ISO/IEC JTC1/SC2/WG2 **N5328**
LUCP L-2503

Universal Multiple-Octet Coded Character Set
International Organization for Standardization
Internationale Standardisierungs-Organisation
Organisation Internationale de Normalisation
Διεθνής Οργανισμός Τυποποίησης
Международная организация по стандартизации

Doc Type: Working Group Document

Title: Proposal to encode 5 historic mathematical operators

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Version: 1st revised version
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Status: forward to Script Encoding Working Group / WG2
Action: for expert review and encoding pipeline
Date: February 14, 2025
Requester's reference: LUCP L-2503

1. Background

This proposal is part of the *Philiumm* research project, headed by Prof. David Rabouin (Paris).

In this updated version of the proposal we follow the comments and recommendations received from Jan Kučera (email, Febr. 7, 2025).

2. Leibniz's notation of mathematical operators

The modern conventions of writing + (plus), – (minus), · or × for multiplication and : or ÷ for division are the result of a longwhile historic process, during which scholars explored a rather great variety of notations for these operations. The + and – symbols in the modern sense date back to a convolute of manuscripts from the end of the 15th century.[1] Still during the 16th century some authors used e.g. *p.* and *m.* or *P* and *M* for "plus" and "minus", but steadily the idea prevailed that the use of special symbols instead of letters had advantages.

Leibniz is regarded to have proposed the symbols · (multiplication) and : (division) around 1698.[2] The remarkable fact is, that by then he had used other symbols for those expressions, for more than 30 years. In his first mathematical publication (released 1666)[3] he introduced the signs ⌢ and ⌣ for multiplication and division. He held onto it for decades and so these characters, alongside a few others, appear in many of his writings.

We will demonstrate the use of the characters by a few manuscript examples as well as historic and modern print usage. For the task of discussion of historic mathematical topics and of creating modern editions of sources it is a requirement to accurately reproduce these historic operation characters in encoded text or formulae.

[1] Mscr. C 80, Landesbibliothek Dresden; see also Cajori vol. I, p. 230-231
[2] see Cajori vol. I, p. 267-268
[3] Leibniz: Dissertatio De Arte Combinatoria. Leipzig 1666

3. Characters

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

1CEF1 ◡ LEIBNIZIAN DIVISION SIGN
= division
→ 00F7 ÷ DIVISION SIGN
→ 2215 ∕ DIVISION SLASH
→ 2236 ∶ RATIO

1CEF2 ◠ LEIBNIZIAN MULTIPLICATION SIGN
= multiplication
→ 00D7 × MULTIPLICATION SIGN

1CEF3 ◠◡ LEIBNIZIAN MULTIPLICATION-DIVISION SIGN
• Ambiguous operator sign
→ 2050 ⁀ CLOSE UP

1CEF4 ⎧ LEIBNIZIAN FRACTION REDUCTION SIGN-1
= division
• shows how numerator and denominator are divided equally to reduce a fraction

1CEF5 ⎨ LEIBNIZIAN FRACTION REDUCTION SIGN-2
= division
• shows how numerator and denominator are divided equally to reduce a fraction

Recommended vertical positioning of glyphs

4. Unicode Character Properties

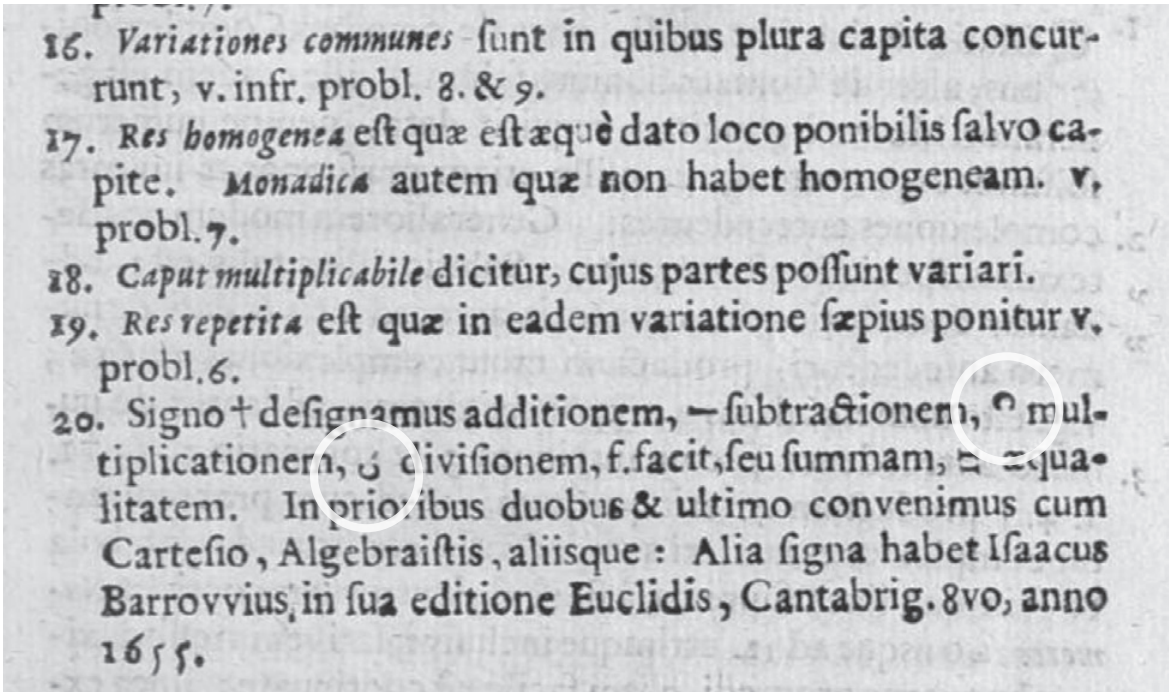
```
1CEF1;LEIBNIZIAN DIVISION SIGN;Sm;0;ON;;;;;N;;;;;
1CEF2;LEIBNIZIAN MULTIPLICATION SIGN;Sm;0;ON;;;;;N;;;;;
1CEF3;LEIBNIZIAN MULTIPLICATION-DIVISION SIGN;Sm;0;ON;;;;;N;;;;;
1CEF4;LEIBNIZIAN FRACTION REDUCTION SIGN-1;Sm;0;ON;;;;;N;;;;;
1CEF5;LEIBNIZIAN FRACTION REDUCTION SIGN-2;Sm;0;ON;;;;;N;;;;;
```

5. Bibliography

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

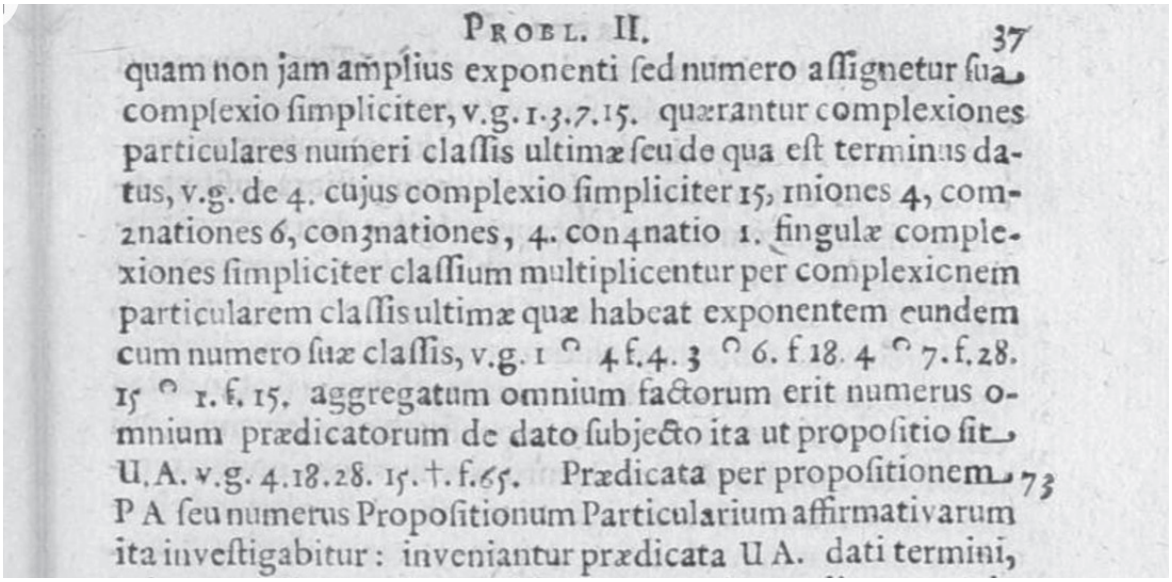
Cajori, Florian: A history of mathematical notations. Chicago 1928
Leibniz, Gottfried Wilhelm: Dissertatio de arte combinatoria. Leipzig 1666
Martin, John N., Leibniz’s *De arte combinatoria,* University of Cincinnati 2003
Rinner, Elisabeth: List of glyphs in Leib.mf. PDF, Hanover 2022

