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Universal Multiple Octet Coded Character Set
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Title: **Additional Mathematical Symbols**
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The set of mathematical symbols proposed for addition to ISO/IEC 10646-1 and Unicode is based on an extensive search of existing mathematical literature. By its very nature, such a search can never be exhaustive, least of all for a notation that is a living and productive as mathematical notation. In order to have a workable proposal, the set was arbitrarily frozen at around the time it was first submitted to WG2.

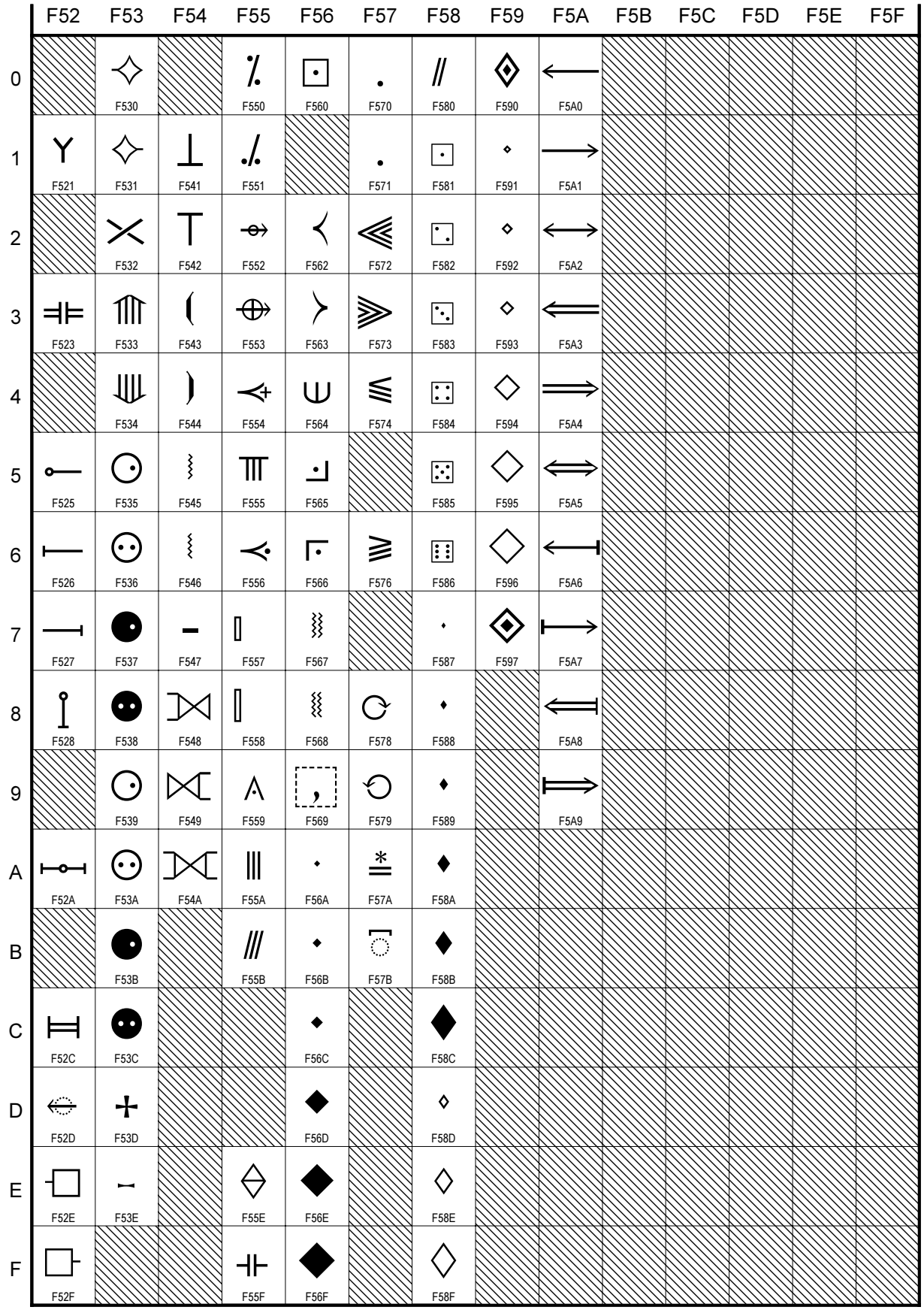
All additional candidate characters for encoding that were found during the lengthy review phase for the original proposal were tracked separately, in order to confine the more tentative characters to a small manageable set. In the meantime, many, if not most of the characters in this secondary, but much smaller set have been confirmed.

