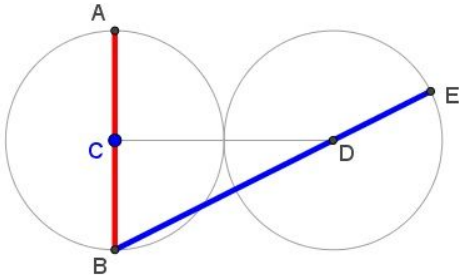




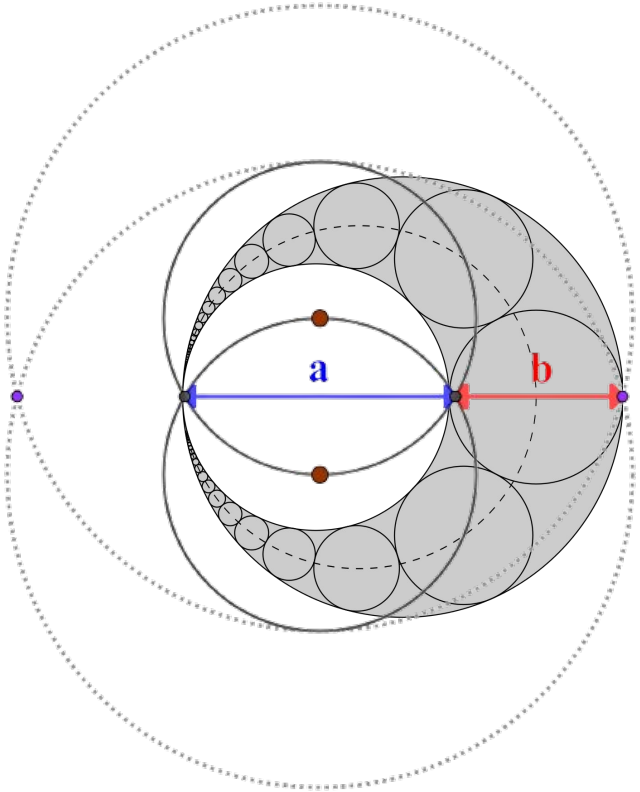




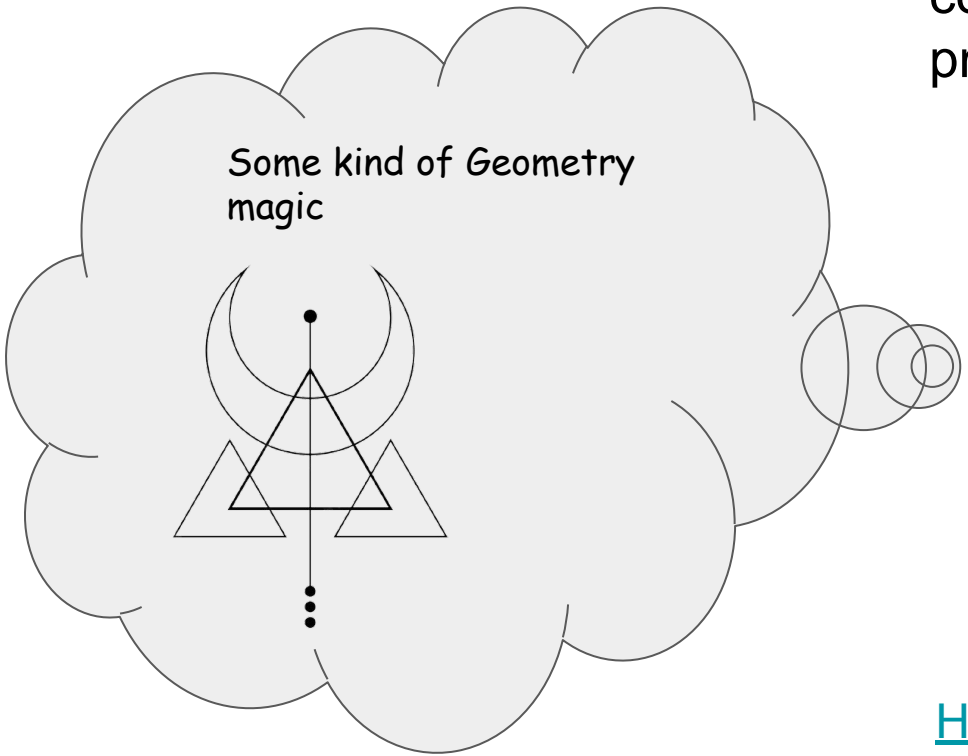




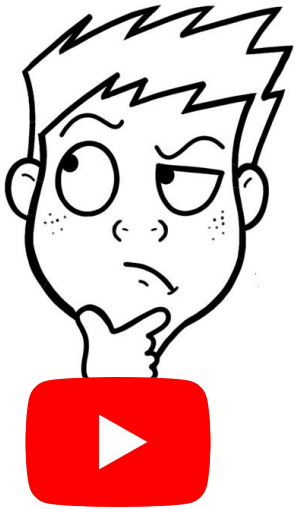
Kurt Hofstetter's Construction