6. Figures and explanations



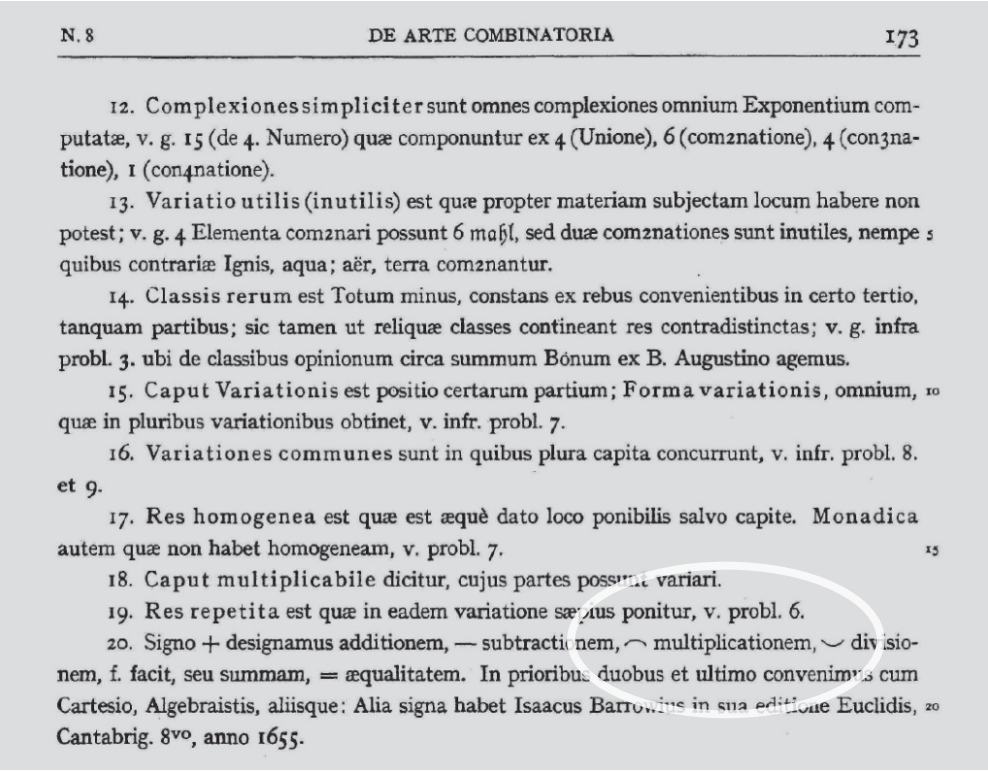
16. *Variationes communes* ſunt in quibus plura capita concurrunt, v. infr. probl. 8. & 9.
17. *Res homogenea* eſt quæ eſt æquè dato loco ponibilis ſalvo capite. *Monadica* autem quæ non habet homogeneam. v. probl. 7.
18. *Caput multiplicabile* dicitur, cujus partes poſſunt variari.
19. *Res repetita* eſt quæ in eadem variatione ſæpius ponitur v. probl. 6.
20. Signo + deſignamus additionem, – ſubtractionem, ⌢ multiplicationem, ⌣ diviſionem, f. facit, ſeu ſummam, = æqualitatem. In prioribus duobus & ultimo convenimus cum Carteſio, Algebraiſtis, aliisque: Alia ſigna habet Iſaacus Barrovvius, in ſua editione Euclidis, Cantabrig. 8vo, anno 1655.

⌣ LEIBNIZIAN DIVISION SIGN, ⌢ LEIBNIZIAN MULTIPLICATION SIGN
Here Leibniz introduces these two symbols to the readers of his *Dissertatio,* alongside with + for addition, – for subtraction and = for equality. He applied these division and multiplication signs in his writings for about three decades from then on.
Note the typographical makeshift in this edition: because the printer had no sorts at hand which would have met the author's intention, he borrowed from the Latin c's which he turned by 90 degrees. However, the actual semantics of the characters having nothing at all to do with a Latin c.
Leibniz, Dissertatio de arte combinatoria, 1666, p. 5. Source: Landesbibliothek Dresden



PROBL. II. 37
quam non jam amplius exponenti ſed numero aſſignetur ſua complexio ſimpliciter, v.g. 1.3.7.15. quærantur complexiones particulares numeri claſſis ultimæ ſeu de qua eſt terminus datus, v.g. de 4. cujus complexio ſimpliciter 15, 1niones 4, com-2nationes 6, con3nationes, 4. con4natio 1. ſingulæ complexiones ſimpliciter claſſium multiplicentur per complexionem particularem claſſis ultimæ quæ habeat exponentem eundem cum numero ſuæ claſſis, v.g. 1 ⌢ 4 f. 4. 3 ⌢ 6. f. 18. 4 ⌢ 7. f. 28. 15 ⌢ 1. f. 15. aggregatum omnium factorum erit numerus omnium prædicatorum de dato ſubjecto ita ut propoſitio ſit U. A. v.g. 4.18.28. 15. †. f. 65. Prædicata per propoſitionem 73
P A ſeu numerus Propoſitionum Particularium affirmativarum ita inveſtigabitur: inveniantur prædicata U A. dati termini,

Another part from the *Dissertatio,* p. 37



N. 8 DE ARTE COMBINATORIA 173

12. Complexiones simpliciter sunt omnes complexiones omnium Exponentium computatæ, v. g. 15 (de 4. Numero) quæ componuntur ex 4 (Unione), 6 (com2natione), 4 (con3natione), 1 (con4natione).

13. Variatio utilis (inutilis) est quæ propter materiam subjectam locum habere non potest; v. g. 4 Elementa com2nari possunt 6 maſſl, sed duæ com2nationes sunt inutiles, nempe quibus contrariæ Ignis, aqua; aër, terra com2nantur.

14. Classis rerum est Totum minus, constans ex rebus convenientibus in certo tertio, tanquam partibus; sic tamen ut reliquæ classes contineant res contradistinctas; v. g. infra probl. 3. ubi de classibus opinionum circa summum Bonum ex B. Augustino agemus.

15. Caput Variationis est positio certarum partium; Forma variationis, omnium, quæ in pluribus variationibus obtinet, v. infr. probl. 7.

16. Variationes communes sunt in quibus plura capita concurrunt, v. infr. probl. 8. et 9.

17. Res homogenea est quæ est æquè dato loco ponibilis salvo capite. Monadica autem quæ non habet homogeneam, v. probl. 7.

18. Caput multiplicabile dicitur, cujus partes possunt variari.

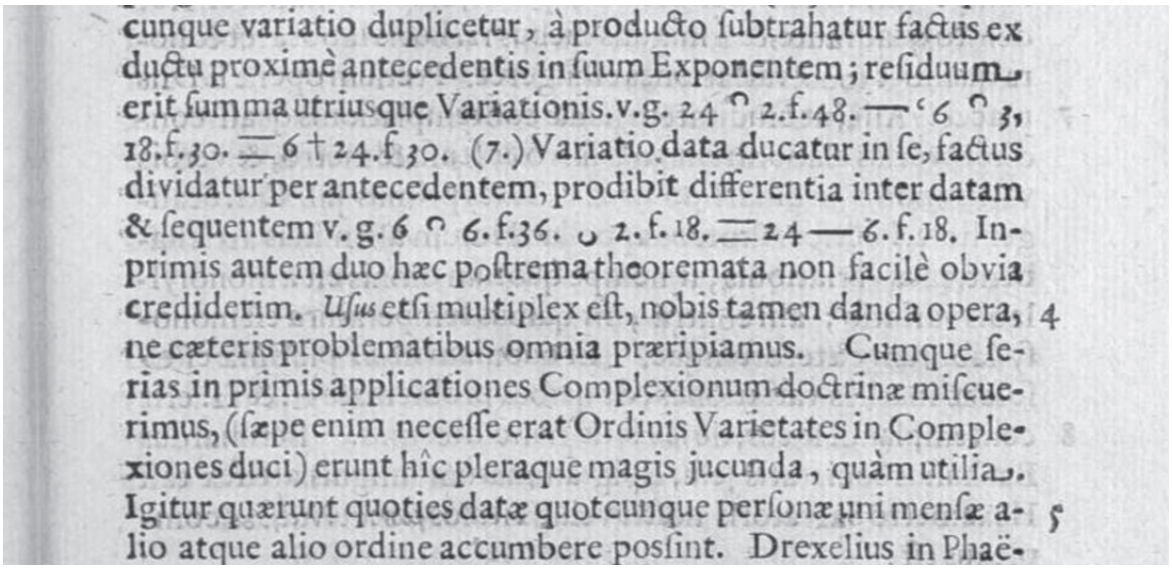
19. Res repetita est quæ in eadem variatione sæpius ponitur, v. probl. 6.

20. Signo + designamus additionem, — subtractionem, ⌢ multiplicationem, ⌣ divisionem, f. facit, seu summam, = æqualitatem. In prioribus duobus et ultimo convenimus cum Cartesio, Algebraistis, aliisque: Alia signa habet Isaacus Barrowius in sua editione Euclidis, Cantabrig. 8vo, anno 1655.

⌣ LEIBNIZIAN DIVISION SIGN, ⌢ LEIBNIZIAN MULTIPLICATION SIGN

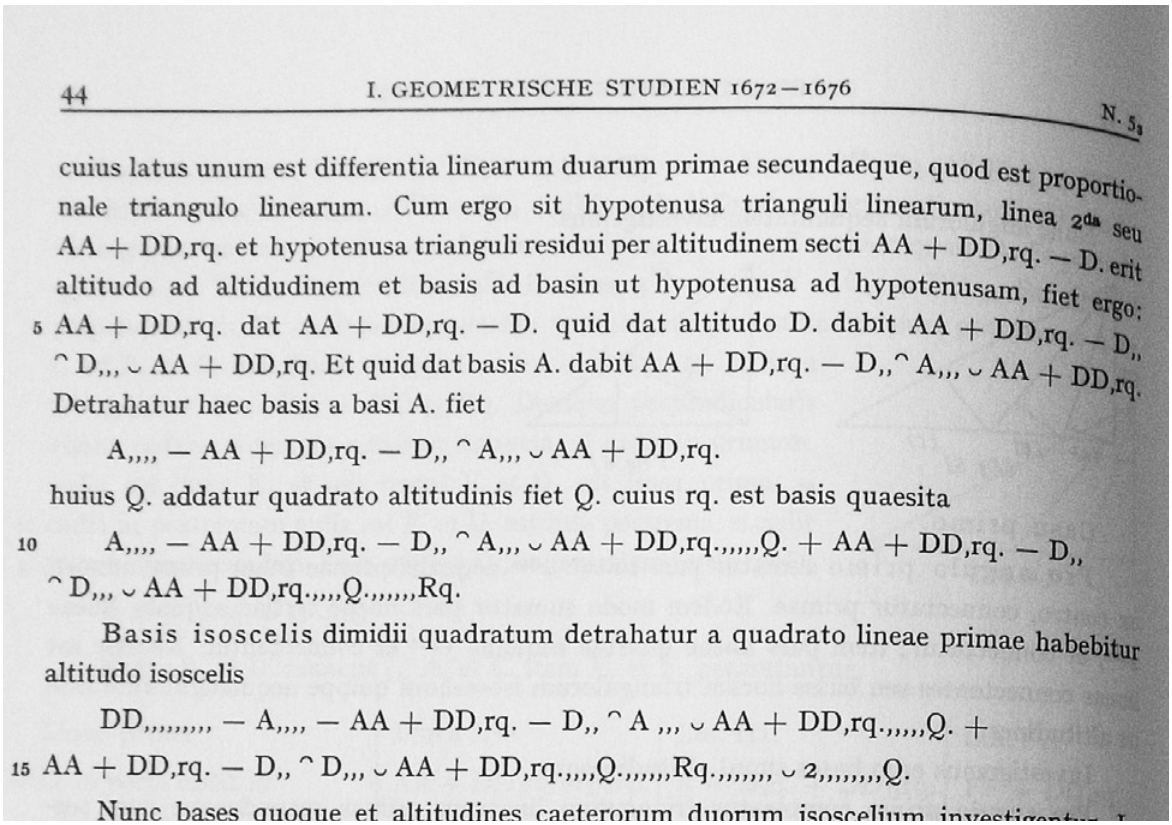
About the same part of text as in the figure of *Dissertatio* p. 5, modern edition: LAA VI-1 p.173. The typographical solution is bad, the bows are too flat and too wide, the vertical positioning is wrong.

No manuscript of the *Dissertatio* exists anymore. But we will see in other manuscripts of Leibniz, how a proper representation of these characters should look like.



cunque variatio duplicetur, à producto ſubtrahatur factus ex ductu proximè antecedentis in ſuum Exponentem; reſiduum erit ſumma utriusque Variationis. v. g. 24 ⌢ 2. f. 48. — 6 ⌢ 3, 18. f. 30. = 6 + 24. f. 30. (7.) Variatio data ducatur in ſe, factus dividatur per antecedentem, prodibit differentia inter datam & ſequentem v. g. 6 ⌢ 6. f. 36. ⌣ 2. f. 18. = 24 — 6. f. 18. Inprimis autem duo hæc poſtrema theoremata non facilè obvia crediderim. *Uſus* etſi multiplex eſt, nobis tamen danda opera, ne cæteris problematibus omnia præripiamus. Cumque ſerias in primis applicationes Complexionum doctrinæ miſcuerimus, (ſæpe enim neceſſe erat Ordinis Varietates in Complexiones duci) erunt hîc pleraque magis jucunda, quàm utilia. Igitur quærunt quoties datæ quotcunque perſonæ uni menſæ alio atque alio ordine accumbere poſſint. Drexelius in Phaë-

From the *Dissertatio*, p. 59



44 I. GEOMETRISCHE STUDIEN 1672—1676 N. 5

cuius latus unum est differentia linearum duarum primae secundaeque, quod est proportionale triangulo linearum. Cum ergo sit hypotenusa trianguli linearum, linea 2da seu AA + DD,rq. et hypotenusa trianguli residui per altitudinem secti AA + DD,rq. — D. erit altitudo ad altidudinem et basis ad basin ut hypotenusa ad hypotenusam, fiet ergo: AA + DD,rq. dat AA + DD,rq. — D. quid dat altitudo D. dabit AA + DD,rq. — D,, ⌢ D,,, ⌣ AA + DD,rq. Et quid dat basis A. dabit AA + DD,rq. — D,,⌢ A,,, ⌣ AA + DD,rq. Detrahatur haec basis a basi A. fiet

A,,,, — AA + DD,rq. — D,, ⌢ A,,, ⌣ AA + DD,rq.

huius Q. addatur quadrato altitudinis fiet Q. cuius rq. est basis quaesita

A,,,, — AA + DD,rq. — D,, ⌢ A,,, ⌣ AA + DD,rq.,,,,,Q. + AA + DD,rq. — D,, ⌢ D,,, ⌣ AA + DD,rq.,,,,Q.,,,,,,Rq.

Basis isoscelis dimidii quadratum detrahatur a quadrato lineae primae habebitur altitudo isoscelis

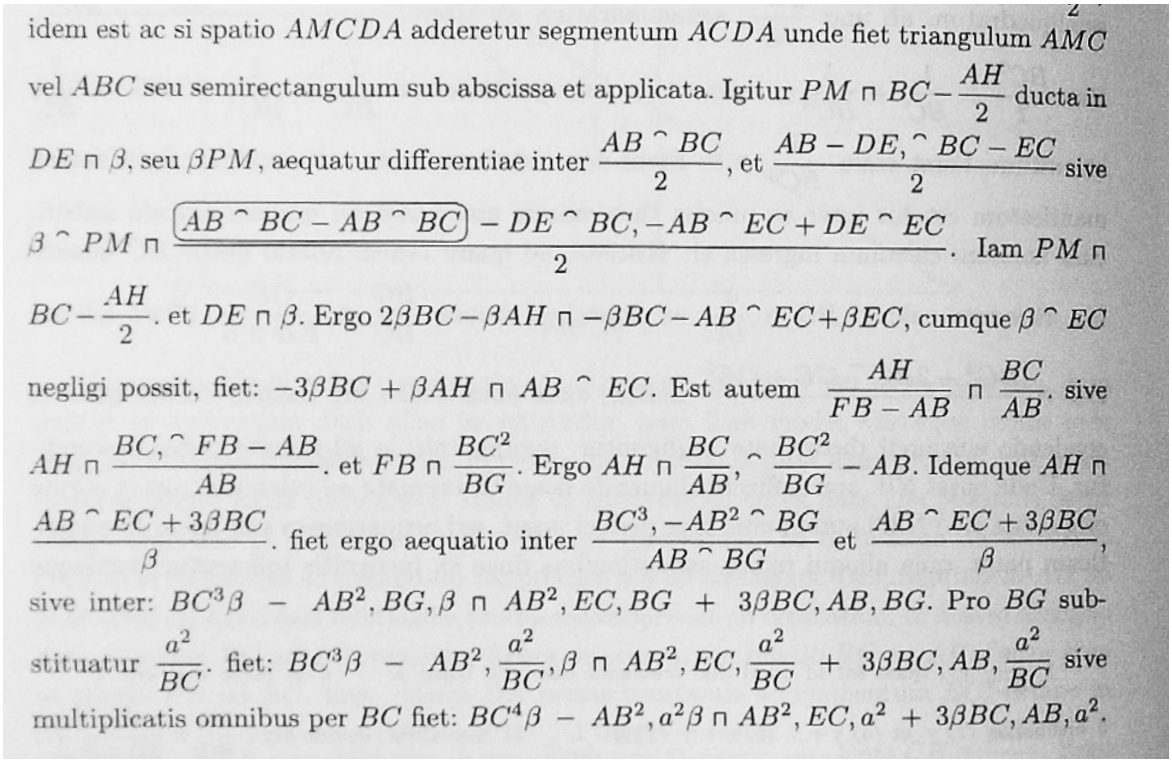
DD,,,,,,,,, — A,,,, — AA + DD,rq. — D,, ⌢ A ,,, ⌣ AA + DD,rq.,,,,,Q. + AA + DD,rq. — D,, ⌢ D,,, ⌣ AA + DD,rq.,,,,Q.,,,,,,Rq.,,,,,,, ⌣ 2,,,,,,,Q.

Nunc bases quoque et altitudines caeterorum duorum isoscelium investigentur, [illegible]

⌣ LEIBNIZIAN DIVISION SIGN, ⌢ LEIBNIZIAN MULTIPLICATION SIGN

More examples from the *Leibniz Akademie-Ausgabe:* LAA VII-1 p. 44 and VII-3 p. 566 (below); here the typographic solution is appropriate.

These two characters should neither be unified with 25E0 and 25E1 (Geometric shapes) nor with 2312 ARC (Miscell. technical), because the semantics (and also the expected typographic depiction) of these existing characters are considerably different from these mathematical operators.



idem est ac si spatio $AMCDA$ adderetur segmentum $ACDA$ unde fiet triangulum AMC vel ABC seu semirectangulum sub abscissa et applicata. Igitur $PM \sqcap BC - \frac{AH}{2}$ ducta in $DE \sqcap \beta$, seu βPM, aequatur differentiae inter $\frac{AB \frown BC}{2}$, et $\frac{AB - DE, \frown BC - EC}{2}$ sive $\beta \frown PM \sqcap \frac{\boxed{AB \frown BC - AB \frown BC} - DE \frown BC, -AB \frown EC + DE \frown EC}{2}$. Iam $PM \sqcap BC - \frac{AH}{2}$. et $DE \sqcap \beta$. Ergo $2\beta BC - \beta AH \sqcap -\beta BC - AB \frown EC + \beta EC$, cumque $\beta \frown EC$ negligi possit, fiet: $-3\beta BC + \beta AH \sqcap AB \frown EC$. Est autem $\frac{AH}{FB - AB} \sqcap \frac{BC}{AB}$, sive $AH \sqcap \frac{BC, \frown FB - AB}{AB}$. et $FB \sqcap \frac{BC^2}{BG}$. Ergo $AH \sqcap \frac{BC}{AB}, \frown \frac{BC^2}{BG} - AB$. Idemque $AH \sqcap \frac{AB \frown EC + 3\beta BC}{\beta}$. fiet ergo aequatio inter $\frac{BC^3, -AB^2 \frown BG}{AB \frown BG}$ et $\frac{AB \frown EC + 3\beta BC}{\beta}$, sive inter: $BC^3\beta - AB^2, BG, \beta \sqcap AB^2, EC, BG + 3\beta BC, AB, BG$. Pro BG substituatur $\frac{a^2}{BC}$. fiet: $BC^3\beta - AB^2, \frac{a^2}{BC}, \beta \sqcap AB^2, EC, \frac{a^2}{BC} + 3\beta BC, AB, \frac{a^2}{BC}$ sive multiplicatis omnibus per BC fiet: $BC^4\beta - AB^2, a^2\beta \sqcap AB^2, EC, a^2 + 3\beta BC, AB, a^2$.

$$\frac{1}{1}\ \frac{1}{2}\ \frac{1}{3}\ \frac{1}{4}$$

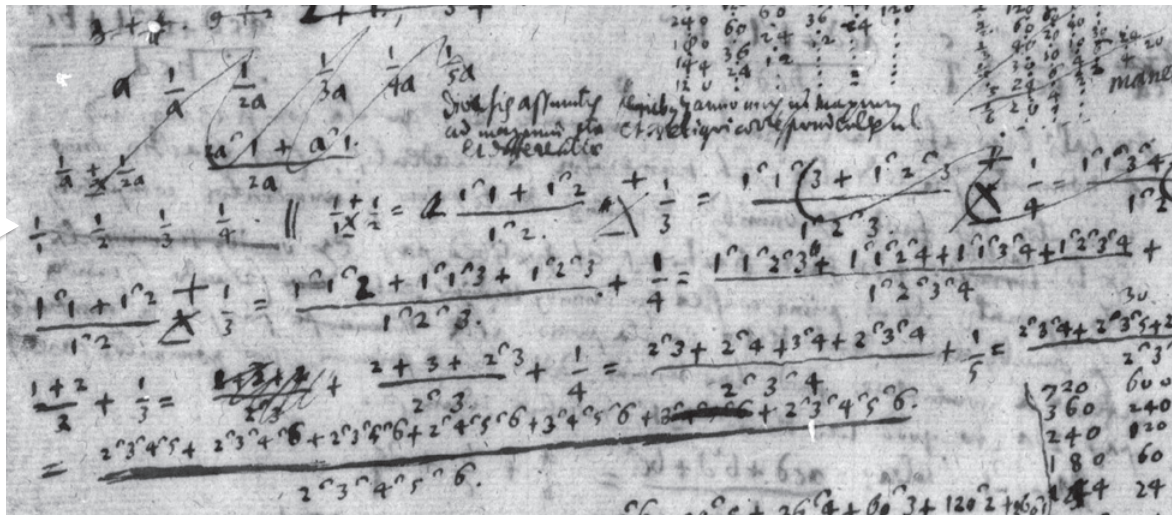
$$\frac{1}{1} \overset{+}{\times} \frac{1}{2} = \frac{1 \frown 1 + 1 \frown 2}{1 \frown 2} \overset{+}{\times} \frac{1}{3} = \frac{1 \frown 1 \frown 2 + 1 \frown 1 \frown 3 + 1 \frown 2 \frown 3}{1 \frown 2 \frown 3} + \frac{1}{4} =$$

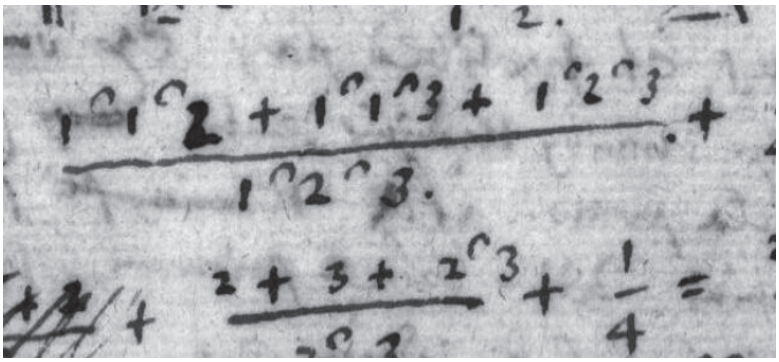
$$\frac{1 \frown 1 \frown 2 \frown 3 + 1 \frown 1 \frown 2 \frown 4 + 1 \frown 1 \frown 3 \frown 4 + 1 \frown 2 \frown 3 \frown 4}{1 \frown 2 \frown 3 \frown 4} + \frac{1}{5}$$

$$\frac{1+2}{2} + \frac{1}{3} = \frac{2 + 3 + 2 \frown 3}{2 \frown 3} + \frac{1}{4} = \frac{2 \frown 3 + 2 \frown 4 + 3 \frown 4 + 2 \frown 3 \frown 4}{2 \frown 3 \frown 4} + \frac{1}{5} =$$

$$\frac{2 \frown 3 \frown 4 + 2 \frown \overset{30}{3} \frown 5 + 2 \frown \overset{40}{4} \frown 5 + 3 \frown \overset{60}{4} \frown 5 + 2 \frown 3 \frown \overset{120}{4} \frown 5}{2 \frown 3 \frown 4 \frown 5} + \frac{1}{6} =$$

◡ LEIBNIZIAN DIVISION SIGN, ⌢ LEIBNIZIAN MULTIPLICATION SIGN
LAA VII-3 p. 167
The corresponding part of the MS text (below), LH 35 XII 2 f. 131v.





Nota, quia differentia et terminus minor sibi mutuo sunt differentia et terminus, ideo variari potest haec enuntiatio multis modis, ut differentiae voci substituatur vox termini minoris et contra.

Videndum quousque haec transpositio permitti possit in differentiis et terminis pluribus continuatis, et in differentiis differentiarum.

Nota in omnibus differentiis decrescentibus terminus ultimus censendus est 0. Is enim est terminus ultimus etsi decrescat series in infinitum.

Hinc summa differentiarum est differentia inter terminum primum et ultimum. Ultimus autem est 0. Ergo summa differentiarum aequalis est termino primo assumto.

Si sint duae series infinitae

$$\begin{array}{lll} B & \frown & b \\ C & \frown & \boxed{c = B} \\ D & \frown & \boxed{d = C} \\ \text{etc.} & & \end{array} \qquad \begin{array}{lll} B & \smile & \boxed{c = C} \\ C & \smile & \boxed{d = D} \\ D & & \\ \text{etc.} & & \end{array}$$

ostensum est $B \frown b$. vel A aequari differentiae inter utramque.

Item differentiam inter

$$\begin{array}{ll} B \smile c & \\ C \smile d & \\ D \smile e & \\ \text{etc.} & \end{array} \quad \text{et} \quad \begin{array}{l} B \\ C \\ D \\ \text{etc.} \end{array}$$

esse B

posito quod c. sit ratio inter B et C et d. sit ratio inter C et D etc.

et inter duas progressiones

$$\frac{2\frown3\frown4\frown5+2\frown3\frown4\frown6+2\frown3\frown5\frown6+2\frown4\frown5\frown6+3\frown4\frown5\frown6+2\frown3\frown4\frown5\frown6}{2\frown3\frown4\frown5\frown6}$$

$$720+360+240+180+144+120 = 120\frown6+24\frown5+36\frown4+60\frown3+120\frown2+360\frown1$$

$$\begin{array}{ccccc} (3)\ 2\frown3\frown4\frown5 & & (3)\ 2\frown3\frown5\frown6 & & (3)\ 3\frown4\frown5\frown6 \\ \diagup\quad\diagdown & & \diagup\quad\diagdown & & \diagup\quad\diagdown \\ 2\frown3\frown4\frown5+2\frown3\frown4\frown6 & + & 2\frown3\frown5\frown6+2\frown4\frown5\frown6 & + & 3\frown4\frown5\frown6+2\frown3\frown4\frown5\frown6 \end{array}$$

Haec ut summemus opus est aequatione eorum seu reductione ad aequalitatem per mutuas compensationes.

$$2\frown3\frown4\frown5+2\frown3\frown4\frown6 = 2\frown3\frown4\frown5\ (2)+2\frown3\frown4\ldots+2\frown3\frown5\frown6 =$$

$$2\frown3\frown4\frown5\ (3)+2\frown3\frown6+(2)\ 2\frown3\frown4\ldots+2\frown4\frown5\frown6 =$$

$$(4)\ 2\frown3\frown4\frown5+(3)\ 2\frown3\frown4+(2)\ 2\frown3\frown6+(1)\ 2\frown5\frown6\ldots+3\frown4\frown5\frown6 =$$

$$(5)\ 2\frown3\frown4\frown5+(4)\ 2\frown3\frown4+(3)\ 2\frown3\frown4+(2)\ 2\frown3\frown6\ldots+2\frown3\frown4\frown5\frown6 =$$

$$(6)\,2\frown3\frown4\frown5+(5)\,2\frown3\frown4+(4)\,2\frown3\frown6+(3)\,2\frown5\frown6+(2)\,4\frown5\frown6+(1)\,3\frown4\frown5\frown6.$$

$6\frown120$	$5\frown24$	$4\frown36$	$3\frown60$	$2\frown120$	$1\frown360$
720	120	144	180	240	360

⌣ LEIBNIZIAN DIVISION SIGN, ⌢ LEIBNIZIAN MULTIPLICATION SIGN
LAA VII-3 p. 95 (top), VII-3 p. 134 (bottom)

II. RECONSTRUCTION

Syntax. The syntax begins by positing a set of basic terms that stand for primitive ideas:

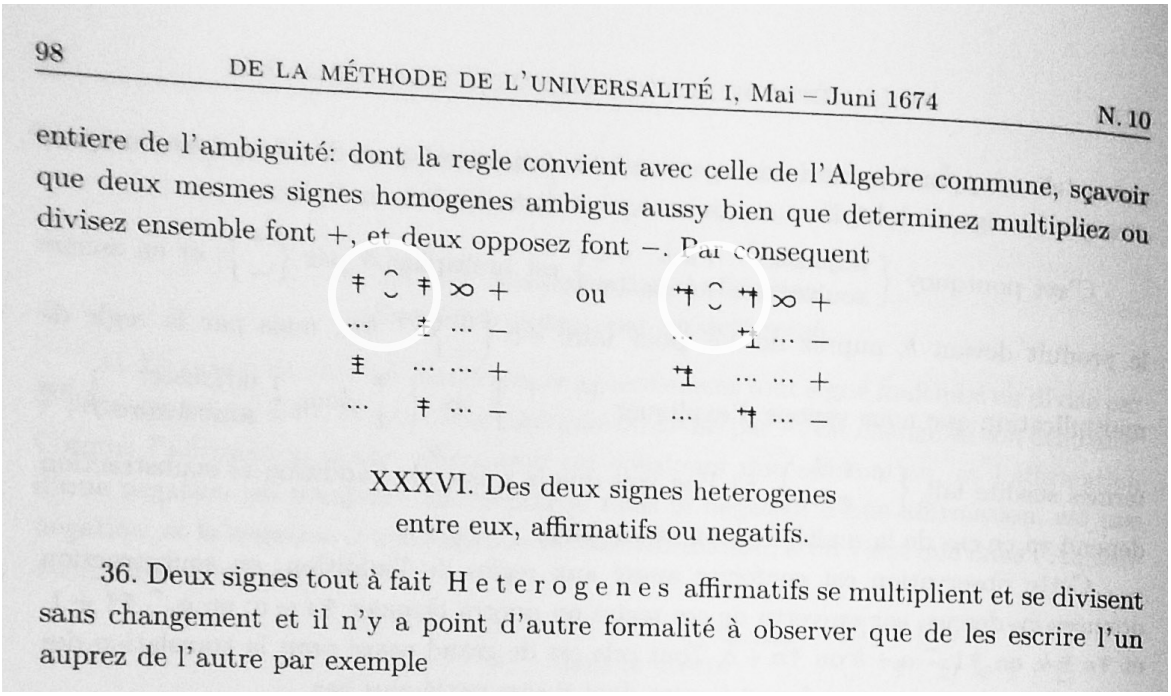
First Terms: $t_1,...,t_n$. Among the first terms is *exists*.

Primitive terms may be joined together to make longer terms. In principle some of these longer terms may be infinitely long, though those of finite length are special. To define strings of first terms we make use of the concatenation operation: let x⌢y mean the result of writing (*concatenating*) x and y. (Later when there is no possibility of confusion, we shall suppress the concatenation symbol and refer to a⌢b⌢c⌢d as abcd.)

Finite Terms: If t^1_1 and t^1_2, are first terms, then $t^1_1 \frown t^1_2$ is a finite term.

If t^n_i is a finite term and t^1_j is a first term, then $t^n_i \frown t^1_j$ is a finite term.

⌣ LEIBNIZIAN DIVISION SIGN, ⌢ LEIBNIZIAN MULTIPLICATION SIGN
A sample from: John N. Martin, Leibniz's *De arte combinatoria;* University of Cincinnati 2003.
© John N. Martin, 2003 – PDF version



98 DE LA MÉTHODE DE L'UNIVERSALITÉ I, Mai – Juni 1674 N. 10

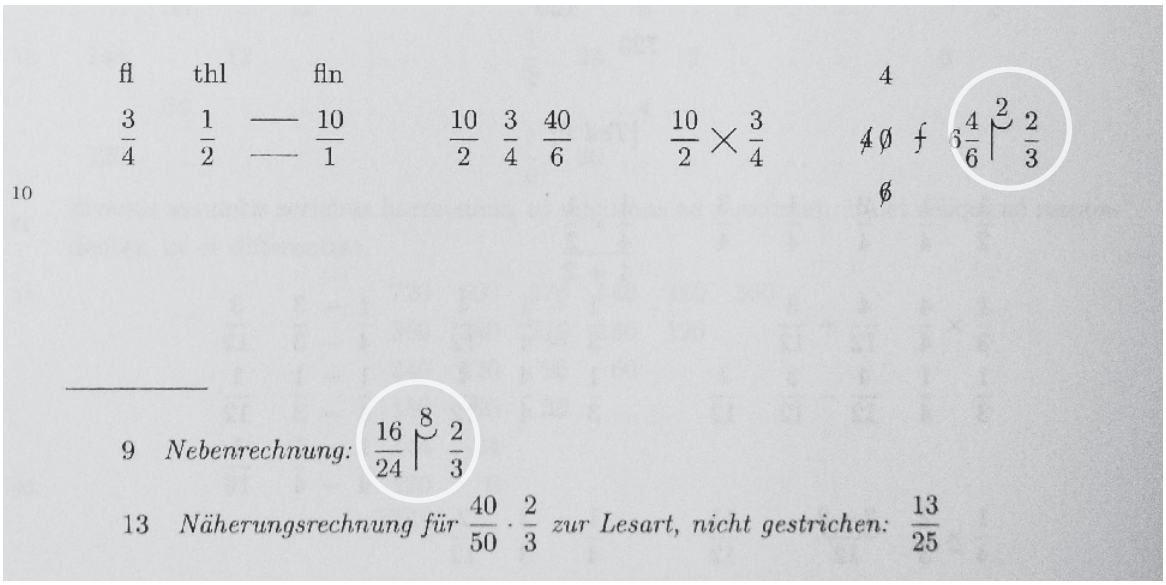
entiere de l'ambiguité: dont la regle convient avec celle de l'Algebre commune, sçavoir que deux mesmes signes homogenes ambigus aussy bien que determinez multipliez ou divisez ensemble font +, et deux opposez font −. Par consequent

ou

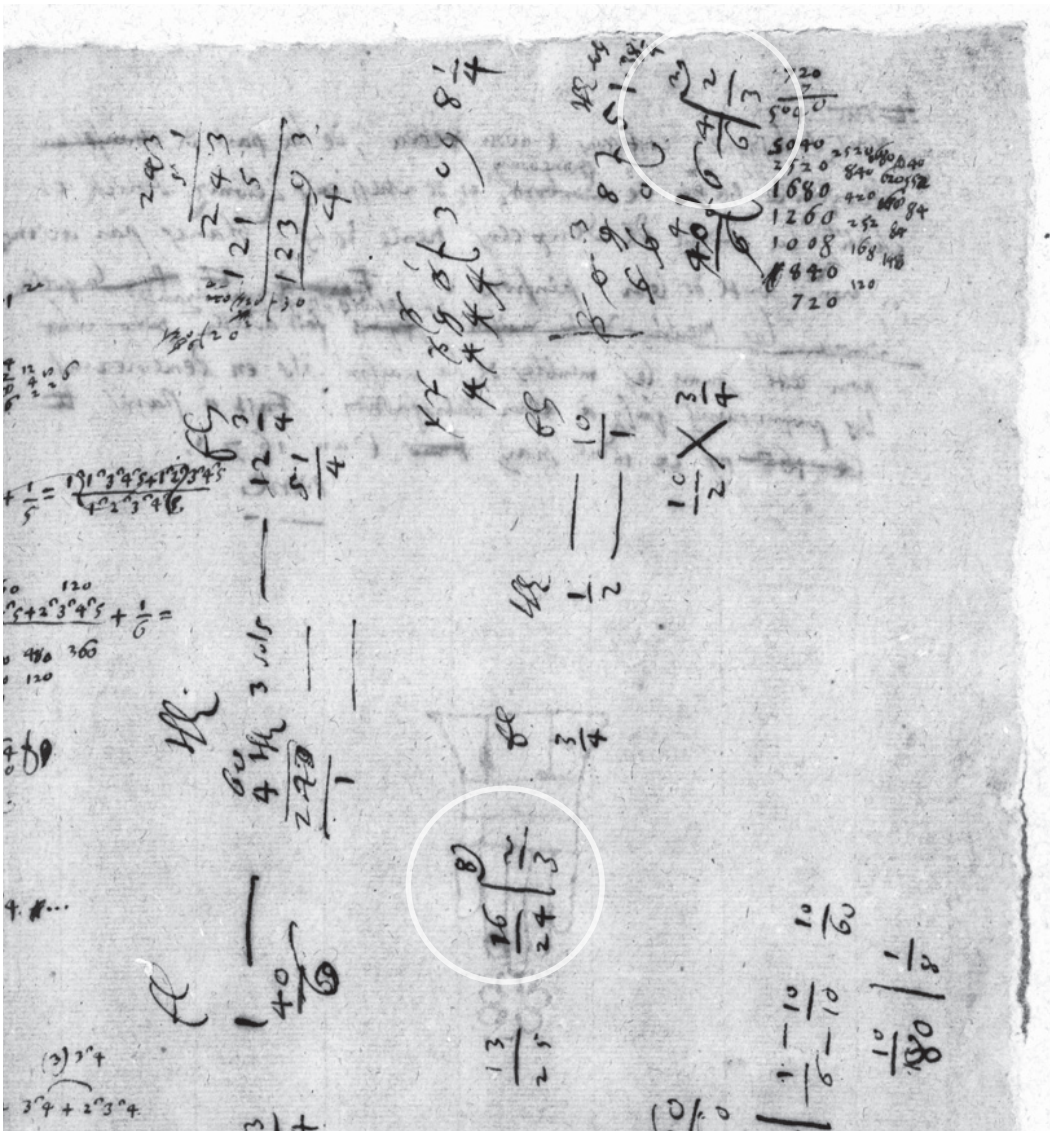
XXXVI. Des deux signes heterogenes entre eux, affirmatifs ou negatifs.

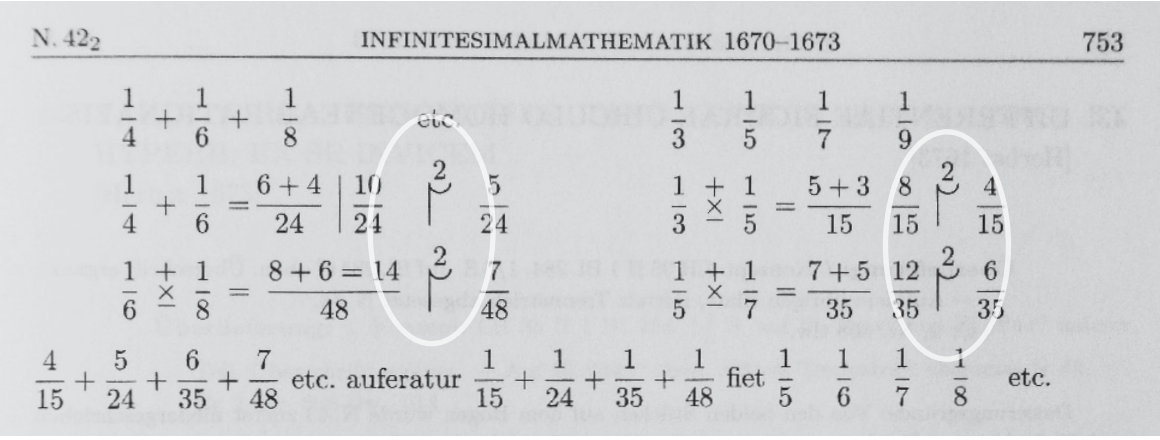
36. Deux signes tout à fait Heterogenes affirmatifs se multiplient et se divisent sans changement et il n'y a point d'autre formalité à observer que de les escrire l'un auprez de l'autre par exemple

⌣ LEIBNIZIAN MULTIPLICATION-DIVISION SIGN
An ambiguous operator sign that combines the Leibnizian division and multiplication signs, to denote a multiplication in one and a division in the other case.
Using ambiguity signs (cf. N5277 section c) can result in the need of a multiplication sign in one and a division sign in the second case. To write this down, Leibniz combines his multiplication sign with his division sign. LAA VII-7 p. 98

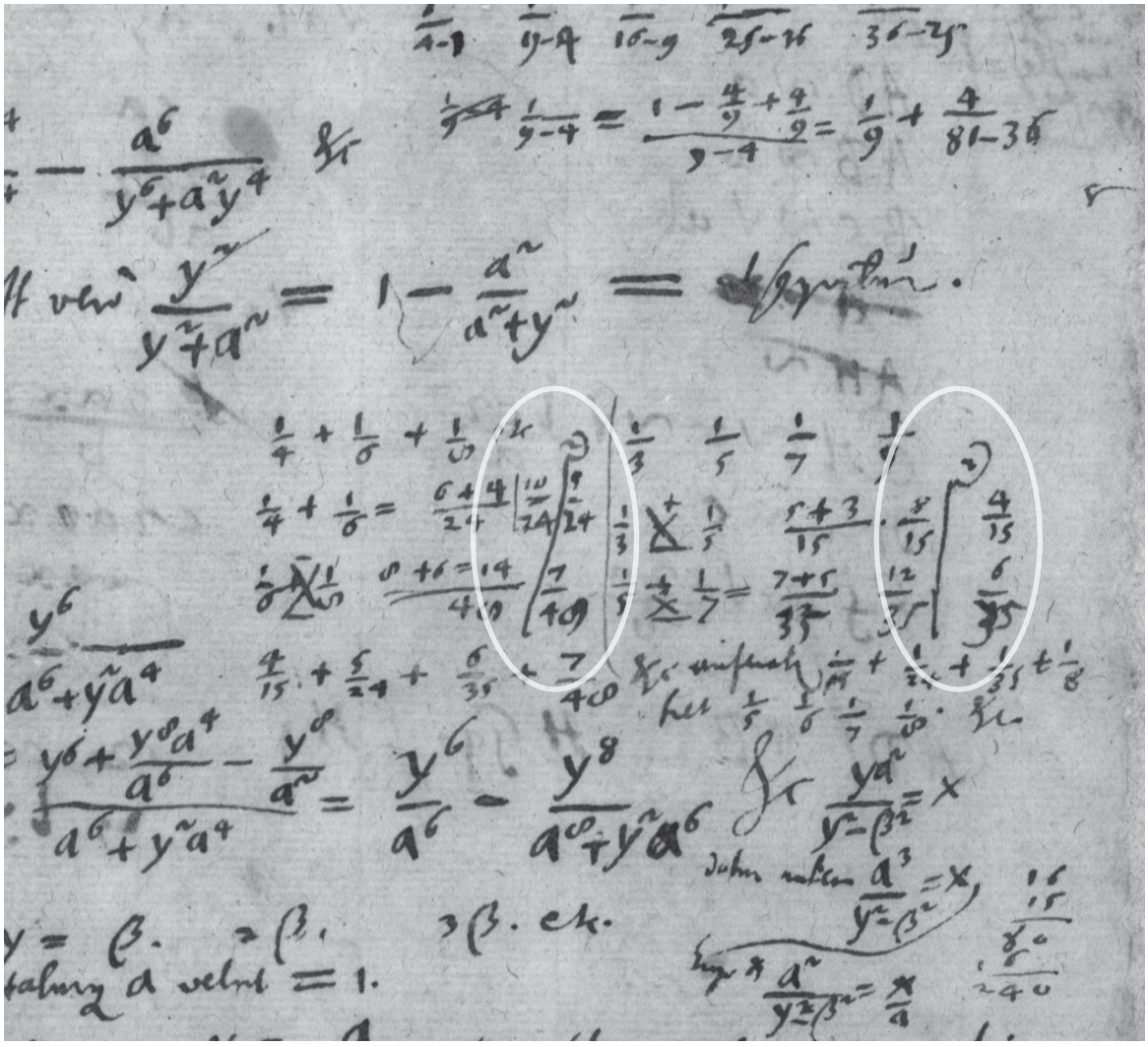


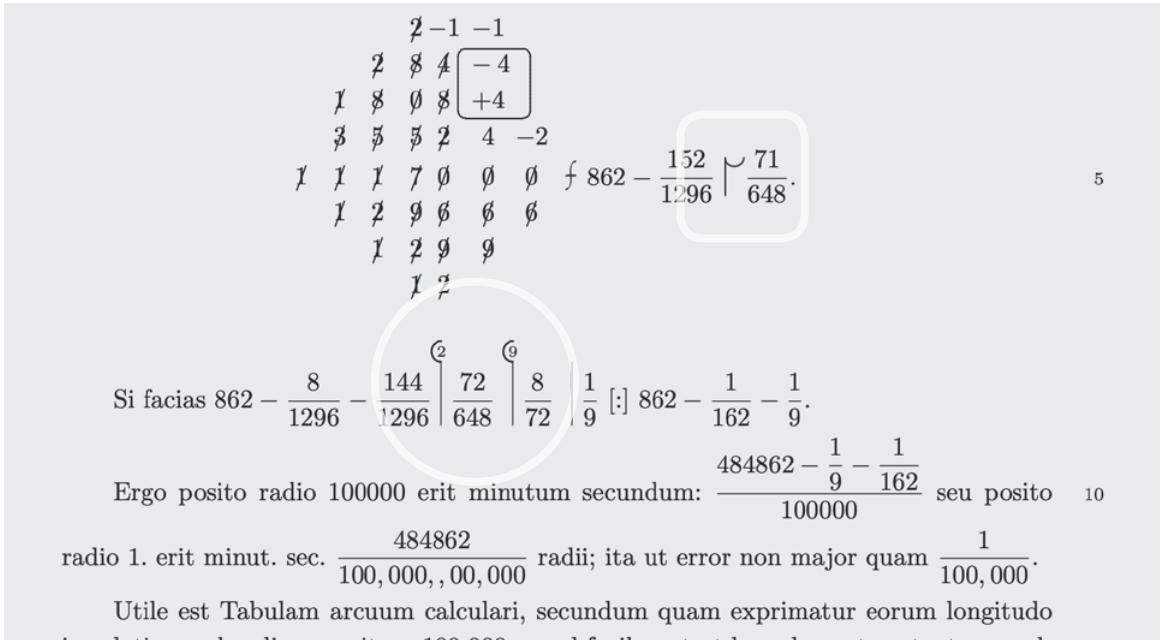
⊦ LEIBNIZIAN FRACTION REDUCTION SIGN-1; LAA VII-3 p. 138,
the corresponding MS part, LH 35 XII 2, f. 132r (below)





⊱ LEIBNIZIAN FRACTION REDUCTION SIGN-1; LAA VII-4 p. 753,
the correponding MS part, LH 35 XII 2, f. 162r (below)



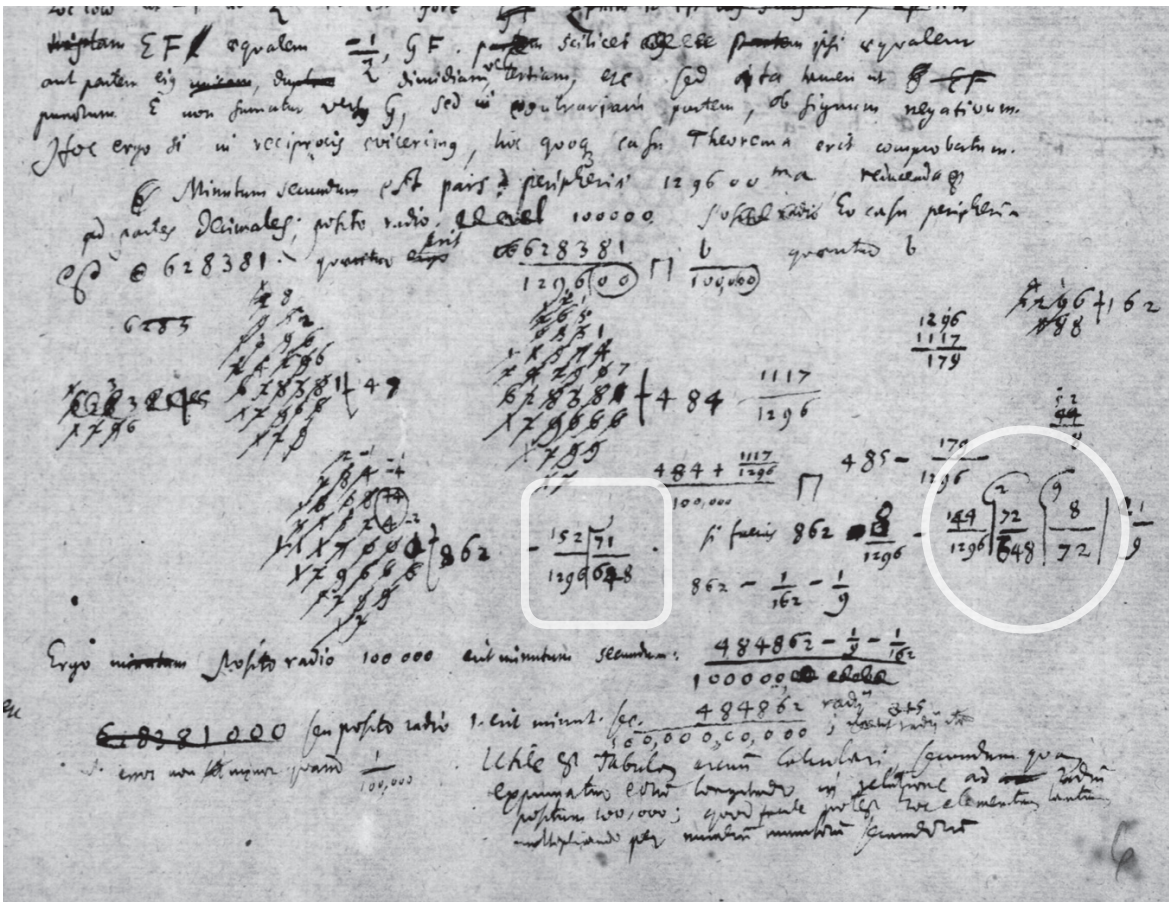


$$\text{Si facias } 862 - \frac{8}{1296} - \frac{144}{1296}\Big|^{(2}\ \frac{72}{648}\Big|^{(9}\ \frac{8}{72}\ \Big|\ \frac{1}{9}\ [:]\ 862 - \frac{1}{162} - \frac{1}{9}.$$

Ergo posito radio 100000 erit minutum secundum: $\frac{484862 - \frac{1}{9} - \frac{1}{162}}{100000}$ seu posito radio 1. erit minut. sec. $\frac{484862}{100,000,,00,000}$ radii; ita ut error non major quam $\frac{1}{100,000}$.

Utile est Tabulam arcuum calculari, secundum quam exprimatur eorum longitudo

⌜ LEIBNIZIAN FRACTION REDUCTION SIGN-1 and ⌝ LEIBNIZIAN FRACTION REDUCTION SIGN-2 in one place; LAA VII-6 p. 379;
the correponding MS part, LH 35 V 17, f. 6r (below).



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 add 11 cossic characters to the UCS
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: 2025-02.14.
5. Requester's reference (if applicable): LUCP L-2503
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: Yes
      Name of the existing block: *since no space is available in the various Math symbols blocks, we propose a new block* Miscellaneous Mathematical Symbols-C *or similar. This new block can also accomodate other related new character sets we will propose (see N5277)*
2. Number of characters in proposal: 5
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 *updated version of doc. L-2442; see also* N5277 / L-24-02n

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)? Yes

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? No

   If YES, is a rationale for its inclusion provided?

   If YES, reference:

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: