17 ΔΙΑΛΕΞΙΣ 2025,

Κυριακη 11-05-2025,

 Webex meeting recording:

 17a INM-20250511 1501-1

Recording link: https://uoa.webex.com/uoa/ldr.php?RCID=dbaed90f5e636dfa5429676ba8ec9dd9

Password: 463Rb9bj,

 Webex meeting recording:

17b INM-20250511 1501-2

Recording link: https://uoa.webex.com/uoa/ldr.php?RCID=0538e6a17d8916bccfe54001d5606f68

Password: iV9kxZRp

 **ΠΡΟΚΑΤΑΡΚΤΙΚΑ,**

 Επαναλαμβανεται η 2004,

 σχολια εκ νεου η 3002

#####  LEGACY,

 **CARDANO, ARS MAGNA, trnl WITMER, p. 7**



 [**https://en.wikipedia.org/wiki/Al-Jabr**](https://en.wikipedia.org/wiki/Al-Jabr)**,**

In the 12th century, Latin translations of his textbook on arithmetic (Algorithmo de Numero Indorum) which codified the various Indian numerals, introduced the decimal positional number system to the Western world.[23] The Compendious Book on Calculation by **Completion and Balancing, translated into Latin by Robert of Chester in 1145, was used until the sixteenth century as the principal mathematical text-book of European universities.[24][25][26][27]**

**Και σημερα στην β/θμια εκπαιδευση**.

 <https://mathshistory.st-andrews.ac.uk/Biographies/Al-Khwarizmi/quotations/>,

 David Eugene Smith. History of Mathematics (1923)

The Arabs contributed nothing new to the theory, but al-Khowirizmi (c. 825) states the usual rules, and the same is true of his successors.

 Το βρηκα στο

COPYRIGHT, 1951, BY EVA MAY LUSE SMITH

COPYRIGHT, 1923, BY DAVID EUGENE SMITH, π. 289 



 **Roshdi Rashed and Angela Armstrong write:**

 Al-Khwarizmi's text can be seen to be distinct not only from the Babylonian tablets, but also from the Diophantus' Arithmetica. It no longer concerns a series of problems to be resolved, but an exposition which starts with primitive terms in which the **combinations must give all possible prototypes for equations**, which henceforward explicitly constitute the **true object of study**. On the other hand, the idea of an equation for its own sake appears from the beginning and, one could say, in a generic manner, insofar as it does not simply emerge in the course of solving a problem, but is specifically called on to define **an infinite class of problems**.[8]

 ΠΟΙΑ ΜΑΘΗΜΑΤΙΚΑ ΕΙΝΑΙ ΣΗΜΑΝΤΙΚΑ,

 **J. J. O'Connor and E. F. Robertson wrote in the MacTutor History of Mathematics archive:**

 Perhaps one of the most significant advances made by Arabic mathematics began at this time with the work of al-Khwarizmi, namely the beginnings of algebra. It is important to understand just how significant this new idea was. It was a revolutionary move away from the **Greek concept of mathematics which was essentially geometry.** Algebra was a unifying theory which allowed **rational numbers, irrational numbers, geometrical magnitudes, etc., to all be treated as "algebraic objects**". **It gave mathematics a whole new development path so much broader in concept to that which had existed before, and provided a vehicle for future development of the subject**. Another important aspect of the introduction of algebraic ideas was that it allowed mathematics to be applied to itself in a way which had not happened before.

 Arabic mathematics : forgotten brilliance?

<https://mathshistory.st-andrews.ac.uk/HistTopics/Arabic_mathematics/>,

 Roshdi Rashed

 <https://en.wikipedia.org/wiki/Roshdi_Rashed>,

 ΣΥΝΕΧΕΙΑ στο

14 ΜΑΘΗΜΑΤΙΚΗ ΠΡΟΠΑΡΑΣΚΕΥΗ τησ ΕΕ (ΕΠΙΣ. ΕΠΑΝΑΣ.),

####  ΣΥΜΠΛΗΡΩΜΑΤΑ,

#####  Quadratic equations, χρησιμα σχολια, να αξιοποιηθουν το 2026,

 <https://en.wikipedia.org/wiki/Al-Jabr#cite_note-15>,

Quadratic equations

Pages from a 14th-century Arabic copy of the book, showing geometric solutions to two quadratic equations.

The book classifies quadratic equations to one of the six basic types and provides algebraic and geometric methods to solve the basic ones. Historian Carl Boyer notes the following regarding the lack of modern abstract notations in the book:[11]

(SGP. To “11” einai o BOYER.

 ... **the algebra of al-Khwarizmi is thoroughly rhetorical**, **with none of the syncopation** (see History of algebra) found in **the Greek Arithmetica** (ΔΙΟΦΑΝΤΟΣ), or in Brahmagupta's work. Even the numbers were written out in words rather than symbols!

 — Carl B. Boyer, A History of Mathematics, p. 206

Thus the equations are verbally described in terms of "squares" (what would today be "x2"), "roots" (what would today be "x") and "numbers" ("constants": ordinary spelled out numbers, like 'forty-two'). The six types, with modern notations, are:

 squares equal roots (ax2 = bx)

 squares equal number (ax2 = c)

 roots equal number (bx = c)

 squares and roots equal number (ax2 + bx = c)

 squares and number equal roots (ax2 + c = bx)

 roots and number equal squares (bx + c = ax2)

Islamic mathematicians, unlike the Hindus**, did not deal with negative numbers at all; hence an equation like bx + c = 0 does not appear in the classification, because it has no positive solutions if all the coefficients are positive.** Similarly equation types 4, 5 and 6, which look equivalent to the modern eye, were distinguished because the coefficients must all be positive.[3][page needed]

Al-Jabr ("forcing", "restoring") operation is moving a deficient quantity from one side of the equation to the other side. In an al-Khwarizmi's example (in modern notation), "x2 = 40x − 4x2" is transformed by al-Jabr into "5x2 = 40x". Repeated application of this rule eliminates negative quantities from calculations.

Al-Muqābala (المقابله, "balancing" or "corresponding") means subtraction of the same positive quantity from both sides: "x2 + 5 = 40x + 4x2" is turned into "5 = 40x + 3x2". Repeated application of this rule makes quantities of each type ("square"/"root"/"number") appear in the equation at most once, which helps to see that there are only 6 basic solvable types of the problem, when restricted to positive coefficients and solutions.

Subsequent parts of the book do not rely on solving quadratic equations.

#####  Al-Jabr, wikipedia,

 <https://en.wikipedia.org/wiki/Al-Jabr>,

(The “Compendious Book on Calculation by Completion and Balancing”,

 “Al-kitāb al-mukhtaṣar fī ḥisāb al-ğabr wa’l-muqābala”[1]

(Latin: Liber Algebræ et Almucabola), .

 The Muslim[52] Persian mathematician Muhammad ibn Mūsā al-Khwārizmī (Latinized as Algorithmi), was a faculty member of the "House of Wisdom" (Bait al-Hikma) in Baghdad, which was established by Al-Mamun. Al-Khwarizmi, who died around 850 CE.

Περαιτερω αναπτυξη του «αγνώστου χ».

 COMPENDIOUS, συνοπτικος, περιεκτικος,

 Kitab,

(among Muslims) a sacred book of certain other religions, such as the Bible.

 Indian :, any book or text.

 Mukhtaṣar (Arabic: المختصر), in Islamic law, refers to a concise handbook of legal treatises, characterized by neatness and clarity.

 ḥisāb, “calculation”

 al-ğabr, αποκατασταση κλπ,

algebrista, χειροπρακτης,

 muqābala, confrontation , a face to face encounter, Αντιμετώπιση, εξισοροπιση,

 ΠΑΡΑΔΕΙΓΜΑ, «εξισοροπισης» και «αποκαταστασης»

Να βρεθει x ώστε x2 +2x=8

**An** υπαρχει x που να ικανοποιει την ως ανω τοτε

x2 +2x+1=8+1 muqābala,

(x+1)2 =9, al-ğabr, klp

#####  Eng. Trans. Compendious Book on Calculation by Completion and Balancing,

 <https://en.wikisource.org/wiki/The_Compendious_Book_on_Calculation_by_Completion_and_Balancing>,

 Είναι αγγλικη μεταφραση του The Compendious Book on Calculation by Completion and Balancing

**ΚΑΛΗ ΠΑΡΟΥΣΙΑΣΗ**

###### COMPLETION AND REDUCTION.,

 <https://en.wikisource.org/wiki/The_Compendious_Book_on_Calculation_by_Completion_and_Balancing/Compendium_on_calculating_by_completion_and_reduction#cite_ref-12>,

######  NA DΩ, arab math

 <https://en.wikipedia.org/wiki/History_of_algebra#cite_ref-Rashed-Armstrong_57-0>,

 <https://en.wikipedia.org/wiki/Arabs#Abbassid_era_(750%E2%80%931258_&_1261%E2%80%931517)>,

 The ink of the scholar is more holy than the blood of martyrs

 ,

https://www.islamweb.net/en/fatwa/85115/the-ink-of-the-scholar-is-holier-than-the-blood-of-the-martyr

###  ΣΥΜΠΛΗΡΩΣΕΙΣ ARABIC ALGEBRA,

####  Muḥammad ibn Mūsā al-Khwārizmī,

 <https://en.wikipedia.org/wiki/Muhammad_ibn_Musa_al-Khwarizmi>,

**Muḥammad ibn Mūsā al-Khwārizmī**[note 1] (Arabic: محمد بن موسى الخوارزمي, romanized: Muḥammad ibn Musā al-Khwārazmi; c. 780 – c. 850), or al-Khwarizmi, was a Persian polymath from Khwarazm,[6][7][8][9][10][11] who produced vastly influential works in mathematics, astronomy, and geography. Around 820 CE, he was appointed as the astronomer and head of the library of the House of Wisdom in Baghdad.[12]: 14

 **al-Kitāb al-Mukhtaṣar fī Ḥisāb al-Jabr wal-Muqābalah,** The Compendious Book on Calculation by Completion and Balancing,

 Compendious, συνοψη,

 Mukhtaṣar (Arabic: المختصر), in Islamic law, refers to a concise handbook of legal treatises, characterized by neatness and clarity.

 Hisaab, in English is Register,

 Algebrista, χειροπρακτησ.

 Al jabr, 'reunion of broken parts, bonesetting')

 Muqabalah means "**putting face to face, confronting, equation**," and. the question arises as to the reason for giving to it the meaning of the special operation of removing the equal positive members.