I’d Like Proof

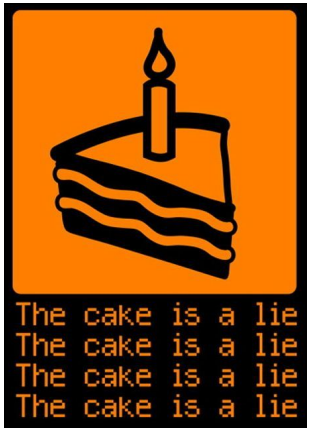


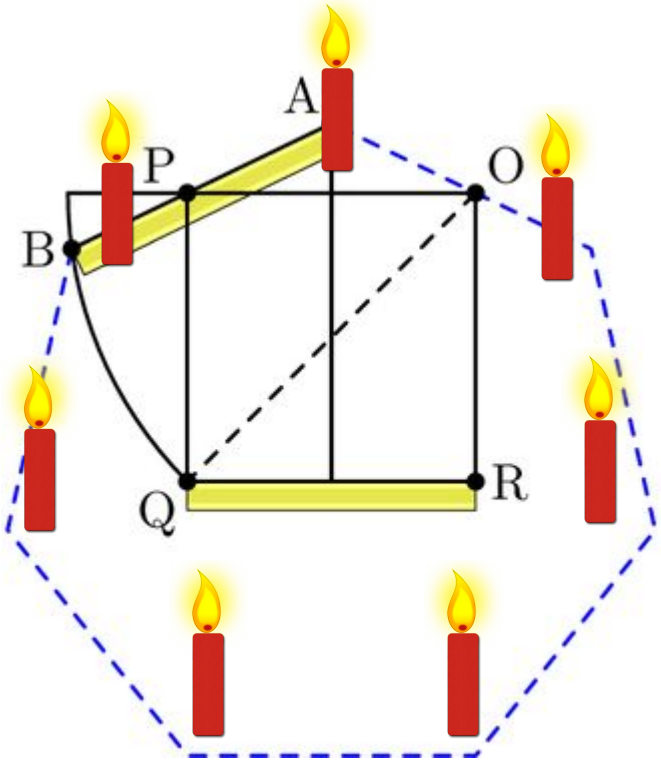
How can we be sure the construction does actually produce the Golden Ratio?



