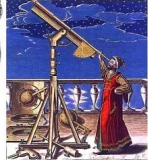
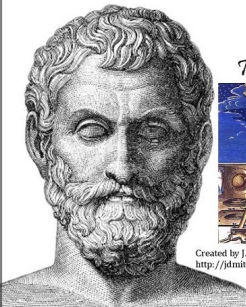


<https://todayinhistory.blog/tag/eclipse-of-thales/>



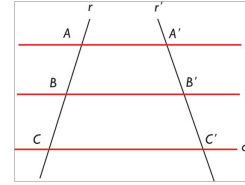
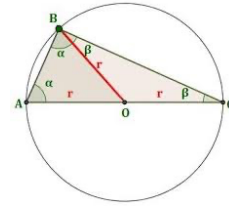
Thales of Miletus

May 25th
Celebrates
The First Solar Eclipse

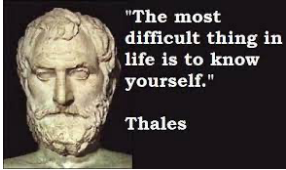


On May 25th 585 B.C., the first known prediction of a solar eclipse was made in Greece. The Greek philosopher Thales of Miletus accurately predicted a solar eclipse, according to *The Histories* of Herodotus.

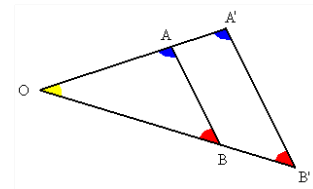
Created by J.D. Mitchell Designs ©
<http://jdmitchelldesigns.wordpress.com>

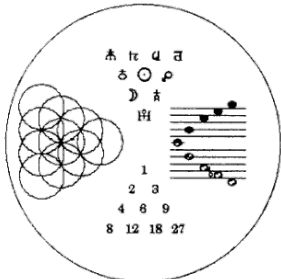
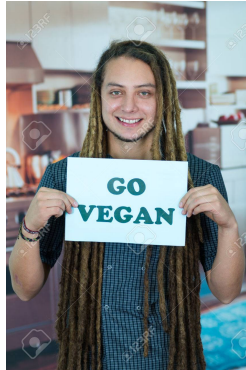
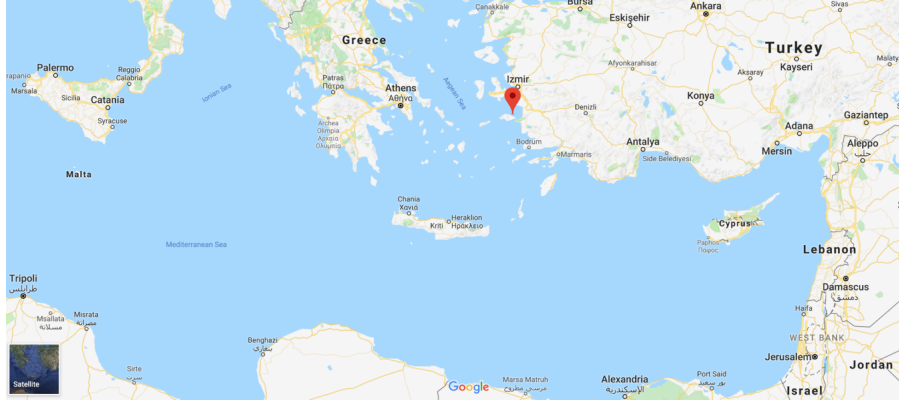


similarity



Thales of Miletus: 625 BC







Pythagoras Quick

Square root of 2 is not rational.

Square root of 3 rational?

