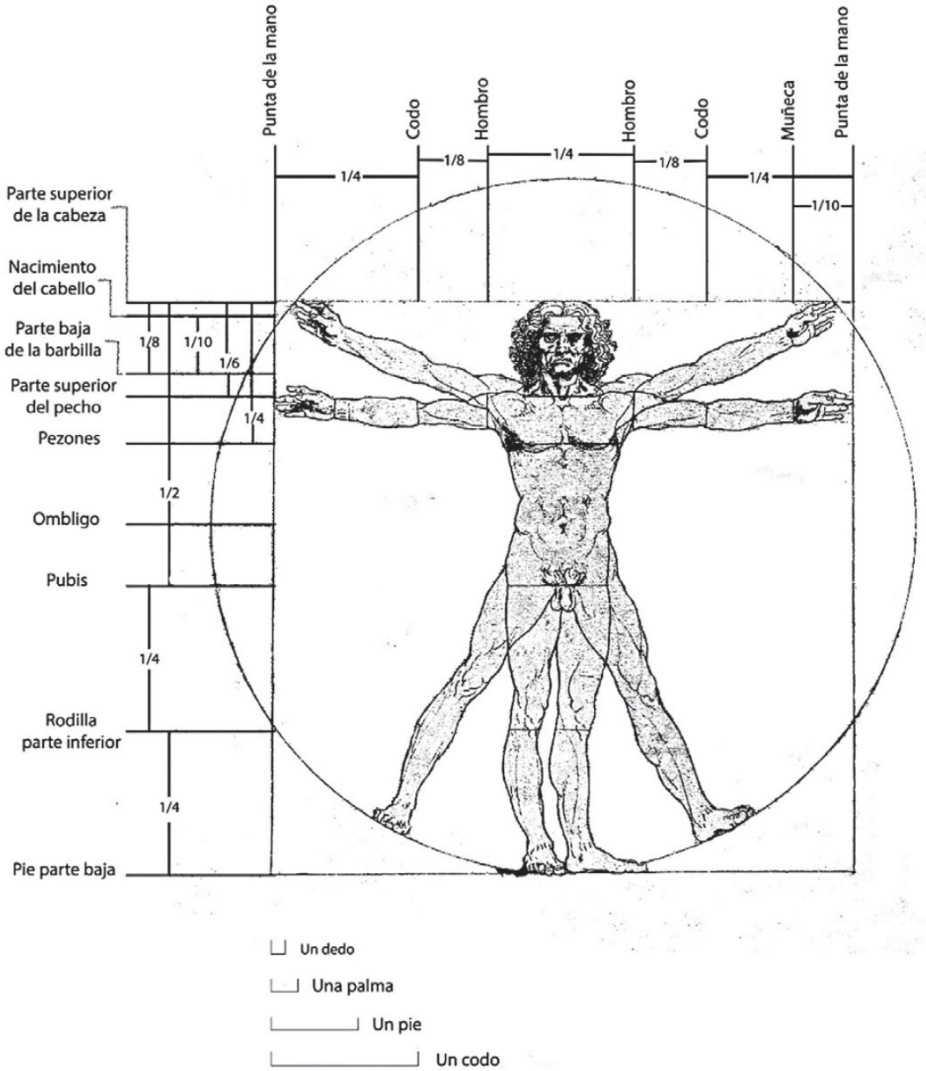
Vitruvio, el arquitecto, dice en su trabajo sobre arquitectura que las medidas del cuerpo humano están distribuidas por la Naturaleza de la siguiente manera: 4 dedos forman 1 palma y 4 palmas componen 1 pie, 6 palmas componen 1 codo; 4 codos hacen la altura de un hombre. Y 4 codos hacen un paso y 24 palmas hacen un hombre; Y estas medidas las utilizó en sus edificios...



Renacimiento de la matemática

Escolásticos vs Humanistas

Contrastes

Reunir, organizar y estudiar con actitud crítica el conocimiento antiguo

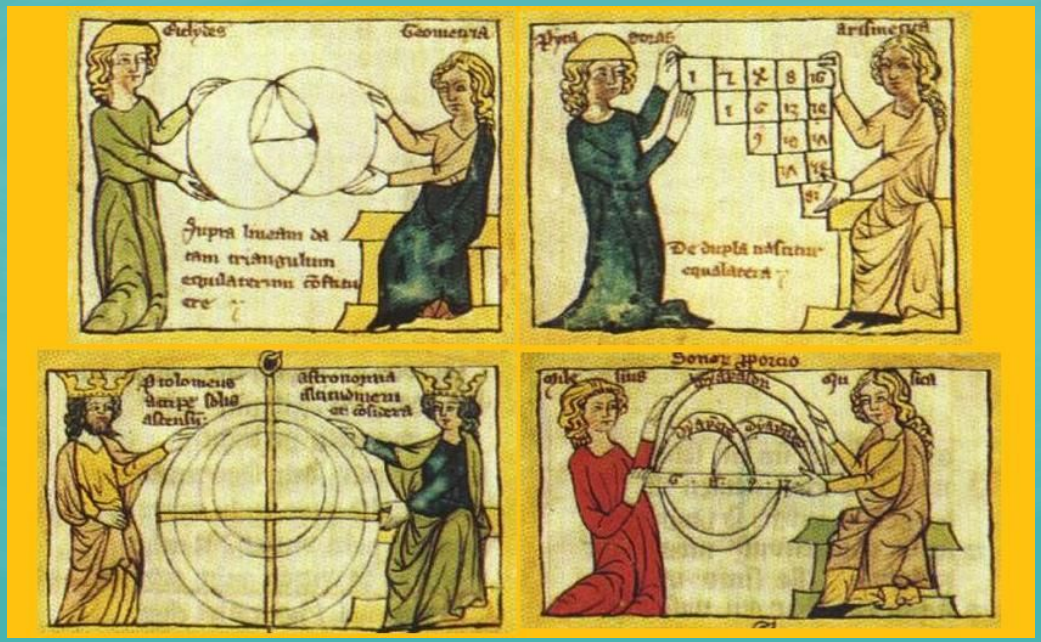
Gramática

Lógica (Dialéctica)

Retórica

Quadrivium

Aritmética Música Geometría Astronomía



Desarrollos matemáticos

Perspectiva

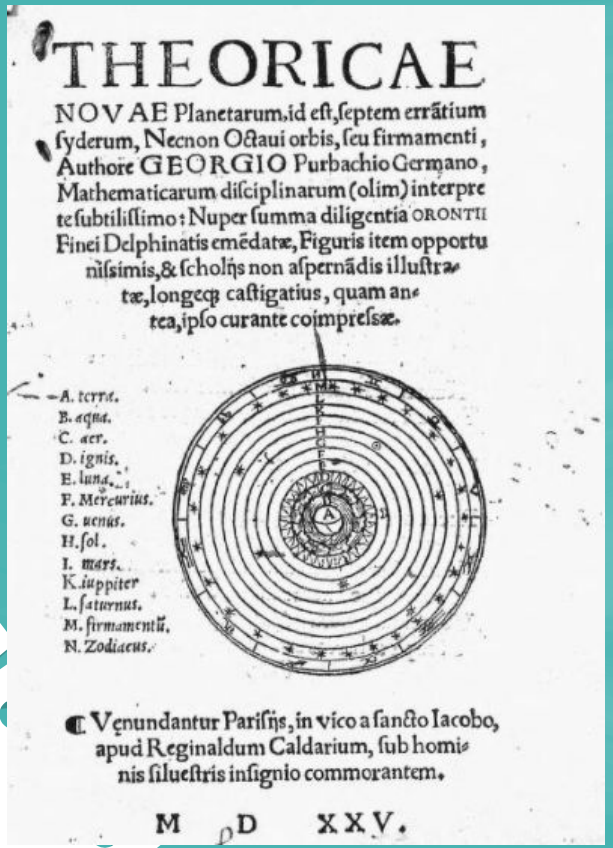
Brunelleschi
Alberti
Pacioli
Durero

Geometría

Trigonometría

Peurbach

Peurbach (1423-1461)



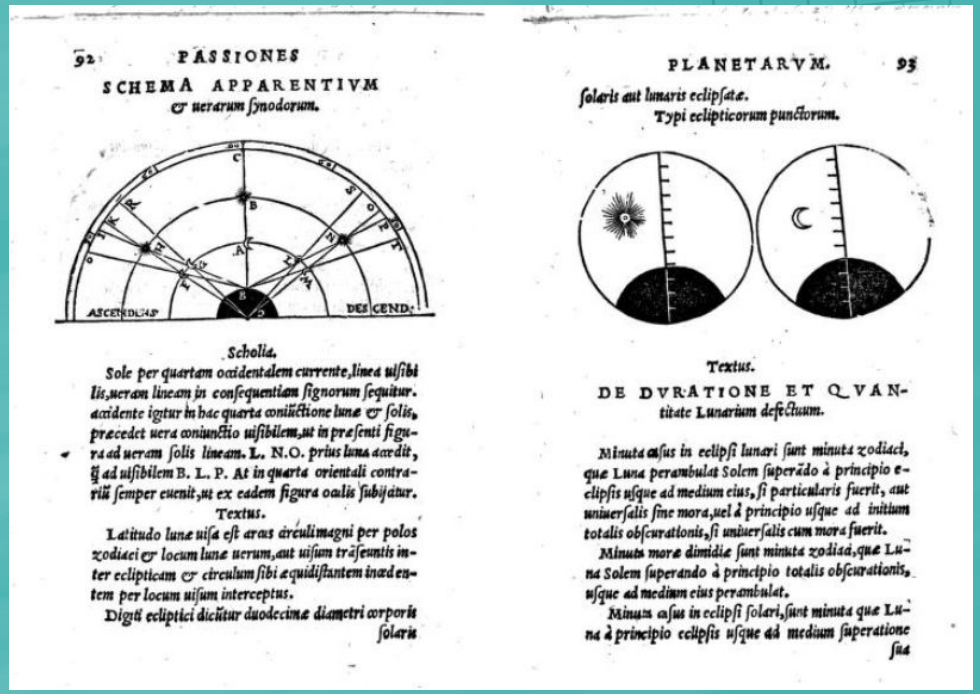
THEORICAE

NOVAE Planetarum, id est, septem errātium syderum, Necnon Octaui orbis, seu firmamenti, Authore GEORGIO Purbachio Germano, Mathematicarum disciplinarum (olim) interprete subtilissimo: Nuper summa diligentia ORONTII Finei Delphinatis emēdatæ, Figuris item opportunissimis, & scholijs non aspernādis illustratæ, longeq; castigatius, quam antea, ipso curante compressæ.

A. terra.
B. aqua.
C. aer.
D. ignis.
E. luna.
F. Mercurius.
G. uenus.
H. sol.
I. mars.
K. Iuppiter
L. saturnus.
M. firmamentū.
N. Zodiacus.

Venundantur Parisijs, in vico a sancto Iacobo, apud Reginaldum Caldarium, sub hominis siluestris insignio commorantem.

M D XXV.



92 PASSIONES

SCHEMA APPARENTIVM & uerarum synodorum.

ASCENDENS DESCEND.

Scholia.

Sole per quartam occidentalem currente, linea uisibilis, ueram lineam in consequentiam signorum sequitur. accidente igitur in hac quarta coniunctione lunæ & solis, præcedet uera coniunctio uisibilem, ut in præsenti figura ad ueram solis lineam. L. N.O. prius luna accedit, q̄ ad uisibilem B. L. P. At in quarta orientali contrarium semper euenit, ut ex eadem figura oculis subijcitur.

Textus.

Latitudo lunæ uisa est arcus circuli magni per polos zodiaci & locum lunæ uerum, aut uisum trāseuntis inter eclipticam & circulum sibi æquidistantem inæquentem per locum uisum interceptus.

Digiti ecliptici dicūtur duodecimæ diametri corporis solaris

PLANETARVM. 93

solaris aut lunaris eclipsatæ.

Typi ecliptic orum punctorum.

Textus.

DE DVRATIONE ET QVANtitate Lunarium defectuum.

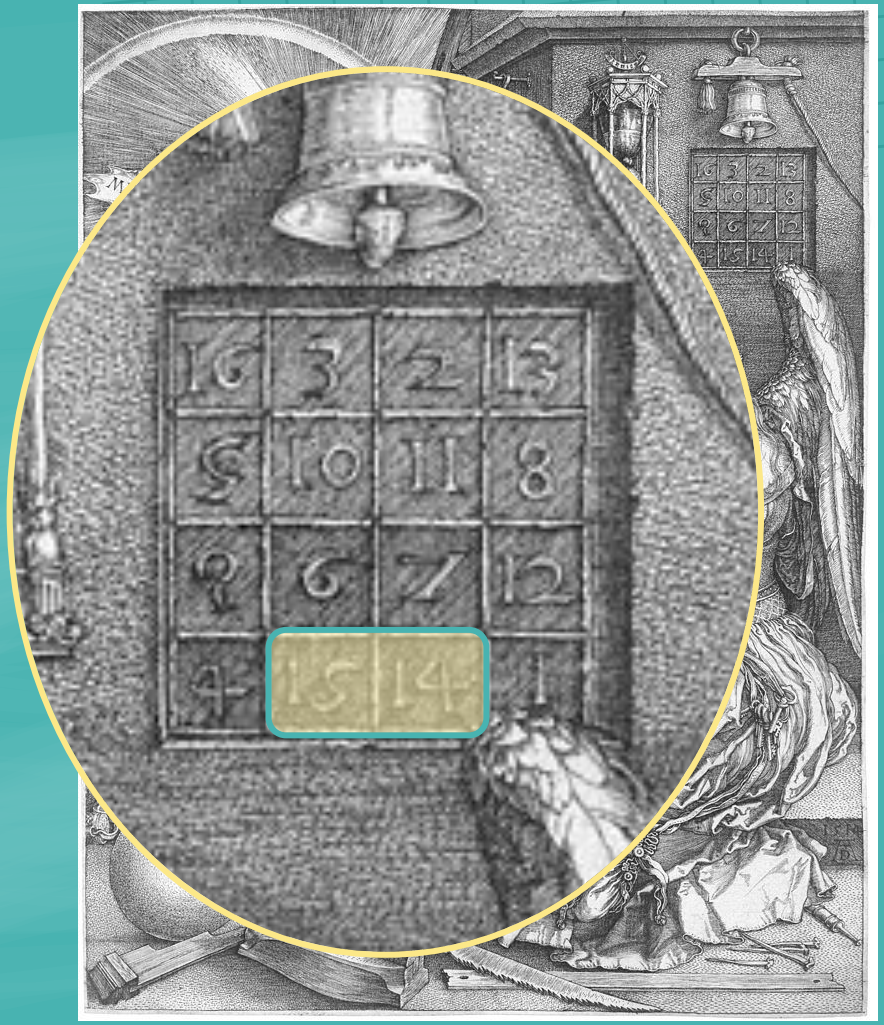
Minuta casus in eclipsi lunari sunt minuta zodiaci, quæ Luna perambulat Solem superādo à principio eclipsis usque ad medium eius, si particularis fuerit, aut uniuersalis sine mora, uel à principio usque ad initium totalis obscurationis, si uniuersalis cum mora fuerit.

Minuta moræ dimidiæ sunt minuta zodiaci, quæ Luna Solem superando à principio totalis obscurationis, usque ad medium eius perambulat.

Minuta casus in eclipsi solari, sunt minuta quæ Luna à principio eclipsis usque ad medium superatione sua

Theoricae Novae Planetarum (1454). Edición de 1525.

Melancolía I
Grabado de 1514



Durero (1471-1528)

Rinoceronte Indio (1515)

Durero (1471-1528)

Nicolás de Cusa

1401-1464

De docta ignorantia

Rafael Bombelli (1526-1573)

Raíces reales como solución.

L ALGEBRA

PARTE MAGGIORE

DELL'ARIMETICA

DIVISA IN TRE LIBRI

DI RAFAEL BOMBELLI

DA BOLOGNA.

Liber Abaci

Illustriamo ancora la moltiplicazione di 37 per 37. Si scrive il 37 sotto il 37, come abbiamo detto sopra dei 12, e si moltiplica il 7 per il 7; si ha 49; quindi il 9 si mette sopra entrambi i 7, come è mostrato nella prima illustrazione, e la figura quattro delle decine, che è in 49, è tenuta in mano; il 7 del numero superiore è moltiplicato per il 3 in basso, e il 7 in basso per il 3 in alto, e si sommano insieme; si ha 42 che si aggiunge al 4 mantenuto prima; si ha 46; le unità di 46, che sono 6, si scrivono sopra i 3 come mostrato nella seconda figura, e il 4 delle decine che sono in 46, si tiene in mano; quindi, il 3 del numero superiore viene moltiplicato per il 3 in basso; si ha 9 che si aggiunge al 4 che è in mano; si ha 13; il 3 di 13 viene messo al terzo posto e 1 al quarto, come nella terza e ultima illustrazione.

Per sapere se la moltiplicazione è corretta, si sommano le figure che sono nel 37 superiore, cioè il 3 e il 7; si ha 10, da cui si sottrae 9; rimane 1 che è tenuto in mano. Sempre allo stesso modo si sommano le figure del 37 in

L'ALGEBRA
OPERA
Di RAFAEL BOMBELLI da Bologna
Diuisa in tre Libri.
Con la quale ciascuno da se potrà venire in perfetta cognitione della teorica dell'Arimetica.
Con vna Tauola copiosa delle materie, che in ella si contengono.
Posta hora in luce à beneficio delli studiosi di detta professione.

IN BOLOGNA,
Per Giouanni Rossi. MDLXXIX.
Con licenza de' Superiori

5

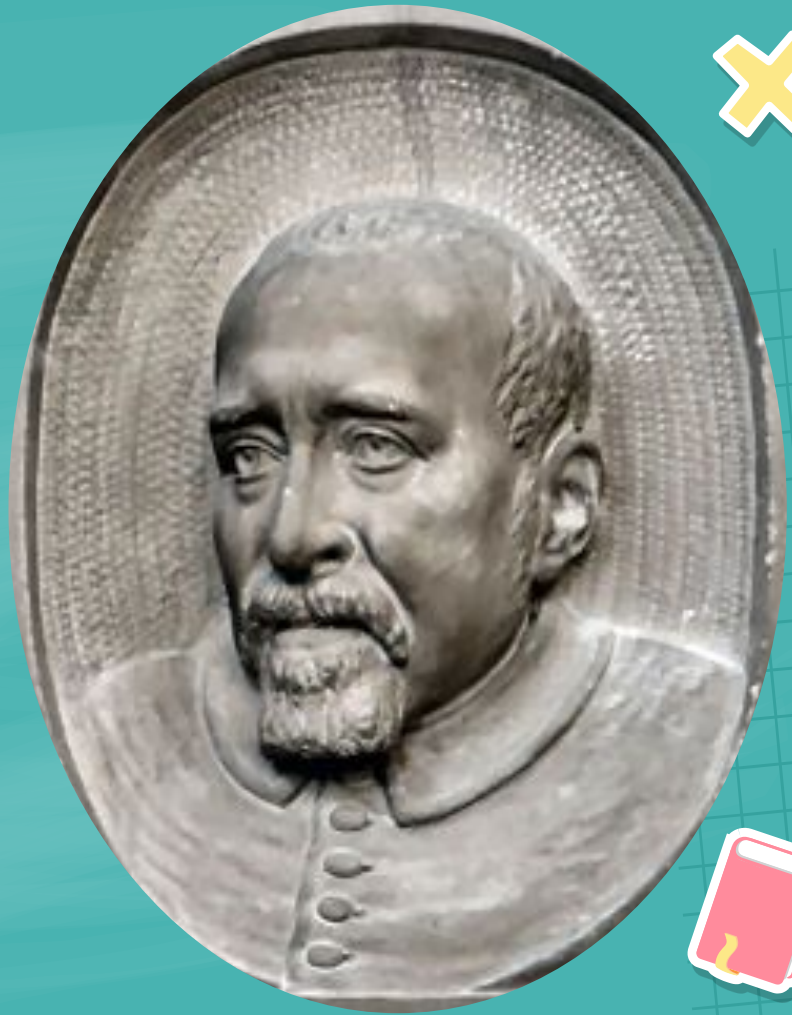
+√-1 “più di meno”
y
−√-1 “meno di meno”.

RECORDE

(1510-1558)

The grounde of artes

The Whetstone of Witte



At 19 s 6 d the yard, what 738 yards?

	738	Otherwise by Rebating.
10 s	369 —	738
5 s	184-10	
4 s	144-12	6 d 18-9 s
6 d	18—9	117 1/2—111
pounds	719—11 s	

The like againe is done by rebating, as by these two examples appeareth.

At 18 s. the Ell, what	418 Ells?
2 s.	41——16
pounds	376——4 s
At 16 s. the Ell, what	517 Ells?
4 s	103——8
pounds	413——12 s

7 Rule. *And now I will touch a little the euen part of a pound, that falleth out in pence and shillings, whereof for those parts you shall take such like part out of the giuen number that is to be multiplied, as the price of that giuen number beareth in proportion to a pound, which also for their better aide is here set downe.*

1 s 8 d			
2	6	is the	part of a pound.
3	4		
4	8		

Item, first for 1 shilling 8 pence take the $\frac{1}{12}$ part

part of the giuen number, and if any thing do remaine, they are twelue parts of a pound, each one being in value 1 shilling 8 pence.

Item, for 2 shillings 6 pence, take the $\frac{1}{8}$ part of the number that is to be multiplied. And if any thing do remaine, they are eight parts of a pound, each one being in value 2 shillings 6 pence.

Item, for 3 shillings 4 pence, as appeareth by the Table, you must take the $\frac{1}{6}$ part of the giuen number, and if any thing do remaine, they are 6 parts of a pound, each one being in value 3 shillings 4 pence.

Item, for 6 shillings 8 pence, take the $\frac{1}{3}$ part of the number that is to be multiplied: And if any vnites do remaine, they are thirds of a pound, euery one being worth 6 shillings 8 pence.

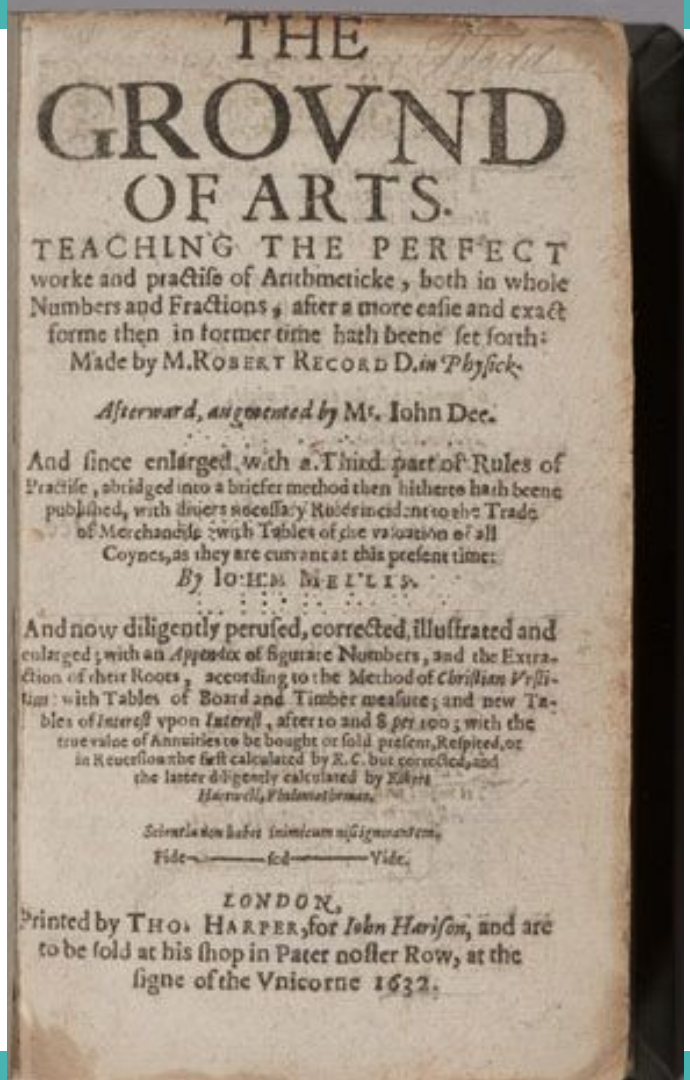
Other infinite numbers there are, that may be reduced by abreuiation into the proportionate parts of a *pound*, as 16 shillings 8 pence maketh $\frac{1}{3}$: which 16 shillings 8 pence is easily reduced into groats, by multiplying 16 by 3, and thereto adde 2, which maketh 50 groats.

Then set 60 the groats of a pound vnder 50: cutting off the 2 ciphers, as is here performed.

16—8
3
5 0
6 0

And then haue you brought 16 shillings 8 d into the knowne parts of a *pound*, which maketh $\frac{1}{3}$.

But



THE
GROVND
OF ARTS.

TEACHING THE PERFECT worke and practise of Arithmeticke, both in whole Numbers and Fractions, after a more easie and exact forme then in former time hath beene set forth: Made by M. ROBERT RECORD D. *in Physick.*

Afterward, augmented by Mr. Iohn Dee.

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By IOHN MELLIS.

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Scientia non habet inimicum nisi ignorantem.

Vide ——— fol. ——— Vide.

LONDON,
Printed by THO. HARPER, for *John Harison*, and are to be sold at his shop in Pater noster Row, at the signe of the Vnicorne 1632.

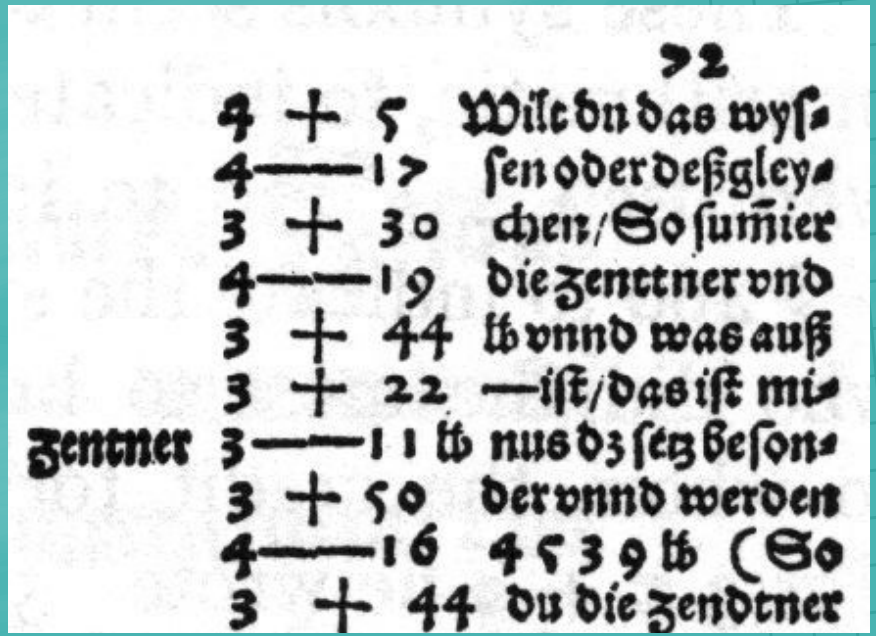
The grounde of artes
1543

p

m

Behende und hüpsche Rechenung auff allen Kauffmanschafft (1489)

WIDMAN

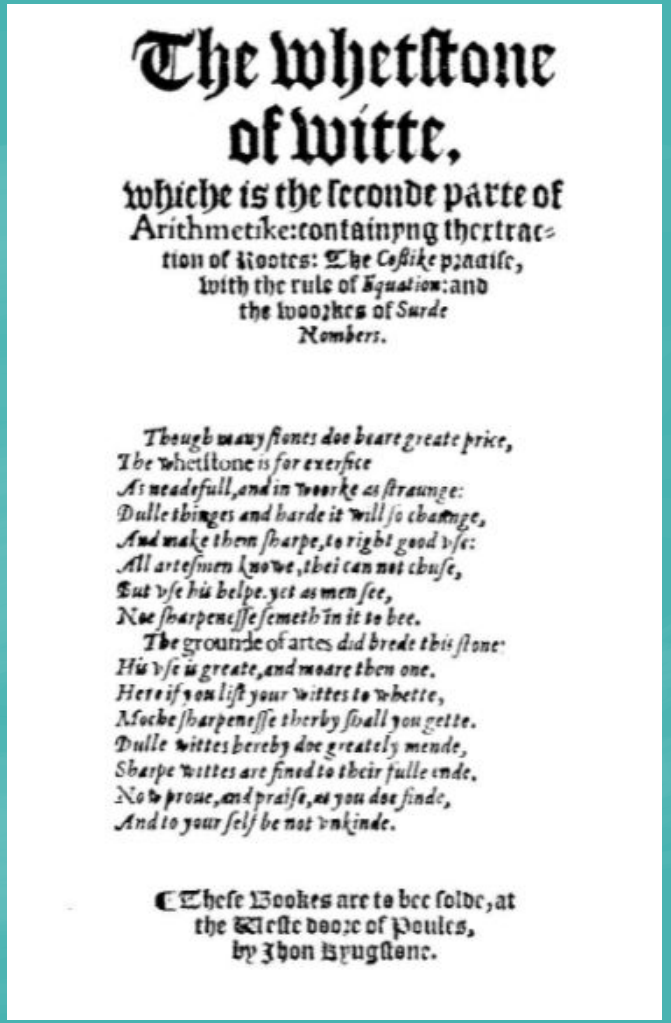


92

4 + 5 Wilt du das wyſ-
4 —— 17 ſen oder deßgley-
3 + 30 chen/ So ſum̃ier
4 —— 19 die Zenttner vnd
3 + 44 ℔ vnnd was auß
3 + 22 —iſt/ das iſt mi-
Zentner 3 —— 11 ℔ nus dz ſetz beſon-
3 + 50 der vnnd werden
4 —— 16 4539 ℔ (So
3 + 44 du die Zendtner

The Whetstone of Witte (1557)

Recorde



The whetſtone of witte,

whiche is the ſeconde parte of Arithmetike: containyng the extraction of Rootes: The Coſſike practife, with the rule of Equation: and the woorkes of Surde Nombers.

Though many ſtones doe beare greate price,
The whetſtone is for exerſice
As needefull, and in woorke as ſtraunge:
Dulle thinges and harde it will ſo chaunge,
And make them ſharpe, to right good vſe:
All arteſmen knowe, thei can not chuſe,
But vſe his helpe. yet as men ſee,
Noe ſharpeneſſe ſemeth in it to bee.
The grounde of artes did brede this ſtone:
His vſe is greate, and moare then one.
Here if you liſt your wittes to whette,
Moche ſharpeneſſe therby ſhall you gette.
Dulle wittes hereby doe greately mende,
Sharpe wittes are fined to their fulle ende.
Now proue, and praiſe, as you doe finde,
And to your ſelf be not vnkinde.

These Bookes are to bee ſolde, at the Weſte doore of Poules, by Ihon Kyngſtone.

And this is all that neadeth to bee taughte, concer-
nyng this woorke.

Howbeit, for easie alteratiō of *equations*. I will pro-
pounde a fewe exāples, bicause the extraction of their
rootes, maie the more aptly bee wroughte. And to a-
uoide the tediouse repetition of these woordes : is e-
qualle to : I will sette as I doe often in woorke use, a
paire of paralleles, or Gemowe lines of one lengthe,
thus: ═════, bicause noe .2. thynges, can be moare
equalle. And now marke these nombers.

1. 14.ze.—+—.15.ϑ═════71.ϑ.

that denomination followe the rules, now lafte declared.

Wherefore I shall not nede to doe any more, but to set forthe onely certain examples, of euery kinde of woorke in them.

Examples of Numeration.

$\frac{3}{4}$ ze. Signifieth $\frac{3}{4}$ of a *Roote*.
$\frac{5}{6}$ ȝ. Betokeneth $\frac{5}{6}$ of a *Square*.
$\frac{12}{13}$ ce. Repzesenteth $\frac{12}{13}$ of a *Cube*.

And so of all other sozmes of *Cossike* signes: where by is intended, that the *Cossike quantitie*, is diuided into so many partes, as the denominator containeth, and there is here repzesented onely so many of them, as the numerator doeth impozte.

Scholar. Hereby I dooe perceiue, that a fraction *Cossike*, maie signifie a nomber, and not onely a parte of an vnitie, as it did in nombers *Abstracte*.

Foz when I saie $\frac{2}{3}$ ȝ. if that *Square* be. 9. then that fraction signifieth. 6. But if the *Square* be. 4. then that fraction doeth repzesente. $2\frac{1}{2}$.

Likewaies $\frac{1}{4}$ ce. if the *Cube* be. 8. then that fraction doeth signifie. 6. But if the *Cube* be. 27. then that fraction is equalle to. 20. $\frac{1}{4}$.

Maister. Pou dooe consider it well.

Of Addition.

Addition. Now foz addition, take these examples.

$\frac{1}{3}$ ȝ. added to $\frac{2}{3}$ ȝ. doe make $\frac{12}{12}$ ȝ. oz. 1 ȝ. $\frac{1}{12}$.

$\frac{1}{4}$ ce ioined with $\frac{3}{4}$ ce. doe make $\frac{12}{16}$ ce. oz 1. ce $\frac{12}{16}$.

And in vnlike signes.

$\frac{3}{4}$ ȝ. added to $\frac{4}{5}$ ce. doe make $\frac{4}{5}$ ce. —|— $\frac{1}{4}$ ȝ. oz els thus by one common denominator. $\frac{16.ce \text{ —|— } 15.ȝ.}{20.}$

Of

Where foz myne owne ease, and aied of memozie, I haue set vnder euery doublyng of the *quotiente*: And the somme that amounteth, by the multiplication of thesame, into the newe *quotiente*, with the Square of thesame newe *quotiente*.

Whereby I perceiue that the nombers, doe not go in soche ozder, that euery odde place, maketh a newe roote, as it doeth in nombers *Abstracte*. But sometime I must take. 2. places nexte together, and at an other tyme, I shall scippe. 2. oz. 3. places.

Maister. Pou marke it well. And yet that is a good and true rule, that some menne teache: that in these *Cossike* nombers, as well as in other *Abstracte* nombers, you shall marke euery odde place, and vnder eche of them to finde a Square roote. But that is to be vnderstande, when the nombers are sette, in their bzefeste and eracteste ozder.

These fewe examples maie suffice, foz a declaratiō of extracting the roote of Square nombers, made by *The rootes of* multiplication. And now touchyng those nombers, *nōbers equal* that bee equalle to some rooted nomber, and namely *to be squrts.* soche as be equalle to a square nomber, I will teache you how their roote maie be extracted.

But firste you shall marke, that a Square beeyng compared, as equalle to rootes and nombers, the rootes maie bee coupled with the nombers onely, in. 3. sozmes. That is. ze. —|— .9 (whiche is all one with 9. —|—. ze) oz els thus. 9. ——. ze. Oz thirdly, ze ——. 9. And foz eche of these. 3. soztes, there is some varietie, in the extraction of the roote. And in them all moche agremente.

Foz the first sozme, where ze —|— 9 is equalle to ȝ. take these exāples 1 ȝ. is equall to. 4. ze —|— 21 9. oz. 1 ȝ. is equalle to 35. 9. —|— 2. ze. Likewaies 1 ȝ. is equalle to. 10 ze. —|— 75. 9. oz. 1. ȝ. is equalle to 105. 9. —|—. 8. ze. *The firste forme.*