[How To Construct a Heptagon]

The Heptagon Cake is a Lie





Typical Proofs - Use an Equivalent Definition *a=1*

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

$\Leftrightarrow$

$$\phi = \frac{\sqrt{5}+1}{2}$$

finition is expressed using the quadratic equation

$$(b-\phi)(b+\psi) = 0$$

Let $a = 1$

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

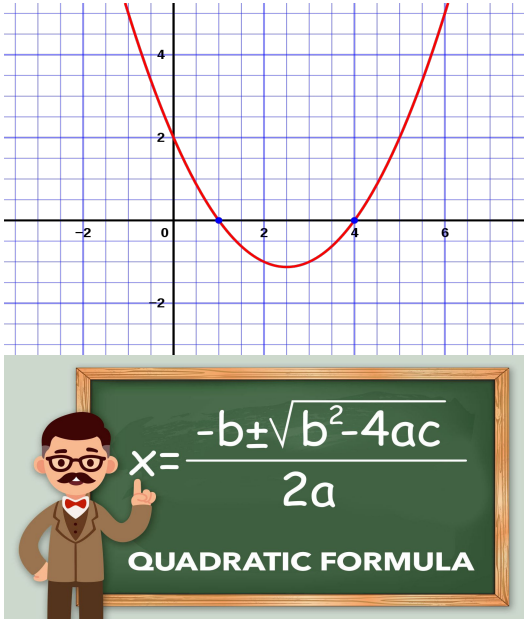
$$b + b^2 = 1$$

$$b^2 + b - 1 = 0$$

$$\phi = \frac{\sqrt{5}+1}{2} \quad , \quad \psi = \frac{\sqrt{5}-1}{2}$$

$$\phi = \frac{1}{\psi} \quad , \quad \phi = \psi + 1 \quad , \quad \phi \approx 1.618...$$

In Ancient Times



Bill and Ted's Health and Safety Guidelines

BILL

All things in Proportion except Proportion itself, which is never irrational.

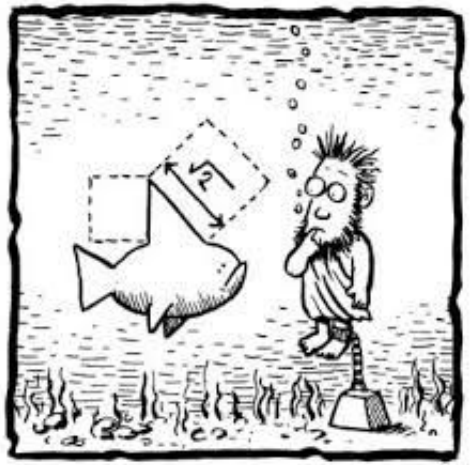
Ted

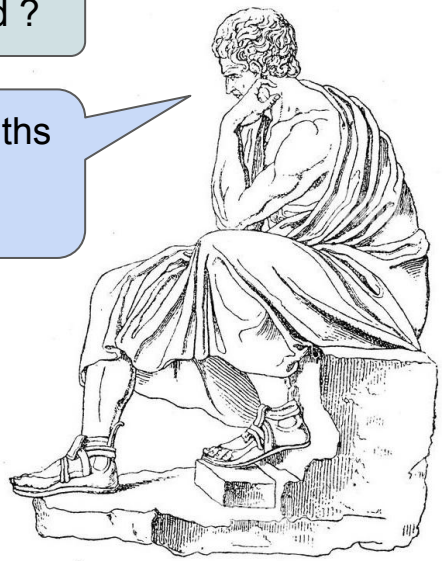
Poor Hippasus

BiLL

So Ted, what exactly did Hippasus do that was so bad ?

Well Bill, he showed there were some lengths that could NOT be written as a fraction of whole numbers



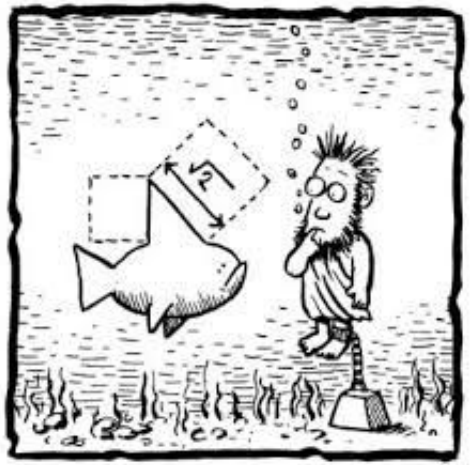


Ted

Poor Hippasus

Eucliding Me! They drowned him for revealing the truth

That's right Bill, they were not **Excellent** to him



BiLL

Ted

Ancient Concept

Ok, we'd better not mention **surds** while we're here then.