Numbers

Constructible

Lunes / Squaring

Is $\sqrt{2} = \frac{a}{b}$ w/ $a \perp b$ having no common factors

If so, square both sides,

$$2 = \frac{a^2}{b^2},$$

then $a^2 = 2b^2$. Remember
so a^2 must be even.
 $\Rightarrow a$ is even.
so $a = 2 \cdot k$ for some integer k .

thus

$$(a^2) = (2k)^2 = 4k^2 = 2b^2$$

$$\text{so } 2k^2 = b^2$$

$\Rightarrow b^2$ is even, so b is even

thus $a \perp b$ have 2
as a common factor \times

a^2 is even $\Rightarrow a$ even

Prime factorization:
every whole number
factors uniquely into
a product of primes.

Ex $12 = 2 \cdot 2 \cdot 3$

$$22 = 2 \cdot 11$$

$$31 = 31$$

so if $a^2 = 2m$ (even)
 m factors uniquely \perp
 a does too!

$$m = p_1 \cdot p_2 \cdot \dots \cdot p_k$$

$$a = q_1 \cdot q_2 \cdot \dots \cdot q_e$$

$$a^2 = (q_1 \cdot q_2 \cdot \dots \cdot q_e)^2$$

$$= q_1 \cdot q_2 \cdot \dots \cdot q_e \cdot q_1 \cdot q_2 \cdot \dots \cdot q_e$$

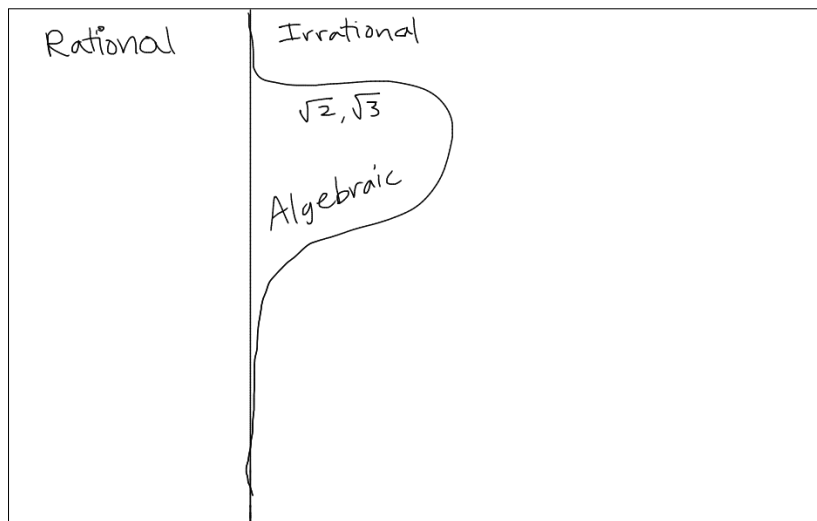
$$= q_1^2 \cdot q_2^2 \cdot \dots \cdot q_e^2$$

$$\overset{\text{so}}{q_1^2 \cdot \dots \cdot q_e^2} = 2 \cdot p_1 \cdot p_2 \cdot \dots \cdot p_k$$

↑ this two has to
appear on LHS

$\Rightarrow 2 = q_i$ so $a = q_1 \cdot q_2 \cdot 2 \cdot \dots \cdot q_e \Rightarrow a$ has 2
as factor

World of Numbers



Every number lives here ↴

Algebraic: Solutions to Equations
w/ integer coefficients

Ex

start $x = \sqrt{2}$

$$\Rightarrow x^2 = 2$$

$$\underbrace{x^2 - 2 = 0}_{\text{alg. eq.}}$$

Ex

$$x = \frac{1 + \sqrt{5}}{2} \Rightarrow 2x = 1 + \sqrt{5}$$

start ↴ $\Rightarrow 2x - 1 = \sqrt{5}$

now square

$$\Rightarrow (2x - 1)^2 = 5$$

$$\Rightarrow 4x^2 - 4x + 1 = 5$$

$$\Rightarrow 4x^2 - 4x - 4 = 0$$

$$\boxed{x^2 - x - 1 = 0}$$

Constructible Numbers \Leftrightarrow Quadrability ---

Quadrable: construct a square w/ same area,

show a rectagle is quadrable.