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LUCP L-2533

Universal Multiple-Octet Coded Character Set
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Διεθνής Οργανισμός Τυποποίησης
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Title: Proposal to encode 12 cossic characters

Source: Uwe Mayer, Siegmund Probst, David Rabouin, Elisabeth Rinner, Andreas Stötzner, Achim Trunk, Charlotte Wahl
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1.a The 5th revision of the Cossic proposal

We defined updated Unicode Character Properties for the two *ſs* characters, according to the recommendation we received after the discussion on October 2. According to **L2/25-232** we added provisional codepoints and made some changes to character names. The cossic characters are to be allocated in the Latin Ext. G block, the Miscellaneous Symbols Supplement block and one in the Mathematical Alphanumeric Symbols block.

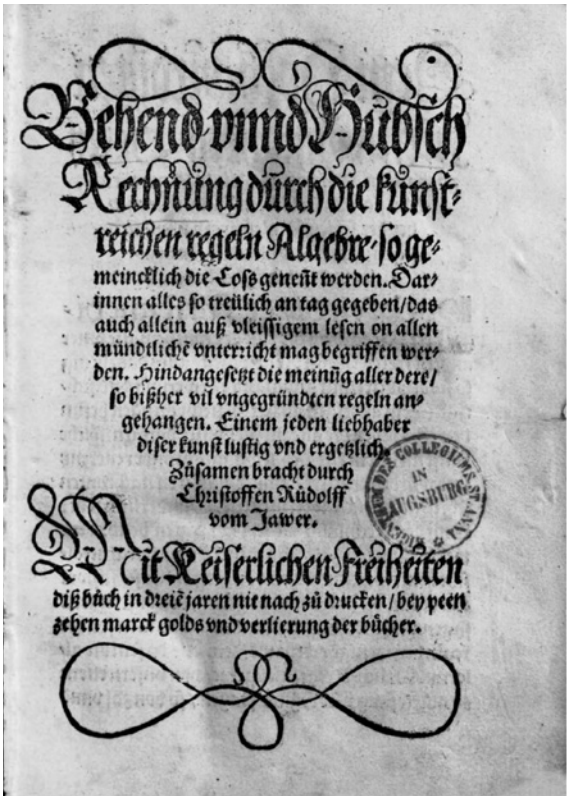
1.b The 4th revision of the Cossic proposal

There is one minor change and one significant change in this proposal, regarding the previous version. The minor thing is: with regard to LOWERCASE KURRENT Z as a variation sequence of 1D4CF, we now reference an analogue case presented in our proposal L-2520 (N5335), the two instances of the same sort of character may strengthen the case pro encoding.
A significant change has been made to the character names of three root characters, according to a recommendation we received from the UTC the names now reflect their historic nomenclature more directly.

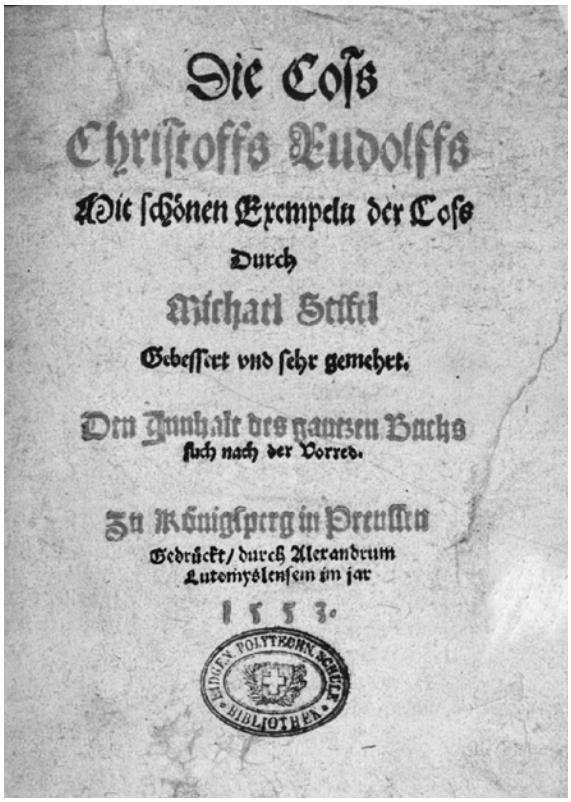
2. About *Coss* or *cossic* characters

"Coss" (or "Coſs", historic) is a German term for written or printed treatises about Algebra.
It derives from Italian *cosa* ("thing") which was used to denote variables in calculations.
The first printed "Coss" was a book by German mathematician Christoff Rudolff (ca. 1500 – before 1543): *Behend und hübſch Rechnung durch die kunſtreichen regeln Algebre, so gemeinicklich die Coſs genen̄t werden*. ("Handy and neat calculation by the artful Algebre rules, commonly so called the Coss.") The work was based on older algebra manuscripts which the author studied

in Vienna. The book was released in Straßburg in 1525 and was out of stock soon. Because it was such a sought-after title, Michael Stifel edited a new and extended version of Rudolff's Coss in 1553.
In the 1525 edition the character "√" was used the first time for *radix* in print. For the expression of powers (up to ninth) Rudolff used a set of special abbreviation characters. Some of them were common in writing at the time (and used for different purposes), some were rather special additions. Since this set of cossic characters appears explicitly for a longer time in mathematical literature, we see a need to have them encoded, in order to enable precise content encoding in facsimile transcriptions of the historic sources.


Behend vnnd Hübsch
Rechnung durch die künst-
reichen regeln Algebre so ge-
meincklich die Coss genesit werden. Dar-
innen alles so treülich an tag gegeben/das
auch allein auß vleissigem lesen on allen
mündliche vnterricht mag begriffen wer-
den. Hindangesetzt die meinūg aller dere/
so bißher vil vngegründten regeln an-
gehangen. Einem jeden liebhaber
diser kunst lustig vnd ergetzlich.
Zūsamen bracht durch
Christoffen Rūdolff
vom Jawer.
Mit Keiserlichen Freiheiten
diß bůch in dreie jaren nit nach zů drucken/bey peen
zehen marck golds vnd verlierung der bücher.

Title page of Rudolff's *Coss*,
edited in Straßburg 1525.
Source:
Münchner Digitalisierungszentrum


Die Coss
Christoffs Rudolffs
Mit schönen Exempeln der Coss
Durch
Michael Stifel
Gebessert vnd sehr gemehret.
Den Innhalt des gantzen Buchs
sich nach der Vorred.
Zu Königsperg in Preussen
Gedruckt/ durch Alexandrum
Lutomyslensem im jar
1553.

Title page of Stifel's new edition of Rudolff's
Coss, printed in Königsberg 1553.
Source:
ETH Zurich

3. Characters

The cossic characters set consists of two sub-groups. Group 1 is a range of 8 Latin abbreviation characters, derivates from Latin letters c, d, r, ſ and z. They represent the initials of the names of roots or powers. These characters are comparable to other already encoded abbreviation characters, like ℔ (*libra,* 2114), ﬓ (*per,* 214C), ℻ (*denarius/penny,* 20B0), ꝑ (*prae-,* A755) or ꝛ (*-rum,* A75D) which show a combination of a modified basic shape with some sort of graphic attachment, like scriptive loops directly connected to or crossing the base glyph.

We propose to encode the characters as *mathematical symbols*. In one case it has been worked out that a double encoding is required: one mathematical symbol character and one as a Latin letter character.

The aspect of case pairing is not relevant in all of the cases since no capital variants of these characters have ever been used anywhere. “Lowercase” in the proposed character names is chosen merely to indicate the proper respective ‘parent’ characters. The cossic characters do not occur as abbreviations in general Latin writing but exclusively in calculation contexts. Hence their specific shapes in combination with very specific meaning should justify their encoding, even if an apparent close optical ‘neighbourhood’ to existing characters can be observed. The proposed annotations will help to understand differences to and similarities with existing characters.

If this proposal gets accepted, the following new characters will exist:

1DF90 ᷐ LATIN LETTER SMALL C WITH SMALL SLASH
= cubus
• denotes cube of the unknown

1DF91 ᷑ LATIN LETTER SMALL C WITH DESCENDER
= census
• denotes square of the unknown

1DF92 ᷒ LATIN LETTER SMALL C WITH RIGHT LOOP
= cubus
• denotes cube of the unknown

1DF93 ᷓ LATIN LETTER SMALL D ROTUNDA WITH CROSSING LOOP
= dragma
• denotes numerus / constant
→ 1E9F ẟ latin small letter delta
→ A77A ꝺ latin small letter insular d
→ 20B0 ₰ german penny sign

1DF94 ᷔ LATIN LETTER SMALL R ROTUNDA WITH LOOP
= res, radix
• denotes the unknown
→ A75D ꝛ latin small letter r rotunda
→ A75D ꝛ latin small letter rum rotunda
→ A776 ꝶ latin letter small capital rum
→ 221A √ square root

1DF95 ſs LATIN SMALL LIGATURE LONG S WITH DESCENDER S
= sursolidum
• denotes fifth power of the unknown in historical mathematics
• glyph always resembles long s and s
→ corresponding mathematical symbol is 1D6A6
→ 017F ſ latin small letter long s
→ 0073 s latin small letter s
→ 00DF ß latin small letter sharp s
→ A7D7 ꟈ latin small letter middle scots s

1DF96 ſ LATIN LETTER SMALL LONG S WITH TOP LOOP
= sursolidum
• denotes fifth power of the unknown in historical mathematics
→ 017F ſ latin small letter long s
→ 1E9C ẜ latin small letter long s with diagonal stroke
→ 1E9D ẝ latin small letter long s with high stroke
→ 1DF95 latin small ligature long s with descender s

1D6A6 *ſs* MATHEMATICAL ITALIC LIGATURE LONG S WITH DESCENDER S
= sursolidum
• denotes fifth power of the unknown in historical mathematics
• glyph always resembles long s and s
• in plain text the corresponding Latin letter 1DF95 is preferred

Group 2 is a set of three *root* or *radix* symbols, historically related to the √ character (221A). The character names have now been defined according to the historic names in Stevin 1634 (see p. 18):

1CEDD SQUARE ROOT OF SQUARE ROOT
→ 221A √ square root

1CEDE SQUARE ROOT OF SQUARE ROOT OF SQUARE ROOT
→ 221A √ square root

1CEDF SQUARE ROOT OF SQUARE ROOT OF SQUARE ROOT OF SQUARE ROOT
→ 221A √ square root

This character is proposed as a variation sequence:

ℨ (LOWERCASE KURRENT Z) *variation sequence to U+1D4CF*

This variation sequence character would introduce a new category of variation sequences related to the Mathematical Alphanumerics (block 1D500) subgroup *Script symbols* (lowercase, 1D4B6 to 1D4CF). There has been a concern wether this single char. should justify such a new series of variation sequence characters. For to justify such a decision it may be considered that in our proposal **N5335** another character of this kind is proposed:

𝔵 LOWERCASE KURRENT X

This may well be regarded as a case of the same kind and dealt with in the same way. Further examples of the use of other *kurrent style* small letters in mathematical notation may be testified in the future.

4. The *cubus* characters

In group 1 there are two different characters for "cubus": ↄ and ↄ̊. Although the meaning is the same, the representative glyphs differ considerably. These typographic differences are strongly tied to certain writing or publishing traditions. Therefore we propose to encode two characters, thus being in line with a principle which has been followed in e.g. the alchemical characters block, where also (in some cases) two or three different characters bear (basically) the same meaning. This character pair situation is also evident with some other characters of the cossic set.

5. *Radix* characters

The LOWERCASE R ROTUNDA WITH LOOP ꝛ̊ occurs frequently with the meaning of "res" or "radix". The left part of the glyph is derived from the shape of the capital R, in a similar way as the base parts of the R ROTUNDA and RUM ROTUNDA characters (A75A to A75D) are derived from R. The distinctive feature of ꝛ̊ is its right half with a prominent crossing loop moving down as a descender. In this form, the character unambiguously denotes the mathematical meaning in contrast to the syllabic meaning "-rum" of A75C/A75D as well as of A776.
But, as the sources show, the small capital R with stroke ʀ̷ (A776, LATIN SMALL CAPITAL RUM) has also been used eventually in the set of cossic characters. Therefore we also propose an addition of new annotations to this character, as follows:

A776 ʀ̷ LATIN LETTER SMALL CAPITAL RUM
- cossic sign for res, radix
- → A75D ꝝ latin small letter rum rotunda
- → [xi05] ꝛ̊ lowercase r rotunda with loop

6. *Sursolidum* characters

"Sursolidum" is also represented by two different characters: ſs and ſ̊. This dual track situation has evolved historically by different local notation traditions. On the one hand, in an edition of historic sources it would not be tolerable to encode e.g. ſs (or even ß, 00DF) instead of ſ̊.
In recent discussions a variety of character names for ſs have been considered:

MATHEMATICAL ITALIC SHARP S

SHARP S WITH HOOK

MATHEMATICAL SHARP S

SHARP S WITH DESCENDER

The background for a decision about the name has changed for two reasons: a) *two* characters are proposed now instead of one; b) a further evaluation has revealed that a definition containing the part 'SHARP S' would give a wrong interpretation of the character's nature, identity and use.
A detailed discussion of this matter is to be found in the appendix at the end of this document.