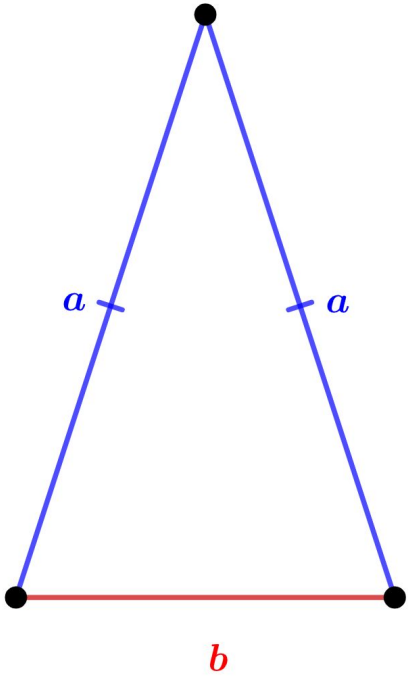
So how did they conceive the ***Golden Ratio***?

Well, I saw **Euclid** draw something pretty ***Phi***-nominal the other day

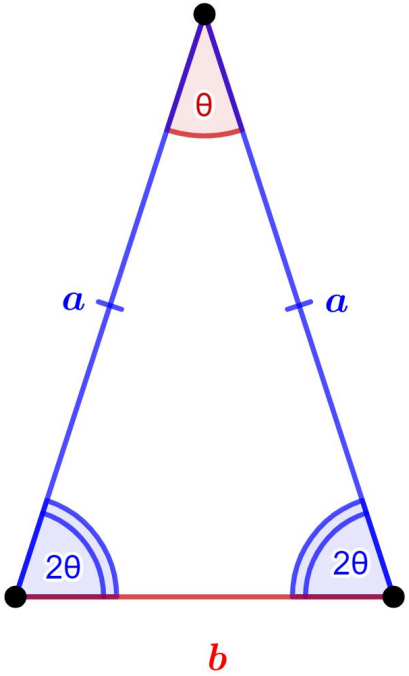
BiLL

Ted

Euclid’s Idea