An ad-hoc group consisting of the authors of this document, with input from Michael Everson, Ken Whistler and Murray Sargent have narrowed the candidate characters down to the list presented here and provided suggested names and annotations.

Format of this document

While the format of this document follows that of a Unicode character names list, no code locations are suggested and many of the annotations are provided mainly for the readers and reviewers of this document; they are not intended to become part of the standard. A few already existing characters are shown for comparison purposes. These are clearly noted in the list of names; there is no intention to request duplicate encodings for them.

In some cases compatibility ‘mappings’ with novel tags can be found in the names list. These are indications of glyphic or semantic relations between characters, not as formal decompositions. In the final standard they would be replaced by simple cross-references.


F52 F53 F54 F55 F56 F57 F58 F59 F5A F5B F5C F5D F5E F5F
0 F530 F550 F560 F570 F580 F590 F5A0
1 F521 F531 F541 F551 F571 F581 F591 F5A1
2 F532 F542 F552 F562 F572 F582 F592 F5A2
3 F523 F533 F543 F553 F563 F573 F583 F593 F5A3
4 F534 F544 F554 F564 F574 F584 F594 F5A4
5 F525 F535 F545 F555 F565 F585 F595 F5A5
6 F526 F536 F546 F556 F566 F576 F586 F596 F5A6
7 F527 F537 F547 F557 F567 F587 F597 F5A7
8 F528 F538 F548 F558 F568 F578 F588 F5A8
9 F539 F549 F559 F569 F579 F589 F5A9
A F52A F53A F54A F55A F56A F57A F58A
B F53B F55B F56B F57B F58B
C F52C F53C F56C F58C
D F52D F53D F56D F58D
E F52E F53E F55E F56E F58E
F F52F F55F F56F F58F

F521 ⅄ CROWN PRODUCT
• weak candidate, marginal
F522 ▨ <reserved>
F523 ⫤ LEFT AND RIGHT DOUBLE TURNSTILE
F524 ▨ <reserved>
F525 ⊸— LEFT MULTIMAP
= continuous Fourier transform
→ 22B8 ⊸ multimap
F526 ⊢— LONG RIGHT TACK
= discrete Fourier transform
F527 —⊣ LONG LEFT TACK
F528 ⟟ UP TACK WITH CIRCLE ABOVE
= radial component
F529 ▨ <reserved>
F52A ⊢⊣ ZONAL SPHERICAL FUNCTION
• weak candidate
F52B ▨ <reserved>
F52C ⊨ GLEICH STARK
= tautological equivalent
F52D ⃪ COMBINING LEFTWARD ARROW OVERLAY
F52E ⊡ WHITE SQUARE WITH LEFTWARDS TICK
= was always
F52F ⊡ WHITE SQUARE WITH RIGHTWARDS TICK
= will always be
F530 ✧ WHITE CONCAVE-SIDED DIAMOND WITH LEFTWARDS TICK
= was never
F531 ✧ WHITE CONCAVE-SIDED DIAMOND WITH RIGHTWARDS TICK
= will never be
F532 ⤫ WINDSCHIEF
= skew
• weak candidate
F533 ⟰ UPWARDS QUADRUPLE ARROW
F534 ⟱ DOWNWARDS QUADRUPLE ARROW

Go markers

F535 ⊙ WHITE CIRCLE WITH DOT RIGHT
F536 ⊙ WHITE CIRCLE WITH TWO DOTS
F537 ⚈ BLACK CIRCLE WITH WHITE DOT RIGHT
F538 ⚉ BLACK CIRCLE WITH WHITE TWO DOTS
F539 ⊙ GRAY CIRCLE WITH GRAY DOT RIGHT
• what is black should be gray in final font
F53A ⊙ GRAY CIRCLE WITH GRAY TWO DOTS
• what is black should be gray in final font
F53B ⚈ GRAY FILLED CIRCLE WITH WHITE DOT RIGHT
• what is black should be gray in final font
F53C ⚉ GRAY FILLED CIRCLE WITH WHITE TWO DOTS
• what is black should be gray in final font