**Al-Khwarizmi's popularizing treatise on algebra (The Compendious Book on Calculation by Completion and Balancing, c. 813–833 CE[13]: 171 )** presented the first systematic solution of linear and quadratic equations. One of his principal achievements in algebra was his demonstration of how to solve quadratic equations by completing the square, for which he provided geometric justifications.[12]: 14  Because he was the first to treat algebra as an independent discipline **and introduced the methods of "reduction" and "balancing**" (the transposition of subtracted terms to the other side of an equation, that is, the cancellation of like terms on opposite sides of the equation),[14] he has been described as the father[6][15][16] or founder[17][18] of algebra. The term algebra itself comes from the title of his book (the word al-jabr meaning "completion" or "rejoining").[19] His name gave rise to the terms algorism and algorithm,[20][21] as well as Spanish, Italian and Portuguese terms algoritmo, and Spanish guarismo[22] and Portuguese algarismo meaning "digit".

In the 12th century, Latin translations of his textbook on arithmetic (Algorithmo de Numero Indorum) which codified the various Indian numerals, introduced the decimal positional number system to the Western world.[23] The Compendious Book on Calculation by **Completion and Balancing, translated into Latin by Robert of Chester in 1145, was used until the sixteenth century as the principal mathematical text-book of European universities.[24][25][26][27]**

In addition to his best-known works, he revised Ptolemy's Geography, listing the longitudes and latitudes of various cities and localities.[28]: 9  He further produced a set of astronomical tables and wrote about calendaric works, as well as the astrolabe and the sundial.[29] He also made important contributions to trigonometry, producing accurate sine and cosine tables, and the first table of tangents.

 ARS MAGNA p. 31

… the arab,

 2025, Σταματαμε εδώ την ροη του μαθηματος και παμε

ΜΑΘΗΜΑΤΙΚΗ ΠΡΟΠΑΡΑΣΚΕΥΗ τησ ΕΕ

 16 ΔΙΑΛΕΞΗ, 2023

 ΣΑΒΑΤΤΟΝ, 20-04-2023,

 Webex meeting recording: 16 Dialekisis INM 2024, SATURDAY 12.00-14.00-20240420 0916-1

Password: mJZDHXM7

Recording link: <https://uoa.webex.com/uoa/ldr.php?RCID=3de4668c2f2a1b2c50fd7ebc85975587>

 ΠΡΟΚΑΤΑΡΚΤΙΚΑ,

 Σαβατο του ΛΑΖΑΡΟΥ, 27-04-2024, να μετακινηθει το

Σαβαττο 18-05-2024 (το πρωτο μετα της διακοπες του ΠΑΣΧΑ, που θα γινει 2ωρο,

Θα το ρυθμισουμε αργοτερα, . Το 18-05-2024, ενεδιν , όχι μαθημα

ΕΤΣΙ καταλληγουμε σε ΧΡΕΟΣ 3 ημερων που πρεπει να καλυφθη

 ERGASIA 2002 καλλιτερο συστημα,

1004 hliokentriko να σθμπληροτηει η λυση,

 ΜΑΛΛΟΝ τα κεφαλαια 12 και 13 ΔΕΝ θα γινουν το 2025,

# [MIDDLE AGES, [ΜΕΣΑΙΩΝ, [ΕΥΡΩΠΗ 500-1500, [DARK AGES

 500-1500,

Μεσαίωνας (476 - 1492 μ.Χ) ονομάζεται η χρονική περίοδος της Ευρωπαϊκής ιστορίας, από τον 5ο μέχρι το 15ο αιώνα μ.Χ..

 DARK AGES, ΣΚΟΤΕΙΝΟΙ ΧΡΟΝΟΙ,

 Οι αγγλόφωνοι ιστορικοί, ακολουθώντας τους γερμανόφωνους συναδέλφους τους, συνήθως διαιρούν το Μεσαίωνα σε τρία τμήματα: τον Πρώιμο, τον Ώριμο ή Μέσο, και τον Ύστερο. Το 19ο αιώνα, ο Μεσαίωνας στο σύνολό του συχνά αναφερόταν ως οι «Σκοτεινοί Αιώνες»,[13] ωστόσο μετά την υιοθέτηση των διαιρέσεων που περιγράφηκαν παραπάνω, η χρήση του όρου περιορίστηκε στο να χαρακτηρίζει τον Πρώιμο Μεσαίωνα, τουλάχιστον σε ό,τι αφορά τους ιστορικούς.[2]

## ΒΙΒΛΙΟΓΡΑΦΙΑ,

###  Medieval Europe, by Chris Wickham (Author)

 Hardcover – November 29, 2016

Λεπτομερες για τον σκοπο μασ

Από <https://www.amazon.com/Medieval-Europe-Chris-Wickham/dp/0300208340>

####  Editorial Reviews, οχι 2025,

 Review

"A dazzling race through a complex millennium."—Publishers Weekly

"A thorough survey of the European continent in the time between antiquity and modernity. . . . Far-ranging, fluent, and thoughtful—of considerable interest to students of history writ large, and not just of Europe."—Kirkus Reviews (starred review)

“Wickham’s interpretation of the European Middle Ages is one of vibrancy and dynamism, a welcome reminder of why many people find this period fascinating.”—Jonathan R. Lyon, Journal of Interdisciplinary History

"Historians of the medieval period and beyond, however, should benefit from Wickham’s particular vision of the Middle Ages as a series of major turning points knit together by structural forces. His assessment of the respective roles played by various elements in this tapestry is thought provoking."—Robert Sutherland-Harris, Renaissance and Reformation

“Medieval Europe is a testament to Chris Wickham’s authoritative command of the material and to his clarity of thought . . . thought-provoking.”—James Davis, Renaissance Quarterly

“[The] broad purview, memorable terseness, and focus on what is important make this book well worth reading.”—Lawrence G. Duggan, Anglican and Episcopal History

"Writing with great wit, style and clarity, Chris Wickham presents to us a powerful account of the middle ages as a period of considerable dynamism and massive change. Emperors, popes, theologians, knights and mystics are found herein, but so too are cities, peasants, merchants, and the material experiences of the many and not just the few. Above all else, Wickham shows us the economic and structural bones beneath the skin. This is the middle ages that the twenty-first century needs to know about – not the gaudy antithesis of 'modernity' but the centuries of human toil, ingenuity and compromise in which real people made choices, albeit not in circumstances of their own choosing."—John Arnold, Professor of Medieval History, University of Cambridge

"Medieval Europe is a model of clarity and accessibility, the superlative answer to a challenge taken up by an eminent and wide-ranging historian: to interpret the history of a millennium in 250 pages. This yields a sense of intellectual adventure that remains compelling throughout, as Chris Wickham engages his readers in his arguments, choices and interpretations, and keeps them on their toes."—Mayke de Jong, Utrecht University

"This is tremendously good. Chris Wickham has an outstandingly keen and understanding eye for the diversities of life across a broadly-framed Europe, and for changes over time. Impressive geographic reach is combined with nuance, and a keen sense of the particularities of different historical landscapes. The author continually makes illuminating connections and comparisons, and does not flinch from offering clear judgments or nailing his own colours to the mast. Indeed, he has a consistently refreshing ability to get the reader away from predictable or ingrained ways of thinking about and judging things."—Len Scales, University of Durham

"Fascinating, judicious, authoritative: by far the best single book about the Middle Ages. I wish this had been around earlier in my teaching career. Perhaps Wickham's most unusual accomplishment is that this survey never seems hurried. Without apparent strain, details and examples of historical trends are related to grand themes and changes."—Paul Freedman, author of Out of the East: Spices and the Medieval Imagination

About the Author

Chris Wickham is Chichele Professor of Medieval History, University of Oxford. He lives in Birmingham, UK.

Product details

 Publisher ‏ : ‎ Yale University Press; Illustrated edition (November 29, 2016)

 Language ‏ : ‎ English

 Hardcover ‏ : ‎ 352 pages

 ISBN-10 ‏ : ‎ 0300208340

 ISBN-13 ‏ : ‎ 978-0300208344

 Item Weight ‏ : ‎ 1.7 pounds

 Dimensions ‏ : ‎ 9.3 x 6 x 1.4 inches

 Best Sellers Rank: #1,037,105 in Books (See Top 100 in Books)

 #7,052 in Historical Study (Books)

 #14,827 in European History (Books)

 Customer Reviews: 4.3 out of 5 stars 337 ratings

##  ΙΣΤΟΡΙΑ,

###  ΣΧΟΛΙΑΣΜΟΣ ΓΙΑ ΤΟΥΣ ΤΡΕΙΣ ΠΥΛΩΝΕΣ ΤΟΥ ΔΥΤΙΚΟΥ ΠΟΛΙΤΙΣΜΟΥ :ΙΣΡΑΗΛ, ΕΛΛΑΔΑ, ΡΩΜΗ,

###  ΜΑΘΗΜΑΤΙΚΑ ΤΟΥ ΠΑΡΕΛΘΟΝΤΟΣ

 ΑΚΜΗ ΑΡΧΑΙΩΝ ΕΛΛΗΝΙΚΩΝ ΜΑΘΗΜΑΤΙΚΩΝ, 600 π.Χ.- 190 π. Χ.

ΕΥΚΛΕΙΔΗΣ, ΑΡΧΙΜΗΔΗΣ, ΑΠΟΛΛΩΝΙΟΣ

 G. H. Hardy, A Mathematician’s Apology, σελ. 12

The Greeks first spoke a language which modern mathematicians can understand: as Littlewood said to me once, they are not clever schoolboys or ‘scholarship candidates’, but ‘Fellows of another college’.

 **ΡΩΜΗ**

**VIRGIL, AINIAD, … “MEMENTO ROMANO”,**

 **http://classicalanthology.theclassicslibrary.com/2012/08/07/aeneid-6-847-853/.**

**Aeneid 6.847-853 – Virgil’s vision of Roman greatness**

Virgil’s vision of Roman greatness put into the mouth of Anchises, the dead father of Aeneas whom Aeneas travels to find in the Underworld in this book – the turning point of the poem.

Anchises points out the future heroes of Rome yet to be born, a long catalogue that is patriotic and visionary but also cautionary and sad. It culminates in this grand passage which, although outwardly imperialistic, also warns of the great responsibilities and dangers that go with power.

**Jane Mason**

Excudent alii spirantia mollius aera,

credo equidem, vivos ducent de marmore voltus,

orabunt causas melius, caelique meatus

describent radio, et surgentia sidera dicent: 850

tu regere imperio populos, **Romane, memento**;

hae tibi erunt artes; pacisque imponere morem,

parcere subiectis, et debellare superbos.”

Others will forge breathing bronzes more smoothly

(I believe it at any rate), and draw forth living features from marble.

They will plead law-suits better and trace the movements

Of the sky with a rod and describe the rising stars.

**You, O Roman, govern the nations with your power- remember this!**

These will be your arts – to impose the ways of peace,

To show mercy to the conquered and to subdue the proud.

 TERTULLIAN, Τερτυλλιανοσ

 TERTULLIAN wiki,

<https://en.wikipedia.org/wiki/Tertullian>,

Tertullian (/tərˈtʌliən/; Latin: Quintus Septimius Florens Tertullianus; c. 155 – c. AD 220)[1] was a prolific early Christian author from Carthage in the Roman province of Africa.[2] Of Berber origin,[3][4][5][6][7] he was the first Christian author to produce an extensive corpus of Latin Christian literature. He was an early Christian apologist and a polemicist against heresy, including contemporary Christian Gnosticism.[8] Tertullian has been called "the father of Latin Christianity"[9][10] and "the founder of Western theology."[11]

 <https://www.academia.edu/20049232/TERTULLIAN_ON_FAITH_AND_REASON>,

TERTULLIAN ON FAITH AND REASON, Michael Okpala

 ΑΡΑΒΙΚΟΣ ΧΡΥΣΟΥΣ ΑΙΩΝ, 8ος έως 13ος ΑΙΩΝ.

 <https://en.wikipedia.org/wiki/Arabs#Abbassid_era_(750%E2%80%931258_&_1261%E2%80%931517)>,

 The Islamic Golden Age was inaugurated by the middle of the 8th century by the ascension of the Abbasid Caliphate and the transfer of the capital from Damascus to the newly founded city of Baghdad. The Abbassids were influenced by the Qur'anic injunctions and hadith such as "**The ink of the scholar is more holy than the blood of martyrs**" stressing the value of knowledge. During this period the Muslim world became an intellectual centre for science, philosophy, medicine and education as the Abbasids championed the cause of knowledge and established the "House of Wisdom" (Arabic: بيت الحكمة‎) in Baghdad. Rival dynasties such as the Fatimids of Egypt and the Umayyads of al-Andalus were also major intellectual centres with cities such as Cairo and Córdoba rivaling Baghdad.[95]

The Abbasids ruled for 200 years before they lost their central control when Wilayas began to fracture in the 10th century; afterwards, in the 1190s, there was a revival of their power, which was ended by the Mongols, who conquered Baghdad in 1258 and killed the Caliph Al-Musta'sim. Members of the Abbasid royal family escaped the massacre and resorted to Cairo, which had broken from the Abbasid rule two years earlier; the Mamluk generals taking the political side of the kingdom while Abbasid Caliphs were engaged in civil activities and continued patronizing science, arts and literature.

 REMARK

A **wilayah** (Arabic: وَلاية, romanized: wālāya or wilāya, plural wilāyat, wilayat; Urdu and Persian: ولایت, velâyat; Turkish: vilayet) is an administrative division, usually translated as "state", "province" or occasionally as "governorate".

 <https://en.wikipedia.org/wiki/Islamic_Golden_Age>,,

 The Islamic Golden Age was a period of cultural, economic and scientific flourishing in the history of Islam, traditionally dated from the 8th century to the 14th century.[1][2][3] This period is traditionally understood to have begun during the reign of the **Abbasid caliph Harun al-Rashid** (786 to 809) with the inauguration of the House of Wisdom in Baghdad, where scholars from various parts of the world with different cultural backgrounds were mandated to gather and translate all of the world's classical knowledge into the Arabic language,

###  The Early Middle Ages,

 <https://www.royhart.org/cms/lib/NY01913927/Centricity/Domain/310/The%20Middle%20Ages%20in%20Europe.pdf>, εκει υπαρχει .pdf, p. 1.

 Είναι κειμενο της Royalton - Hartland School District / 54 State Street Middleport, NY 14105, . Home page

<https://www.royhart.org/>,

 After the collapse of Rome, Western Europe entered a period of political, social, and economic decline. **From about 500 to 1000**, invaders swept across the region, trade declined, towns emptied, and classical learning halted. For those reasons, this period in Europe is sometimes called the “Dark Ages.” However, Greco-Roman, Germanic, and Christian traditions eventually blended, creating the medieval civilization. This period between ancient times and modern times – from about 500 to 1500 – is called the Middle Ages.

###  High Middle Ages

<https://www.royhart.org/cms/lib/NY01913927/Centricity/Domain/310/The%20Middle%20Ages%20in%20Europe.pdf>, p. 6

 During the early Middle Ages monarchs in Europe stood at the head of society but had limited power. Nobles and the Church had their own courts, collected their own taxes, and fielded their own armies. During the High Middle Ages – **about 1000 to 1300** – monarchs were able to centralize power.

####  Η ΕΥΡΩΠΗ ΕΞΟΡΜΑ, c. 1000,

 AITIA.

 ΑΝΑΧΑΙΤΙΖΟΝΤΑΙ ΟΙ ΕΙΣΒΟΛΕΣ η ΔΙΑΚΟΠΤΟΝΤΑΙ,

 ΜΕΤΑΡΡΥΘΜΙΣΕΙΣ στην ΓΕΩΡΓΙΑ,

 ΜΕΤΑΡΡΥΘΜΙΣΕΙΣ ΣΤΗΝ ΠΟΛΕΜΙΚΗ ΤΕΧΝΗ,

 ΚΛΙΜΑΤΙΚΕΣ ΑΛΛΑΓΕΣ,

 ΔΙΑΚΟΠΤΟΝΤΑΙ ΟΙ ΕΠΙΔΗΜΙΕΣ

 ΠΡΩΤΑ ΕΠΙΤΕΥΓΜΑΤΑ,

 ΚΑΤΑΛΗΨΙΣ ΤΗΣ ΙΕΡΟΥΣΑΛΗΜ,

 ΚΑΘΕΔΡΙΚΟΙ ΝΑΟΙ,

 ΠΑΝΕΠΙΣΤΗΜΙΑ,

###  Late Middle Ages,

###  ΑΝΑΓΕΝΝΗΣΗ, ?1350-?1700,

 ??? ΖΩΓΡΑΦΙΚΟΙ ΠΙΝΑΚΕΣ

 ΟΙΚΟΝΟΜΙΚΗ ΑΝΑΠΤΥΞΗ,

 ΕΜΠΟΡΙΟ, ΒΙΟΜΗΧΑΝΙΑ ΥΦΑΣΜΑΤΩΝ, ΤΡΑΠΕΖΙΤΙΚΟ ΣΥΣΤΗΜΑ,

 ΦΛΩΡΕΝΤΙΑ,

 ΑΡΝΗΣΗ ΤΟΥ ΠΑΡΕΛΘΟΝΤΟΣ,

 ΟΙΚΟΝΟΜΙΚΑ ΠΡΟΒΛΗΜΑΤΑ,

 ΜΕΤΑΔΟΤΙΚΕΣ ΑΣΘΕΝΙΕΣ,

 ΚΑΘΟΛΙΚΗ ΕΚΚΛΗΣΙΑ,

 ΕΧΕΙ ΑΞΙΑ Η ΠΑΡΟΥΣΑ ΖΩΗ.

Μπορουμε να την κανουμε καλη με ΚΟΣΜΙΚΑ ΜΕΣΑ.

 ΑΝΑΦΟΡΑ σε ΡΩΜΗ, ΕΛΛΑΔΑ,

 ΣΥΣΤΗΜΑ ΔΙΑΚΥΒΕΡΝΗΣΗΣ,

<https://en.wikipedia.org/wiki/The_School_of_Athens#/media/File:%22The_School_of_Athens%22_by_Raffaello_Sanzio_da_Urbino.jpg>,

 WHO IS WHO, <https://en.wikipedia.org/wiki/The_School_of_Athens#Program,_subject,_figure_identifications_and_interpretations>,

 PERSPECTIVE, <https://www.google.com/search?q=school+of+athens+perspective&client=firefox-b-d&tbm=isch&source=iu&ictx=1&fir=axhbeN3_dXSZ6M%253A%252C-O_Nz2sgSlkVWM%252C_&vet=1&usg=AI4_-kQtgUkD1jbN3Ls4ayTflIW7P0MpZg&sa=X&ved=2ahUKEwiLspS-nqLhAhULEpoKHdCDBv0Q9QEwAHoECAwQBg#imgrc=L6vM1LETchQheM:&vet=1>,

 GOOGLE SCHOOL OF ATHENS PERSPECTIVE,

#  ΙΣΤΟΡΙΚΟΣ ΠΡΟΛΟΓΟΣ και ΠΕΡΙΓΥΡΟΣ ΤΗΣ ΕΕ (ΕΠΙΣΤΗΜΟΝΙΚΗΣ ΕΠΑΝΑΣΤΑΣΗΣ), (c. 1500-1700)

##  ΜΕΣΑΙΩΝΑΣ (MIDDLE AGES), 500-1500 m.X.

 500-1500,

Μεσαίωνας (476 - 1492 μ.Χ) ονομάζεται η χρονική περίοδος της Ευρωπαϊκής ιστορίας, από τον 5ο μέχρι το 15ο αιώνα μ.Χ..

 DARK AGES, ΣΚΟΤΕΙΝΟΙ ΧΡΟΝΟΙ,

 Οι αγγλόφωνοι ιστορικοί, ακολουθώντας τους γερμανόφωνους συναδέλφους τους, συνήθως διαιρούν το Μεσαίωνα σε τρία τμήματα**: τον Πρώιμο (EARLY), , τον Ώριμο ή Μέσο (HIGH), και τον Ύστερο (LATE).** Το 19ο αιώνα, ο Μεσαίωνας στο σύνολό του συχνά αναφερόταν ως οι «Σκοτεινοί Αιώνες»,[13] ωστόσο μετά την υιοθέτηση των διαιρέσεων που περιγράφηκαν παραπάνω, η χρήση του όρου περιορίστηκε στο να χαρακτηρίζει τον Πρώιμο Μεσαίωνα, τουλάχιστον σε ό,τι αφορά τους ιστορικούς.[2]

 What happened in 476?

In 476 C.E. Romulus, (nicknamed Augustulus) the last of the Roman emperors in the west, was overthrown by the Germanic leader Odoacer, who became the first Barbarian to rule in Rome. T

####  ΜΕΙΟΤΙΚΟ ΟΝΟΜΑ,

###  ΠΡΩΙΜΟΣ ΜΕΣΑΙΩΝΑΣ, EARLY MIDDLE AGES, «ΣΚΟΤΕΙΝΟΙ» ΧΡΟΝΟΙ, DARK AGES, 500-1000μ.Χ.,

 Εμφαση στην μελλουσα ζωη.

###  Η ΕΥΡΩΠΗ ΕΞΟΡΜΑ, 1000-1500,

####  ΜΕΣΟΣ (η ΩΡΙΜΟΣ) ΜΕΣΑΙΩΝΑΣ, HIGH MIDDLE AGES, 1000-1300

 Battle of Lechfeld

The Battle of Lechfeld was a series of military engagements over the course of three days from 10–12 **August 955 in** which the Kingdom of Germany, led by King Otto I the Great, annihilated the Hungarian army led by Harka Bulcsú and the chieftains Lél and Súr. With the German victory, further invasions by the **Magyars** into Latin Europe were ended.

#####  ΠΑΡΑΓΟΝΤΕΣ

 ΓΕΩΡΓΙΚΗ ΜΕΤΑΡΥΘΜΙΣΗ

ΑΡΟΤΡΟ. ΣΛΑΒΙΚΟ αντι ΡΩΜΑΙΚΟ

ΑΛΛΑΓΗ ΧΑΛΙΝΟΥ. ΑΛΟΓΟ αντι ΒΟΟΣ

 Medieval Warm Period, ΑΥΞΗΣΗ ΓΕΩΡΓΙΚΗΣ ΠΑΡΑΓΩΓΗΣ

 https://en.wikipedia.org/wiki/Medieval\_Warm\_Period

 The Medieval Warm Period (MWP), also known as the Medieval Climate Optimum or the Medieval Climatic Anomaly, was a time of warm climate in the North Atlantic region that lasted **from c. 950 to c. 1250**.[2] Climate proxy records show peak warmth occurred at different times for different regions, which indicate that the MWP **was not a globally uniform event**.[3] Some refer to the MWP as the Medieval Climatic Anomaly to emphasize that climatic effects other than temperature were also important.[4][5]

 ΣΤΡΑΤΙΩΤΙΚΗ ΜΕΤΑΡΡΥΘΜΙΣΗ

ΣΕΛΛΑ, ΑΝΑΒΑΤΗΡΕΣ ΑΛΟΓΟΥ, ΚΑΤΑΦΡΑΚΤΟΣ ΑΝΑΒΑΤΗΣ,

ΥΨΗΛΗ ΤΕΧΝΙΚΗ του ΑΝΑΒΑΤΗ,

 ΔΙΑΚΟΠΗ εισβολων «βαρβαρων»,

#####  ΑΠΟΤΕΛΕΣΜΑΤΑ

######  The Cathedral, ΚΑΘΕΔΡΙΚΟΣ ΝΑΟΣ,

 <https://en.wikipedia.org/wiki/Cathedral>,

A cathedral is a church that contains the cathedra (Latin for 'seat') of a bishop,[1] thus serving as the central church of a diocese, conference, or episcopate.[2] Churches with the function of "cathedral" are usually specific to those Christian denominations with an episcopal hierarchy, such as the Catholic, Eastern Orthodox, Anglican, and some Lutheran churches.[2] Church buildings embodying the functions of a cathedral first appeared in Italy, Gaul, Spain, and North Africa in the 4th century, but cathedrals did not become universal within the Western Catholic Church until the 12th century, by which time they had developed architectural forms, institutional structures, and legal identities distinct from parish churches, monastic churches, and episcopal residences. The cathedral is more important in the hierarchy than the church because it is from the cathedral that the bishop governs the area under his or her administrative authority.[3][4][5]

 Etymology and definition

The word cathedral is derived, possibly via the French cathédrale, from the Latin ecclesia cathedralis and from the Latin cathedra ('seat'), and ultimately from the **Ancient Greek καθέδρα** (kathédra), 'seat, bench', from κατά (kata) 'down' and ἕδρα (hedra) 'seat, base, chair'.

#####  Medieval university

 <https://en.wikipedia.org/wiki/Medieval_university>,

A medieval university was a corporation organized during the Middle Ages for the purposes of higher education. The first Western European institutions generally considered to be universities were established in present-day Italy (including the Kingdom of Sicily, the Kingdom of Naples, and the Kingdom of Italy), the Kingdom of England, the Kingdom of France, Holy Roman Empire, the Kingdom of Spain, the Kingdom of Portugal and the Kingdom of Scotland between **the 11th and 15th centuries** for the study of the arts and the higher disciplines of theology, law, and medicine.[1] These universities evolved from much older Christian cathedral schools and monastic schools,[2][3][4] and it is difficult to define the exact date when they became true universities, though the lists of studia generalia for higher education in Europe held by the Vatican are a useful guide.

Among the earliest universities of this type were the University of **Bologna (1088),** **University of Paris (c. 1150), University of Oxford (1167),** University of Modena (1175), University of Palencia (1208), University of Cambridge (1209), University of Salamanca (1218), University of Montpellier (1220), University of Padua (1222), University of Naples (1224), University of Toulouse (1229), University of Orleans (1235), University of Siena (1240), University of Valladolid (1241) University of **Northampton (1261),** University of Coimbra (1288), University of Pisa (1343), Charles University in Prague (1348), Jagiellonian University (1364), University of Vienna (1365), Heidelberg University (1386) and the **University of St Andrews (1413)** begun as private corporations of teachers and their pupils.[16][17]

######  STUDENTS,

Students attended the medieval university at different ages—from 14 if they were attending Oxford or Paris to study the arts, to their 30s if they were studying law in Bologna. During this period of study, students often lived far from home and unsupervised, and as such developed a reputation, both among contemporary commentators and modern historians, for drunken debauchery. Students are frequently criticized in the Middle Ages for neglecting their studies for drinking, gambling and sleeping with prostitutes.[25] In Bologna, some of their laws permitted students to be citizens of the city if they were enrolled at a university.[26]

**debauchery** excessive indulgence in sex, alcohol, or drugs.

######  ΠΤΥΧΕΙΑ, Course of study,

<https://en.wikipedia.org/wiki/Medieval_university#Course_of_study>,

University studies **took six years for a Master of Arts degree (a Bachelor of Arts degree was awarded after completing the third or fourth year).** Studies for this were organized by the faculty of arts, where the **seven liberal arts** were taught: arithmetic, geometry, astronomy, music theory, grammar, logic, and rhetoric.[27][28][page needed] All **instruction was given in Latin and students** were expected to converse in that language.[29] The trivium comprised the three subjects that were taught first: grammar, logic, and rhetoric.[30] The quadrivium consisted of arithmetic, geometry, music, and astronomy. The quadrivium was taught after the preparatory work of the trivium and would lead to the degree of Master of Arts.[31] The curriculum came also to include the three Aristotelian philosophies: physics, metaphysics and moral philosophy.[30]

Once a Master of Arts degree had been conferred, the student could leave the university or pursue further studies in one of the higher faculties, law, medicine, or theology, the last one being the most prestigious. Originally, only few universities had a faculty of theology, because the popes wanted to control the theological studies. Until the mid-14th century, theology could be studied only at universities in Paris, Oxford, Cambridge and Rome. First the establishment of the University of Prague (1347) ended their monopoly and afterwards also other universities got the right to establish theological faculties.[34]

#####  VARIOUS,

**Students** often entered the university at fourteen to fifteen years of age, though many were older.[39] Classes usually started at 5:00 or 6:00 a.m.

######  Legal status

**As students had the legal status of clerics, Canon Law prohibited women from being admitted into universities**. Students were afforded the legal protection of the clergy, as well. In this way, no one was allowed to physically harm them; they could only **be tried for crimes in an ecclesiastical court**, and were thus immune from any corporal punishment. This gave students free rein in urban environments to break secular laws with impunity, which led to many abuses: theft, rape, and murder. Students did not face serious consequences[40] from the law. Students were also known to engage in drunkenness. Sometimes citizens were forbidden to interact with students because they made accusations against the university.

This led to uneasy tensions with secular authorities—the demarcation between town and gown. **Masters and students would sometimes "strike" by leaving** a city and not returning for years. This happened at the University of Paris strike of 1229 after a riot left a number of students dead. The university went on strike and they did not return for two years.

Most universities in Europe were recognized by the **Holy See** (ΑΓΙΑ ΕΔΡΑ), as studia generalia, testified by a papal bull. Members of these institutions were encouraged to disseminate their knowledge across Europe, often lecturing at a different studium generale. Indeed, one of the privileges the papal bull confirmed was the right to confer the ius ubique docendi, an entitlement to teach everywhere.[41]

#####  First Crusade (1096–1099), ΚΑΤΑΚΤΗΣΗ ΤΗΣ ΙΕΡΟΥΣΑΛΙΜ (1099),

 «αντιδραση» στην αραβικη κατακτηση.

#####  ΣΥΜΠΛΗΡΩΜΑΤΑ,

 Renaissance of the 12th century,

 <https://en.wikipedia.org/wiki/Renaissance_of_the_12th_century>,

 ΠΡΟΚΑΤΑΡΚΤΙΚΑ,

 Εργασιες 22, 23, . μονο η 22 εγινε,

 Συνοψη προηγουμενων

####  ΥΣΤΕΡΟΣ ΜΕΣΑΙΩΝΑΣ, LATE MIDDLE AGES, 1300-1500,

#####  Black Death, ΠΑΝΩΛΗΣ,

 <https://en.wikipedia.org/wiki/Black_Death>,

 The **Black Death** (also known as the Pestilence, the Great Mortality or the **Plague**)[a] was a bubonic plague pandemic occurring in **Western Eurasia and North Africa from 1346 to 1353.** It is the most fatal pandemic recorded in human history, causing the deaths of 75–200 million people,[1] peaking in Europe from **1347 to 1351**.[2][3] Bubonic plague is caused by the bacterium Yersinia pestis spread by fleas, but during the Black Death it probably also took a secondary form, spread by person-to-person contact via aerosols, causing **pneumonic plague.**[4][5]

##### <https://www.google.com/search?client=firefox-b-d&q=deaths+by+black+death>,

How many died from Black Death?

The Black Death was so extreme that it's surprising even to scientists who are familiar with the general details. The epidemic **killed 30 to 50 percent of the entire population of Europe. B**etween 75 and 200 million people died in a few years' time, starting in 1348 when the plague reached London.

 ΣΥΝΕΠΙΕΣ,

 ΑΥΞΗΣΗ ΜΙΣΘΩΝ ΕΡΓΑΖΟΜΕΝΩΝ,

Slaves, > surfs, > ανεξαρτητοι εργαζομενοι,

 ΑΙΣΘΗΣΗ ΑΝΑΓΚΗΣ ΑΛΛΑΓΗΣ

Εδώ ξεκιναει η ΑΝΑΓΕΝΝΗΣΗ στην ΙΤΑΛΙΑ.

 ΚΕΝΤΡΙΚΗ ΙΔΕΑ, ΚΕΝΤΡΙΚΗ ΑΠΟΚΛΙΣΗ ΑΠΟ ΜΕΣΑΙΩΝΑ,

 Η παρουσα ζωη εχει αξια, μπορει να γινει καλη με κοσμικα μεσα,

 Pandemics and inequality,

 <https://warwick.ac.uk/fac/soc/economics/research/centres/cage/news/03-12-20-pandemics_and_inequality/>,

 Thursday 3 Dec 2020

Pandemics of the past have had major consequences for inequality, not all of them positive. What lessons can we learn about the potential redistributive effects of COVID-19? Guido Alfani explores the impact of plague and influenza on inequality, and asks how infection spread and mortality rates affect wealth and income redistribution.

The Black Death and subsequent plagues

The Black Death, which struck Europe and the Mediterranean **during 1347–52 killing about half the population of the area, caused a significant and long-lasting reduction in wealth and income inequality**. This is clearly visible in Italy (Fig.1), which is the area for which we currently have the best information. In the aftermath of the Black Death, the richest 10% of the population lost their grip on between 15 and 20% of their **overall wealth, and pre-plague levels were not reached again before the second half of the seventeenth century**.

######  Περαιτερω πληροφοριες

 Historical effects of shocks on inequality: the great leveler revisited.

<https://www.nature.com/articles/s41599-021-00763-4#Sec1>,

## ΑΝΑΓΕΝΝΗΣΙΣ, RENNAISANCE, rinascita (Italian), ? 1350-?1800,

 <https://en.wikipedia.org/wiki/Renaissance>,

This article is about the European Renaissance of the 15th and 16th centuries. For the earlier European Renaissance, see Renaissance of the 12th century. For other uses, see Renaissance (disambiguation).

Renaissance

"The School of Athens" by Raffaello Sanzio da Urbino.jpg

The School of Athens (1509–11) by Raphael

###  Rinascita,

 <https://en.wikipedia.org/wiki/Renaissance>,

The term **rinascita** ('rebirth') first appeared in Giorgio Vasari's Lives of the Artists (c. 1550), **anglicized as the Renaissance in the 1830s**.[19] The word has also been extended to other historical and cultural movements, such as the Carolingian Renaissance (8th and 9th centuries), Ottonian Renaissance (10th and 11th century), and the Renaissance of the 12th century.[20]

###  OVERVIEW,

 **In all, the Renaissance could be viewed as an attempt by intellectuals to study and improve the secular and worldly, both through the revival of ideas from antiquity, and through novel approaches to thought.** Some scholars, such as Rodney Stark,[24] play down the Renaissance in favor of the earlier innovations of the Italian city-states in the High Middle Ages, which married responsive government, Christianity and the birth of capitalism. This analysis argues that, whereas the great European states (France and Spain) were absolute monarchies, and others were under direct Church control, the independent city-republics of Italy took over the principles of capitalism invented on monastic estates and set off a vast unprecedented Commercial Revolution that preceded and financed the Renaissance.

 ΑΙΣΘΗΣΗ ΑΝΑΓΚΗΣ ΑΛΛΑΓΗΣ

Εδώ ξεκιναει η ΑΝΑΓΕΝΝΗΣΗ στην ΙΤΑΛΙΑ.

 ΚΕΝΤΡΙΚΗ ΙΔΕΑ, ΚΕΝΤΡΙΚΗ ΑΠΟΚΛΙΣΗ ΑΠΟ ΜΕΣΑΙΩΝΑ, ΚΟΣΜΙΚΟΤΗΣ,

### ΘΡΗΣΚΕΥΤΙΚΟΙ ΠΟΛΕΜΟΙ, ΜΕΤΑΡΥΘΜΙΣΗ, REFORMATION, RELIGIOUS WARS,

European wars of religion

<https://en.wikipedia.org/wiki/European_wars_of_religion>,

 **The European wars of religion were a series of wars waged in Europe during the 16th, 17th** and early 18th centuries.[1][2] **Fought after the Protestant Reformation began in 1517,** the wars disrupted the religious and political order in the Catholic countries of Europe, or Christendom. **Other motives during the wars involved revolt, territorial ambitions and great power conflicts**. **By the end of the Thirty Years' War (1618–1648), Catholic France (δυναστια ΒΟΥΡΒΩΝΩΝ), had allied with the Protestant forces against the Catholic Habsburg monarchy.[3]** The wars were largely ended by the Peace of Westphalia (1648), which established a new political order that is now known as Westphalian sovereignty.

 Ninety-five Theses,

 <https://en.wikipedia.org/wiki/Ninety-five_Theses#cite_note-FOOTNOTEBrecht1985199%E2%80%93200-34>,

 Luther sent the Theses enclosed with a letter **to Albert of Brandenburg, Archbishop of Mainz, on 31 October 1517**, a date now considered the start of the Reformation and commemorated annually as Reformation Day. **Luther may have also posted the Ninety-five Theses on the door of All Saints'** Church and other churches in Wittenberg—in accordance with University custom—on 31 October or in mid-November. The Theses were quickly reprinted and translated, and distributed throughout Germany and Europe.

### ΕΝΙΣΧΥΣΗ ΚΕΝΤΡΙΚΗΣ ΕΞΟΥΣΙΑΣ,

ΣΥΝΘΗΚΗ ΒΕΣΤΦΑΛΙΑΣ, (1648)

###  ΕΞΕΡΕΥΝΗΣΕΙΣ,

###  ΟΘΩΜΑΝΙΚΗ ΑΠΕΙΛΗ

####  Siege of Vienna (1529)

[https://en.wikipedia.org/wiki/Siege\_of\_Vienna\_(1529)](https://en.wikipedia.org/wiki/Siege_of_Vienna_%281529%29),

The siege of Vienna, in 1529, was the first attempt by the Ottoman Empire to capture the capital city of Vienna, Austria, Holy Roman Empire. Suleiman the Magnificent, sultan of the Ottomans, attacked the city with over 100,000 men, while the defenders, led by Niklas Graf Salm, numbered no more than 21,000. Nevertheless, Vienna was able to survive the siege, which ultimately lasted just over two weeks**, from 27 September to 15 October, 1529.**

####  Battle of Vienna,

 <https://en.wikipedia.org/wiki/Battle_of_Vienna>,

The Battle of Vienna[a] took place at Kahlenberg Mountain near Vienna on 12 September 1683[2] after the imperial city had been besieged by the Ottoman Empire for two months. The battle was fought by the **Holy Roman Empire (led by the Habsburg monarchy and the Polish–Lithuanian Commonwealth, both under the command of King John III Sobieski)** against the Ottomans and their vassal and tributary states. The battle marked the first time the Commonwealth and the Holy Roman Empire had cooperated militarily against the Ottomans, and it is often seen as **a turning point in history, after which "the Ottoman Turks ceased to be a menace to the Christian world".[21][Note 3]** In the ensuing war that lasted until 1699, the Ottomans lost almost all of Hungary to the Holy Roman Emperor Leopold I.[21]

###  German Peasants' War (1524–1525)

###  ΔΙΑΦΟΡΑ,

####  crescent (n.), ημισέληνος, croissante (θηλυκό),

####  croissant fr, το γλυκο

croissant en, κρουασαντ

 <https://www.etymonline.com/search?q=crescent>,

late 14c., cressaunt, "crescent-shaped ornament," from Anglo-French cressaunt, from **Old French** creissant, croisant "crescent of the moon" (12c., Modern French croissant), from Latin crescentum (nominative crescens), present participle of crescere "come forth, spring up, grow, thrive, swell, increase in numbers or strength," from PIE root \*ker- (2) **"to grow."**

Applied in Latin to the waxing (the act or process of applying wax, as in polishing or filling. ), moon, luna crescens, but subsequently in Latin mistaken to refer to the shape, not the stage. The original Latin sense is preserved in crescendo.

 GOOGLE. The word crescent is derived etymologically from the present participle of the Latin verb **crescere "to grow",** technically denoting the waxing moon (luna crescens).

####  Cross, croix (fr), σταυρος, .

 late Old English cros (in the sense ‘monument in the form of a cross’), from Old Norse kross, from Old Irish cros, **from Latin crux** .

#####  **crux** (n.)

1814, "a cross," from Latin crux "cross," a word of uncertain origin. Sometimes said to be cognate with Irish cruach "heap, hill," Gaulish \*krouka "summit," Old Norse hryggr "backbone," Old English hrycg "back." But de Vaan is suspicious:

 The Celtic and Gm. forms are often reconstructed as \*kr(e)u-k-, but we find vacillating vocalism within Gm.; also, the meanings 'backbone' and 'heap' are not necessarily connected. Even if the words in \*kruk- from Latin and Italo-Celtic belong together, the root structure does not look PIE (and a root enlargement k is unknown), and might be interpreted as a non-IE substratum word borrowed into Italo-Celtic. But Latin may also just have borrowed the word from a contemporary language.

The figurative use for "a central difficulty" (1718) is older in English than the literal sense; perhaps it is from Latin **crux interpretum** "a point in a text that is impossible to interpret," **the literal meaning of which is something like "crossroads of interpreters."** But Century Dictionary ascribes it to "the cross as an instrument of torture; hence anything that puzzles or vexes in a high degree ...." Extended sense of "central point" is attested by 1888.

 Mallon φωνητικη μονον η σχεση croissant, cross,

####  Crusade, σταυροφορια, croisade,

####  Onomatopoeia

[**https://en.wikipedia.org/wiki/Onomatopoeia**](https://en.wikipedia.org/wiki/Onomatopoeia)**,**

Onomatopoeia[note 1] is the use or creation of a word that phonetically imitates, resembles, or suggests the sound that it describes. Such a word itself is also called an onomatopoeia. Common onomatopoeias include animal noises such as oink, meow (or miaow), roar, and chirp. Onomatopoeia can differ between languages: it conforms to some extent to the broader linguistic system;[6][7] hence the sound of a clock may be expressed as tick tock in English, tic tac in Spanish and Italian (shown in the picture), dī dā in Mandarin, kachi kachi in Japanese, or tik-tik in Hindi.

The English term comes from the Ancient Greek compound onomatopoeia, 'name-making', composed of onomato- 'name' and -poeia 'making'. Thus, words that imitate sounds can be said to be onomatopoeic or onomatopoetic.[8]

####  ΛΕΞΕΙΣ ΟΜΟΗΧΕΣ,

Λυκος,

λυκοφως, λυκαυγες, latin lux,

 103 μαθημα, τεταρτη 03-05-2023,

 Webex meeting recording: 103 WEDNESDAY INM-20230503 0913-1

Password: JmNrJfe3

Recording link: <https://uoa.webex.com/uoa/ldr.php?RCID=e75eead27b7b437dd966f398a49ac3d3>,

 **ΣΧΕΔΙΑΣΜΟΣ,**

 ΕΡΓΑΣΙΑ 23,

 Μικρη συνοψις προτερων, . ΕΞΟΡΜΙΣΗΣ ΑΠ 1000, ΑΝΑΓΕΝΝΗΣΗ,

 Υπενθυμιση 19.2.5 ΕΞΕΡΕΥΝΗΣΕΙΣ,

##  SCIENTIFIC REVOLUTION, ΕΠΙΣΤΗΜΟΝΙΚΗ ΕΠΑΝΑΣΤΑΣΗ, ΕΕ, (1500-1700),

###  ΒΙΒΛΙΟΓΡΑΦΙΑ,

 The Invention of Science: A New History of the Scientific Revolution

Author(s): David Wootton

Publisher: HarperCollins Publishers, Year: 2015

ISBN: 006175952X, 9780061759529

 The SCIENTIFIC REVOLUTION

STEVEN SHAPIN, To exo

###  “ΕΝΑΡΞΗ»: τρεις ανακαλυψεις,

####  Nicolaus Copernicus,

 <https://en.wikipedia.org/wiki/Nicolaus_Copernicus>,

Nicolaus Copernicus[b] (19 February 1473 – 24 May 1543) was a Renaissance polymath, active as a mathematician, astronomer, and Catholic canon, who formulated a model of the universe that placed the Sun rather than Earth at its center. In all likelihood, Copernicus **developed his model independently of Aristarchus of Samos,** an ancient Greek astronomer who had formulated such a model some eighteen centuries earlier.[6][c][d][e]

The publication of Copernicus's model in his book **De revolutionibus orbium coelestium** (On the Revolutions of the Celestial Spheres), just before his death in 1543, was a major event in the history of science, triggering the Copernican Revolution and making a pioneering contribution to the Scientific Revolution.[8]

Copernicus was born and died in Royal Prussia, a semiautonomous and multilingual region that had been part of the Kingdom of Poland since 1466. A polyglot and polymath, he obtained a doctorate in canon law and was a mathematician, astronomer, physician, classics scholar, translator, governor, diplomat, and economist. From 1497 he was a Warmian Cathedral chapter canon. In 1517 he derived a quantity theory of money—a key concept in economics—and in 1519 he formulated an economic principle that later came to be called Gresham's law.[f]

 Nicolaus Copernicus was born on 19 February 1473 in the city of Toruń (Thorn), in the province of Royal Prussia, in the Crown of the Kingdom of Poland[10][11] to German-speaking parents.[12],

 Copernicus never married and is not known to have had children, but from at least 1531 until 1539 his relations with Anna Schilling, a live-in housekeeper, were seen as scandalous by two bishops of Warmia who urged him over the years to break off relations with his "mistress".[14],



 <https://en.wikipedia.org/wiki/Nicolaus_Copernicus>,

#####  Ad lectorem

Rheticus left Nürnberg to take up his post as professor in Leipzig. Andreas Osiander had taken over the task of supervising the printing and publication.[5**] In an effort to reduce the controversial impact of the book Osiander** added his own unsigned letter **Ad lectorem de hypothesibus huius operis** (To the reader concerning the hypotheses of this work)[7] **printed in front of Copernicus' preface which was a dedicatory letter to Pope Paul III** and which kept the title "Praefatio authoris" (to acknowledge that the unsigned letter was not by the book's author). Osiander's letter **stated that Copernicus' system was mathematics intended to aid computation and not an attempt to declare literal truth**:

“ it is the duty of an astronomer to compose the history of the celestial motions through careful and expert study. Then he must conceive and devise the causes of these motions or hypotheses about them. Since he cannot in any way attain to the true causes, **he will adopt whatever suppositions enable the motions to be computed correctly** ... The present author has performed both these duties excellently. For these hypotheses need not be true nor even probable. On the contrary, if they provide a **calculus consistent** with the observations, that alone is enough ...

For this art, it is quite clear, is completely and absolutely ignorant of the causes of the apparent [movement of the heavens]. And if any causes are devised by the imagination, as indeed very many are, they are not put forward to convince anyone that they are true, but merely to provide a reliable basis for computation. However, since different hypotheses are sometimes offered for one and the same ... the astronomer will take as his first choice that hypothesis which is the easiest to grasp. The philosopher will perhaps rather seek the semblance of the truth. But neither of them will understand or state anything certain, unless it has been divinely revealed to him ... Let no one expect anything certain from astronomy, which cannot furnish it, lest he accept as the truth ideas conceived for another purpose, and depart this study a greater fool than when he entered.[8]”

As even Osiander's defenders point out, the Ad lectorem "expresses views on the aim and nature of scientific theories at variance with Copernicus' claims for his own theory".[9] Many view Osiander's letter as a betrayal of science and Copernicus, and an attempt to pass his own thoughts off as those of the book's author. An example of this type of claim can be seen in the Catholic Encyclopedia, which states **"Fortunately for him [the dying Copernicus], he could not see what Osiander had done. This reformer, knowing the attitude of Luther and Melanchthon against the heliocentric system ... without adding his own name, replaced the preface of Copernicus by another strongly contrasting in spirit with that of Copernicus."**[10]

While Osiander's motives behind the letter have been questioned by many, he has been defended by historian Bruce Wrightsman, who points out he was not an enemy of science. Osiander had many scientific connections including "Johannes Schoner, Rheticus's teacher, whom Osiander recommended for his post at the Nurnberg Gymnasium; Peter Apian of Ingolstadt University; Hieronymous Schreiber...Joachim Camerarius...Erasmus Reinhold...Joachim Rheticus...and finally, Hieronymous Cardan."[9]

The historian Wrightsman put forward that Osiander did not sign the letter because he "was such a notorious [Protestant] reformer whose name was well-known and infamous among Catholics",[9] so that signing would have likely caused negative scrutiny of the work of Copernicus (a loyal Catholic canon and scholar). Copernicus himself had communicated to Osiander his "own fears that his work would be scrutinized and criticized by the 'peripatetics and theologians',"[9] and he had already been in trouble with his bishop, Johannes Dantiscus, on account of his former relationship with his mistress and friendship with Dantiscus's enemy and suspected heretic, Alexander Scultetus. It was also possible that Protestant Nurnberg could fall to the forces of the Holy Roman Emperor and since "the books of hostile theologians could be burned...why not scientific works with the names of hated theologians affixed to them?[9]" Wrightsman also holds that this is why Copernicus did not mention his top student, Rheticus (a Lutheran) in the book's dedication to the Pope.[9]

####  Andreas Vesalius

(Latinized from Andries van Wezel)

(/vɪˈseɪliəs/;[2] 31 **December 1514 – 15 October 1564**) was a 16th-century anatomist, physician, and author of one of the most influential books on human anatomy,

**De Humani Corporis Fabrica Libri Septem** (On the fabric of the human body in seven books), (**1543**), a major advance over the long-dominant work of Galen. Vesalius is often referred to as the founder of modern human anatomy. He was born in Brussels, which was then part of the Habsburg Netherlands. He was a professor at the **University of Padua** (1537–1542) and later became Imperial physician at the court of Emperor Charles V.

##### De Humani Corporis Fabrica

 <https://en.wikipedia.org/wiki/Andreas_Vesalius#De_Humani_Corporis_Fabrica>,

In 1543, Vesalius asked Johannes Oporinus to publish the book De humani corporis fabrica (On the fabric of the human body), a groundbreaking work of human anatomy he dedicated to Charles V and which many believe was illustrated by Titian's pupil Jan Stephen van Calcar.

####  Gerolamo Cardano,

<https://en.wikipedia.org/wiki/Gerolamo_Cardano>,

(Italian: [dʒeˈrɔːlamo karˈdaːno]; also Girolamo[3] or Geronimo;[4] French: Jérôme Cardan; Latin: Hieronymus Cardanus; 24 **September 1501– 21 September 1576)** was an Italian polymath, whose interests and proficiencies ranged through those of mathematician, physician, biologist, physicist, chemist, astrologer, astronomer, philosopher, writer, and gambler.[5] He was one of the most influential mathematicians of the Renaissance, and was one of the key figures in the foundation of probability and the earliest introducer of the binomial coefficients and the binomial theorem in the Western world. He wrote more than 200 works on science.[6].

ABSENCE of 3rd 4th degree equations !!!

Today, he is well known for his achievements in algebra. In his **1545 book Ars Magna**, he made the first systematic use of ??? negative numbers in Europe, published with attribution the solutions of other mathematicians for the cubic and quartic equations, and acknowledged the existence of imaginary numbers. [suggested edit: French Nicholas Chiquet in his text, Triparty en la science des nombres, discussed negative numbers, and thus this credit to Cardano might not be applicable. Source: A History of Mathematics 3rd edition by Merzbach and Boyer pages 249 and 250.]

## ΣΥΜΠΛΗΡΩΣΕΙΣ,

Θα εξετάσουμε τα Μαθηματικά της Δ. ΕΥΡΩΠΗΣ, της περιόδου 1500-1700 (ΕΠΙΣΤΗΜΟΝΙΚΗ ΕΠΑΝΑΣΤΑΣΗ)

 Η εξέταση αυτή περιλαμβάνει εν περιλήψει την ιστορία της εποχής και των εποχών που προηγήθηκαν.

### MODERNITY,

 https://en.wikipedia.org/wiki/Modernity

 **Modernity**, a topic in the [humanities](https://en.wikipedia.org/wiki/Humanities) and [social sciences](https://en.wikipedia.org/wiki/Social_science), is both a [historical period](https://en.wikipedia.org/wiki/Historical_period) (the [modern era](https://en.wikipedia.org/wiki/Modern_era)) and the ensemble of particular [socio-cultural](https://en.wikipedia.org/w/index.php?title=Socio-cultural&action=edit&redlink=1) [norms](https://en.wikipedia.org/wiki/Norm_%28social%29), attitudes and **practices that arose in the wake of the** [**Renaissance**](https://en.wikipedia.org/wiki/Renaissance)**—in the "**[**Age of Reason**](https://en.wikipedia.org/wiki/Age_of_Enlightenment)**" of 17th-century thought and the 18th-century "**[**Enlightenment**](https://en.wikipedia.org/wiki/Age_of_Enlightenment)**".** Some[*[citation needed](https://en.wikipedia.org/wiki/Wikipedia%3ACitation_needed%22%20%5Co%20%22Wikipedia%3ACitation%20needed)*] commentators consider the **era of modernity to have ended by 1930,** with [World War II](https://en.wikipedia.org/wiki/World_War_II) in 1945, or the 1980s or 1990s; the following era is called [postmodernity](https://en.wikipedia.org/wiki/Postmodernity). The term "[contemporary history](https://en.wikipedia.org/wiki/Contemporary_history)" is also used to refer to the post-1945 timeframe, without assigning it to either the modern or postmodern era. (Thus "modern" may be used as a name of a particular era in the past, as opposed to meaning "the current era".)

### POSTMODERNITY,

 https://en.wikipedia.org/wiki/Postmodernity

 **Postmodernity** (**post-modernity** or the **postmodern condition**) is the economic or cultural state or condition of society which is said to exist *after* [modernity](https://en.wikipedia.org/wiki/Modernity).[[nb 1]](https://en.wikipedia.org/wiki/Postmodernity#cite_note-1) Some schools of thought hold that modernity ended in the late 20th century – **in the 1980s or early 1990s –** and that it was replaced by postmodernity, and still others would extend modernity to cover the developments denoted by postmodernity. The idea of the postmodern condition is sometimes characterized as a culture stripped of its capacity to function in any linear or autonomous state like regressive isolationism, as opposed to the progressive mind state of [modernism](https://en.wikipedia.org/wiki/Modernism).[[1]](https://en.wikipedia.org/wiki/Postmodernity#cite_note-2)

Εδώ είναι η συνεχεις από

Το τελος του, LEGACY,

# ΜΑΘΗΜΑΤΙΚΗ ΠΡΟΠΑΡΑΣΚΕΥΗ τησ ΕΕ (ΕΠΙΣ. ΕΠΑΝΑΣ.),

##  ΕΙΣΑΓΩΓΙΚΟΙ ΟΡΙΣΜΟΙ ΜΙΓΑΔΙΚΩΝ, (ως εχουν σημερα)

 ΣΥΣΤΑΣΗΣ, MerkourakhsSΣημειώσειςΜιγαδικήςΑνάλυσης.pdf

 Κεφαλαιο 1.

 Εντρυφηστε το ανωτερω, η ότι άλλο βιβλιο σας αρεσει.

##  (s+t)3 -3st(s+t) –(s3 +t3) =0

Να αποδειχθη η ανωτερω ταυτοτητα.

 GEOMETRIC PROOF,

<https://www.pinterest.com/pin/299489443969463718/>,

 A visual proof of the cubic binomial formula

(p + q)³= p³ + 3pq² + 3p²q + q³

 ΣΗΜ. Η αλγεβρικη αποδειξη υπαρχει στην ΕΡΓΑΣΙΑ 8041,

##  Fibonacci

 See <https://en.wikipedia.org/wiki/Fibonacci>,

Fibonacci (/ˌfɪbəˈnɑːtʃi/;[3] also US: /ˌfiːb-/,[4][5] Italian: [fiboˈnattʃi]; **c. 1170 – c. 1240–50),[**6] also known as **Leonardo Bonacci**, Leonardo of Pisa, or Leonardo Bigollo Pisano ('Leonardo the Traveller from Pisa'[7]), was an Italian mathematician from the Republic of Pisa, considered to be "the most talented Western mathematician of the Middle Ages".[8]

 REMARK

[8]. Eves, Howard. An Introduction to the History of Mathematics. Brooks Cole, 1990: ISBN 0-03-029558-0 (6th ed.), p. 261.

Oxi den leei kati tetoio,

**The name he is commonly called, Fibonacci, was made up in 1838 by the Franco-Italian historian Guillaume Libri[9][10]** and is short for filius Bonacci ('son of Bonacci').[11][b] However, even earlier in 1506 a notary of the Holy Roman Empire, Perizolo mentions Leonardo as "Lionardo Fibonacci".[12]

Fibonacci popularized the Indo–Arabic numeral system in the Western world primarily through his composition in **1202** of **Liber Abaci (Book of Calculation).[**13][14]

 REMARK.

**OXI “ΒΙΒΛΙΟ του ΑΒΑΚΑ”,**

He also introduced Europe to the sequence of Fibonacci numbers, which he used as an example in Liber Abaci.[15]

 See KATZ, p. 336

###  SEE DevlinFibonacciManNumbers.pdf, p. 68pdf

 104 ΜΑΘΗΜΑ, ΔΕΥΤΕΡΑ, 08-05-2023,

Webex meeting recording: 104 MONDAY INM-20230508 0912-1

Password: Myb2mBEx

Recording link: <https://uoa.webex.com/uoa/ldr.php?RCID=bd4645e08a7115f0a7b51651eac59290>,

 104AbaxFibonAlgAnagen.docx

 **ΣΧΕΔΙΑΣΜΟΣ,**

 Ανεβηκε το 103 μαθημα.

 Συζητηση για crescent,

 ΕΡΓΑΣΙΕΣ 24, 25, tis exoyme dei sto 103 μα

 ΠΕΡΙΛΗΨΗ ΠΡΟΗΓΟΥΜΕΝΩΝ,

 Εισοδος εε, Fibonacci,

Υπενθυμιση 19.2.5 ΕΞΕΡΕΥΝΗΣΕΙΣ,

###  ΑΒΑΞ, ABACUS ital., ABACI eng,

####  ΑΒΑΞ, ABACUS ital., ABACI eng,

 GOOGLE, Η λέξη άβακας είναι η ελληνική λέξη **άβαξ** που σύμφωνα με τρία αρχαία λεξικά σημαίνει μια πινακίδα, μια σανίδα, κάτι που δεν έχει βάση Ἄβαξ· κυρίως ? ὁ μὴ ἔχων βάσιν, καταχρηστικῶς δὲ καὶ ἐπὶ οἵουδήποτε σανιδίου. **Δηλαδή αρχικά δεν σημαίνει αριθμητήριο.**

[**https://el.wiktionary.org/wiki/%E1%BC%84%CE%B2%CE%B1%CE%BE**](https://el.wiktionary.org/wiki/%E1%BC%84%CE%B2%CE%B1%CE%BE)**,**

**η**

**<https://el.wiktionary.org/wiki/%E1%BC%84%CE%B2%CE%B1%CE%BE>,**

σανίδα ή πλάκα για την καταμέτρηση ψήφων

 ※ 4ος αιώνας πκε ⌘ Αριστοτέλης, Ἀθηναίων πολιτεία Arist.Ath.69.1@perseus.tufts.edu

 πάντες δ᾽ ἐπειδὰν ὦσι διεψηφισμένοι, λαβόντες οἱ ὑπηρέται τὸν ἀμφορέα τὸν κύριον, ἐξερῶσι ἐπὶ ἄβακα τρυπήματα ἔχοντα ὅσαιπερ εἰσὶν αἱ ψῆφοι, ἵν᾽ αὗται φανεραὶ προκείμεναι καὶ εὐαρίθμητοι ὦσιν, καὶ τὰ τρυπητὰ καὶ τὰ πλήρη δῆλα τοῖς ἀντιδίκοις. οἱ δὲ ἐπὶ τὰς ψήφους εἰληχότες διαριθμοῦσιν αὐτὰς ἐπὶ τοῦ ἄβακος, χωρὶς μὲν τὰς πλήρεις, χωρὶς δὲ τὰς τετρυπημένας. καὶ ἀναγορεύει ὁ κήρυξ τὸν ἀριθμὸν τῶν ψήφων, τοῦ μὲν διώκοντος τὰς τετρυπημένας, τοῦ δὲ φεύγοντος τὰς πλήρεις: ὁποτέρῳ δ᾽ ἂν πλείων γένηται, οὗτος νικᾷ, ἂν δὲ ἴσαι, ὁ φεύγων.

 ABACUS,

GOOGLE. Etymology. The word abacus dates to at least AD 1387 when a Middle English work borrowed the word from Latin that described a sandboard abacus. The Latin word is derived from ancient Greek ἄβαξ (abax) which means something without a base, and colloquially, any piece of rectangular material.

 ο άβαξ (πλάκα) της Σαλαμίνος

<https://el.wiktionary.org/wiki/%CE%AC%CE%B2%CE%B1%CE%BA%CE%B1%CF%82#%CE%95%CF%84%CF%85%CE%BC%CE%BF%CE%BB%CE%BF%CE%B3%CE%AF%CE%B1>,

Salamis Tablet: oldest abacus from 300 BC found 1846 at the island of Salamis, Greece

 [https://el.wiktionary.org/wiki/%CE%91%CF%81%CF%87%CE%B5%CE%AF%CE%BF:Salaminische\_Tafel\_Salamis\_Tablet\_nach\_Wilhelm\_Kubitschek\_Numismatische\_Zeitschrift\_Bd\_31\_Wien\_1899\_p.\_394\_ff.jpg](https://el.wiktionary.org/wiki/%CE%91%CF%81%CF%87%CE%B5%CE%AF%CE%BF%3ASalaminische_Tafel_Salamis_Tablet_nach_Wilhelm_Kubitschek_Numismatische_Zeitschrift_Bd_31_Wien_1899_p._394_ff.jpg),

####  ROMAN NUMERALS,

 <https://gr.pinterest.com/pin/9359111718602986/>,

####  Hindu–Arabic numeral system

The Hindu–Arabic numeral system or Indo-Arabic numeral system[1] (also called the Hindu numeral system or Arabic numeral system)[2][note 1] is a positional decimal numeral system, and is the most common system for the symbolic representation of numbers in the world.

**It was invented between the 1st and 4th centuries by Indian mathematicians. The** system **was adopted in Arabic mathematics by the 9th century.** It became more widely known through the writings of the Persian mathematician Al-Khwārizmī[3] (**On the Calculation with Hindu Numerals, c. 825)** and Arab mathematician Al-Kindi (On the Use of the Hindu Numerals, c. 830). The system had spread to medieval Europe by the High Middle Ages.

####  Arabic numerals, Adoption and spread,

 <https://en.wikipedia.org/wiki/Arabic_numerals>,

Adoption and spread,

**The first Arabic numerals in the West** appeared in the Codex Albeldensis in Spain. The Codex Vigilanus or Codex Albeldensis (Spanish: Códice Vigilano or Albeldense. Updated 976).

The first mentions of the numerals from 1 to 9 in the West are found in the Codex Vigilanus of 976, an illuminated collection of various historical documents covering a period from antiquity to the 10th century in Hispania.[12] Other texts show that numbers from 1 to 9 were occasionally supplemented by a placeholder known as sipos, represented as a circle or wheel, reminiscent of the eventual symbol for zero. The Arabic term for zero is sifr (صفر), transliterated into Latin as cifra, and the origin of the English word cipher.

**From the 980s, Gerbert of Aurillac** (later, Pope Sylvester II ((life c. 946 – 12 May 1003), **(Pope (999-1203**)), ) used his position to spread knowledge of the numerals in Europe. Gerbert studied in Barcelona in his youth. He was known to have requested mathematical treatises concerning the astrolabe from Lupitus of Barcelona after he had returned to France.[12]

The reception of Arabic numerals in the West was gradual and lukewarm, as other numeral systems circulated in addition to the older Roman numbers. As a discipline, the first to adopt Arabic numerals as part of their own writings were **astronomers and astrologists,** evidenced from manuscripts surviving from mid-12th-century Bavaria. Reinher of Paderborn (1140–1190) used the numerals in his calendrical tables to calculate the dates of Easter more easily in his text Compotus emendatus.[13]

 Adjective, Sylvester

silvestris (neuter silvestre); third-declension two-termination adjective

 Of or pertaining to a forest or wood

 forested, wooded, overgrown with trees

 rural, wild, living in forests

 COMMENT.

<https://www.reddit.com/r/AskHistorians/comments/49z4d6/why_did_florence_ban_hinduarabic_numerals_in_1299/>,

GOOGLE. In Florence, for example, people argued that Arabic numerals were easier to falsify than Roman ones. The poor legibility of the figures in merchants' ledgers was also criticised. In 1299, the city banned the use of Arabic numerals in contracts and official documents.

 COMMENT.

SOCIAL INERTIA, another example

####  Dispute between abacists and algorists,

 <https://library.ethz.ch/en/locations-and-media/platforms/virtual-exhibitions/fibonacci-un-ponte-sul-mediterraneo/fibonaccis-significance-for-the-present-day/dispute-between-abacists-and-algorists.html>,

Extract from "Margarita philosophica nova" by Gregor Reisch

(1512 edition),

Man has always striven to simplify life by using technical aids. And this was also the case with counting and calculating. So the abacus was used in different forms for centuries. Even today the abacus is used in East Asia, India and Russia.

**In the thirteenth century the system of calculation with written numerals in use in the Arab world was introduced into the Western world first via the Arabs and then by Leonardo of Pisa,** known as Fibonacci. Fibonacci above all sought in his "Liber abaci", the "Book of arithmetic", to persuade merchants of the great benefit of Indo-​Arabic arithmetic.

Ideological conflict until the French Revolution

However, the authorities and the church were set against the widespread introduction of calculation with numerals. So even as late as 1300 there was a ban in various Italian cities on using Indo-​Arabic numerals in contracts and official documents. An ideological conflict lasting centuries then began between the abacists, who stuck to calculating with the abacus and continued to use Roman numerals, and the algorists, the adherents of written calculation with Indo-​Arabic numerals and place-​value writing. **It was only in the course of the 1789 French Revolution, when the abacus was banned from schools and administration, that Indo-​Arabic numerals could finally be imposed throughout Europe.**

**The anachronistic picture from "Margarita philosophica nova" shows on the right the ancient Greek scholar Pythagoras as representative of the abacists with an abacus.** On the left can be seen the late Roman philosopher Boethius, who is already calculating with the new Indo-​Arabic numerals and represents the algorists. In the middle is Arithmetica, who has decided the dispute between abacists and algorists in favour of the algorists.

#####  Boethius, ΒΟΗΘΙΟΣ,

 Wikipedia, Anicius Manlius Severinus Boethius,[6][note 1] commonly known as Boethius (/boʊˈiːθiəs/; Latin: Boetius; c. 480–524 AD), was a Roman senator, consul, magister officiorum, historian, and philosopher of the Early Middle Ages. He was a central figure in the translation of the Greek classics into Latin, a precursor to the Scholastic movement, and, along with Cassiodorus**, one of the two leading Christian scholars of the 6th century.** The local cult of Boethius in the Diocese of Pavia was sanctioned by the Sacred Congregation of Rites in 1883, confirming the diocese's custom of honouring him on the 23 October.[9]

#####  Gregor Reisch, wikipedia

Gregor Reisch (c. 1467 – 9 May 1525) was a German **Carthusian monk and humanist scholar.** He is best known for **his compilation Margarita Philosophica, one of the earliest printed encyclopedias** of general knowledge.[1]

#####  Carthusians

The Carthusians, also known as the Order of Carthusians (Latin: Ordo Cartusiensis), are a Latin enclosed religious order of the Catholic Church. The order was founded by Bruno of Cologne **in 1084 and includes both monks and nuns**.

 COMMENT

##  Luca Pacioli (1445–1517).

 See KATZ, p, 389,

Pacioli, one of the last of the abacists, was ordained as a Franciscan friar in the 1470s

and taught mathematics at various places in Italy during the remainder of his career. He

became so famous as a teacher that there is a painting of him by Jacopo di Barbari now

hanging in the Naples Museum, which shows him teaching geometry to a young man

tentatively identified as Guidobaldo, the son of his patron, the Duke of Urbino (Fig. 12.1).

As part of his teaching, Pacioli composed three different abacus texts for his students. He

regretted what he believed to be the low ebb to which teaching had fallen. Because he

felt that one of the problems was the scarcity of available subject material, he gathered

mathematical materials for some twenty years and in **1494 completed the most comprehensive**

mathematics text of the time, and one of the earliest mathematics texts to be printed. This

was the ***Summa de arithmetica, geometrica, proportioni et proportionalita*, a 600-page work**

written in the Tuscan dialect rather than in Latin. It contained not only practical arithmetic but also much of the algebra already discussed, the first published **treatment of double entry**

bookkeeping, and a section on practical geometry. There was little that was original

in this work. In fact, a large number of the algebra problems are taken directly from della

Francesco’s treatise, while the practical geometry is very similar to that of Leonardo of Pisa.

Nevertheless, its comprehensiveness and the fact that it was the first such work to be printed

made it into a widely circulated and influential text, extensively studied by sixteenth-century

Italian mathematicians. It became the common base from which these men were able to

extend the range of algebra. Before considering these advances, however, we first turn to

contemporaneous developments elsewhere in Europe. It is not only from Italy that our algebra

comes.

 See <https://en.wikipedia.org/wiki/Luca_Pacioli>,

 Fra Luca Bartolomeo de Pacioli (sometimes Paccioli or Paciolo; c. 1447 – 19 June 1517)[3] was an Italian mathematician, Franciscan friar, collaborator with Leonardo da Vinci, and an early contributor to the field now known as accounting. **He is referred to as the father of accounting and bookkeeping and he was the first person to publish a work on the double-entry system of book-keeping on the continent**.[4][a] He was also called Luca di Borgo after his birthplace, Borgo Sansepolcro, Tuscany.

#####  WORKS

######  Tractatus mathematicus ad discipulos perusinos

 (Ms. Vatican Library, Lat. 3129), a nearly 600-page textbook dedicated to his students at the University of Perugia where Pacioli taught from 1477 to 1480.

######  Summa de arithmetica, geometria.

Proportioni et proportionalita (Venice 1494), a textbook for use in the schools of Northern Italy. It was a synthesis of the mathematical knowledge of his time and contained the first printed work on algebra written in the vernacular (i.e., the spoken language of the day). It is also notable for including one of the first published descriptions of the bookkeeping method that Venetian merchants used during the Italian Renaissance, known as the double-entry accounting system. The system he published included most of the accounting cycle as we know it today. He described the use of journals and ledgers and warned that a person should not go to sleep at night until the debits equalled the credits. His ledger had accounts for assets (including receivables and inventories), liabilities, capital, income, and expenses – the account categories that are reported on an organization's balance sheet and income statement, respectively. He demonstrated year-end closing entries and proposed that a trial balance be used to prove a balanced ledger. Additionally, his treatise touches on a wide range of related topics from accounting ethics to cost accounting. He introduced the Rule of 72, using an approximation of 100\*ln 2 more than 100 years before Napier and Briggs.[9] Its exercises were largely copied without credit from Piero della Francesca's earlier book, Trattato d'abaco.[10]

RDard

i gave a similar rule for solving special quartic equations, while Piero

#  ΕΞΙΣΩΣΕΙΣ ΤΡΙΤΟΥ ΒΑΘΜΟΥ, 2024, ,

 See KATZ, p. 383,

**But of number, cosa [unknown], and**

**cubo [cube of the unknown], however**

**they are compounded . . . , nobody until**

**now has formed general rules,** because they

are not ?? proportional among them. . . . And

therefore, until now, for their equations,

one cannot give general rules except that,

sometimes, by trial, . . . in some particular

cases. And therefore when in your equations

you find terms with different intervals

without proportion, you shall say that the

art, until now, **has not given the solution to**

**this case, . . . even if the case may be possible**.

—From the **Summa de arithmetica**,

geometrica, proportioni et proportionalita

of **Luca Pacioli, 1494**

 **Fra. Luca Bartolomeo de Pacioli (sometimes Paccioli or Paciolo; c. 1447 – 19 June 1517)[3]**

was an Italian mathematician, Franciscan friar, collaborator with Leonardo da Vinci, and an early contributor to the field now known as accounting. He is referred to as the father of accounting and bookkeeping and he was the first person to publish a work on the **double-entry system** of book-keeping on the continent.[4][a] He was also called Luca di Borgo after his birthplace, Borgo Sansepolcro, Tuscany.

Several of his works were plagiarised from Piero della Francesca, in what has been called "probably the first full-blown case of plagiarism in the history of mathematics".[6]