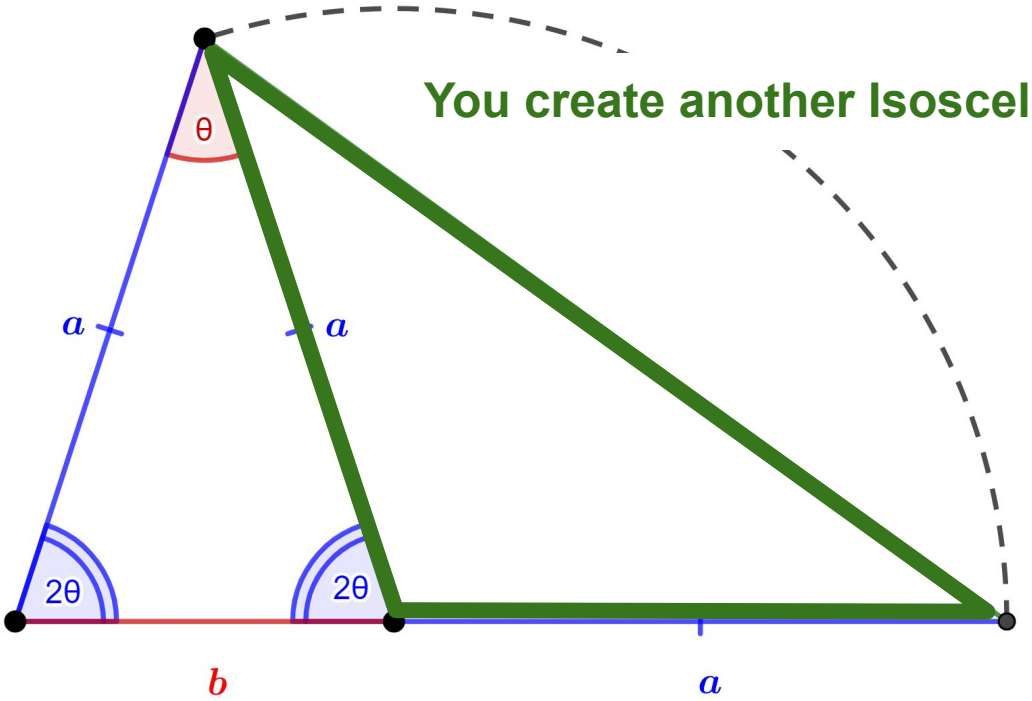
Euclid's Idea



$$2\theta + 2\theta + \theta = 5\theta$$

$$5\theta = 180^\circ$$

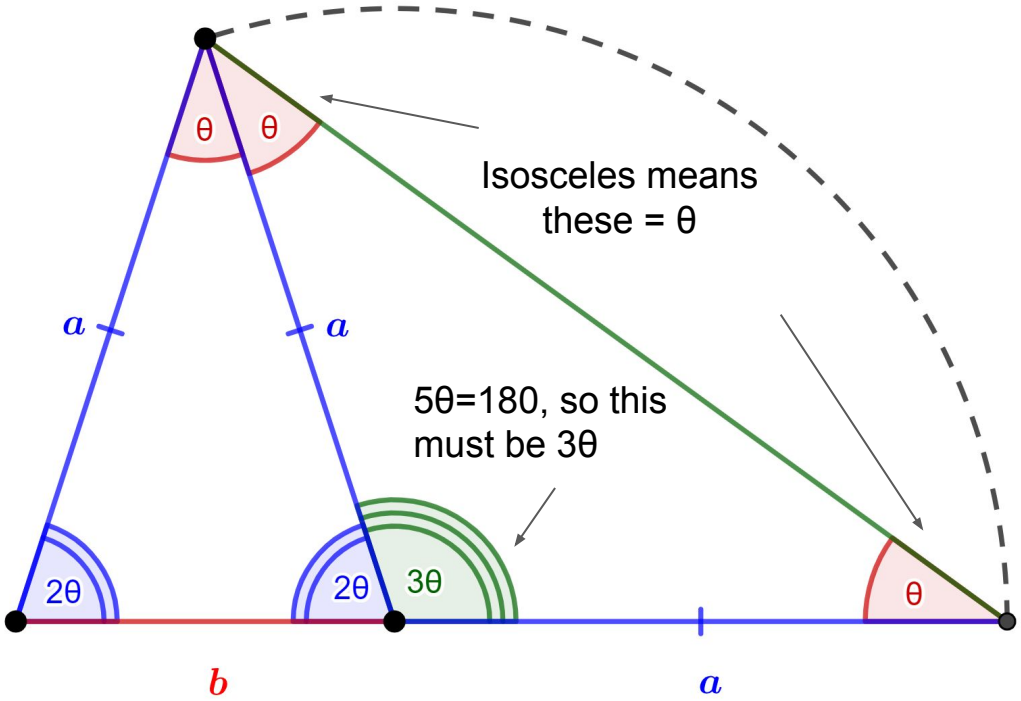
Euclid's Idea

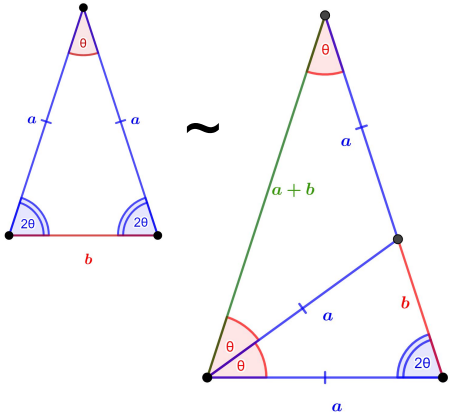


Arc the apex down to the base.

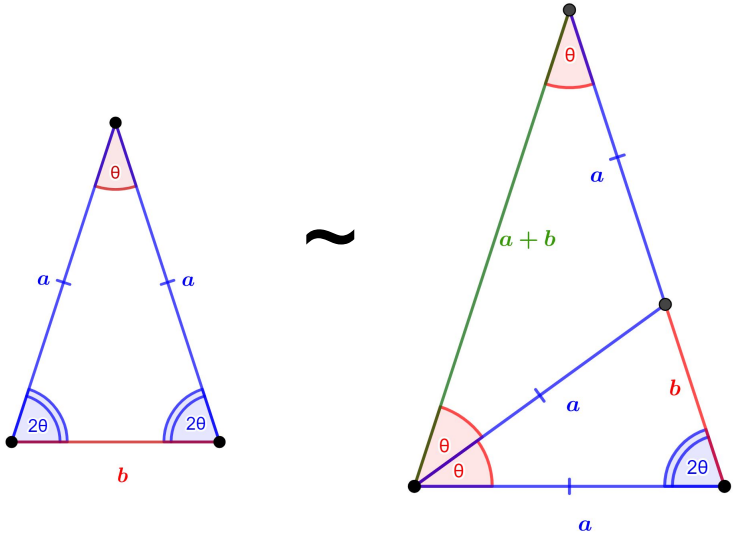
Radius = **a**

Euclid's Idea





So a and b are in Proportion to the Golden Ratio



$$\Rightarrow \quad \frac{a+b}{a} = \frac{a}{b}$$

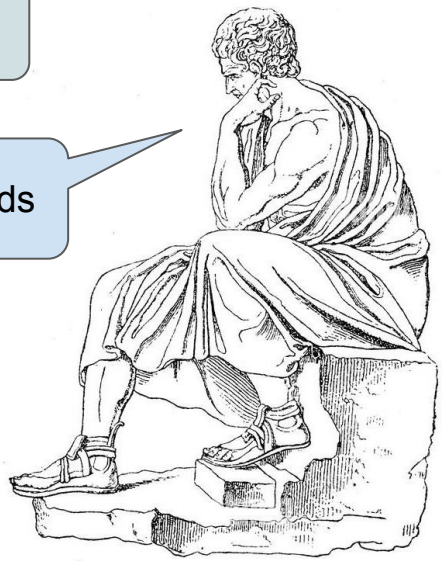
Meanwhile, back at the Parthenon

Awesome Ted, that is a truly bodacious ratio.

Totally dude, and Euclid proves it without using any surds

True, it was so **absent** of **surds**

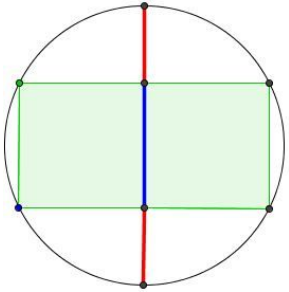
It's an **Absurd** proof

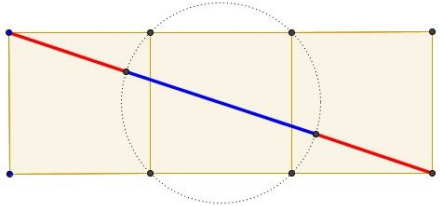


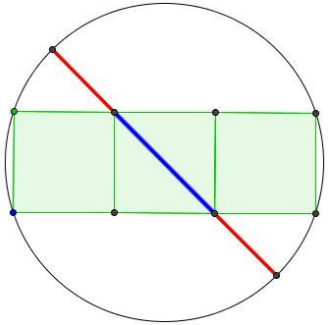
BiLL

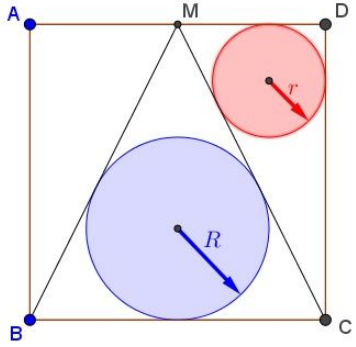
Ted

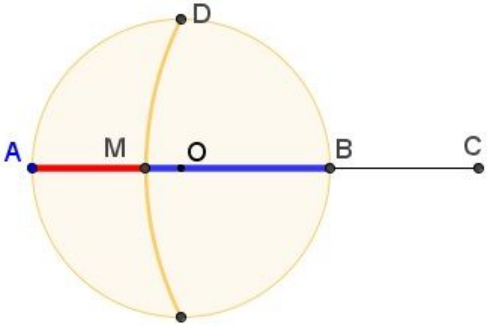
So Many Ways

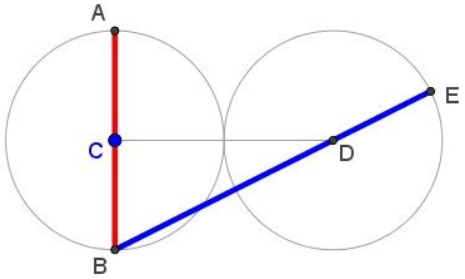












Can **All** Golden Ratio Constructions be Proved Absurdly

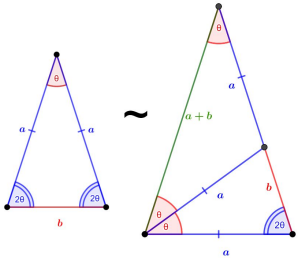
If not, why not?

Surely if you can prove it with surds there must be a way?

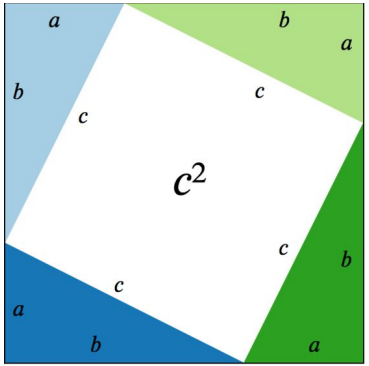
If not, which ones can't be?

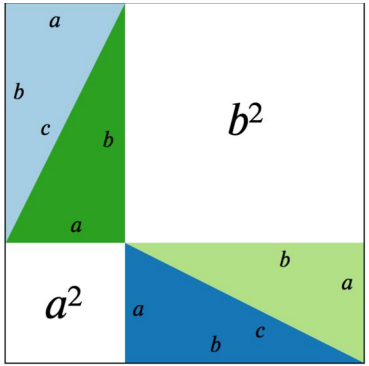
What I Want to Believe

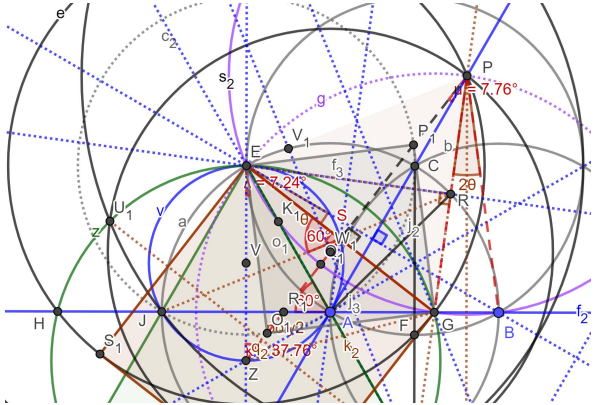
$$\phi = \frac{\sqrt{5}+1}{2}$$



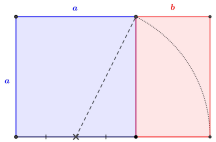
$$\Rightarrow \quad \frac{a+b}{a} = \frac{a}{b}$$

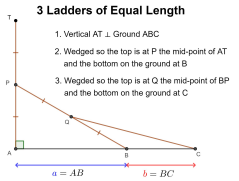


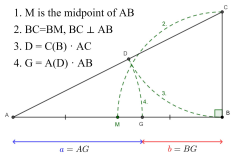


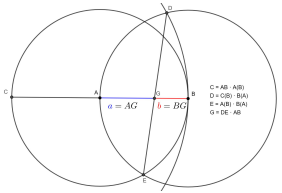


bit.ly/phicon-absurd







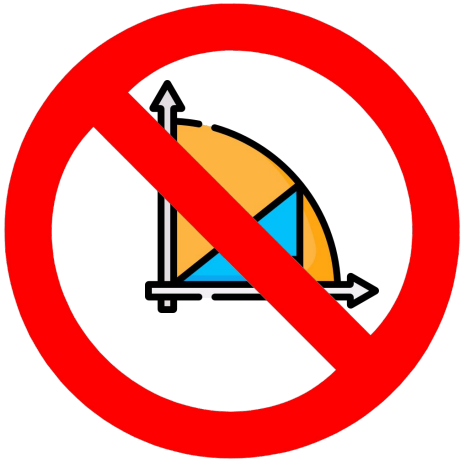


bit.ly/phicon-absurd

- No Surds
- No Trigonometry

Just plane ol’ Euclidean Geometry

Ask me for a printed copy if you have no internet access



Enter the Competition

Rule Alert!

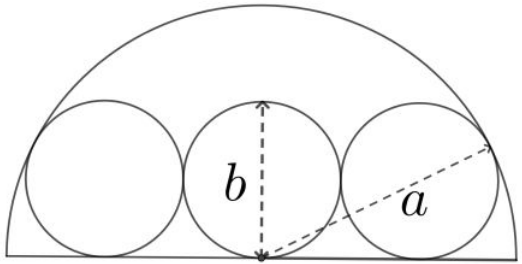
You now have all the information required

Yule Be Back Again

(sequel to bit.ly/yule-be-wondering 2021)

Last years Yule Log is still smouldering

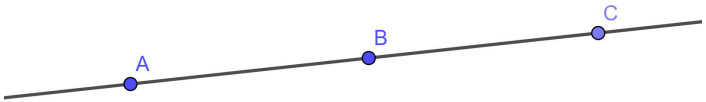
Can you prove *absurdly* that ***a:b*** is the golden ratio?



Elegant Geometry is Great

⚠ Hazards ⚠

Proof By GeoGebra

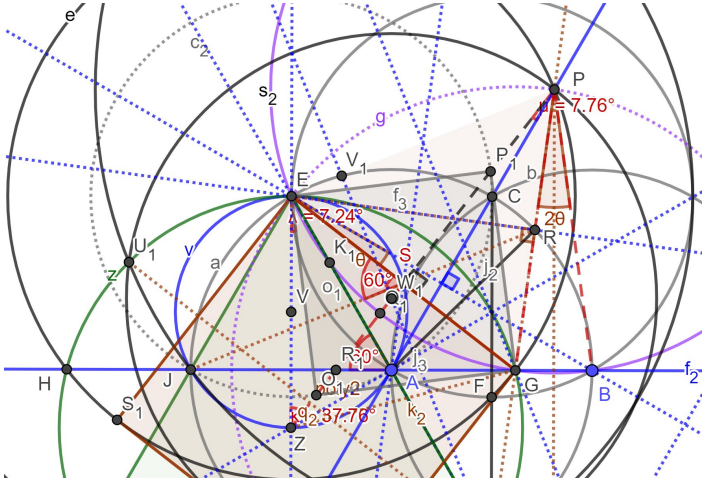


Given 3 points on a plane A,B,C

Are A,B,C collinear?

Just because GeoGebra always draws a line through a point does not prove a point.

They can get very messy very quickly



Thanks for Listening

Dave Budd

maildavebudd@gmail.com

bit.ly/phicon-absurd

ϕ-natic *(approach with caution)*