Other Symbols

F53D ₊ TINY
F53E ₋ MINY
F53F ▨ <reserved>
F540 ▨ <reserved>
F541 ⊥ LARGE UP TACK
≈ <large> 22A5 ⊥ up tack
F542 ⊤ LARGE DOWN TACK
≈ <large> 22A4 ⊤ down tack
F543 ❨ LEFT BLACK TORTOISE SHELL BRACKET
≈ <black> 3014 〔 left tortoise shell bracket
F544 ❩ RIGHT BLACK TORTOISE SHELL BRACKET
≈ <black> 3015 〕 right tortoise shell bracket
F545 ⦚ LEFT WIGGLY FENCE
F546 ⦚ RIGHT WIGGLY FENCE
F547 ➖ BOLD MINUS SIGN
→ 2212 − minus sign
F548 ⟕ LEFT OUTER JOIN
F549 ⟖ RIGHT OUTER JOIN
F54A ⟗ FULL OUTER JOIN
F54B ▨ <reserved>
F54C ▨ <reserved>
F54D ▨ <reserved>
F54E ▨ <reserved>
F54F ▨ <reserved>
F550 ⅋ COMMERCIAL MINUS SIGN
F551 ⅋ COMMERCIAL MINUS SIGN
• glyph variant of F550 ⅋ - candidate for VS1?
F552 ⊸ RIGHT ARROW WITH SMALL CIRCLE
F553 ⟴ RIGHT ARROW WITH CIRCLED PIUS
F554 ⪯ IRREFLEXIVE PARTIAL ORDER
• weak candidate
F555 ⫴ X-F555
• weak candidate - no suggested name
F556 ≺ PARTIAL ORDER
• weak candidate
F557 ⫿ DIJKSTRA CHOICE
F558 ⨿ N-ARY DIJKSTRA CHOICE
F559 ⩑ AND WITH DOT
F55A ⫼ LARGE TRIPLE VERTICAL BAR OPERATOR
often n-ary
→ 2AF4 ⫼ triple vertical bar binary relation
→ 2980 ⫼ triple vertical bar delimiter
F55B ⫻ TRIPLE SOLIDUS BINARY RELATION
= triple slash binary relation
→ 2AF4 ⫼ triple vertical bar binary relation
F55C ▨ <reserved>
F55D ▨ <reserved>

F55E ⧫ LOZENGE DIVIDED BY HORIZONTAL RULE
F55F ⫩ LEFT AND RIGHT TACK
F560 ⊡ SQUARED DOT
→ 29C7 ⧈ squared small circle
F561 ▨ <reserved>
F562 ⧼ LEFT POINTING CURVED ANGLE BRACKET
→ 2329 〈 left pointing angle bracket
F563 ⧽ RIGHT POINTING CURVED ANGLE BRACKET
→ 232A 〉 right pointing angle bracket
F564 ⋓ ELEMENT OF OPENING UPWARDS
→ 2AD9 ⋒ element of opening downwards
F565 ⌟ LOWER RIGHT CORNER WITH DOT
= pullback
F566 ⌜ UPPER LEFT CORNER WITH DOT
= pushout
F567 ⦙ LEFT DOUBLE WIGGLY FENCE
F568 ⦚ RIGHT DOUBLE WIGGLY FENCE
F569 ⁣ INVISIBLE COMMA
= invisible separator

Diamonds

Diamonds are needed in several sizes, the sizes here are from an existing and widely available set of fonts

F56A ⋄ BLACK TINY DIAMOND
F56B ⋄ BLACK VERY SMALL DIAMOND
F56C ⋄ BLACK SMALL DIAMOND
F56D ◆ BLACK MEDIUM DIAMOND
F56E ◆ BLACK DIAMOND
• not a candidate - shown for comparison only
≡ 25C6 ◆ black diamond
F56F ◆ BLACK LARGE DIAMOND

On-line

F570 . MULTIPLICATION ON-LINE
= often omitted
→ F571 . on-line dot
F571 . ON-LINE DOT
= paired, used as fence
→ F570 . multiplication on-line

Relations

F572 ⋘ STACKED VERY MUCH LESS-THAN
≈ <stacked> 22D8 ⋘ very much less-than
F573 ⋙ STACKED VERY MUCH GREATER-THAN
≈ <stacked> 22D9 ⋙ very much greater-than
F574 ≦ VARIANT LESS-THAN OVER EQUAL TO
≈ <variant> 2266 ≦ less-than over equal to
F575 ▨ <reserved>
F576 ≧ VARIANT GREATER-THAN OVER EQUAL TO
≈ <variant> 2267 ≧ greater-than over equal to
F577 ▨ <reserved>
F578 ⟳ CLOCKWISE
F579 ⟲ ANTI CLOCKWISE
F57A ≛ EQUALS WITH ASTERISK
F57B ◌̿ COMBINING WIDE BRIDGE ABOVE
this character extends the full width of the base character
→ 0346 ◌͆ combining bridge above
F57C ▨ <reserved>
F57D ▨ <reserved>
F57E ▨ <reserved>
F57F ▨ <reserved>
F580 ⫽ DOUBLE SLASH OPERATOR
= tangential to

Dice

F581 ⚀ DIE FACE-1
F582 ⚁ DIE FACE-2
F583 ⚂ DIE FACE-3
F584 ⚃ DIE FACE-4
F585 ⚄ DIE FACE-5
F586 ⚅ DIE FACE-6

Lozenges

Lozenges are needed in several sizes, the sizes here are from an existing and widely available set of fonts

F587 ⋄ BLACK TINY LOZENGE
F588 ⋄ BLACK VERY SMALL LOZENGE
F589 ⋄ BLACK SMALL LOZENGE
F58A ⧫ BLACK MEDIUM LOZENGE
F58B ⧫ FILLED LOZENGE
• this is not a candidate - shown for comparison
≡ 29EB ⧫ filled lozenge
F58C ⧫ BLACK LARGE LOZENGE
F58D ⋄ DIAMOND OPERATOR
• this is not a candidate - shown for comparison
misnomer: this is a lozenge shape, not a diamond
≡ 22C4 ⋄ diamond operator
F58E ◊ LOZENGE
• this is not a candidate - shown for comparison
≡ 25CA ◊ lozenge
F58F ◊ LARGE LOZENGE
F590 ⧫ LARGE LOZENGE CONTAINING SMALL FILLED LOZENGE

White Diamonds

White diamonds are needed in at least two sizes, the sizes here are derived from the black diamonds. Widely available fonts have the large diamond only, Unicode 3.0 has the 'normal' size, and mathematical publications need at least one size smaller than the current size

F591 ◦ WHITE TINY DIAMOND
F592 ◦ WHITE VERY SMALL DIAMOND
F593 ◦ WHITE SMALL DIAMOND
F594 ◇ WHITE MEDIUM DIAMOND
F595 ◇ WHITE DIAMOND
• this is not a candidate - shown for comparison
≡ 25C7 ◇ white diamond
F596 ◇ WHITE LARGE DIAMOND
F597 ◈ WHITE LARGE DIAMOND CONTAINING BLACK SMALL DIAMOND
widely available fonts contain this symbol with two or three variations of the size of the inner diamond

Long Arrows

These have been proposed as variations or characters

F5A0 ⟵ LONG LEFTWARDS ARROW
F5A1 ⟶ LONG RIGHTWARDS ARROW
F5A2 ⟷ LONG LEFT RIGHT ARROW
F5A3 ⟸ LONG LEFTWARDS DOUBLE ARROW
F5A4 ⟹ LONG RIGHTWARDS DOUBLE ARROW
F5A5 ⟺ LONG LEFT RIGHT DOUBLE ARROW
F5A6 ⟻ LONG LEFTWARDS ARROW FROM BAR
= maps from
F5A7 ⟼ LONG RIGHTWARDS ARROW FROM BAR
= maps to
F5A8 ⟽ LONG LEFTWARDS DOUBLE ARROW FROM BAR
F5A9 ⟾ LONG RIGHTWARDS DOUBLE ARROW FROM BAR