Following a suggestion made by A. Freytag, we propose the names:

LATIN SMALL LIGATURE LONG S WITH DESCENDER S
MATHEMATICAL ITALIC LIGATURE LONG S WITH DESCENDER S

By this naming we achieve:
- compliance with established UCS naming conventions
- a structural and historical correct explanation

- a clearly understandable definition of the characters nature
- correct naming of the character's base characters
- to avoid confusion with the German ß (SHARP S)
- maintain the distinction between a plain-text character and a specific math character
- allow a different treatment of (xi07) and (xi06) in an Italic font, if there should be any need for that
- leave the door open for a possible later request for a *mathematical sharp s* (without a descender)

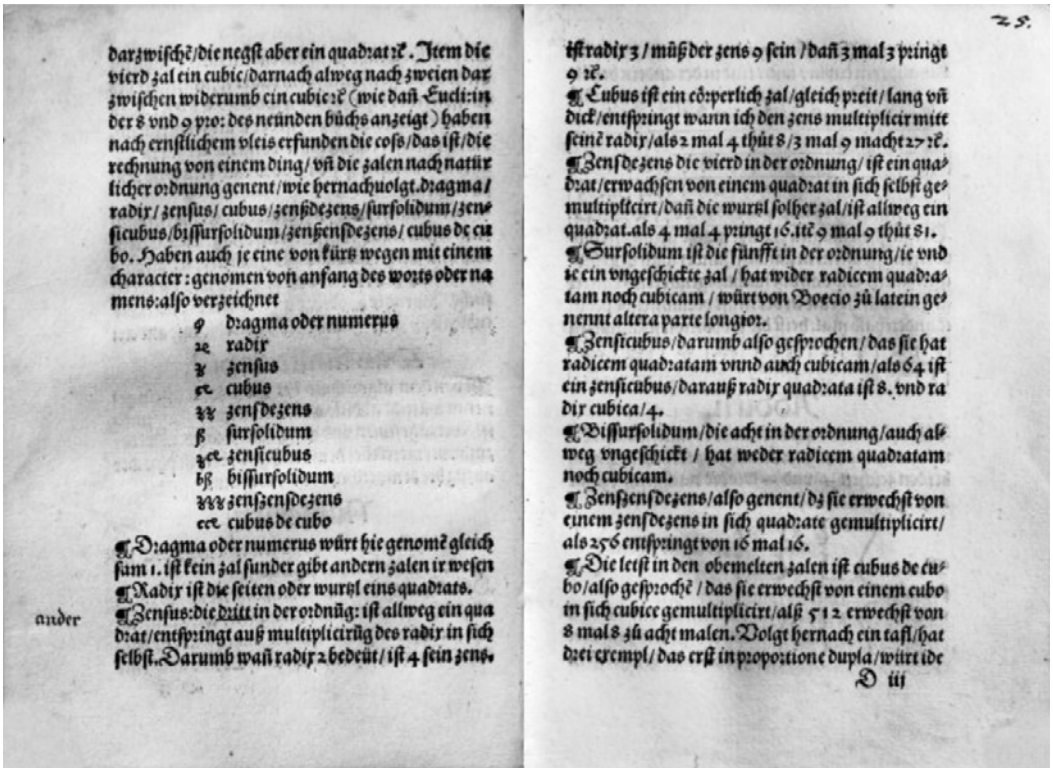
7. *Census* characters

There are also two different characters for "census/zensus": ȼ and ȝ, related either to *c* or to *z*.
We propose LOWERCASE KURRENT Z as a new variation sequence on U+1D4CF.
Since ȼ and ȝ are derivates of two different base letters, ȼ is proposed separately.

8. Figures and further explanations

The *Coss* characters became a widely adopted set of characters for denoting powers and roots, in the 16th and 17th century. We show a couple of instances from printed sources and also a piece of manuscript evidence by Leibniz.

See page 19 for a synopsis of all characters belonging to the first group.



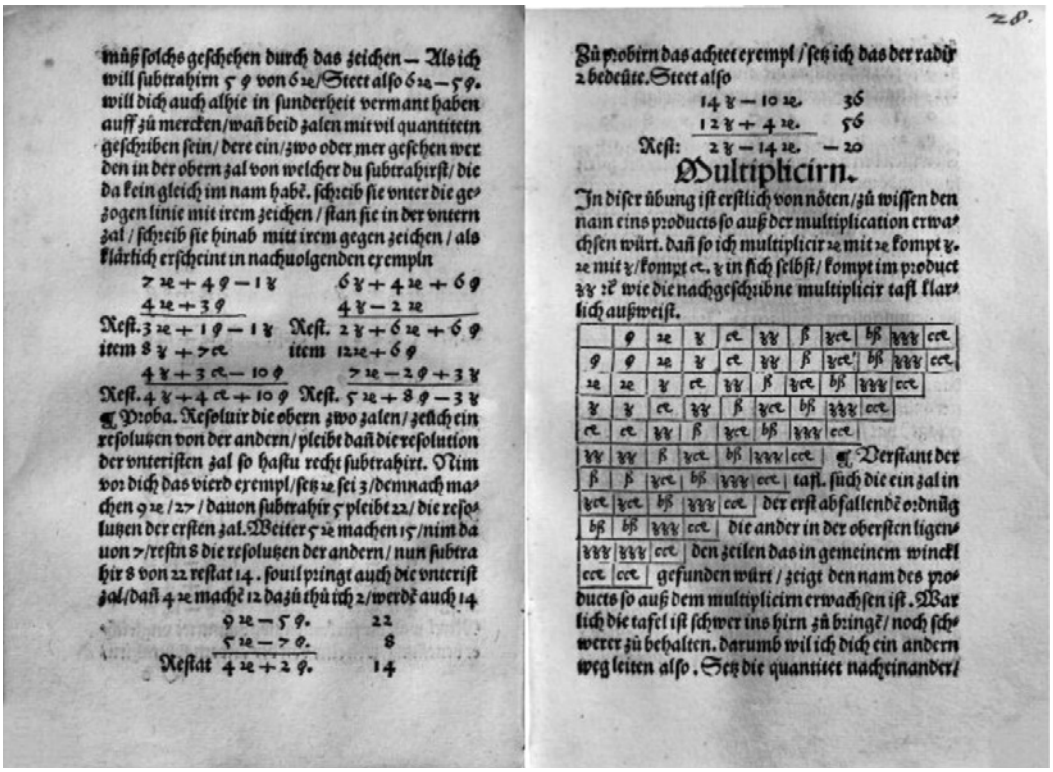
darzwischē/die negst aber ein quadrat rē. Item die vierd zal ein cubic/darnach alweg nach zweien dar zwischen widerumb ein cubic rē (wie dañ Euclides in der 8 vnd 9 pto: des neünden büchs anzeigt) haben nach ernstlichem vleis erfunden die cos/das ist/die rechnung von einem ding/ vñ die zalen nach natürlicher ordnung genent/wie hernachuolgt. Dragma/radix/zensus/cubus/zenßdezens/sursolidum/zensicubus/bissursolidum/zenßenßdezens/cubus de cubo. Haben auch je eine von kürtz wegen mit einem character: genomen von anfang des worts oder namens: also verzeichnet

9 dragma oder numerus
1e radix
ɣ zensus
ce cubus
ɣɣ zenßdezens
ß sursolidum
ɣce zensicubus
bß bissursolidum
ɣɣɣ zenßzenßdezens
cce cubus de cubo

¶ Dragma oder numerus würt hie genomē gleichsam 1. ist kein zal sunder gibt andern zalen ir wesen
¶ Radix ist die seiten oder wurtzl eins quadrats.
anderer ¶ Zensus: die dritt in der ordnūg: ist allweg ein quadrat/entspringt auß multiplicirūg des radix in sich selbst. Darumb wañ radix 2 bedeūt/ist 4 sein zens.

ist radix 3/müß der zens 9 sein/dañ 3 mal 3 pringt 9 rē.
¶ Cubus ist ein cōperlich zal/gleich preit/lang vñ dick/entspringt wann ich den zens multiplicir mit seinē radix/als 2 mal 4 thůt 8/3 mal 9 macht 27 rē.
¶ Zenßdezens die vierd in der ordnung/ist ein quadrat/erwachsen von einem quadrat in sich selbst gemultiplicirt/dañ die wurtzl solher zal/ist allweg ein quadrat. als 4 mal 4 pringt 16. itē 9 mal 9 thůt 81.
¶ Sursolidum ist die fünfft in der ordnung/ie vnd ie ein vngeschickte zal/hat wider radicem quadratam noch cubicam/würt von Boecio zů latein genennt altera parte longior.
¶ Zensicubus/darumb also gesprochen/das sie hat radicem quadratam vnnd auch cubicam/als 64 ist ein zensicubus/darauß radix quadrata ist 8. vnd radix cubica/4.
¶ Bissursolidum/die acht in der ordnung/auch allweg vngeschickt/hat weder radicem quadratam noch cubicam.
¶ Zenßenßdezens/also genent/dz sie erwechst von einem zenßdezens in sich quadrate gemultiplicirt/als 256 entspringt von 16 mal 16.
¶ Die letst in den obemelten zalen ist cubus de cubo/also gesprochē/das sie erwechst von einem cubo in sich cubice gemultiplicirt/alß 512 erwechst von 8 mal 8 zů acht malen. Volgt hernach ein tafl/hat drei exempl/das erst in proportione dupla/würt ide

D iij



můß solchs geschehen durch das zeichen — Als ich will subtrahirn 5 9 von 6 1e/Steet also 6 1e — 5 9. will dich auch alhie in sunderheit vermant haben auff zů mercken/waß beid zalen mit vil quantiteten geschriben sein/dere ein/zwo oder mer gesetzen werden in der obern zal von welcher du subtrahirst/die da kein gleich im nam habē. schreib sie vnter die gezogen linie mit irem zeichen/stan sie in der vntern zal/schreib sie hinab mit irem gegen zeichen/als klärlich erscheint in nachuolgenden exempln

7 1e + 4 9 — 1 ɣ / 4 1e + 3 9
Rest. 3 1e + 1 9 — 1 ɣ
item 8 ɣ + 7 ce — 10 9
Rest. 4 ɣ + 4 ce + 10 9

6 ɣ + 4 1e + 6 9 / 4 ɣ — 2 1e
Rest. 2 ɣ + 6 1e + 6 9
item 12 1e + 6 9
7 1e — 2 9 + 3 ɣ
Rest. 5 1e + 8 9 — 3 ɣ

¶ Proba. Resoluir die obern zwo zalen/zeuch ein resolutzen von der andern/pleibt dañ die resolution der vnteristen zal so hastu recht subtrahirt. Nim vor dich das vierd exempl/sets 1e sei 3/demnach machen 9 1e/27/davon subtrahir 5 pleibt 22/die resolutzen der ersten zal. Weiter 5 1e machen 15/nim davon 7/restn 8 die resolutzen der andern/nun subtrahir 8 von 22 restat 14. soul pringt auch die vnterist zal/dañ 4 1e machē 12 dazů thů ich 2/werdē auch 14

9 1e — 5 9. 22
5 1e — 7 9. 8
Restat 4 1e + 2 9. 14

Zů probirn das achtet exempl/setz ich das der radix 2 bedeūte. Steet also

14 ɣ — 10 1e. 36
12 ɣ + 4 1e. 56
Rest: 2 ɣ — 14 1e. — 20

Multiplicirn.

In diser übung ist erstlich von nöten/zů wissen den nam eins products so auß der multiplication erwachsen würt. dañ so ich multiplicir 1e mit 1e kompt ɣ. 1e mit ɣ/kompt ce. ɣ in sich selbst/kompt im product ɣɣ rē wie die nachgeschribne multiplicir tafl klarlich außweist.

	9	1e	ɣ	ce	ɣɣ	ß	ɣce	bß	ɣɣɣ	cce
9	9	1e	ɣ	ce	ɣɣ	ß	ɣce	bß	ɣɣɣ	cce
1e	1e	ɣ	ce	ɣɣ	ß	ɣce	bß	ɣɣɣ	cce	
ɣ	ɣ	ce	ɣɣ	ß	ɣce	bß	ɣɣɣ	cce		
ce	ce	ɣɣ	ß	ɣce	bß	ɣɣɣ	cce			
ɣɣ	ɣɣ	ß	ɣce	bß	ɣɣɣ	cce				
ß	ß	ɣce	bß	ɣɣɣ	cce					
ɣce	ɣce	bß	ɣɣɣ	cce						
bß	bß	ɣɣɣ	cce							
ɣɣɣ	ɣɣɣ	cce								
cce	cce									

¶ Verstant der tafl. sůch die ein zal in der erst abfallendē ordnūg die ander in der obersten ligenden zeilen das in gemeinem winckl gefunden würt/zeigt den nam des products so auß dem multiplicirn erwachsen ist. Warlich die tafel ist schwer ins hirn zů bringē/noch schwerer zů behalten. darumb wil ich dich ein andern weg leiten also. Setz die quantitet nacheinander/

Christoff Rudolff: *Behend und hübſch Rechnung durch die kunſtreichen regeln Algebre, ſo gemeinicklich die Coſs genennt werden*. Straßburg 1525. fol. 24v-25r, 27v-28r.

resolution der vnteristen zal / so hastu recht gemultiplicirt. Als ich wil probirn dz drit exempl / setze den werdt radicis 5. demnach würt die erst der obern: nemlich 6 ze + 8 9: resoluirt in 38. die ander in 18 / multiplicir 38 mit 18 komen 684. souil bedeüt auch das facit / daß 30 ɣ machen 750 / dauon subtrahir 10 / als den werdt 2ze / mer subtrahir 56 / pleiben 684 hab ich wellen probiren.

Diuidirn.

Waß du hast diuidirt die gröſſer quantitet durch die kleiner / wilt wiſſen den nam des quocients / Gee in die nachuolgēd tafl / ſůch die gröſſer quantitet in der obern / die kleiner in der vntern übereck hengenden zeilen ſo würt dir in gemeinem winckl der nam des quocients angezeigt.

	9	ze	ɣ	ce	ɣɣ	ß	ɣce	bß	ɣɣɣ	cce
9	9	ze	ɣ	ce	ɣɣ	ß	ɣce	bß	ɣɣɣ	cce
ze	9	ze	ɣ	ce	ɣɣ	ß	ɣce	bß	ɣɣɣ	
ɣ	9	ze	ɣ	ce	ɣɣ	ß	ɣce	bß		
ce	9	ze	ɣ	ce	ɣɣ	ß	ɣce			
ɣɣ	9	ze	ɣ	ce	ɣɣ	ß				
ß	9	ze	ɣ	ce	ɣɣ					
ɣce	9	ze	ɣ	ce						
bß	9	ze	ɣ							
ɣɣɣ	9	ze								
cce	9									

Waß ein quantitet würt geteilt durch ein andere in im namen gleich / kompt alweg 9 im quocient. würt ein quantitet durch 9 geteilt / so kompt solch quantitet im quocient. daß 9 verandert keine quantitet wider im multiplicirn nach diuidirn.

¶ Ein ander weiß / den nam des quocients zů sůchē waß die gröſſer geteilt würt durch ein kleinere oder gleiche quantitet.

Schreib die quantitet nacheinander vñ verzeichē sie mit der zal natürlicher ordnung / wie du im multiplicirn gelernt hast also.

0 1 2 3 4 5 6 7 8 9
9 ze ɣ ce ɣɣ ß ɣce bß ɣɣɣ cce

Subtrahir die zal der kleinern von der zal der gröſſern quantitet / durch dz übrig würt kundt der nam des quocients. Als ich diuidir ß durch ce / subtrahir 3 von 5 resten 2 / zeigt das der quocient sei ɣ. Item ich diuidir ɣce durch ß / subtrahir 5 von 6 restat 1 / zeigt im quocient ze. Item ich diuidir ce durch ce / subtrahir 3 von 3 restat 0 / zeigt 9. Des zů mererm verstandt nim diſe exempl. Ich diuidir 6 ɣ durch 2 ze Steet alſo.

6 ɣ (fa: 3 ze. Item 5 ce (fa: 2 ½ ɣ. Item 12 ɣ (fa: 4 9
2ze 2ze 3ɣ

¶ Proba. Reſoluir peide zalen. Diuidir ein reſolutzen durch die ander / das auß ſolcher teilung komen würdt / můß gleich ſein des quocients reſolutzen. Zů einer prob nim das erſt exempel / ſetz den werdt

diuidirt werdē durch 3. Darumb laß dich alhie nit irren / was oben im fünfften capitl des erſten teyls bey der diuiſion geſagt iſt.

¶ Die erſt equation oder regl der coſs.

Waß zwo quantitetn natürlicher ordnung einander gleich werden / diuidir die kleiner in die gröſſer quantitet / der quocient zeigt an den werdt ze. Als in diſen exempln.

Die teiler

3 ze		6 9	
4 ɣ		8 ze	
5 ce		10 ɣ	
6 ɣɣ		12 ce	
7 ß	Sein gleich	14 ɣɣ	facit ze. 2 9
8 ɣce		16 ß	
9 bß		18 ɣce	
10 ɣɣɣ		20 bß	
11 cce		22 ɣɣɣ	

¶ Die ander equation.

Waß zwo quantitetn einander gleich werden / zwiſchen welchen eine: natürlicher ordnung nach begriffen: geſchwigen iſt. Diuidier die kleiner in die gröſſer quantitet / radix quadrata des quocients zeigt an den werdt ze. Als

Die teiler

2 ɣ		8 9	
3 ce		12 ze	
4 ɣɣ		16 ɣ	
5 ß	Sein gleich	20 ce	fa: ze. 2 9
6 ɣce		24 ɣɣ	
7 bß		28 ß	
8 ɣɣɣ		32 ɣce	
9 cce		36 bß	

¶ Die dritt equation.

Waß zwo quantitetn einander gleich werden / zwiſchen welchē zwo andere: natürlicher ordnůg nach begriffen: geſchwigē ſein. Diuidir die kleiner in die gröſſer quātitet / radix cubica des quocients zeigt an den werdt ze. Als

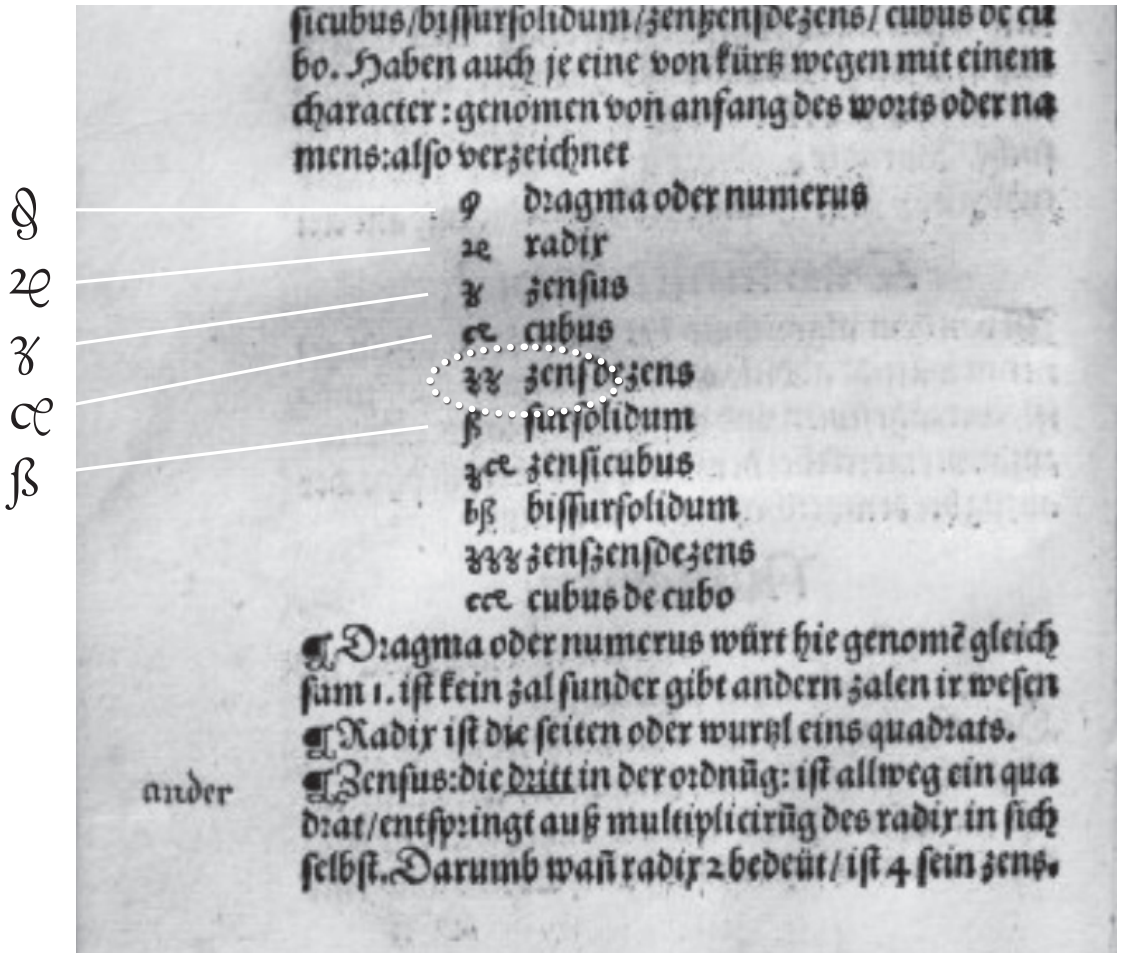
Die teiler

2 ce		16 9	
3 ɣɣ		24 ze	
4 ß		32 ɣ	
5 ɣce	Sein gleich	40 ce	fa: ze. 2 ze
6 bß		48 ɣɣ	
7 ɣɣɣ		56 ß	
8 cce		64 ɣce	

Die vierd equation

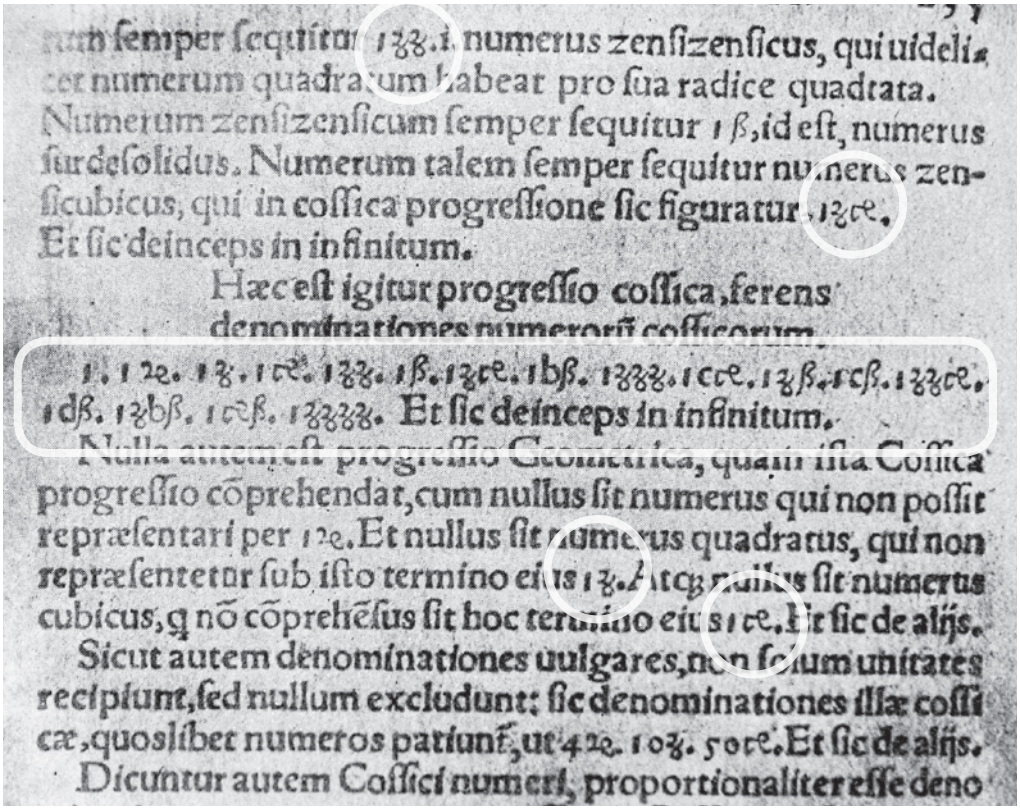
Waß zwo quantitetn einander gleich werden zwiſchen welchē / drey andere natürlicher ordnůg nach begriffen / geſchwigē ſein. Diuidir die kleiner in die gröſſer quantitet / Radix quadrata von radice quadrata des quocients / zeigt an den werdt ze. Als

Christoff Rudolff: *Behend und hübſch Rechnung durch die kunſtreichen regeln Algebre, ſo gemeinicklich die Coſs genennt werden*. Straßburg 1525. fol. 29v-30r, 53v-54r.

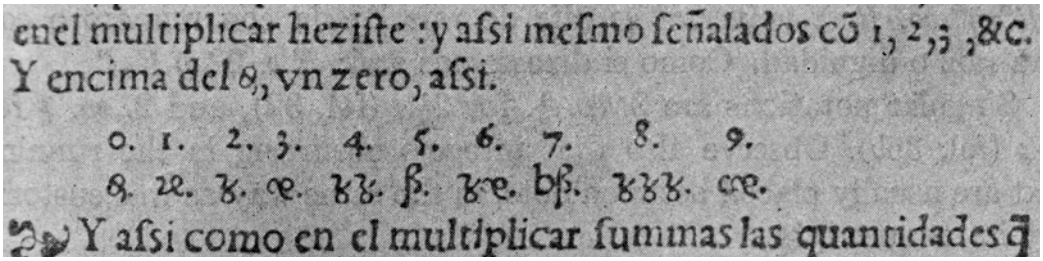


Christoff Rudolff: *Behend und hübſch Rechnung* … Straßburg 1525, part of fol. 24v. In this chapter Rudolff introduces the set of root and power symbols by samples and explanations. We can see: ȝ (LOWERCASE KURRENT Z), ꝺ LOWERCASE D ROTUNDA WITH CROSSING LOOP, ꝛe LOWERCASE R ROTUNDA WITH LOOP, ce LOWERCASE C WITH RIGHT LOOP and ß LATIN SMALL LIGATURE LONG S WITH DESCENDER S.

This print demonstrates the deliberate distinction between the cossic character ȝ and the normal fraktur z (see at). Whereas in other scenarios this two shapes could be seen as 'just' glyph variants without semantic distinction, in this case the form difference is clearly an indicator for a specific meaning. The character ȝ (LOWERCASE KURRENT Z) is denoting *zensus*. It is graphically characterized by a) a round-shaped upper part (mostly), and b) a prominent loop descender which crosses upwards. The origin of its shape is neither *Fraktur* type nor Latin script style but the German *Kurrent* writing style.

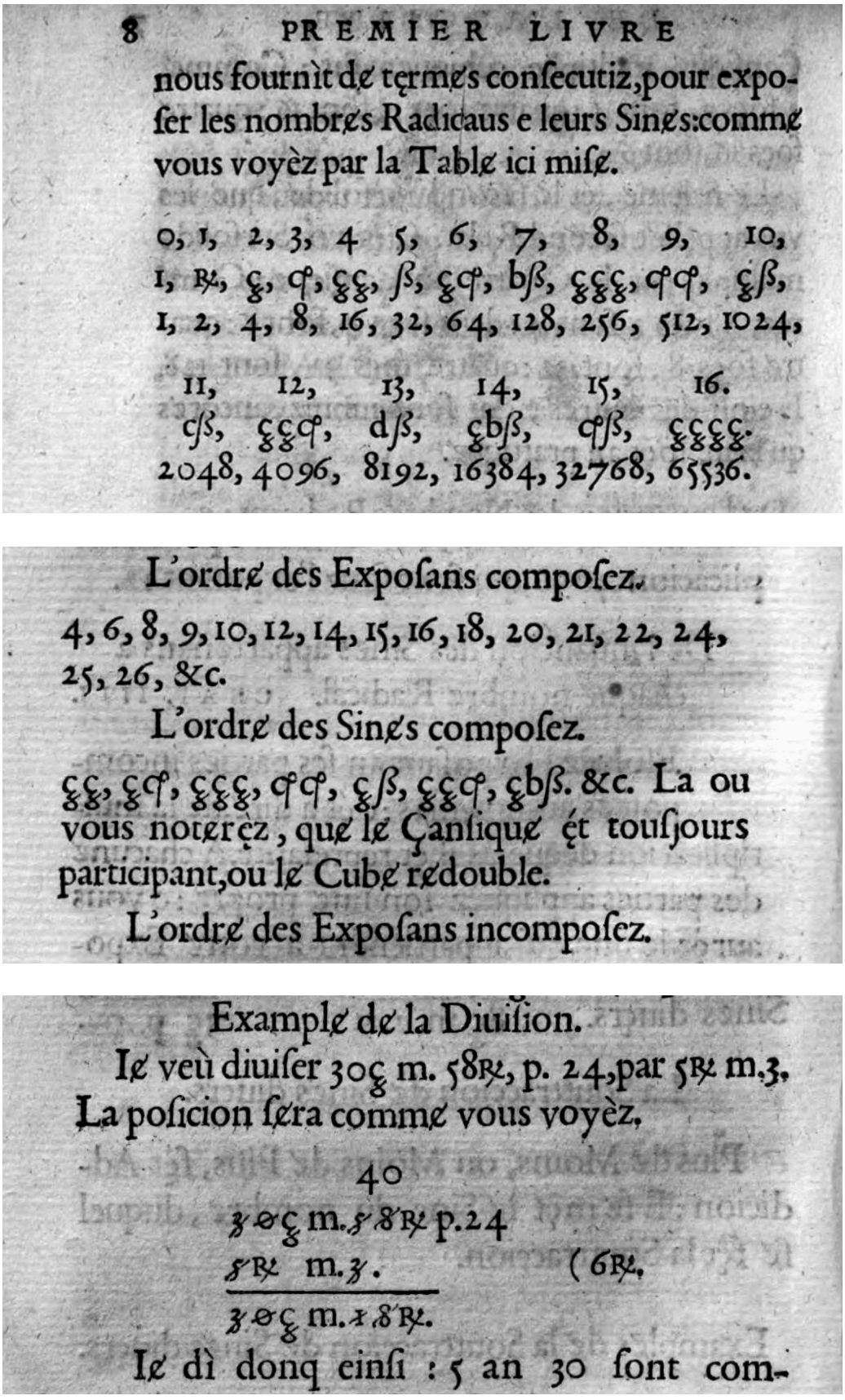


Stifel 1544 (after Cajori). This sample shows ȝ (LOWERCASE KURRENT Z), 2ҽ LOWERCASE R ROTUNDA WITH LOOP, cҽ LOWERCASE C WITH RIGHT LOOP and ß LATIN SMALL LIGATURE LONG S WITH DESCENDER S.



Aurel 1552, fol. 73B (after Cajori). This sample shows ȝ (LOWERCASE KURRENT Z) (2., 4., 6., 8.), ȣ LOWERCASE D ROTUNDA WITH CROSSING LOOP (0.), 2ҽ LOWERCASE R ROTUNDA WITH LOOP (1.), cҽ LOWERCASE C WITH RIGHT LOOP 3., 6., 9.), and ß LATIN SMALL LIGATURE LONG S WITH DESCENDER S (5., 7.).

These samples also show how those characters were used in combination to express the powers 4th and so on.



8 PREMIER LIVRE

nous fournìt de termes conſecutiz, pour expoſer les nombres Radicaus e leurs Sines: comme vous voyèz par la Table ici miſe.

0, 1, 2, 3, 4 5, 6, 7, 8, 9, 10,
1, R/, ç, c, çç, ſ, çc, bſ, ççç, cc, çſ,
1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024,

11, 12, 13, 14, 15, 16.
cſ, ççc, dſ, çbſ, cſ, çççç.
2048, 4096, 8192, 16384, 32768, 65536.

L'ordre des Expoſans compoſez.

4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, &c.

L'ordre des Sines compoſez.

çç, çc, ççç, cc, çſ, ççc, çbſ. &c. La ou vous noterèz, que le Çanſique ét touſjours participant, ou le Cube redouble.

L'ordre des Expoſans incompoſez.

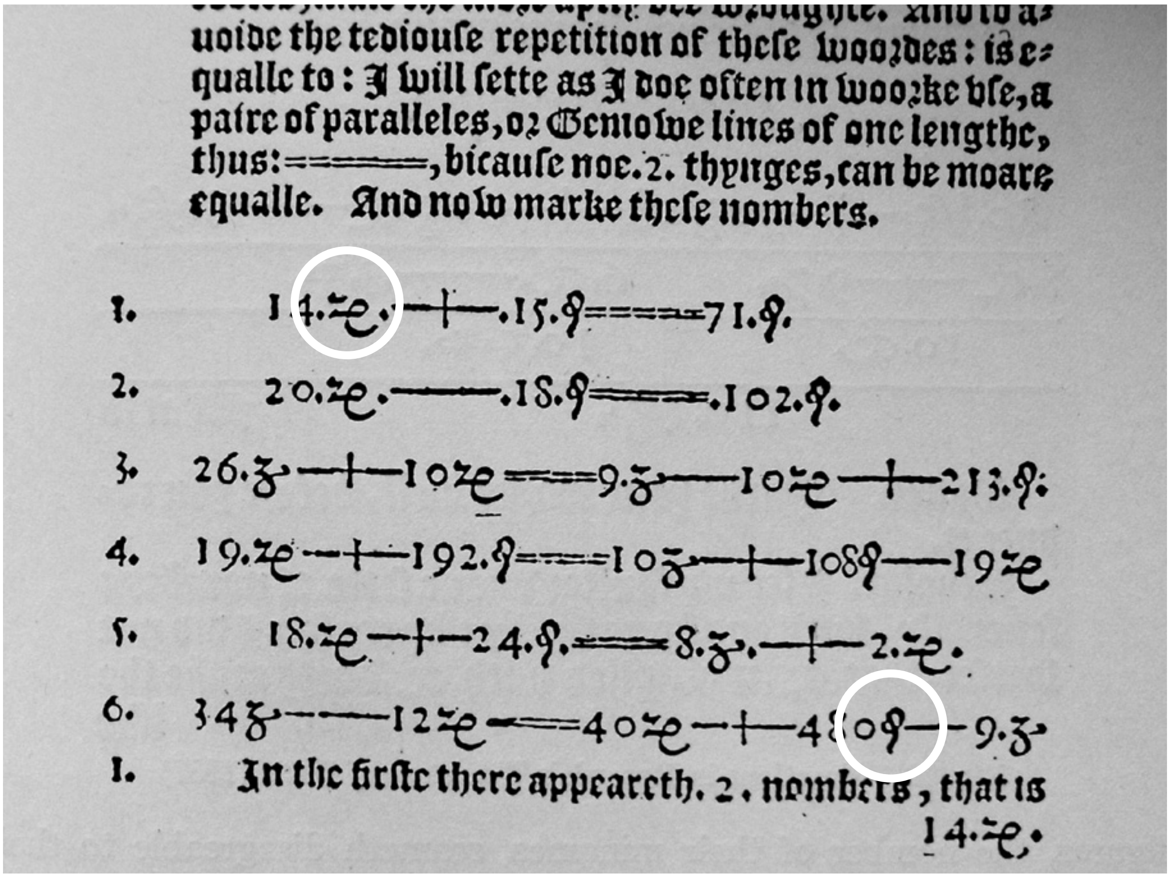
Example de la Diuiſion.

Ie veù diuiſer 30ç m. 58R/, p. 24, par 5R/ m. 3.
La poſicion ſera comme vous voyèz.

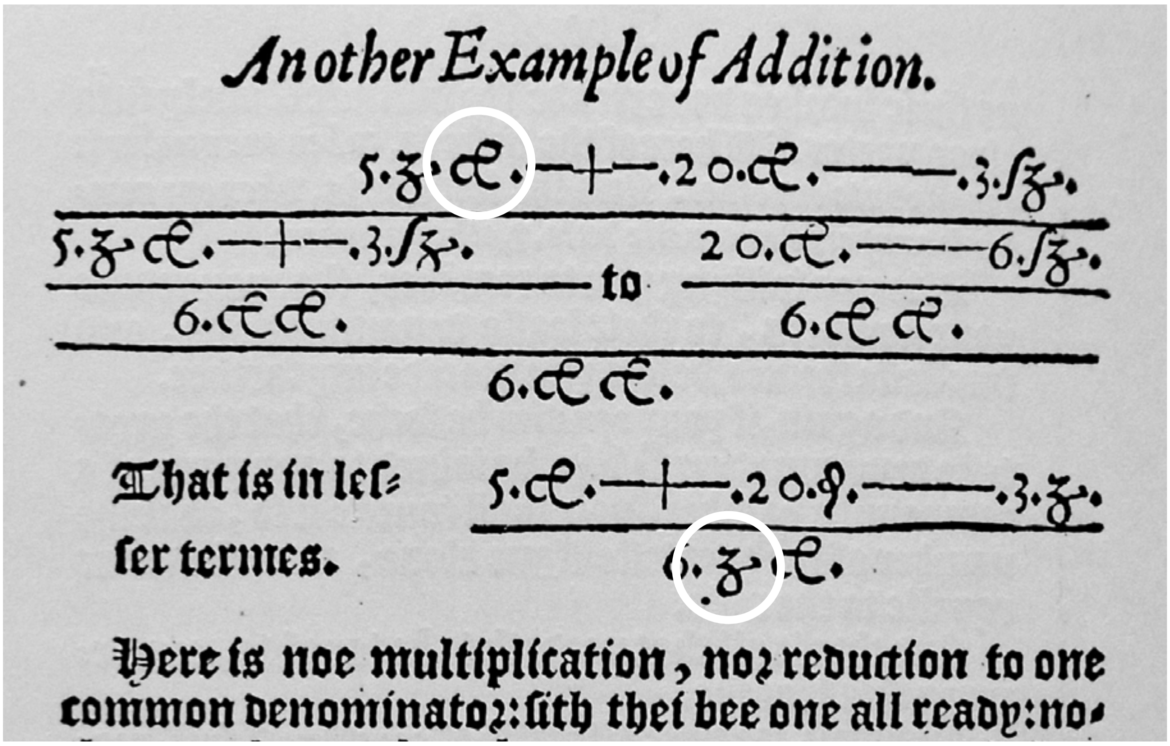
40
3 ⊘ ç m. 5 8R/ p. 24
5R/ m. 3. (6R/.
3 ⊘ ç m. 1 8R/.

Ie dì donq einſi : 5 an 30 ſont com-

Three extracts from Peletier 1554: ç LOWERCASE C WITH DESCENDER, c LOWERCASE C WITH RIGHT LOOP and ſ LATIN SMALL LIGATURE LONG S WITH DESCENDER S. These samples also demonstrate the usage of R/ (A776) as part of the cossic set, as well as the use of slashed digits.


uoide the tediouſe repetition of theſe woordes : is e-
qualle to : I will ſette as I doe often in woorke vſe, a
paire of paralleles, or Gemowe lines of one lengthe,
thus: =======, bicauſe noe. 2. thynges, can be moare
equalle. And now marke theſe nombers.

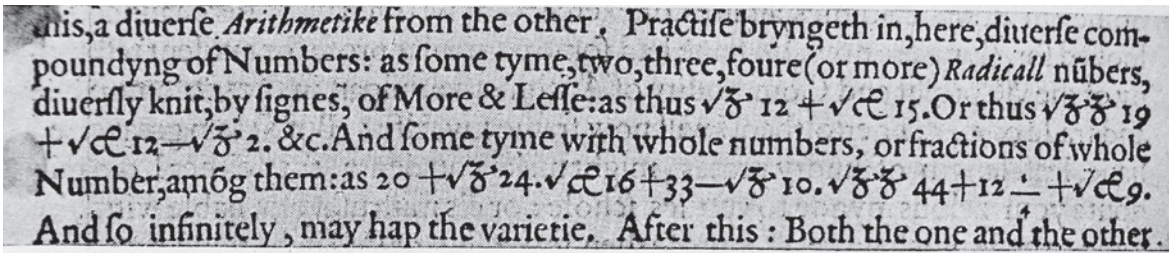
1. In the firſte there appeareth. 2. nombers, that is


Another Example of Addition.

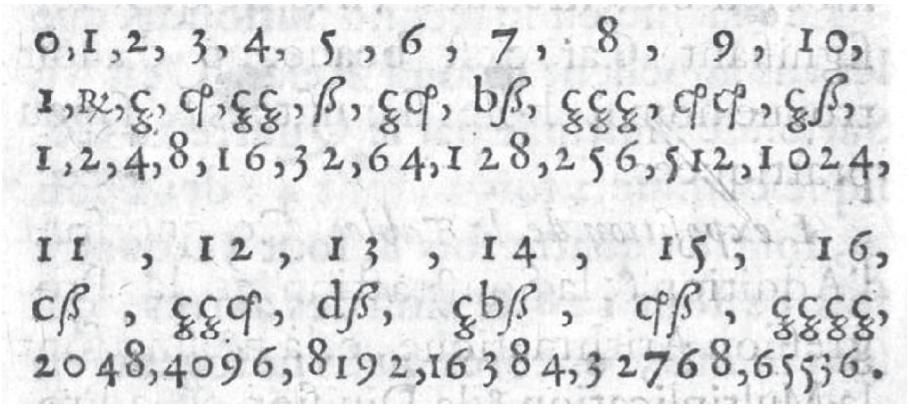
That is in leſ-
ſer termes.

Here is noe multiplication, nor reduction to one
common denominator: ſith thei bee one all ready: no-

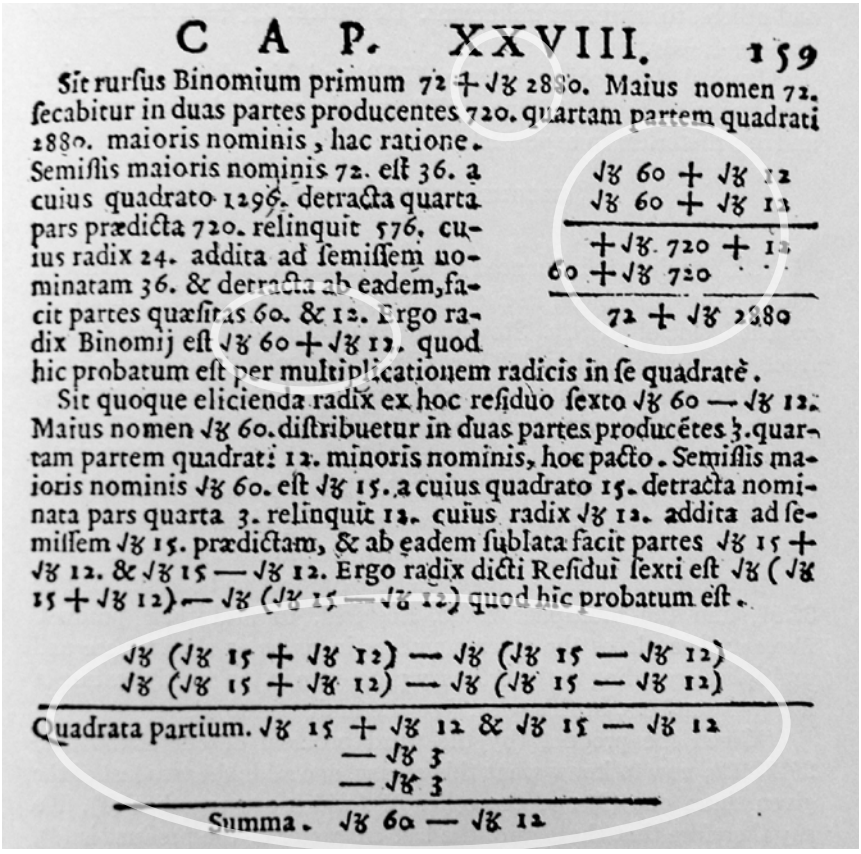
Two extracts from Recorde 1557 (after Cajori): LOWERCASE C WITH RIGHT LOOP, LOWERCASE D ROTUNDA WITH CROSSING LOOP, LOWERCASE R ROTUNDA WITH LOOP and (LOWERCASE KURRENT Z).


this, a diuerſe *Arithmetike* from the other. Practiſe bryngeth in, here, diuerſe compoundyng of Numbers: as ſome tyme, two, three, foure (or more) *Radicall* nũbers, diuerſly knit, by ſignes, of More & Leſſe: as thus √ 12 + √ 15. Or thus √ √ 19 + √ 12 — √ 2. &c. And ſome tyme with whole numbers, or fractions of whole Number, amõg them: as 20 + √ 24. √ 16 + 33 — √ 10. √ √ 44 + 12 ½ + √ 9. And ſo infinitely, may hap the varietie. After this: Both the one and the other.

Example from Dee 1570 (after Cajori): ꞓ LOWERCASE C WITH RIGHT LOOP and ȝ (LOWERCASE KURRENT Z).



From Peletier 1620.


CAP. XXVIII. 159

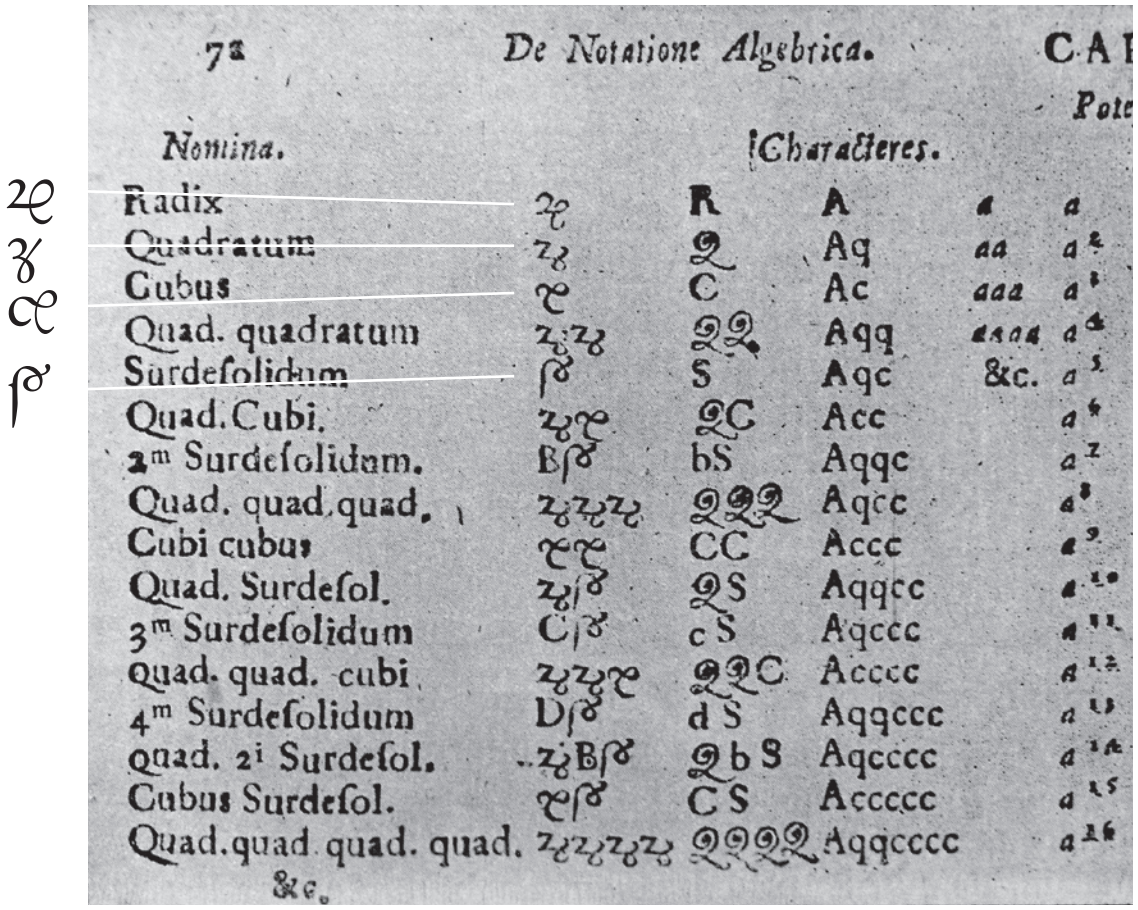
Sit rurſus Binomium primum 72 + √ 2880. Maius nomen 72. ſecabitur in duas partes producentes 720. quartam partem quadrati 2880. maioris nominis, hac ratione. Semiſſis maioris nominis 72. eſt 36. a cuius quadrato 1296. detracta quarta pars prædicta 720. relinquit 576. cuius radix 24. addita ad ſemiſſem nominatam 36. & detracta ab eadem, facit partes quæſitas 60. & 12. Ergo radix Binomij eſt √ 60 + √ 12. quod hic probatum eſt per multiplicationem radicis in ſe quadratè.

√ 60 + √ 12
√ 60 + √ 12
+ √ 720 + 12
60 + √ 720
72 + √ 2880

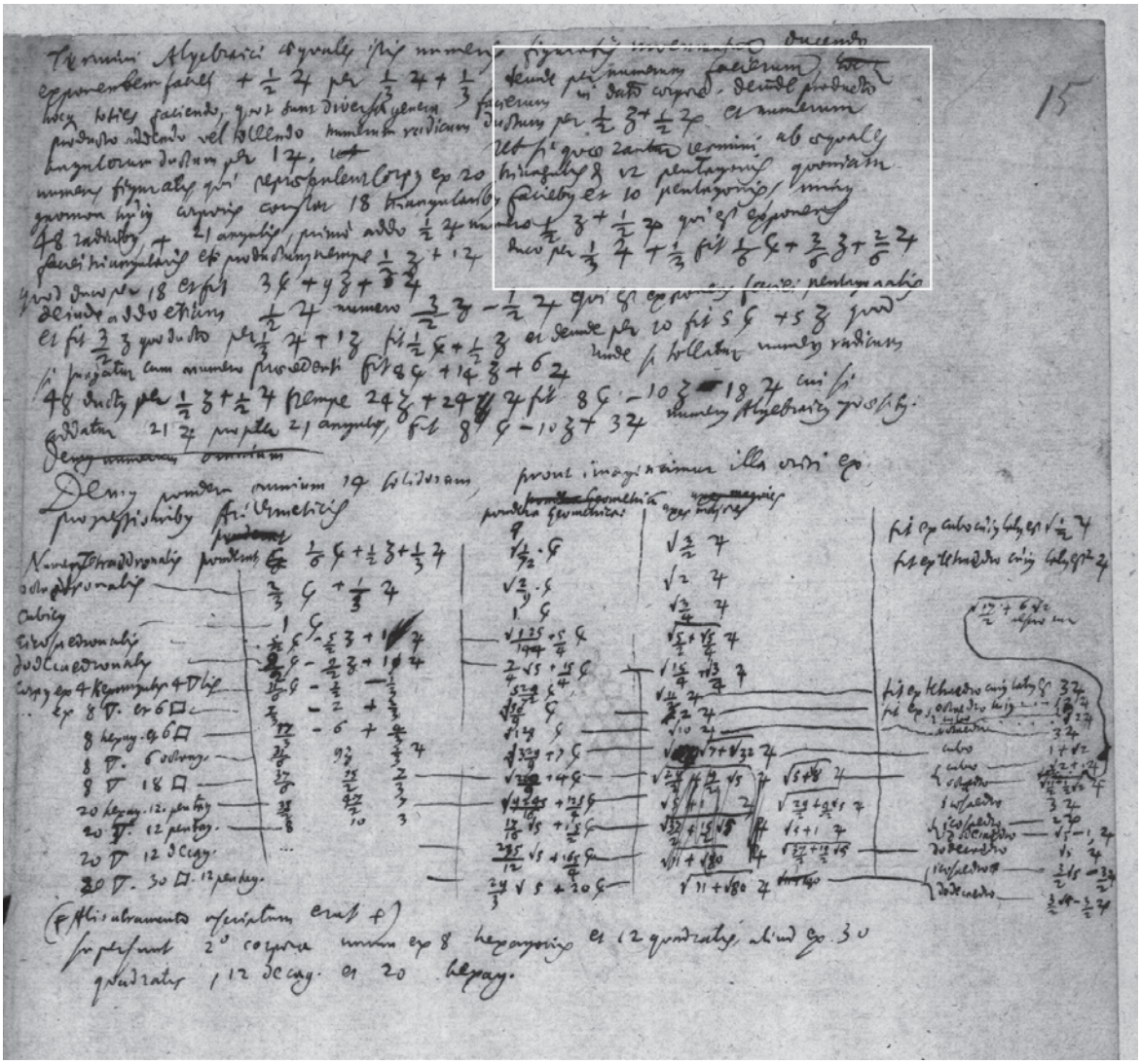
Sit quoque elicienda radix ex hoc reſiduo ſexto √ 60 — √ 12. Maius nomen √ 60. diſtribuetur in duas partes producẽtes 3. quartam partem quadrati 12. minoris nominis, hoc pacto. Semiſſis maioris nominis √ 60. eſt √ 15. a cuius quadrato 15. detracta nominata pars quarta 3. relinquit 12. cuius radix √ 12. addita ad ſemiſſem √ 15. prædictam, & ab eadem ſublata facit partes √ 15 + √ 12. & √ 15 — √ 12. Ergo radix dicti Reſidui ſexti eſt √ (√ 15 + √ 12) — √ (√ 15 — √ 12) quod hic probatum eſt.

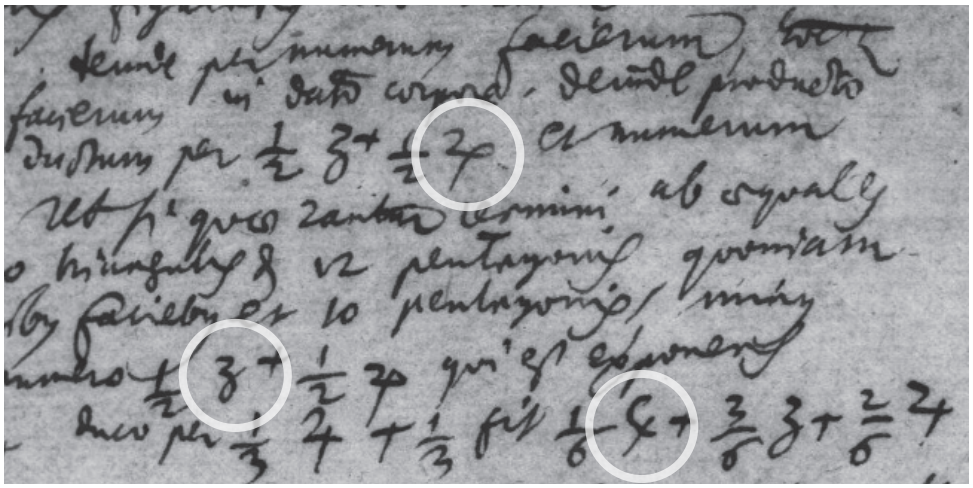
√ (√ 15 + √ 12) — √ (√ 15 — √ 12)
√ (√ 15 + √ 12) — √ (√ 15 — √ 12)
Quadrata partium. √ 15 + √ 12 & √ 15 — √ 12
— √ 3
— √ 3
Summa. √ 60 — √ 12

Clavius 1608 (after Cajori): ȝ (LOWERCASE KURRENT Z). In this setting of Roman type style the common z character will have the usual Greek-Latin 'Zeta' shape, **z**, whereas the symbol for *zensus* retains not only the z initial (in this Latin treatise one may expect **c**ensus instead), but also the specific *kurrent* script form of the letter.

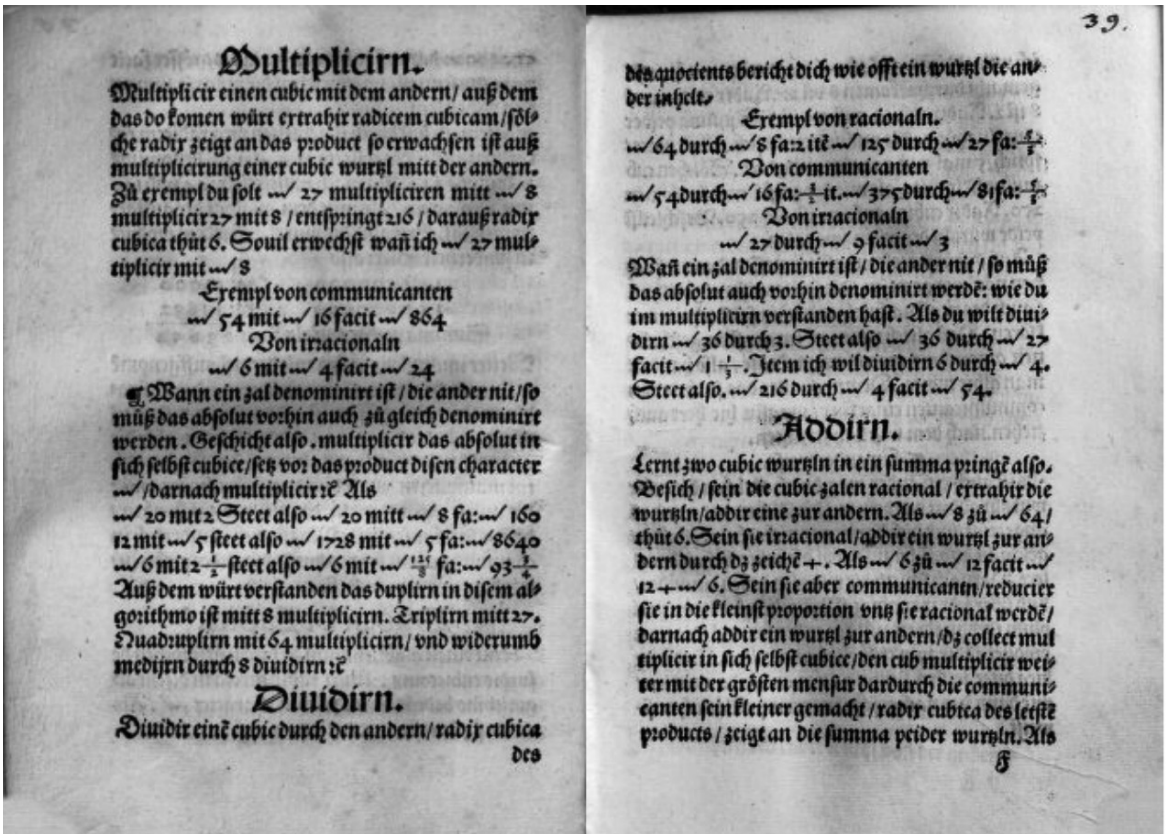


From Wallis, Operum mathematicorum, 1657 (after Cajori); shows the use of ſ LOWERCASE LONG S WITH TOP LOOP for “sursolidum”.
The ȝ (LOWERCASE KURRENT Z) has been given a sort of ‘Latinization treatment’ here, based rather on the Greek/Roman zeta shape. We regard this as a glyph variant with no distinctive meaning.





Ms. LH 4 I 4b 1v., Leibniz 1676, shows a frequent use of cossic signs: ç LOWERCASE C WITH SMALL SLASH for *cubus*, ꝛ LOWERCASE R ROTUNDA WITH LOOP for *radix* and ȝ (LOWERCASE KURRENT Z) for *zensus*.
The use of the simplier ç instead of cꝛ for *cubus* is believed to originate from writings of Descartes, from whom Leibniz (and other authors) made text copies.



Multiplicirn.

Multiplicir einen cubic mit dem andern/ auß dem das do komen würt extrahir radicem cubicam/ sölche radix zeigt an das product so erwachsen ist auß multiplicirung einer cubic wurtzl mitt der andern. Zů exempl du solt ✓ 27 multipliciren mitt ✓ 8 multiplicir 27 mit 8 / entspringt 216 / darauß radix cubica thůt 6. Souil erwechst waß ich ✓ 27 multiplicir mit ✓ 8

Exempl von communicanten

✓ 54 mit ✓ 16 facit ✓ 864

Von irracionaln

✓ 6 mit ✓ 4 facit ✓ 24

¶ Wann ein zal denominirt ist / die ander nit/ so můß das absolut vorhin auch zů gleich denominirt werden. Geschicht also. multiplicir das absolut in sich selbst cubice/ setz vor das product disen character ✓/ darnach multiplicir rē Als

✓ 20 mit 2 Steet also ✓ 20 mitt ✓ 8 fa: ✓ 160

12 mit ✓ 5 steet also ✓ 1728 mit ✓ 5 fa: ✓ 8640

✓ 6 mit $2\frac{1}{2}$ steet also ✓ 6 mit ✓ $\frac{125}{8}$ fa: ✓ $93\frac{3}{4}$

Auß dem würt verstanden das duplirn in disem algorithmo ist mitt 8 multiplicirn. Triplirn mitt 27. Quadruplirn mit 64 multiplicirn/ vnd widerumb medijrn durch 8 dividirn rē

Dividirn.

Dividir einē cubic durch den andern/ radix cubica des

des quocients bericht dich wie offt ein wurtzl die ander inhelt.

Exempl von racionaln.

✓ 64 durch ✓ 8 fa: 2 itē ✓ 125 durch ✓ 27 fa: $\frac{4}{5}$

Von communicanten

✓ 54 durch ✓ 16 fa: $\frac{3}{4}$ it. ✓ 375 durch ✓ 81 fa: $\frac{5}{6}$

Von irracionaln

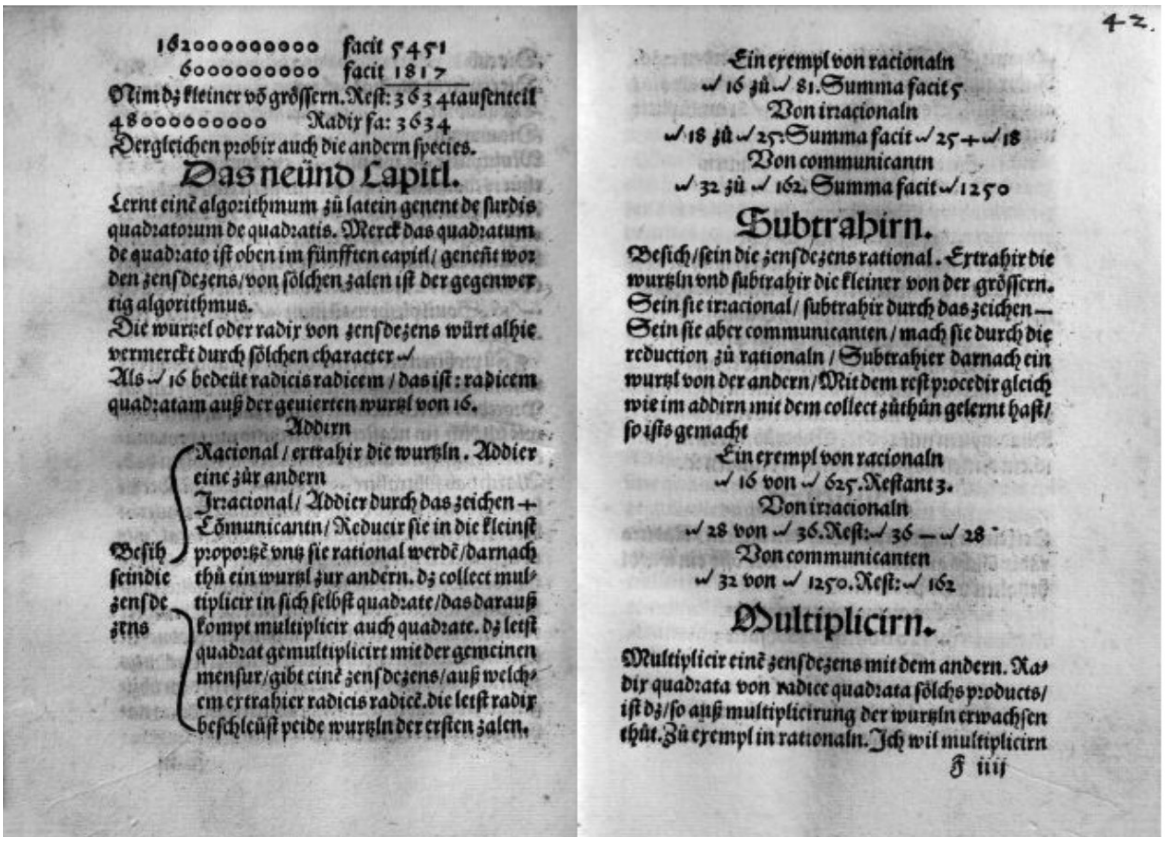
✓ 27 durch ✓ 9 facit ✓ 3

Waß ein zal denominirt ist / die ander nit / so můß das absolut auch vorhin denominirt werdē: wie du im multiplicirn verstanden hast. Als du wilt dividirn ✓ 36 durch 3. Steet also ✓ 36 durch ✓ 27 facit ✓ $1\frac{1}{3}$. Item ich wil dividirn 6 durch ✓ 4. Steet also. ✓ 216 durch ✓ 4 facit ✓ 54.

Addirn.

Lernt zwo cubic wurtzln in ein summa pringē also. Besich / sein die cubic zalen racional / extrahir die wurtzln/ addir eine zur andern. Als ✓ 8 zů ✓ 64 / thůt 6. Sein sie irracional/ addir ein wurtzl zur andern durch dz zeichē +. Als ✓ 6 zů ✓ 12 facit ✓ 12 + ✓ 6. Sein sie aber communicantn/ reducier sie in die kleinst proportion vntz sie racional werdē/ darnach addir ein wurtzl zur andern/ dz collect multiplicir in sich selbst cubice/ den cub multiplicir weiter mit der grösten mensur dardurch die communicanten sein kleiner gemacht / radix cubica des letstē products / zeigt an die summa peider wurtzln. Als

F



1820000000000 facit 5451

600000000 facit 1817

Nim dz kleiner vō grösstern. Rest: 3634 tausenteil

4800000000 Radix fa: 3634

Dergleichen probir auch die andern species.

Das neünd Capitl.

Lernt einē algorithmum zů latein genent de surdis quadratorum de quadratis. Merck das quadratum de quadrato ist oben im fünfften capitl / geneśt worden zensdezens/ von sölchen zalen ist der gegenwertig algorithmus.

Die wurtzel oder radix von zensdezens würt alhie vermerckt durch sölchen character ✓

Als ✓ 16 bedeůt radicis radicem / das ist: radicem quadratam auß der geuierten wurtzl von 16.

Addirn

Besih seindie zensdezens

Racional / extrahir die wurtzln. Addier eine zůr andern

Irracional / Addier durch das zeichen +

Cōmunicantn / Reducir sie in die kleinst proportz vntz sie rational werdē / darnach thů ein wurtzl zur andern. dz collect multiplicir in sich selbst quadrate / das darauß kompt multiplicir auch quadrate. dz letst quadrat gemultiplicirt mit der gemeinen mensur / gibt einē zensdezens / auß welchem extrahier radicis radicē. die letst radix beschleüst peide wurtzln der ersten zalen.

Ein exempl von racionaln

✓ 16 zů ✓ 81. Summa facit 5

Von irracionaln

✓ 18 zů ✓ 25: Summa facit ✓ 25 + ✓ 18

Von communicantn

✓ 32 zů ✓ 162. Summa facit ✓ 1250

Subtrahirn.

Besich / sein die zensdezens rational. Extrahir die wurtzln vnd subtrahir die kleiner von der grössern. Sein sie irracional / subtrahir durch das zeichen — Sein sie aber communicanten / mach sie durch die reduction zů rationaln / Subtrahier darnach ein wurtzl von der andern / Mit dem rest procedir gleich wie im addirn mit dem collect zůthůn gelernt hast / so ists gemacht

Ein exempl von racionaln

✓ 16 von ✓ 625. Restant 3.

Von irracionaln

✓ 28 von ✓ 36. Rest: ✓ 36 — ✓ 28

Von communicanten

✓ 32 von ✓ 1250. Rest: ✓ 162

Multiplicirn.

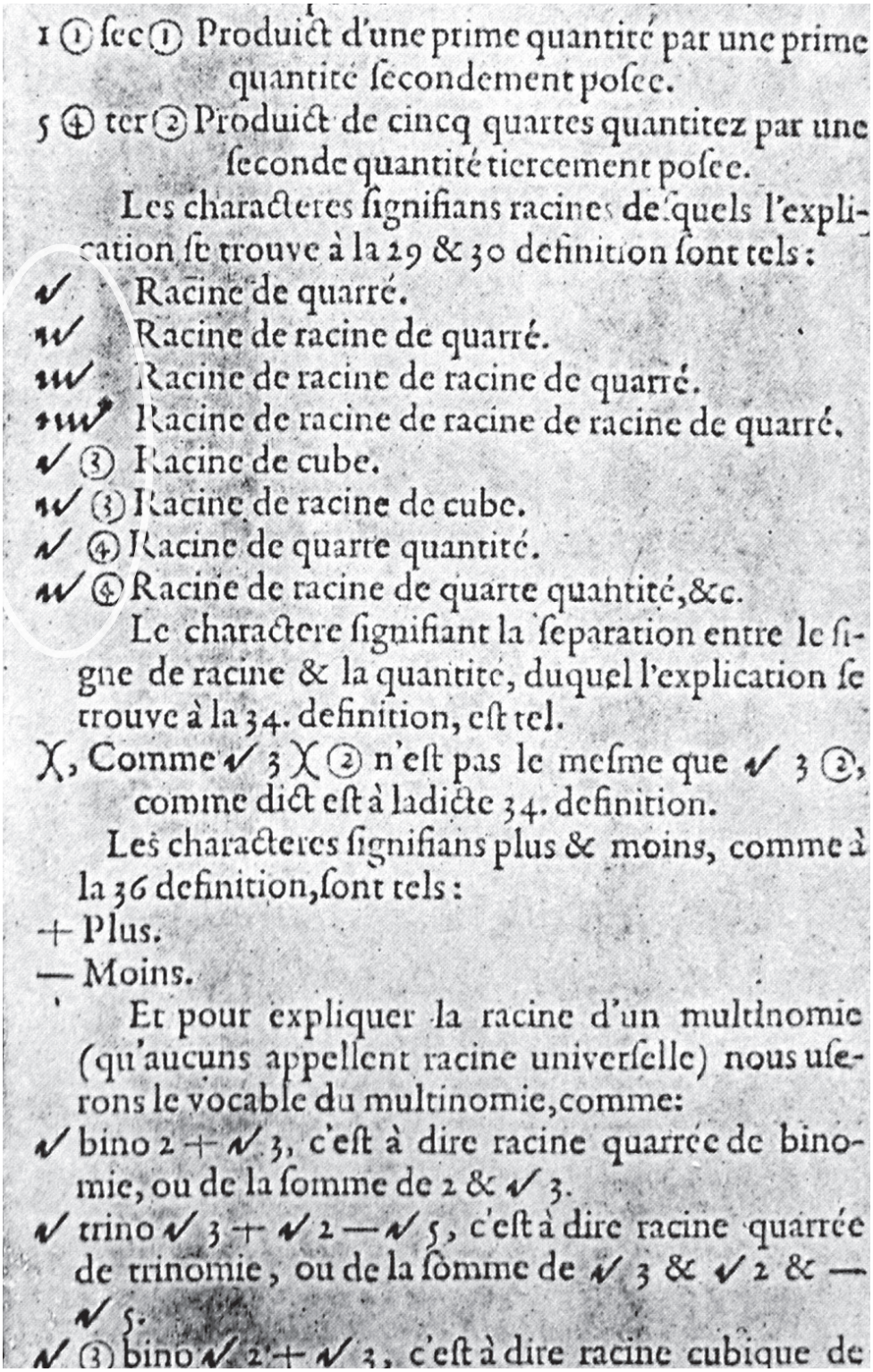
Multiplicir einē zensdezens mit dem andern. Radix quadrata von radice quadrata sölchs products / ist dz / so auß multiplicirung der wurtzln erwachsen thůt. Zů exempl in rationaln. Ich wil multiplicirn

F iiij

W/ SQUARE ROOT OF SQUARE ROOT

WW/ SQUARE ROOT OF SQUARE ROOT OF SQUARE ROOT

Christoff Rudolff: *Behend und hübſch Rechnung durch die kunſtreichen regeln Algebre, ſo gemeinicklich die Coſs genennt werden*. Straßburg 1525. fol. 38v-39r., 41v-42r



1 ① sec ① Produict d'une prime quantité par une prime quantité ſecondement poſee.

5 ④ ter ② Produict de cincq quartes quantitez par une ſeconde quantité tiercement poſee.

Les characteres ſignifians racines deſquels l'explication ſe trouve à la 29 & 30 definition ſont tels:

√ Racine de quarré.

√√ Racine de racine de quarré.

√√√ Racine de racine de racine de quarré.

√√√√ Racine de racine de racine de racine de quarré.

√ ③ Racine de cube.

√√ ③ Racine de racine de cube.

√ ④ Racine de quarte quantité.

√√ ④ Racine de racine de quarte quantité, &c.

Le charactere ſignifiant la ſeparation entre le ſigne de racine & la quantité, duquel l'explication ſe trouve à la 34. definition, eſt tel.

Χ, Comme √ 3 Χ ② n'eſt pas le meſme que √ 3 ②, comme dict eſt à ladicte 34. definition.

Les characteres ſignifians plus & moins, comme à la 36 definition, ſont tels:

+ Plus.

— Moins.

Et pour expliquer la racine d'un multinomie (qu'aucuns appellent racine univerſelle) nous uſerons le vocable du multinomie, comme:

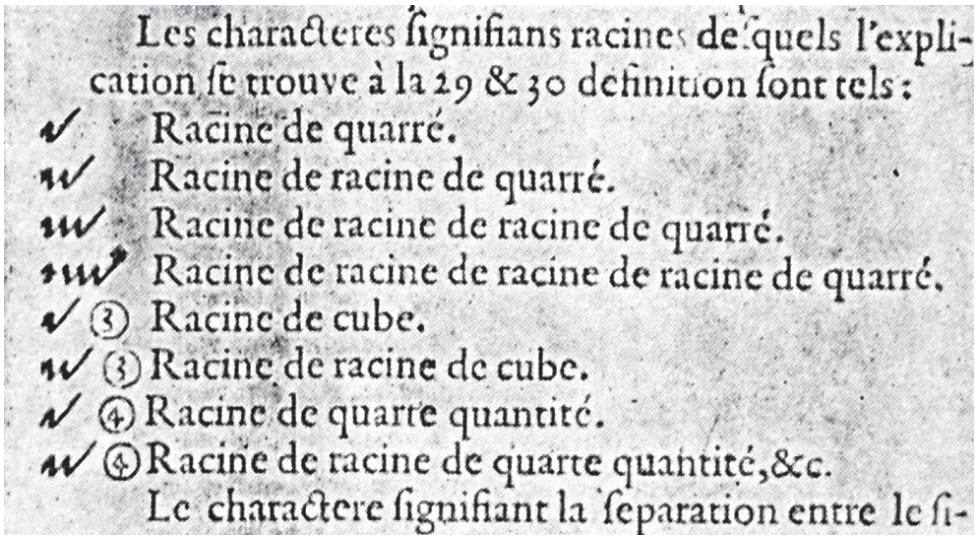
√ bino 2 + √ 3, c'eſt à dire racine quarrée de binomie, ou de la ſomme de 2 & √ 3.

√ trino √ 3 + √ 2 — √ 5, c'eſt à dire racine quarrée de trinomie, ou de la ſomme de √ 3 & √ 2 & — √ 5.

√ ③ bino √ 2 + √ 3, c'eſt à dire racine cubique de

see also next page

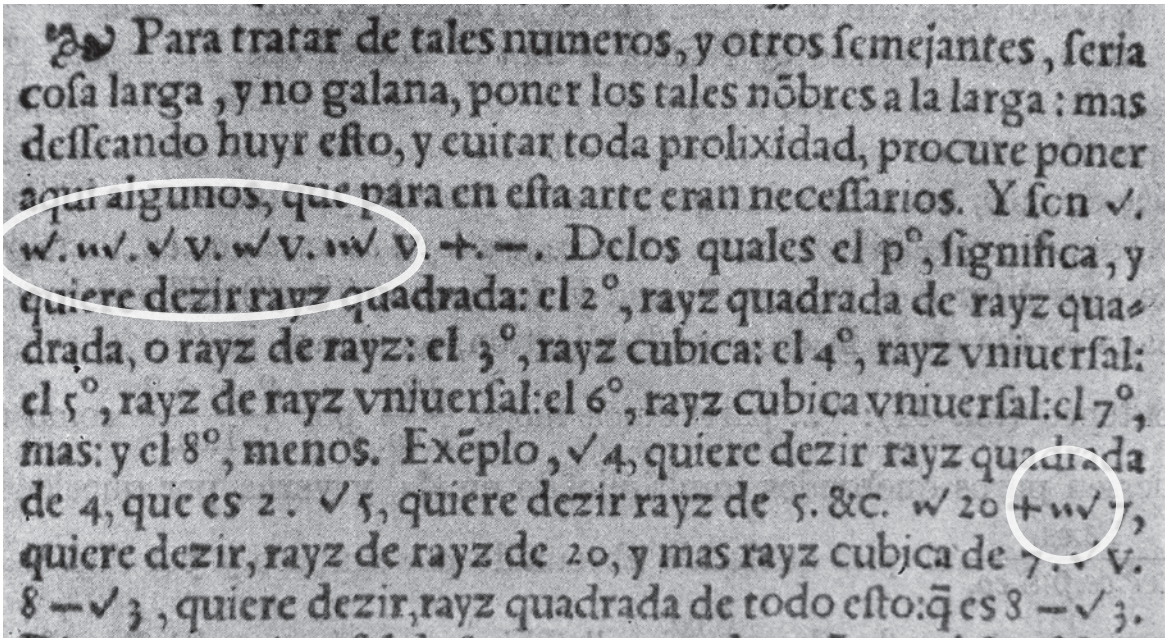
√ SQUARE ROOT OF SQUARE ROOT,
√√ SQUARE ROOT OF SQUARE ROOT OF SQUARE ROOT,
√√√ SQUARE ROOT OF SQUARE ROOT OF SQUARE ROOT OF SQUARE ROOT.
These characters can be seen related to the established radix symbol √ (221A).
Simon Stevin, L'arithmétique in Œuvres mathématiques, 1634 (after Cajori)


Les characteres ſignifians racines deſquels l'explication ſe trouve à la 29 & 30 definition ſont tels:
√ Racine de quarré.
√√ Racine de racine de quarré.
√√√ Racine de racine de racine de quarré.
√√√√ Racine de racine de racine de racine de quarré.
√ ③ Racine de cube.
√√ ③ Racine de racine de cube.
√ ④ Racine de quarte quantité.
√√ ④ Racine de racine de quarte quantité,&c.
Le charactere ſignifiant la ſeparation entre le ſi-

Simon Stevin, L'arithmétique in Œuvres mathématiques, 1634 (after Cajori)

The number of ascending lines indicates how often an operation of root determination is performed on an expression. In the Stevin example the combination with an encircled number indicates, which type of root is meant. If there is no such number, the square root is to be considered. For example, the combinations denote the following:

√√ square root of square root, which corresponds to the forth root;
√√√ square root of square root of square root, which corresponds to the eighth root;
√√√√ square root of square root of square root of square root, which corresponds to the sixteenth root;
√ ③ cubic root of cubic root, which corresponds to the ninth root;
√ ④ forth root of forth root, which corresponds to the sixteenth root.


Para tratar de tales numeros, y otros ſemejantes, ſeria coſa larga, y no galana, poner los tales nõbres a la larga: mas deſſeando huyr eſto, y cuitar toda prolixidad, procure poner aqui algunos, que para en eſta arte eran neceſſarios. Y ſon √. √√. √√√. √ v. √ v. √√ v. +. −. Dclos quales el p°, ſignifica, y quiere dezir rayz quadrada: el 2°, rayz quadrada de rayz quadrada, o rayz de rayz: el 3°, rayz cubica: el 4°, rayz vniuerſal: el 5°, rayz de rayz vniuerſal: el 6°, rayz cubica vniuerſal: el 7°, mas: y el 8°, menos. Exẽplo, √ 4, quiere dezir rayz quadrada de 4, que es 2. √ 5, quiere dezir rayz de 5. &c. √ 20 + √√ 5, quiere dezir, rayz de rayz de 20, y mas rayz cubica de 7 [illegible] v. 8 − √ 3, quiere dezir, rayz quadrada de todo eſto: q̃ es 8 − √ 3.

√√ SQUARE ROOT OF SQUARE ROOT,
√√√ SQUARE ROOT OF SQUARE ROOT OF SQUARE ROOT,
√√√√ SQUARE ROOT OF SQUARE ROOT OF SQUARE ROOT OF SQUARE ROOT.
Marco Aurel, Arithmetica algebratica, 1552 (after Cajori)

9. Synopsis of historic Cossic characters (Group 1)

	Glyph								
	Character	LOWERCASE D ROTUNDA WITH CROSSING LOOP	LOWERCASE R ROTUNDA WITH LOOP	LOWERCASE KURRENT Z SIGN	LOWERCASE C WITH DESCENDER	LOWERCASE C WITH SMALL SLASH	LOWERCASE C WITH RIGHT LOOP	LATIN SMALL LIGATURE LONG S WITH DESCENDER S	LOWERCASE LONG S WITH TOP LOOP
	Meaning	dragma	radix	zensus	census	cubus	cubus	solidus sursolidum semis	sursolidum
1	Rudolf 1525								
2	Stifel 1544								
3	Aurel 1552								
4	Peletier 1554								
5	Recorde 1557								
6	Dee 1570								
7	Peletier 1620								
8	Clavius 1608/12								
9	Beeckmann 1628								
10	Wallis 1657								
11	Leibniz MS 1676								
12	MS Leiden 17. c.								
13	MS Hamburg 17. c.								

Comparative survey of Coss characters in various sources, 1525 to 1676.

10. Unicode Character Properties

```
1D4CF FE02; kurrent style; # MATHEMATICAL SCRIPT SMALL Z

1DF90;LATIN LETTER SMALL C WITH SMALL SLASH;Sm;0;ON;;;;;N;;;;;
1DF91;LATIN LETTER SMALL C WITH DESCENDER;Sm;0;ON;;;;;N;;;;;
1DF92;LATIN LETTER SMALL C WITH RIGHT LOOP;Sm;0;ON;;;;;N;;;;;
1DF93;LATIN LETTER SMALL D ROTUNDA WITH CROSSING LOOP;Sm;0;ON;;;;;N;;;;;
1DF94;LATIN LETTER SMALL R ROTUNDA WITH LOOP;Sm;0;ON;;;;;N;;;;;
1DF95;LATIN SMALL LIGATURE LONG S WITH DESCENDER S;Ll;0;L;<compat>00DF;;;;N;;;;;
1DF96;LATIN LETTER SMALL LONG S WITH TOP LOOP;Sm;0;ON;;;;;N;;;;;

1CEDD;SQUARE ROOT OF SQUARE ROOT;Sm;0;ON;;;;;N;;;;;
1CEDE;SQUARE ROOT OF SQUARE ROOT OF SQUARE ROOT;Sm;0;ON;;;;;N;;;;;
1CEDF;SQUARE ROOT OF SQUARE ROOT OF SQUARE ROOT OF SQUARE ROOT;Sm;0;ON;;;;;N;;;;;

1D6A6;MATHEMATICAL ITALIC LIGATURE LONG S WITH DESCENDER S;Sm;0;ON;<font>1DF95;;;;N;;;;;
```

11. Bibliography

LAA – refers to: Leibniz, Gottfried Wilhelm: Sämtliche Schriften und Briefe. (‘Leibniz-Akademie-Ausgabe’, many volumes)
LBr – refers to: Leibniz’s original correspondence papers, GWLB Hanover
LH – refers to: Leibniz’s original manuscripts, GWLB Hanover

Aurel, Marco: Arithmetica algebratica, Valencia 1552
Bombelli, Rafael: L’Algebra. Bologna 1579
— : L’Algebra. Milan 1966
Cajori, Florian: A history of mathematical notations. Chicago 1928
Cardano, Gerolamo: Opera omnia. Lyon 1663
Clavius, Christophorus: Algebra. Rome 1608
Dee, John: [preface] in: Euclid: The elements. Henry Billingsley (ed.), London 1570
Descartes, René: La Géométrie. Leiden 1637
Dulaurens, François: Specimina Mathematica. Paris 1667
Ghaligai, Francesco: Pratica d’Arithmetica, Florence 1552
Peletier, Jaques: L’Algèbre. Lyon 1554
Probst, Siegmund: Édition des symboles de Leibniz. PDF, Hanover 2023 (presentation Paris 2023)
Rudolff, Christoff: Behend und hübsch Rechnung durch die kunstreichen regeln Algebre, so gemeinicklich die Coß genennt werden. Straßburg 1525
Stevin, Simon: Œuvres mathématiques. Leiden 1634
Stifel, Michael: Arithmetica integra. Nürnberg 1544
Wallis, John: De sectionibus conicis nova methodo expositis tractatus. Oxford 1655
— : Operum mathematicorum, Oxford 1657
— : Treatise of Algebra. London 1685

ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[1]
Please fill all the sections A, B and C below.
Please read Principles and Procedures Document (P & P) from http://std.dkuug.dk/JTC1/SC2/WG2/docs/principles.html **for guidelines and details before filling this form.**
Please ensure you are using the latest Form from http://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html**.**
See also http://std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html **for latest *Roadmaps*.**

A. Administrative

1. **Title:** **Proposal to encode 12 cossic characters**
2. Requester's name: Uwe Mayer, Siegmund Probst, David Rabouin, Elisabeth Rinner, Andreas Stötzner, Achim Trunk, Charlotte Wahl
3. Requester type (Member body/Liaison/Individual contribution): Individual (work group)
4. Submission date: 2025-11.25.
5. Requester's reference (if applicable): LUCP L-2533
6. Choose one of the following:
   This is a complete proposal: Yes
   (or) More information will be provided later:

B. Technical – General

1. Choose one of the following:
   a. This proposal is for a new script (set of characters): No
      Proposed name of script:
   b. The proposal is for addition of character(s) to an existing block:
      Name of the existing block: Latin Extented G, Miscellaneous Symbols Supplement, Mathematical Alphanumeric Symbols
2. Number of characters in proposal: 12
3. Proposed category (select one from below - see section 2.2 of P&P document):
   A-Contemporary B.1-Specialized (small collection) Yes B.2-Specialized (large collection)
   C-Major extinct D-Attested extinct E-Minor extinct
   F-Archaic Hieroglyphic or Ideographic G-Obscure or questionable usage symbols
4. Is a repertoire including character names provided? Yes
   a. If YES, are the names in accordance with the “character naming guidelines” in Annex L of P&P document? Yes
   b. Are the character shapes attached in a legible form suitable for review? Yes
5. Fonts related:
   a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard?
      Andreas Stötzner
   b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.):
      Andreas Stötzner Gestaltung, Klauflügelweg 21, 88400 Biberach/R., Germany, as@signographie.de
6. References:
   a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? Yes
   b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached? Yes
7. Special encoding issues:
   Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)? No

8. Additional Information:

Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at http://www.unicode.org for such information on other scripts. Also see Unicode Character Database (http://www.unicode.org/reports/tr44/) and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

[1] Form number: N4502-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10, 2007-03, 2008-05, 2009-11, 2011-03, 2012-01)

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? Yes
   If YES explain *see N5333R; L-2518 (N5333); L2/25-123 (L-2509)*
2. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)? Yes
   If YES, with whom? Leibniz-Archiv, Forschungsstelle der Leibniz-Edition, Niedersächsische Landesbibliothek (GWLB), Hanover, Göttingen Academy of Science and Humanities in Lower Saxony (DE), Philiumm research group of CNRS (UMR 7219, laboratoire SPHERE) / Université de Paris VII; general: scholars, researchers, authors and editors working in the field of science history and upon editions of historic text corpora (e.g. of G. W. Leibniz, but also many others)
   If YES, available relevant documents: L-2409, L-2410
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? Yes
   Reference:
4. The context of use for the proposed characters (type of use; common or rare) Common
   Reference: mainly specialist usage, scholarly, worldwide
5. Are the proposed characters in current use by the user community? Yes
   If YES, where? Reference: mainly Europe, Americas; other countries
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? No
   If YES, is a rationale provided?
   If YES, reference:
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)? No
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence? No
   If YES, is a rationale for its inclusion provided?
   If YES, reference:
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters? Yes
   If YES, is a rationale for its inclusion provided? *Yes*
   If YES, reference: *1 variation sequence, see p. 4*
10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to, or could be confused with, an existing character? No
    If YES, is a rationale for its inclusion provided?
    If YES, reference:
11. Does the proposal include use of combining characters and/or use of composite sequences? No
    If YES, is a rationale for such use provided?
    If YES, reference:
    Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided? No
    If YES, reference:
12. Does the proposal contain characters with any special properties such as control function or similar semantics? No
    If YES, describe in detail (include attachment if necessary)
13. Does the proposal contain any Ideographic compatibility characters? No
    If YES, are the equivalent corresponding unified ideographic characters identified?
    If YES, reference: