

**Title: Math characters and variation sequences**

**Source: Project Editor**

**Distribution: WG2 members and liaison organizations**

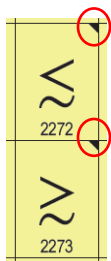
The following document proposes changes to the Mathematical glyph representation in the charts and the introduction of representative glyphs for documented variation sequences.

**Context:**

Amendment 2 to ISO/IEC 10646:2012 has introduced the description of variation sequences in the code charts. However, while the sequences were added in the name list no representative glyphs were shown. With that capability now added to the Charting tool, it is possible to display the representative glyphs of the variations sequences described in clause 16.5. Therefore, to insure consistency between the standard character and its variation it is important to use the same font design for both. This has led to the introduction of a new font for many of the mathematical characters based on the Math STIX set (See <http://stixfonts.org/> for further information on the STIX project).

Example

In the main chart the glyph box for 2272 and 2273 contain a small black triangle in the upper right corner to indicate that these characters are used as base characters for variation sequences.



In the name list, a representative glyph is shown for the variation sequence.

2272	$\lesssim$	LESS-THAN OR EQUIVALENT TO ~ 2272 FE00 $\lesssim$ following the slant of the lower leg
2273	$\gtrsim$	GREATER-THAN OR EQUIVALENT TO ~ 2273 FE00 $\gtrsim$ following the slant of the lower leg

**New glyphs for the Math character in the code chart**

Beyond the motivation for consistency between the default representation and the representation used for the variation sequence, the Math STIX font set is a better representation of the mathematical characters encoded in the standard.

The code charts pages following this text show the proposed changes (highlighted in yellow) in the affected blocks:














- Letterlike Symbols (2100-214F)
- Arrows (2190-21FF)
- Mathematical Operators (2200-22FF)
- Miscellaneous Technical (2300-23FF)
- Miscellaneous Mathematical Symbols-A (27C0-27EF)
- Supplemental Arrows-A (27F0-27FF)
- Supplemental Arrows –B (2900-297F)
- Miscellaneous Mathematical Symbols-B (2980-29FF)
- Supplemental Mathematical Operators (2A00-2AFF)
- Miscellaneous Symbols and Arrows (2B00-2BFF)
- Mathematical Alphanumeric Symbols (1D400-1D5FF)

The criteria for inclusion/changes were as follows:

- The characters were available in the Math STIX font. For example, some recently added characters such as 27CA, 27CE, and 27CF, although used in math are not part of the STIX font set. Same for 1D7CA and 1D7CB.
- The characters were consistent with other included sets. This causes some arrows to be excluded (such as the ‘keyboard’ arrows in 21E6-21F3). Most of the geometric shapes were also excluded (too many conflicts in size with other sources).

### Summary of standardized variation sequences after block

The charts shown in the following pages have an experimental section showing summaries of standardized variation sequences after the block in which they appear as base character (except CJK Unified Ideographs). A fragment is shown below:

Standardized Variation Sequences	
<i>Experimental listing</i>	
2229	 INTERSECTION <small>2229</small>  with serifs <small>2229 FE00</small>
222A	 UNION <small>222A</small>  with serifs <small>222A FE00</small>
2268	 LESS-THAN BUT NOT EQUAL TO <small>2268</small>  with vertical stroke <small>2268 FE00</small>
2294	 SQUARE CUP <small>2294</small>  with serifs <small>2294 FE00</small>
2295	 CIRCLED PLUS <small>2295</small>  with white rim <small>2295 FE00</small>
2297	 CIRCLED TIMES <small>2297</small>  with white rim <small>2297 FE00</small>
229C	 CIRCLED EQUALS <small>229C</small>

This (or an edited version) could be added in a future edition/amendment of the standard. However it requires that all variation sequences have a displayable representation; without them these summaries are not that useful.

## Open issues

There is no convention of what could be a good representation of ‘Emoji style’ in the code charts. It could be argued that none exists by definition. The editor is open to suggestion.

Based on the current design of the charts, there is no easy solution to display the representation of variation sequences for scripts which are typically represented vertically (such as Mongolian and Phags-pa). The main reason is that commercial/production fonts that represent these characters are designed with characters laid in horizontal flow, not vertical. These commercial fonts contain these variants and it would be easier to use them accordingly for these representations. A separate document (WG2 N4435) covers that issue and possible solutions.

The chart format for the CJK Unified Ideographs provides no simple way to show the standardized variation sequences along with base characters as typical for other blocks. The suggestion is to add them to the annotation associated with the CJK Compatibility Ideographs described in the names of these variations sequences.

Example:

7DF4 FE00; CJK COMPATIBILITY IDEOGRAPH-F996

F996  
系 120.9 練  
KO-665F  
≡ 7DF4 練  
~ 7DF4 FE00

If this was accepted, the sub-clause 31.2 Characters name list describing entries with ‘~’ (introduced in 10646:2012 Amendment 2) should be modified accordingly.

What is unclear is whether a visual representation should be added, and if one is added, which one should be chosen.

Example

F907  
龜 213.0 龜 龜  
KO-5022 H3-8BF8  
≡ 9F9C 龜  
~ 9F9C FE00 龜 (K source) or  
~ 9F9C FE00 龜 (H source) (glyphs shown bigger than in chart)

(It is not clear which of the glyphs corresponding to the K source or H source should be used.)

Alternatively, one standardized variant could be created for each IRG source such as:



9F9C FE00; CJK COMPATIBILITY IDEOGRAPH-F996-K

9F9C FE03; CJK COMPATIBILITY IDEOGRAPH-F996-H


(FE01 and FE02 are used for other CJK Compatibility ideographs 'related' to 9F9C)


Then the example would become:

F907  
龜 213.0

	
KO-5022	H3-8BF8

≡ 9F9C 龜

~ 9F9C FE00  K source

~ 9F9C FE03  H source

Because these standardized variation sequences are not yet finalized it would probably make sense to renumber them to give consecutive numbers within a CJK Compatibility Ideograph entry (i.e. use FE00 and FE01 above and use FE02 and FE03 for the other cases).

















































































































### Presentation of the charts in following pages:

The modified characters are highlighted in yellow (or light shade in black/white version). The name lists have been omitted when they do not contain mathematical variation sequences (except for the 27F0-27FF where both large characters and name list fit in the same page).

Summaries for standardized variation sequences are shown after the Mathematical Operators block (2200-22FF) and the Supplemental Mathematical Operators block (2A00-2AFF).

Page numbers for those charts pages are not in sequences (shown as page 1, 6, 10-17, 24, 27-28, 33, 37-43, 50-53).

	210	211	212	213	214
0	<i>a/c</i> 2100	<i>J</i> 2110	SM 2120	<i>E</i> 2130	$\Sigma$ 2140
1	<i>a/s</i> 2101	<i>S</i> 2111	TEL 2121	<i>F</i> 2131	$\Theta$ 2141
2	$\text{C}$ 2102	<i>L</i> 2112	TM 2122	$\text{F}$ 2132	$\text{L}$ 2142
3	$^{\circ}\text{C}$ 2103	<i>l</i> 2113	<i>V</i> 2123	<i>M</i> 2133	$\text{J}$ 2143
4	$\text{E}$ 2104	$\text{W}$ 2114	Z 2124	<i>o</i> 2134	$\text{A}$ 2144
5	$\%$ 2105	N 2115	$\text{Z}$ 2125	<i>N</i> 2135	<i>D</i> 2145
6	<i>c/u</i> 2106	<i>No</i> 2116	$\Omega$ 2126	$\text{C}$ 2136	<i>d</i> 2146
7	$\text{E}$ 2107	$\text{P}$ 2117	$\text{U}$ 2127	$\lambda$ 2137	<i>e</i> 2147
8	$\text{D}$ 2108	$\text{O}$ 2118	$\text{Z}$ 2128	$\text{L}$ 2138	<i>i</i> 2148
9	$^{\circ}\text{F}$ 2109	$\text{P}$ 2119	$\text{I}$ 2129	<b>i</b> 2139	<i>j</i> 2149
A	<i>g</i> 210A	Q 211A	K 212A	$\text{O}$ 213A	$\text{E}$ 214A
B	<i>H</i> 210B	<i>R</i> 211B	$\text{A}$ 212B	FAX 213B	$\text{S}$ 214B
C	<i>S</i> 210C	<i>R</i> 211C	<i>B</i> 212C	$\pi$ 213C	$\text{P}$ 214C
D	H 210D	R 211D	$\text{C}$ 212D	$\text{Y}$ 213D	A/S 214D
E	<i>h</i> 210E	<i>R</i> 211E	<i>e</i> 212E	$\text{L}$ 213E	$\text{F}$ 214E
F	<i>h</i> 210F	<i>R</i> 211F	<i>e</i> 212F	$\text{I}$ 213F	<i>lll</i> 214F

	219	21A	21B	21C	21D	21E	21F
0	 2190	 21A0	 21B0	 21C0	 21D0	 21E0	 21F0
1	 2191	 21A1	 21B1	 21C1	 21D1	 21E1	 21F1
2	 2192	 21A2	 21B2	 21C2	 21D2	 21E2	 21F2
3	 2193	 21A3	 21B3	 21C3	 21D3	 21E3	 21F3
4	 2194	 21A4	 21B4	 21C4	 21D4	 21E4	 21F4
5	 2195	 21A5	 21B5	 21C5	 21D5	 21E5	 21F5
6	 2196	 21A6	 21B6	 21C6	 21D6	 21E6	 21F6
7	 2197	 21A7	 21B7	 21C7	 21D7	 21E7	 21F7
8	 2198	 21A8	 21B8	 21C8	 21D8	 21E8	 21F8
9	 2199	 21A9	 21B9	 21C9	 21D9	 21E9	 21F9
A	 219A	 21AA	 21BA	 21CA	 21DA	 21EA	 21FA
B	 219B	 21AB	 21BB	 21CB	 21DB	 21EB	 21FB
C	 219C	 21AC	 21BC	 21CC	 21DC	 21EC	 21FC
D	 219D	 21AD	 21BD	 21CD	 21DD	 21ED	 21FD
E	 219E	 21AE	 21BE	 21CE	 21DE	 21EE	 21FE
F	 219F	 21AF	 21BF	 21CF	 21DF	 21EF	 21FF

	220	221	222	223	224	225	226	227	228	229	22A	22B	22C	22D	22E	22F
0	$\nabla$ 2200	$\amalg$ 2210	$\sphericalangle$ 2220	$\int$ 2230	$\zeta$ 2240	$\doteq$ 2250	$\neq$ 2260	$\nlessgtr$ 2270	$\nlessgtr$ 2280	$\sqsupset$ 2290	$\boxtimes$ 22A0	$\wp$ 22B0	$\bigwedge$ 22C0	$\in$ 22D0	$\nlessgtr$ 22E0	$\ddots$ 22F0
1	$\complement$ 2201	$\sum$ 2211	$\triangleleft$ 2221	$f$ 2231	$\zeta$ 2241	$\doteq$ 2251	$\equiv$ 2261	$\nlessgtr$ 2271	$\nlessgtr$ 2281	$\sqsubseteq$ 2291	$\square$ 22A1	$\wp$ 22B1	$\nabla$ 22C1	$\supset$ 22D1	$\nlessgtr$ 22E1	$\ddots$ 22F1
2	$\partial$ 2202	$-$ 2212	$\triangleleft$ 2222	$\oint$ 2232	$\zeta$ 2242	$\doteq$ 2252	$\neq$ 2262	$\nlessgtr$ 2272	$\subset$ 2282	$\sqsubseteq$ 2292	$\top$ 22A2	$\triangle$ 22B2	$\cup$ 22C2	$\supset$ 22D2	$\nlessgtr$ 22E2	$\in$ 22F2
3	$\exists$ 2203	$\mp$ 2213	$ $ 2223	$\oint$ 2233	$\zeta$ 2243	$\doteq$ 2253	$\equiv$ 2263	$\nlessgtr$ 2273	$\supset$ 2283	$\sqsupset$ 2293	$\top$ 22A3	$\triangle$ 22B3	$\cup$ 22C3	$\supset$ 22D3	$\nlessgtr$ 22E3	$\in$ 22F3
4	$\nlessgtr$ 2204	$\dagger$ 2214	$\dagger$ 2224	$\ddots$ 2234	$\nlessgtr$ 2244	$\doteq$ 2254	$\leq$ 2264	$\nlessgtr$ 2274	$\nlessgtr$ 2284	$\sqsupset$ 2294	$\top$ 22A4	$\triangle$ 22B4	$\diamond$ 22C4	$\supset$ 22D4	$\nlessgtr$ 22E4	$\in$ 22F4
5	$\emptyset$ 2205	$/$ 2215	$\parallel$ 2225	$\ddots$ 2235	$\parallel$ 2245	$\doteq$ 2255	$\geq$ 2265	$\nlessgtr$ 2275	$\nlessgtr$ 2285	$\oplus$ 2295	$\perp$ 22A5	$\triangle$ 22B5	$\cdot$ 22C5	$\#$ 22D5	$\nlessgtr$ 22E5	$\in$ 22F5
6	$\triangle$ 2206	$\setminus$ 2216	$\#$ 2226	$:$ 2236	$\nlessgtr$ 2246	$\nlessgtr$ 2256	$\leq$ 2266	$\leq$ 2276	$\subset$ 2286	$\ominus$ 2296	$\top$ 22A6	$\circ$ 22B6	$\star$ 22C6	$\nlessgtr$ 22D6	$\nlessgtr$ 22E6	$\in$ 22F6
7	$\nabla$ 2207	$*$ 2217	$\wedge$ 2227	$\ddots$ 2237	$\nlessgtr$ 2247	$\doteq$ 2257	$\geq$ 2267	$\geq$ 2277	$\supset$ 2287	$\otimes$ 2297	$\top$ 22A7	$\circ$ 22B7	$*$ 22C7	$\nlessgtr$ 22D7	$\nlessgtr$ 22E7	$\in$ 22F7
8	$\in$ 2208	$\circ$ 2218	$\nabla$ 2228	$\cdot$ 2238	$\approx$ 2248	$\equiv$ 2258	$\nlessgtr$ 2268	$\nlessgtr$ 2278	$\nlessgtr$ 2288	$\ominus$ 2298	$\top$ 22A8	$\circ$ 22B8	$\otimes$ 22C8	$\nlessgtr$ 22D8	$\nlessgtr$ 22E8	$\in$ 22F8
9	$\nlessgtr$ 2209	$\cdot$ 2219	$\cup$ 2229	$\cdot$ 2239	$\nlessgtr$ 2249	$\equiv$ 2259	$\nlessgtr$ 2269	$\nlessgtr$ 2279	$\nlessgtr$ 2289	$\odot$ 2299	$\top$ 22A9	$\dagger$ 22B9	$\otimes$ 22C9	$\nlessgtr$ 22D9	$\nlessgtr$ 22E9	$\in$ 22F9
A	$\in$ 220A	$\sqrt{\quad}$ 221A	$\cup$ 222A	$\ddots$ 223A	$\approx$ 224A	$\leq$ 225A	$\nlessgtr$ 226A	$\nlessgtr$ 227A	$\nlessgtr$ 228A	$\odot$ 229A	$\top$ 22AA	$\top$ 22BA	$\otimes$ 22CA	$\nlessgtr$ 22DA	$\nlessgtr$ 22EA	$\in$ 22FA
B	$\supset$ 220B	$\sqrt[3]{\quad}$ 221B	$\int$ 222B	$\approx$ 223B	$\approx$ 224B	$\equiv$ 225B	$\nlessgtr$ 226B	$\nlessgtr$ 227B	$\nlessgtr$ 228B	$\otimes$ 229B	$\top$ 22AB	$\nabla$ 22BB	$\nlessgtr$ 22CB	$\nlessgtr$ 22DB	$\nlessgtr$ 22EB	$\in$ 22FB
C	$\nlessgtr$ 220C	$\sqrt[4]{\quad}$ 221C	$\iint$ 222C	$\approx$ 223C	$\approx$ 224C	$\equiv$ 225C	$\nlessgtr$ 226C	$\nlessgtr$ 227C	$\nlessgtr$ 228C	$\ominus$ 229C	$\nlessgtr$ 22AC	$\nlessgtr$ 22BC	$\nlessgtr$ 22CC	$\nlessgtr$ 22DC	$\nlessgtr$ 22EC	$\in$ 22FC
D	$\supset$ 220D	$\alpha$ 221D	$\iiint$ 222D	$\approx$ 223D	$\approx$ 224D	$\equiv$ 225D	$\nlessgtr$ 226D	$\nlessgtr$ 227D	$\nlessgtr$ 228D	$\ominus$ 229D	$\nlessgtr$ 22AD	$\nabla$ 22BD	$\nlessgtr$ 22CD	$\nlessgtr$ 22DD	$\nlessgtr$ 22ED	$\in$ 22FD
E	$\blacksquare$ 220E	$\infty$ 221E	$\oint$ 222E	$\approx$ 223E	$\approx$ 224E	$\equiv$ 225E	$\nlessgtr$ 226E	$\nlessgtr$ 227E	$\nlessgtr$ 228E	$\oplus$ 229E	$\nlessgtr$ 22AE	$\nabla$ 22BE	$\nlessgtr$ 22CE	$\nlessgtr$ 22DE	$\ddots$ 22EE	$\in$ 22FE
F	$\amalg$ 220F	$\perp$ 221F	$\int$ 222F	$\approx$ 223F	$\approx$ 224F	$\equiv$ 225F	$\nlessgtr$ 226F	$\nlessgtr$ 227F	$\sqsupset$ 228F	$\square$ 229F	$\nlessgtr$ 22AF	$\triangle$ 22BF	$\nlessgtr$ 22CF	$\nlessgtr$ 22DF	$\ddots$ 22EF	$\in$ 22FF

**Miscellaneous mathematical symbols**

2200	$\forall$	<b>FOR ALL</b> = universal quantifier
2201	$\complement$	<b>COMPLEMENT</b> → 0297 $\complement$ latin letter stretched c
2202	$\partial$	<b>PARTIAL DIFFERENTIAL</b>
2203	$\exists$	<b>THERE EXISTS</b> = existential quantifier
2204	$\nexists$	<b>THERE DOES NOT EXIST</b> ≡ 2203 $\exists$ 0338 $\not\exists$
2205	$\emptyset$	<b>EMPTY SET</b> = null set • used in linguistics to indicate a null morpheme or phonological “zero” → 00D8 $\emptyset$ latin capital letter o with stroke → 2300 $\emptyset$ diameter sign
2206	$\Delta$	<b>INCREMENT</b> = Laplace operator = forward difference = symmetric difference (in set theory) • other symbols may also be used for symmetric difference → 0394 $\Delta$ greek capital letter delta → 25B3 $\Delta$ white up-pointing triangle
2207	$\nabla$	<b>NABLA</b> = backward difference = gradient, del • used for Laplacian operator (written with superscript 2) → 25BD $\nabla$ white down-pointing triangle

**Set membership**

2208	$\in$	<b>ELEMENT OF</b>
2209	$\notin$	<b>NOT AN ELEMENT OF</b> ≡ 2208 $\in$ 0338 $\not\in$
220A	$\epsilon$	<b>SMALL ELEMENT OF</b> • originates in math pi fonts; not the straight epsilon → 03F5 $\epsilon$ greek lunate epsilon symbol
220B	$\ni$	<b>CONTAINS AS MEMBER</b> = such that
220C	$\not\ni$	<b>DOES NOT CONTAIN AS MEMBER</b> ≡ 220B $\ni$ 0338 $\not\ni$
220D	$\ni$	<b>SMALL CONTAINS AS MEMBER</b> → 03F6 $\ni$ greek reversed lunate epsilon symbol

**Miscellaneous mathematical symbol**

220E	$\blacksquare$	<b>END OF PROOF</b> = q.e.d. → 2023 $\blacktriangleright$ triangular bullet → 25AE $\blacksquare$ black vertical rectangle
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**N-ary operators**

220F	$\prod$	<b>N-ARY PRODUCT</b> = product sign → 03A0 $\prod$ greek capital letter pi
2210	$\coprod$	<b>N-ARY COPRODUCT</b> = coproduct sign
2211	$\sum$	<b>N-ARY SUMMATION</b> = summation sign → 03A3 $\sum$ greek capital letter sigma → 2140 $\sum$ double-struck n-ary summation

**Operators**

2212	$-$	<b>MINUS SIGN</b> → 002D $-$ hyphen-minus → 2796 $\text{—}$ heavy minus sign
2213	$\mp$	<b>MINUS-OR-PLUS SIGN</b> → 00B1 $\pm$ plus-minus sign
2214	$\dot{+}$	<b>DOT PLUS</b>
2215	$/$	<b>DIVISION SLASH</b> • generic division operator → 002F $/$ solidus → 2044 $/$ fraction slash → 27CB $/$ mathematical rising diagonal
2216	$\setminus$	<b>SET MINUS</b> → 005C $\setminus$ reverse solidus → 27CD $\setminus$ mathematical falling diagonal → 29F5 $\setminus$ reverse solidus operator
2217	$*$	<b>ASTERISK OPERATOR</b> → 002A $*$ asterisk
2218	$\circ$	<b>RING OPERATOR</b> = composite function = APL jot → 00B0 $^\circ$ degree sign → 0970 $^\circ$ devanagari abbreviation sign → 25E6 $\circ$ white bullet → 10B39 $^\circ$ avestan abbreviation mark
2219	$\bullet$	<b>BULLET OPERATOR</b> → 00B7 $\bullet$ middle dot → 2022 $\bullet$ bullet → 2024 $\cdot$ one dot leader
221A	$\sqrt{\quad}$	<b>SQUARE ROOT</b> = radical sign → 2713 $\checkmark$ check mark
221B	$\sqrt[3]{\quad}$	<b>CUBE ROOT</b> → 0606 $\sqrt[3]{\quad}$ arabic-indic cube root
221C	$\sqrt[4]{\quad}$	<b>FOURTH ROOT</b> → 0607 $\sqrt[4]{\quad}$ arabic-indic fourth root
221D	$\propto$	<b>PROPORTIONAL TO</b> → 03B1 $\alpha$ greek small letter alpha

**Miscellaneous mathematical symbols**

221E	$\infty$	<b>INFINITY</b>
221F	$\perp$	<b>RIGHT ANGLE</b>
2220	$\sphericalangle$	<b>ANGLE</b>
2221	$\sphericalangle$	<b>MEASURED ANGLE</b>
2222	$\sphericalangle$	<b>SPHERICAL ANGLE</b> = angle arc

**Relations**

2223	$\mid$	<b>DIVIDES</b> = such that = APL stile → 007C $\mid$ vertical line → 01C0 $\mid$ latin letter dental click
2224	$\nmid$	<b>DOES NOT DIVIDE</b> ≡ 2223 $\mid$ 0338 $\not\mid$
2225	$\parallel$	<b>PARALLEL TO</b> → 01C1 $\parallel$ latin letter lateral click → 2016 $\parallel$ double vertical line
2226	$\nparallel$	<b>NOT PARALLEL TO</b> ≡ 2225 $\parallel$ 0338 $\not\parallel$



**Logical and set operators**

2227	$\wedge$	<b>LOGICAL AND</b> = wedge, conjunction → 22C0 $\bigwedge$ n-ary logical and → 2303 $\frown$ up arrowhead
2228	$\vee$	<b>LOGICAL OR</b> = vee, disjunction → 22C1 $\bigvee$ n-ary logical or → 2304 $\vee$ down arrowhead
2229	$\cap$	<b>INTERSECTION</b> = cap, hat → 22C2 $\bigcap$ n-ary intersection ~ 2229 FE00 $\cap$ with serifs
222A	$\cup$	<b>UNION</b> = cup → 22C3 $\bigcup$ n-ary union ~ 222A FE00 $\cup$ with serifs

**Integrals**

222B	$\int$	<b>INTEGRAL</b> → 0283 $\int$ latin small letter esh
222C	$\iint$	<b>DOUBLE INTEGRAL</b> ≈ 222B $\int$ 222B $\int$
222D	$\iiint$	<b>TRIPLE INTEGRAL</b> → 2A0C $\iiint$ quadruple integral operator ≈ 222B $\int$ 222B $\int$ 222B $\int$
222E	$\oint$	<b>CONTOUR INTEGRAL</b> → 2A15 $\oint$ integral around a point operator
222F	$\oiint$	<b>SURFACE INTEGRAL</b> ≈ 222E $\oint$ 222E $\oint$
2230	$\iiint$	<b>VOLUME INTEGRAL</b> ≈ 222E $\oint$ 222E $\oint$ 222E $\oint$
2231	$\int\limits_{\curvearrowright}$	<b>CLOCKWISE INTEGRAL</b>
2232	$\oint\limits_{\curvearrowright}$	<b>CLOCKWISE CONTOUR INTEGRAL</b>
2233	$\oint\limits_{\curvearrowleft}$	<b>ANTICLOCKWISE CONTOUR INTEGRAL</b> • clockwise or anticlockwise arrows do not reverse during layout mirroring

**Miscellaneous mathematical symbols**

2234	$\therefore$	<b>THEREFORE</b> → 26EC $\therefore$ historic site
2235	$\because$	<b>BECAUSE</b>

**Relations**

2236	$:$	<b>RATIO</b> → 003A $:$ colon
2237	$::$	<b>PROPORTION</b>

**Operator**

2238	$\dot{-}$	<b>DOT MINUS</b> = saturating subtraction • sometimes claimed as notation for symmetric set difference, but 2206 $\Delta$ is preferred
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**Relation**

2239	$-\text{:}$	<b>EXCESS</b>
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**Operator**

223A	$\text{:}$	<b>GEOMETRIC PROPORTION</b>
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**Relations**

223B	$\sim$	<b>HOMOTHETIC</b> → 2A6B $\sim$ tilde operator with rising dots
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223C	$\sim$	<b>TILDE OPERATOR</b> = varies with (proportional to) = difference between = similar to = not = cycle = APL tilde → 007E $\sim$ tilde → 00AC $\nabla$ not sign → 02DC $\sim$ small tilde
223D	$\smile$	<b>REVERSED TILDE</b> = lazy S • reversed tilde and lazy S are glyph variants
223E	$\simeq$	<b>INVERTED LAZY S</b> = most positive

**Miscellaneous mathematical symbol**

223F	$\sim$	<b>SINE WAVE</b> = alternating current
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**Operator**

2240	$\wr$	<b>WREATH PRODUCT</b>
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**Relations**

2241	$\not\sim$	<b>NOT TILDE</b> ≡ 223C $\sim$ 0338 $\not\sim$
2242	$\not\approx$	<b>MINUS TILDE</b>
2243	$\approx$	<b>ASYMPTOTICALLY EQUAL TO</b>
2244	$\not\approx$	<b>NOT ASYMPTOTICALLY EQUAL TO</b> ≡ 2243 $\approx$ 0338 $\not\approx$
2245	$\cong$	<b>APPROXIMATELY EQUAL TO</b>
2246	$\not\cong$	<b>APPROXIMATELY BUT NOT ACTUALLY EQUAL TO</b>
2247	$\not\cong$	<b>NEITHER APPROXIMATELY NOR ACTUALLY EQUAL TO</b> ≡ 2245 $\cong$ 0338 $\not\cong$
2248	$\approx$	<b>ALMOST EQUAL TO</b> = asymptotic to
2249	$\not\approx$	<b>NOT ALMOST EQUAL TO</b> ≡ 2248 $\approx$ 0338 $\not\approx$
224A	$\approx$	<b>ALMOST EQUAL OR EQUAL TO</b>
224B	$\approx$	<b>TRIPLE TILDE</b>
224C	$\equiv$	<b>ALL EQUAL TO</b> • reversed tilde and lazy S are glyph variants
224D	$\asymp$	<b>EQUIVALENT TO</b>
224E	$\simeq$	<b>GEOMETRICALLY EQUIVALENT TO</b>
224F	$\asymp$	<b>DIFFERENCE BETWEEN</b>
2250	$\doteq$	<b>APPROACHES THE LIMIT</b>
2251	$\doteq$	<b>GEOMETRICALLY EQUAL TO</b>
2252	$\doteq$	<b>APPROXIMATELY EQUAL TO OR THE IMAGE OF</b> = nearly equals
2253	$\doteq$	<b>IMAGE OF OR APPROXIMATELY EQUAL TO</b>
2254	$\doteq$	<b>COLON EQUALS</b>
2255	$\doteq$	<b>EQUALS COLON</b>
2256	$\doteq$	<b>RING IN EQUAL TO</b>
2257	$\doteq$	<b>RING EQUAL TO</b> = approximately equal to
2258	$\doteq$	<b>CORRESPONDS TO</b>
2259	$\doteq$	<b>ESTIMATES</b> = corresponds to
225A	$\doteq$	<b>EQUIANGULAR TO</b>
225B	$\doteq$	<b>STAR EQUALS</b>
225C	$\doteq$	<b>DELTA EQUAL TO</b> = equiangular = equal to by definition

225D	$\equiv$	EQUAL TO BY DEFINITION
225E	$\equiv$	MEASURED BY
225F	$\stackrel{?}{\equiv}$	QUESTIONED EQUAL TO
2260	$\neq$	NOT EQUAL TO → 003D = equals sign → 01C2 † latin letter alveolar click ≡ 003D = 0338 $\neq$
2261	$\equiv$	IDENTICAL TO
2262	$\not\equiv$	NOT IDENTICAL TO ≡ 2261 ≡ 0338 $\neq$
2263	$\equiv$	STRICTLY EQUIVALENT TO
2264	$\leq$	LESS-THAN OR EQUAL TO
2265	$\geq$	GREATER-THAN OR EQUAL TO
2266	$\leq$	LESS-THAN OVER EQUAL TO
2267	$\geq$	GREATER-THAN OVER EQUAL TO
2268	$\leq$	LESS-THAN BUT NOT EQUAL TO ~ 2268 FE00 $\leq$ with vertical stroke
2269	$\geq$	GREATER-THAN BUT NOT EQUAL TO ~ 2269 FE00 $\geq$ with vertical stroke
226A	$\ll$	MUCH LESS-THAN → 00AB $\ll$ left-pointing double angle quotation mark
226B	$\gg$	MUCH GREATER-THAN → 00BB $\gg$ right-pointing double angle quotation mark
226C	$\bowtie$	BETWEEN = plaintiff, quantic
226D	$\not\approx$	NOT EQUIVALENT TO ≡ 224D $\approx$ 0338 $\neq$
226E	$\nless$	NOT LESS-THAN ≡ 003C < 0338 $\neq$
226F	$\ngtr$	NOT GREATER-THAN ≡ 003E > 0338 $\neq$
2270	$\nlessgtr$	NEITHER LESS-THAN NOR EQUAL TO ≡ 2264 $\leq$ 0338 $\neq$
2271	$\ngtrless$	NEITHER GREATER-THAN NOR EQUAL TO ≡ 2265 $\geq$ 0338 $\neq$
2272	$\lesssim$	LESS-THAN OR EQUIVALENT TO ~ 2272 FE00 $\lesssim$ following the slant of the lower leg
2273	$\gtrsim$	GREATER-THAN OR EQUIVALENT TO ~ 2273 FE00 $\gtrsim$ following the slant of the lower leg
2274	$\nlessgtr$	NEITHER LESS-THAN NOR EQUIVALENT TO ≡ 2272 $\lesssim$ 0338 $\neq$
2275	$\ngtrless$	NEITHER GREATER-THAN NOR EQUIVALENT TO ≡ 2273 $\gtrsim$ 0338 $\neq$
2276	$\leq$	LESS-THAN OR GREATER-THAN
2277	$\geq$	GREATER-THAN OR LESS-THAN
2278	$\nlessgtr$	NEITHER LESS-THAN NOR GREATER-THAN ≡ 2276 $\leq$ 0338 $\neq$
2279	$\ngtrless$	NEITHER GREATER-THAN NOR LESS-THAN ≡ 2277 $\geq$ 0338 $\neq$
227A	$\prec$	PRECEDES = lower rank than → 22B0 $\prec$ precedes under relation
227B	$\succ$	SUCCEEDS = higher rank than → 22B1 $\succ$ succeeds under relation
227C	$\leq$	PRECEDES OR EQUAL TO
227D	$\geq$	SUCCEEDS OR EQUAL TO
227E	$\lesssim$	PRECEDES OR EQUIVALENT TO
227F	$\gtrsim$	SUCCEEDS OR EQUIVALENT TO

2280	$\nprec$	DOES NOT PRECEDE ≡ 227A < 0338 $\neq$
2281	$\nsuc$	DOES NOT SUCCEED ≡ 227B > 0338 $\neq$
2282	$\subset$	SUBSET OF = included in set → 2E26 $\subset$ left sideways u bracket
2283	$\supset$	SUPERSET OF = includes in set → 2E27 $\supset$ right sideways u bracket
2284	$\not\subset$	NOT A SUBSET OF ≡ 2282 $\subset$ 0338 $\neq$
2285	$\not\supset$	NOT A SUPERSET OF ≡ 2283 $\supset$ 0338 $\neq$
2286	$\subseteq$	SUBSET OF OR EQUAL TO
2287	$\supseteq$	SUPERSET OF OR EQUAL TO
2288	$\not\subseteq$	NEITHER A SUBSET OF NOR EQUAL TO ≡ 2286 $\subseteq$ 0338 $\neq$
2289	$\not\supseteq$	NEITHER A SUPERSET OF NOR EQUAL TO ≡ 2287 $\supseteq$ 0338 $\neq$
228A	$\subsetneq$	SUBSET OF WITH NOT EQUAL TO ~ 228A FE00 $\subsetneq$ with stroke through bottom members
228B	$\supsetneq$	SUPERSET OF WITH NOT EQUAL TO ~ 228B FE00 $\supsetneq$ with stroke through bottom members

**Operators**

228C	$\uplus$	MULTISET
228D	$\uplus$	MULTISET MULTIPLICATION → 2A03 $\uplus$ n-ary union operator with dot → 2A40 $\uplus$ intersection with dot
228E	$\uplus$	MULTISET UNION = z notation bag addition → 2A04 $\uplus$ n-ary union operator with plus

**Relations**

228F	$\square$	SQUARE IMAGE OF
2290	$\square$	SQUARE ORIGINAL OF
2291	$\square$	SQUARE IMAGE OF OR EQUAL TO
2292	$\square$	SQUARE ORIGINAL OF OR EQUAL TO

**Operators**

2293	$\sqcap$	SQUARE CAP → 2A05 $\sqcap$ n-ary square intersection operator ~ 2293 FE00 $\sqcap$ with serifs
2294	$\sqcup$	SQUARE CUP ~ 2294 FE00 $\sqcup$ with serifs
2295	$\oplus$	CIRCLED PLUS = direct sum = vector pointing into page → 2A01 $\oplus$ n-ary circled plus operator → 1F728 $\oplus$ alchemical symbol for verdigris ~ 2295 FE00 $\oplus$ with white rim
2296	$\ominus$	CIRCLED MINUS = symmetric difference → 29B5 $\ominus$ circle with horizontal bar → 1F714 $\ominus$ alchemical symbol for salt
2297	$\otimes$	CIRCLED TIMES = tensor product = vector pointing into page → 26D2 $\otimes$ circled crossing lanes → 2A02 $\otimes$ n-ary circled times operator → 2BBE $\otimes$ circled x ~ 2297 FE00 $\otimes$ with white rim

2298	$\oslash$	CIRCLED DIVISION SLASH
2299	$\odot$	CIRCLED DOT OPERATOR = direct product = vector pointing out of page → 0298 $\odot$ latin letter bilabial click → 2609 $\odot$ sun → 2A00 $\odot$ n-ary circled dot operator
229A	$\odot$	CIRCLED RING OPERATOR → 233E $\odot$ apl functional symbol circle jot → 25CE $\odot$ bullseye
229B	$\otimes$	CIRCLED ASTERISK OPERATOR → 235F $\otimes$ apl functional symbol circle star
229C	$\ominus$	CIRCLED EQUALS ~ 229C FE00 $\ominus$ with equal sign touching the circle
229D	$\ominus$	CIRCLED DASH
229E	$\boxplus$	SQUARED PLUS
229F	$\boxminus$	SQUARED MINUS
22A0	$\boxtimes$	SQUARED TIMES → 2612 $\boxtimes$ ballot box with x → 26DD $\boxtimes$ squared saltire → 1F771 $\boxtimes$ alchemical symbol for month
22A1	$\boxdot$	SQUARED DOT OPERATOR → 1F755 $\boxdot$ alchemical symbol for urine
22A2	$\dashv$	RIGHT TACK = turnstile = proves, implies, yields = reducible
22A3	$\dashv$	LEFT TACK = reverse turnstile = non-theorem, does not yield

**Miscellaneous mathematical symbols**

22A4	$\top$	DOWN TACK = top → 2E06 $\top$ raised interpolation marker → 1F768 $\top$ alchemical symbol for crucible-4
22A5	$\perp$	UP TACK = base, bottom → 27C2 $\perp$ perpendicular

**Relations**

22A6	$\vDash$	ASSERTION = reduces to
22A7	$\models$	MODELS
22A8	$\vDash$	TRUE = statement is true, valid = is a tautology = satisfies = results in
22A9	$\Vdash$	FORCES
22AA	$\equiv$	TRIPLE VERTICAL BAR RIGHT TURNSTILE
22AB	$\equiv$	DOUBLE VERTICAL BAR DOUBLE RIGHT TURNSTILE
22AC	$\nVdash$	DOES NOT PROVE $\equiv$ 22A2 $\dashv$ 0338 $\nVdash$
22AD	$\nVdash$	NOT TRUE $\equiv$ 22A8 $\vDash$ 0338 $\nVdash$
22AE	$\nVdash$	DOES NOT FORCE $\equiv$ 22A9 $\Vdash$ 0338 $\nVdash$
22AF	$\nVdash$	NEGATED DOUBLE VERTICAL BAR DOUBLE RIGHT TURNSTILE $\equiv$ 22AB $\equiv$ 0338 $\nVdash$
22B0	$\prec$	PRECEDES UNDER RELATION → 227A $\prec$ precedes

22B1	$\succ$	SUCCEEDS UNDER RELATION → 227B $\succ$ succeeds
22B2	$\triangleleft$	NORMAL SUBGROUP OF → 25C5 $\triangleleft$ white left-pointing pointer
22B3	$\triangleright$	CONTAINS AS NORMAL SUBGROUP → 25BB $\triangleright$ white right-pointing pointer
22B4	$\trianglelefteq$	NORMAL SUBGROUP OF OR EQUAL TO
22B5	$\trianglerighteq$	CONTAINS AS NORMAL SUBGROUP OR EQUAL TO
22B6	$\rightarrow$	ORIGINAL OF
22B7	$\rightarrow$	IMAGE OF
22B8	$\rightarrow$	MULTIMAP
22B9	$\ddagger$	HERMITIAN CONJUGATE MATRIX

**Operators**

22BA	$\upbar{\top}$	INTERCALATE
22BB	$\underline{\vee}$	XOR → 26BA $\underline{\vee}$ semisextile
22BC	$\bar{\wedge}$	NAND → 2305 $\bar{\wedge}$ projective → 26BB $\bar{\wedge}$ quincunx
22BD	$\nabla$	NOR

**Miscellaneous mathematical symbols**

22BE	$\sphericalangle$	RIGHT ANGLE WITH ARC
22BF	$\triangle$	RIGHT TRIANGLE

**N-ary operators**

22C0	$\bigwedge$	N-ARY LOGICAL AND • also used to denote the universal quantifier → 2227 $\bigwedge$ logical and
22C1	$\bigvee$	N-ARY LOGICAL OR • also used to denote the existential quantifier → 2228 $\bigvee$ logical or
22C2	$\bigcap$	N-ARY INTERSECTION = z notation generalised intersection → 2229 $\bigcap$ intersection
22C3	$\bigcup$	N-ARY UNION = z notation generalised union → 222A $\bigcup$ union

**Operators**

22C4	$\blacklozenge$	DIAMOND OPERATOR → 25C7 $\blacklozenge$ white diamond → 2B29 $\blacklozenge$ black small diamond
22C5	$\cdot$	DOT OPERATOR → 00B7 $\cdot$ middle dot
22C6	$\star$	STAR OPERATOR • APL → 066D $\star$ arabic five pointed star → 2605 $\star$ black star → 2B50 $\star$ white medium star
22C7	$\ast$	DIVISION TIMES

**Relation**

22C8	$\bowtie$	BOWTIE → 2445 $\bowtie$ ocr bow tie
------	-----------	--

**Operators**

22C9	$\ltimes$	LEFT NORMAL FACTOR SEMIDIRECT PRODUCT
22CA	$\rtimes$	RIGHT NORMAL FACTOR SEMIDIRECT PRODUCT
22CB	$\times$	LEFT SEMIDIRECT PRODUCT
22CC	$\ltimes$	RIGHT SEMIDIRECT PRODUCT → 2041 $\ltimes$ caret insertion point

**Relation**22CD  $\simeq$  REVERSED TILDE EQUALS**Logical operators**22CE  $\curlyvee$  CURLY LOGICAL OR22CF  $\curlywedge$  CURLY LOGICAL AND**Relations**22D0  $\subseteq$  DOUBLE SUBSET22D1  $\supseteq$  DOUBLE SUPerset**Operators**22D2  $\cap$  DOUBLE INTERSECTION22D3  $\cup$  DOUBLE UNION**Relations**22D4  $\pitchfork$  PITCHFORK

= proper intersection

22D5  $\#$  EQUAL AND PARALLEL TO→ 2317  $\#$  viewdata square22D6  $\lessdot$  LESS-THAN WITH DOT22D7  $\gtrdot$  GREATER-THAN WITH DOT22D8  $\lll$  VERY MUCH LESS-THAN22D9  $\ggg$  VERY MUCH GREATER-THAN22DA  $\lesseqgtr$  LESS-THAN EQUAL TO OR GREATER-THAN~ 22DA FE00  $\lesseqgtr$  with slanted equal22DB  $\gtrlessgtr$  GREATER-THAN EQUAL TO OR LESS-THAN~ 22DB FE00  $\gtrlessgtr$  with slanted equal22DC  $\lesseqgtr$  EQUAL TO OR LESS-THAN22DD  $\lesseqgtr$  EQUAL TO OR GREATER-THAN22DE  $\lesseqgtr$  EQUAL TO OR PRECEDES22DF  $\lesseqgtr$  EQUAL TO OR SUCCEEDS22E0  $\nlessseqgtr$  DOES NOT PRECEDE OR EQUAL $\equiv$  227C  $\leq$  0338  $\not\leq$ 22E1  $\ngtrlessgtr$  DOES NOT SUCCEED OR EQUAL $\equiv$  227D  $\geq$  0338  $\not\geq$ 22E2  $\nlessseqgtr$  NOT SQUARE IMAGE OF OR EQUAL TO $\equiv$  2291  $\sqsubseteq$  0338  $\not\sqsubseteq$ 22E3  $\nlessseqgtr$  NOT SQUARE ORIGINAL OF OR EQUAL TO $\equiv$  2292  $\sqsupseteq$  0338  $\not\sqsupseteq$ 22E4  $\nlessseqgtr$  SQUARE IMAGE OF OR NOT EQUAL TO22E5  $\nlessseqgtr$  SQUARE ORIGINAL OF OR NOT EQUAL TO22E6  $\nlessseqgtr$  LESS-THAN BUT NOT EQUIVALENT TO22E7  $\nlessseqgtr$  GREATER-THAN BUT NOT EQUIVALENT TO22E8  $\nlessseqgtr$  PRECEDES BUT NOT EQUIVALENT TO22E9  $\nlessseqgtr$  SUCCEEDS BUT NOT EQUIVALENT TO22EA  $\nlessseqgtr$  NOT NORMAL SUBGROUP OF $\equiv$  22B2  $\triangleleft$  0338  $\not\triangleleft$ 22EB  $\nlessseqgtr$  DOES NOT CONTAIN AS NORMAL SUBGROUP $\equiv$  22B3  $\triangleright$  0338  $\not\triangleright$ 22EC  $\nlessseqgtr$  NOT NORMAL SUBGROUP OF OR EQUAL TO $\equiv$  22B4  $\triangleleft$  0338  $\not\triangleleft$ 22ED  $\nlessseqgtr$  DOES NOT CONTAIN AS NORMAL SUBGROUP































OR EQUAL




























































































































































































































































 $\equiv$  22B5  $\triangleright$  0338  $\not\triangleright$ 22EE  $\ddots$  VERTICAL ELLIPSIS

















































- these four ellipses are used for matrix row/column elision
- 205D  $\ddots$  tricolon
- 2026  $\dots$  horizontal ellipsis
- FE19  $\ddots$  presentation form for vertical horizontal ellipsis

















22EF  $\dots$  MIDLINE HORIZONTAL ELLIPSIS22F0  $\therefore$  UP RIGHT DIAGONAL ELLIPSIS22F1  $\therefore$  DOWN RIGHT DIAGONAL ELLIPSIS22F2  $\inleftarrow$  ELEMENT OF WITH LONG HORIZONTAL STROKE22F3  $\inleftarrow$  ELEMENT OF WITH VERTICAL BAR AT END OF HORIZONTAL STROKE22F4  $\inleftarrow$  SMALL ELEMENT OF WITH VERTICAL BAR AT END OF HORIZONTAL STROKE22F5  $\inleftarrow$  ELEMENT OF WITH DOT ABOVE22F6  $\overleftarrow{\in}$  ELEMENT OF WITH OVERBAR22F7  $\overleftarrow{\in}$  SMALL ELEMENT OF WITH OVERBAR22F8  $\underleftarrow{\in}$  ELEMENT OF WITH UNDERBAR22F9  $\inleftarrow$  ELEMENT OF WITH TWO HORIZONTAL STROKES22FA  $\ni$  CONTAINS WITH LONG HORIZONTAL STROKE22FB  $\ni$  CONTAINS WITH VERTICAL BAR AT END OF HORIZONTAL STROKE22FC  $\ni$  SMALL CONTAINS WITH VERTICAL BAR AT END OF HORIZONTAL STROKE22FD  $\overni$  CONTAINS WITH OVERBAR22FE  $\overni$  SMALL CONTAINS WITH OVERBAR22FF  $\E$  Z NOTATION BAG MEMBERSHIP

Experimental listing














Standardized Variation Sequences	
<i>Experimental listing</i>	
2229	 INTERSECTION <small>2229</small>  with serifs <small>2229 FE00</small>
222A	 UNION <small>222A</small>  with serifs <small>222A FE00</small>
2268	 LESS-THAN BUT NOT EQUAL TO <small>2268</small>  with vertical stroke <small>2268 FE00</small>
2269	 GREATER-THAN BUT NOT EQUAL TO <small>2269</small>  with vertical stroke <small>2269 FE00</small>
2272	 LESS-THAN OR EQUIVALENT TO <small>2272</small>  following the slant of the lower leg <small>2272 FE00</small>
2273	 GREATER-THAN OR EQUIVALENT TO <small>2273</small>  following the slant of the lower leg <small>2273 FE00</small>
228A	 SUBSET OF WITH NOT EQUAL TO <small>228A</small>  with stroke through bottom members <small>228A FE00</small>
228B	 SUPERSET OF WITH NOT EQUAL TO <small>228B</small>  with stroke through bottom members <small>228B FE00</small>
2293	 SQUARE CAP <small>2293</small>  with serifs <small>2293 FE00</small>
2294	 SQUARE CUP <small>2294</small>  with serifs <small>2294 FE00</small>
2295	 CIRCLED PLUS <small>2295</small>  with white rim <small>2295 FE00</small>
2297	 CIRCLED TIMES <small>2297</small>  with white rim <small>2297 FE00</small>
229C	 CIRCLED EQUALS <small>229C</small>  with equal sign touching the circle <small>229C FE00</small>
22DA	 LESS-THAN EQUAL TO OR GREATER-THAN <small>22DA</small>  with slanted equal <small>22DA FE00</small>
22DB	 GREATER-THAN EQUAL TO OR LESS-THAN <small>22DB</small>  with slanted equal <small>22DB FE00</small>

	230	231	232	233	234	235	236	237	238	239	23A	23B	23C	23D	23E	23F
0	 2300	 2310	 2320	 2330	 2340	 2350	 2360	 2370	 2380	 2390	 23A0	 23B0	 23C0	 23D0	 23E0	 23F0
1	 2301	 2311	 2321	 2331	 2341	 2351	 2361	 2371	 2381	 2391	 23A1	 23B1	 23C1	 23D1	 23E1	 23F1
2	 2302	 2312	 2322	 2332	 2342	 2352	 2362	 2372	 2382	 2392	 23A2	 23B2	 23C2	 23D2	 23E2	 23F2
3	 2303	 2313	 2323	 2333	 2343	 2353	 2363	 2373	 2383	 2393	 23A3	 23B3	 23C3	 23D3	 23E3	 23F3
4	 2304	 2314	 2324	 2334	 2344	 2354	 2364	 2374	 2384	 2394	 23A4	 23B4	 23C4	 23D4	 23E4	 23F4
5	 2305	 2315	 2325	 2335	 2345	 2355	 2365	 2375	 2385	 2395	 23A5	 23B5	 23C5	 23D5	 23E5	 23F5
6	 2306	 2316	 2326	 2336	 2346	 2356	 2366	 2376	 2386	 2396	 23A6	 23B6	 23C6	 23D6	 23E6	 23F6
7	 2307	 2317	 2327	 2337	 2347	 2357	 2367	 2377	 2387	 2397	 23A7	 23B7	 23C7	 23D7	 23E7	 23F7
8	 2308	 2318	 2328	 2338	 2348	 2358	 2368	 2378	 2388	 2398	 23A8	 23B8	 23C8	 23D8	 23E8	 23F8
9	 2309	 2319	 2329	 2339	 2349	 2359	 2369	 2379	 2389	 2399	 23A9	 23B9	 23C9	 23D9	 23E9	 23F9
A	 230A	 231A	 232A	 233A	 234A	 235A	 236A	 237A	 238A	 239A	 23AA	 23BA	 23CA	 23DA	 23EA	 23FA
B	 230B	 231B	 232B	 233B	 234B	 235B	 236B	 237B	 238B	 239B	 23AB	 23BB	 23CB	 23DB	 23EB	
C	 230C	 231C	 232C	 233C	 234C	 235C	 236C	 237C	 238C	 239C	 23AC	 23BC	 23CC	 23DC	 23EC	
D	 230D	 231D	 232D	 233D	 234D	 235D	 236D	 237D	 238D	 239D	 23AD	 23BD	 23CD	 23DD	 23ED	
E	 230E	 231E	 232E	 233E	 234E	 235E	 236E	 237E	 238E	 239E	 23AE	 23BE	 23CE	 23DE	 23EE	
F	 230F	 231F	 232F	 233F	 234F	 235F	 236F	 237F	 238F	 239F	 23AF	 23BF	 23CF	 23DF	 23EF	

	27C	27D	27E
0	 27C0	 27D0	 27E0
1	 27C1	 27D1	 27E1
2	 27C2	 27D2	 27E2
3	 27C3	 27D3	 27E3
4	 27C4	 27D4	 27E4
5	 27C5	 27D5	 27E5
6	 27C6	 27D6	 27E6
7	 27C7	 27D7	 27E7
8	 27C8	 27D8	 27E8
9	 27C9	 27D9	 27E9
A	 27CA	 27DA	 27EA
B	 27CB	 27DB	 27EB
C	 27CC	 27DC	 27EC
D	 27CD	 27DD	 27ED
E	 27CE	 27DE	 27EE
F	 27CF	 27DF	 27EF





















	27F
0	 27F0
1	 27F1
2	 27F2
3	 27F3
4	 27F4
5	 27F5
6	 27F6
7	 27F7
8	 27F8
9	 27F9
A	 27FA
B	 27FB
C	 27FC
D	 27FD
E	 27FE
F	 27FF

**Arrows**
































































































































27F0		<b>UPWARDS QUADRUPLE ARROW</b> → 290A  upwards triple arrow → 2B45  leftwards quadruple arrow
27F1		<b>DOWNWARDS QUADRUPLE ARROW</b> → 290B  downwards triple arrow
27F2		<b>ANTICLOCKWISE GAPPED CIRCLE ARROW</b> → 21BA  anticlockwise open circle arrow → 2940  anticlockwise closed circle arrow
27F3		<b>CLOCKWISE GAPPED CIRCLE ARROW</b> → 21BB  clockwise open circle arrow → 2941  clockwise closed circle arrow
27F4		<b>RIGHT ARROW WITH CIRCLED PLUS</b> → 2B32  left arrow with circled plus

































































































































**Long arrows**




























































































































































































































































The long arrows are used for mapping whereas the short forms would be used in limits. They are also needed for MathML to complete mapping to the AMSA sets.

27F5		<b>LONG LEFTWARDS ARROW</b> → 2190  leftwards arrow
27F6		<b>LONG RIGHTWARDS ARROW</b> → 2192  rightwards arrow
27F7		<b>LONG LEFT RIGHT ARROW</b> → 2194  left right arrow
27F8		<b>LONG LEFTWARDS DOUBLE ARROW</b> → 21D0  leftwards double arrow
27F9		<b>LONG RIGHTWARDS DOUBLE ARROW</b> → 21D2  rightwards double arrow
27FA		<b>LONG LEFT RIGHT DOUBLE ARROW</b> → 21D4  left right double arrow
27FB		<b>LONG LEFTWARDS ARROW FROM BAR</b> = maps from → 21A4  leftwards arrow from bar
27FC		<b>LONG RIGHTWARDS ARROW FROM BAR</b> = maps to → 21A6  rightwards arrow from bar
27FD		<b>LONG LEFTWARDS DOUBLE ARROW FROM BAR</b> → 2906  leftwards double arrow from bar
27FE		<b>LONG RIGHTWARDS DOUBLE ARROW FROM BAR</b> → 2907  rightwards double arrow from bar
27FF		<b>LONG RIGHTWARDS SQUIGGLE ARROW</b> → 21DD  rightwards squiggle arrow → 2B33  long leftwards squiggle arrow



	290	291	292	293	294	295	296	297
0	 2900	 2910	 2920	 2930	 2940	 2950	 2960	 2970
1	 2901	 2911	 2921	 2931	 2941	 2951	 2961	 2971
2	 2902	 2912	 2922	 2932	 2942	 2952	 2962	 2972
3	 2903	 2913	 2923	 2933	 2943	 2953	 2963	 2973
4	 2904	 2914	 2924	 2934	 2944	 2954	 2964	 2974
5	 2905	 2915	 2925	 2935	 2945	 2955	 2965	 2975
6	 2906	 2916	 2926	 2936	 2946	 2956	 2966	 2976
7	 2907	 2917	 2927	 2937	 2947	 2957	 2967	 2977
8	 2908	 2918	 2928	 2938	 2948	 2958	 2968	 2978
9	 2909	 2919	 2929	 2939	 2949	 2959	 2969	 2979
A	 290A	 291A	 292A	 293A	 294A	 295A	 296A	 297A
B	 290B	 291B	 292B	 293B	 294B	 295B	 296B	 297B
C	 290C	 291C	 292C	 293C	 294C	 295C	 296C	 297C
D	 290D	 291D	 292D	 293D	 294D	 295D	 296D	 297D
E	 290E	 291E	 292E	 293E	 294E	 295E	 296E	 297E
F	 290F	 291F	 292F	 293F	 294F	 295F	 296F	 297F

	298	299	29A	29B	29C	29D	29E	29F
0	 2980	 2990	 29A0	 29B0	 29C0	 29D0	 29E0	 29F0
1	 2981	 2991	 29A1	 29B1	 29C1	 29D1	 29E1	 29F1
2	 2982	 2992	 29A2	 29B2	 29C2	 29D2	 29E2	 29F2
3	 2983	 2993	 29A3	 29B3	 29C3	 29D3	 29E3	 29F3
4	 2984	 2994	 29A4	 29B4	 29C4	 29D4	 29E4	 29F4
5	 2985	 2995	 29A5	 29B5	 29C5	 29D5	 29E5	 29F5
6	 2986	 2996	 29A6	 29B6	 29C6	 29D6	 29E6	 29F6
7	 2987	 2997	 29A7	 29B7	 29C7	 29D7	 29E7	 29F7
8	 2988	 2998	 29A8	 29B8	 29C8	 29D8	 29E8	 29F8
9	 2989	 2999	 29A9	 29B9	 29C9	 29D9	 29E9	 29F9
A	 298A	 299A	 29AA	 29BA	 29CA	 29DA	 29EA	 29FA
B	 298B	 299B	 29AB	 29BB	 29CB	 29DB	 29EB	 29FB
C	 298C	 299C	 29AC	 29BC	 29CC	 29DC	 29EC	 29FC
D	 298D	 299D	 29AD	 29BD	 29CD	 29DD	 29ED	 29FD
E	 298E	 299E	 29AE	 29BE	 29CE	 29DE	 29EE	 29FE
F	 298F	 299F	 29AF	 29BF	 29CF	 29DF	 29EF	 29FF

	2A0	2A1	2A2	2A3	2A4	2A5	2A6	2A7	2A8	2A9	2AA	2AB	2AC	2AD	2AE	2AF
0	 2A00	 2A10	 2A20	 2A30	 2A40	 2A50	 2A60	 2A70	 2A80	 2A90	 2AA0	 2AB0	 2AC0	 2AD0	 2AE0	 2AF0
1	 2A01	 2A11	 2A21	 2A31	 2A41	 2A51	 2A61	 2A71	 2A81	 2A91	 2AA1	 2AB1	 2AC1	 2AD1	 2AE1	 2AF1
2	 2A02	 2A12	 2A22	 2A32	 2A42	 2A52	 2A62	 2A72	 2A82	 2A92	 2AA2	 2AB2	 2AC2	 2AD2	 2AE2	 2AF2
3	 2A03	 2A13	 2A23	 2A33	 2A43	 2A53	 2A63	 2A73	 2A83	 2A93	 2AA3	 2AB3	 2AC3	 2AD3	 2AE3	 2AF3
4	 2A04	 2A14	 2A24	 2A34	 2A44	 2A54	 2A64	 2A74	 2A84	 2A94	 2AA4	 2AB4	 2AC4	 2AD4	 2AE4	 2AF4
5	 2A05	 2A15	 2A25	 2A35	 2A45	 2A55	 2A65	 2A75	 2A85	 2A95	 2AA5	 2AB5	 2AC5	 2AD5	 2AE5	 2AF5
6	 2A06	 2A16	 2A26	 2A36	 2A46	 2A56	 2A66	 2A76	 2A86	 2A96	 2AA6	 2AB6	 2AC6	 2AD6	 2AE6	 2AF6
7	 2A07	 2A17	 2A27	 2A37	 2A47	 2A57	 2A67	 2A77	 2A87	 2A97	 2AA7	 2AB7	 2AC7	 2AD7	 2AE7	 2AF7
8	 2A08	 2A18	 2A28	 2A38	 2A48	 2A58	 2A68	 2A78	 2A88	 2A98	 2AA8	 2AB8	 2AC8	 2AD8	 2AE8	 2AF8
9	 2A09	 2A19	 2A29	 2A39	 2A49	 2A59	 2A69	 2A79	 2A89	 2A99	 2AA9	 2AB9	 2AC9	 2AD9	 2AE9	 2AF9
A	 2A0A	 2A1A	 2A2A	 2A3A	 2A4A	 2A5A	 2A6A	 2A7A	 2A8A	 2A9A	 2AA	 2ABA	 2ACA	 2ADA	 2AEA	 2AFA
B	 2A0B	 2A1B	 2A2B	 2A3B	 2A4B	 2A5B	 2A6B	 2A7B	 2A8B	 2A9B	 2AAB	 2ABB	 2ACB	 2ADB	 2AEB	 2AFB
C	 2A0C	 2A1C	 2A2C	 2A3C	 2A4C	 2A5C	 2A6C	 2A7C	 2A8C	 2A9C	 2AAC	 2ABC	 2ACC	 2ADC	 2AEC	 2AFC
D	 2A0D	 2A1D	 2A2D	 2A3D	 2A4D	 2A5D	 2A6D	 2A7D	 2A8D	 2A9D	 2AAD	 2ABD	 2ACD	 2ADD	 2AED	 2AFD
E	 2A0E	 2A1E	 2A2E	 2A3E	 2A4E	 2A5E	 2A6E	 2A7E	 2A8E	 2A9E	 2AAE	 2ABE	 2ACE	 2ADE	 2AEE	 2AFE
F	 2A0F	 2A1F	 2A2F	 2A3F	 2A4F	 2A5F	 2A6F	 2A7F	 2A8F	 2A9F	 2AAF	 2ABF	 2ACF	 2ADF	 2AEF	 2AFF

**N-ary operators**

2A00	$\odot$	N-ARY CIRCLED DOT OPERATOR → 2299 $\odot$ circled dot operator → 25C9 $\odot$ fisheye
2A01	$\oplus$	N-ARY CIRCLED PLUS OPERATOR → 2295 $\oplus$ circled plus
2A02	$\otimes$	N-ARY CIRCLED TIMES OPERATOR → 2297 $\otimes$ circled times → 2B59 $\otimes$ heavy circled saltire
2A03	$\dot{\cup}$	N-ARY UNION OPERATOR WITH DOT
2A04	$\dot{\cup}$	N-ARY UNION OPERATOR WITH PLUS → 228E $\dot{\cup}$ multiset union
2A05	$\sqcap$	N-ARY SQUARE INTERSECTION OPERATOR → 2293 $\sqcap$ square cap
2A06	$\sqcup$	N-ARY SQUARE UNION OPERATOR → 2294 $\sqcup$ square cup
2A07	$\pitchfork$	TWO LOGICAL AND OPERATOR = merge → 2A55 $\pitchfork$ two intersecting logical and
2A08	$\pitchfork$	TWO LOGICAL OR OPERATOR → 2A56 $\pitchfork$ two intersecting logical or
2A09	$\times$	N-ARY TIMES OPERATOR → 00D7 $\times$ multiplication sign

**Summations and integrals**

2A0A	$\sum_2$	MODULO TWO SUM → 2211 $\sum$ n-ary summation
2A0B	$\int$	SUMMATION WITH INTEGRAL
2A0C	$\iiint$	QUADRUPLE INTEGRAL OPERATOR → 222D $\iiint$ triple integral $\approx$ 222B $\int$ 222B $\int$ 222B $\int$ 222B $\int$
2A0D	$\int$	FINITE PART INTEGRAL
2A0E	$\int$	INTEGRAL WITH DOUBLE STROKE
2A0F	$\int$	INTEGRAL AVERAGE WITH SLASH
2A10	$\int$	CIRCULATION FUNCTION
2A11	$\int$	ANTICLOCKWISE INTEGRATION
2A12	$\int$	LINE INTEGRATION WITH RECTANGULAR PATH AROUND POLE
2A13	$\int$	LINE INTEGRATION WITH SEMICIRCULAR PATH AROUND POLE
2A14	$\int$	LINE INTEGRATION NOT INCLUDING THE POLE
2A15	$\oint$	INTEGRAL AROUND A POINT OPERATOR → 222E $\oint$ contour integral
2A16	$\int$	QUATERNION INTEGRAL OPERATOR
2A17	$\int$	INTEGRAL WITH LEFTWARDS ARROW WITH HOOK
2A18	$\int$	INTEGRAL WITH TIMES SIGN
2A19	$\int$	INTEGRAL WITH INTERSECTION
2A1A	$\int$	INTEGRAL WITH UNION
2A1B	$\int$	INTEGRAL WITH OVERBAR = upper integral
2A1C	$\int$	INTEGRAL WITH UNDERBAR = lower integral

**Miscellaneous large operators**

2A1D	$\bowtie$	JOIN = large bowtie • relational database theory → 22C8 $\bowtie$ bowtie → 27D7 $\bowtie$ full outer join
2A1E	$\triangleleft$	LARGE LEFT TRIANGLE OPERATOR • relational database theory → 25C1 $\triangleleft$ white left-pointing triangle

2A1F	$\S$	Z NOTATION SCHEMA COMPOSITION → 2A3E $\S$ z notation relational composition
2A20	$\gg$	Z NOTATION SCHEMA PIPING → 226B $\gg$ much greater-than
2A21	$\upharpoonright$	Z NOTATION SCHEMA PROJECTION → 21BE $\upharpoonright$ upwards harpoon with barb rightwards

**Plus and minus sign operators**

2A22	$\ddagger$	PLUS SIGN WITH SMALL CIRCLE ABOVE
2A23	$\dagger$	PLUS SIGN WITH CIRCUMFLEX ACCENT ABOVE
2A24	$\mp$	PLUS SIGN WITH TILDE ABOVE = positive difference or sum
2A25	$\dagger$	PLUS SIGN WITH DOT BELOW → 2214 $\dagger$ dot plus
2A26	$\ddagger$	PLUS SIGN WITH TILDE BELOW = sum or positive difference
2A27	$\ddagger$	PLUS SIGN WITH SUBSCRIPT TWO = nim-addition
2A28	$\dagger$	PLUS SIGN WITH BLACK TRIANGLE
2A29	$\dagger$	MINUS SIGN WITH COMMA ABOVE
2A2A	$\dagger$	MINUS SIGN WITH DOT BELOW → 2238 $\dagger$ dot minus
2A2B	$\ddagger$	MINUS SIGN WITH FALLING DOTS
2A2C	$\ddagger$	MINUS SIGN WITH RISING DOTS
2A2D	$\oplus$	PLUS SIGN IN LEFT HALF CIRCLE
2A2E	$\oplus$	PLUS SIGN IN RIGHT HALF CIRCLE

**Multiplication and division sign operators**

2A2F	$\times$	VECTOR OR CROSS PRODUCT → 00D7 $\times$ multiplication sign
2A30	$\times$	MULTIPLICATION SIGN WITH DOT ABOVE
2A31	$\times$	MULTIPLICATION SIGN WITH UNDERBAR
2A32	$\times$	SEMIDIRECT PRODUCT WITH BOTTOM CLOSED
2A33	$\otimes$	SMASH PRODUCT
2A34	$\otimes$	MULTIPLICATION SIGN IN LEFT HALF CIRCLE
2A35	$\otimes$	MULTIPLICATION SIGN IN RIGHT HALF CIRCLE
2A36	$\otimes$	CIRCLED MULTIPLICATION SIGN WITH CIRCUMFLEX ACCENT
2A37	$\otimes$	MULTIPLICATION SIGN IN DOUBLE CIRCLE
2A38	$\oslash$	CIRCLED DIVISION SIGN

**Miscellaneous mathematical operators**

2A39	$\triangle$	PLUS SIGN IN TRIANGLE
2A3A	$\triangle$	MINUS SIGN IN TRIANGLE
2A3B	$\triangle$	MULTIPLICATION SIGN IN TRIANGLE
2A3C	$\lrcorner$	INTERIOR PRODUCT → 230B $\lrcorner$ right floor ~ 2A3C FE00 $\lrcorner$ tall variant with narrow foot
2A3D	$\llcorner$	RIGHTHAND INTERIOR PRODUCT → 230A $\llcorner$ left floor → 2319 $\llcorner$ turned not sign ~ 2A3D FE00 $\llcorner$ tall variant with narrow foot
2A3E	$\S$	Z NOTATION RELATIONAL COMPOSITION → 2A1F $\S$ z notation schema composition
2A3F	$\amalg$	AMALGAMATION OR COPRODUCT → 2210 $\amalg$ n-ary coproduct

**Intersections and unions**

2A40	$\cap$	INTERSECTION WITH DOT → 2227 $\cap$ logical and → 27D1 $\cap$ and with dot
2A41	$\dot{\cup}$	UNION WITH MINUS SIGN = z notation bag subtraction → 228E $\dot{\cup}$ multiset union

2A42	$\bar{\cup}$	UNION WITH OVERBAR
2A43	$\bar{\cap}$	INTERSECTION WITH OVERBAR
2A44	$\bar{\cap}$	INTERSECTION WITH LOGICAL AND
2A45	$\bar{\cup}$	UNION WITH LOGICAL OR
2A46	$\bar{\cup} \cap$	UNION ABOVE INTERSECTION
2A47	$\bar{\cap} \cup$	INTERSECTION ABOVE UNION
2A48	$\bar{\cup} \bar{\cap}$	UNION ABOVE BAR ABOVE INTERSECTION
2A49	$\bar{\cap} \bar{\cup}$	INTERSECTION ABOVE BAR ABOVE UNION
2A4A	$\bar{\cup} \bar{\cap}$	UNION BESIDE AND JOINED WITH UNION
2A4B	$\bar{\cap} \bar{\cup}$	INTERSECTION BESIDE AND JOINED WITH INTERSECTION
2A4C	$\bar{\cup}$	CLOSED UNION WITH SERIFS → 222A $\bar{\cup}$ union
2A4D	$\bar{\cap}$	CLOSED INTERSECTION WITH SERIFS → 2229 $\bar{\cap}$ intersection
2A4E	$\bar{\cap}$	DOUBLE SQUARE INTERSECTION
2A4F	$\bar{\cup}$	DOUBLE SQUARE UNION
2A50	$\bar{\cup}$	CLOSED UNION WITH SERIFS AND SMASH PRODUCT

**Logical ands and ors**

2A51	$\wedge$	LOGICAL AND WITH DOT ABOVE
2A52	$\vee$	LOGICAL OR WITH DOT ABOVE
2A53	$\wedge$	DOUBLE LOGICAL AND
2A54	$\vee$	DOUBLE LOGICAL OR
2A55	$\wedge$	TWO INTERSECTING LOGICAL AND → 2A07 $\wedge$ two logical and operator
2A56	$\vee$	TWO INTERSECTING LOGICAL OR → 2A08 $\vee$ two logical or operator
2A57	$\sloperight$	SLOPING LARGE OR
2A58	$\slopleft$	SLOPING LARGE AND
2A59	$\times$	LOGICAL OR OVERLAPPING LOGICAL AND
2A5A	$\wedge$	LOGICAL AND WITH MIDDLE STEM
2A5B	$\vee$	LOGICAL OR WITH MIDDLE STEM
2A5C	$\wedge$	LOGICAL AND WITH HORIZONTAL DASH
2A5D	$\vee$	LOGICAL OR WITH HORIZONTAL DASH
2A5E	$\bar{\wedge}$	LOGICAL AND WITH DOUBLE OVERBAR → 2306 $\bar{\wedge}$ perspective
2A5F	$\underline{\wedge}$	LOGICAL AND WITH UNDERBAR
2A60	$\underline{\wedge}$	LOGICAL AND WITH DOUBLE UNDERBAR → 2259 $\underline{\wedge}$ estimates
2A61	$\sloperight$	SMALL VEE WITH UNDERBAR → 225A $\sloperight$ equiangular to
2A62	$\bar{\vee}$	LOGICAL OR WITH DOUBLE OVERBAR
2A63	$\underline{\vee}$	LOGICAL OR WITH DOUBLE UNDERBAR → 225A $\underline{\vee}$ equiangular to

**Miscellaneous mathematical operators**

2A64	$\triangleleft$	Z NOTATION DOMAIN ANTIRESTRICTION
2A65	$\triangleright$	Z NOTATION RANGE ANTIRESTRICTION → 2332 $\triangleright$ conical taper

**Relational operators**

2A66	$\doteq$	EQUALS SIGN WITH DOT BELOW → 2250 $\doteq$ approaches the limit
2A67	$\doteq$	IDENTICAL WITH DOT ABOVE
2A68	$\#$	TRIPLE HORIZONTAL BAR WITH DOUBLE VERTICAL STROKE = identical and parallel to → 22D5 $\#$ equal and parallel to → 29E5 $\#$ identical to and slanted parallel
2A69	$\#$	TRIPLE HORIZONTAL BAR WITH TRIPLE VERTICAL STROKE
2A6A	$\sim$	TILDE OPERATOR WITH DOT ABOVE

2A6B	$\approx$	TILDE OPERATOR WITH RISING DOTS → 223B $\approx$ homothetic
2A6C	$\approx$	SIMILAR MINUS SIMILAR
2A6D	$\doteq$	CONGRUENT WITH DOT ABOVE → 2245 $\doteq$ approximately equal to
2A6E	$\doteq$	EQUALS WITH ASTERISK → 225B $\doteq$ star equals
2A6F	$\approx$	ALMOST EQUAL TO WITH CIRCUMFLEX ACCENT
2A70	$\doteq$	APPROXIMATELY EQUAL OR EQUAL TO
2A71	$\doteq$	EQUALS SIGN ABOVE PLUS SIGN • black stands slightly better (chess notation)
2A72	$\doteq$	PLUS SIGN ABOVE EQUALS SIGN • white stands slightly better (chess notation)
2A73	$\doteq$	EQUALS SIGN ABOVE TILDE OPERATOR
2A74	$\doteq$	DOUBLE COLON EQUAL $\approx$ 003A : 003A : 003D =
2A75	$\doteq$	TWO CONSECUTIVE EQUALS SIGNS $\approx$ 003D = 003D =
2A76	$\doteq$	THREE CONSECUTIVE EQUALS SIGNS $\approx$ 003D = 003D = 003D =
2A77	$\doteq$	EQUALS SIGN WITH TWO DOTS ABOVE AND TWO DOTS BELOW
2A78	$\doteq$	EQUIVALENT WITH FOUR DOTS ABOVE
2A79	$\triangleleft$	LESS-THAN WITH CIRCLE INSIDE
2A7A	$\triangleright$	GREATER-THAN WITH CIRCLE INSIDE
2A7B	$\triangleleft$	LESS-THAN WITH QUESTION MARK ABOVE
2A7C	$\triangleright$	GREATER-THAN WITH QUESTION MARK ABOVE
2A7D	$\triangleleft$	LESS-THAN OR SLANTED EQUAL TO → 2264 $\triangleleft$ less-than or equal to
2A7E	$\triangleright$	GREATER-THAN OR SLANTED EQUAL TO → 2265 $\triangleright$ greater-than or equal to
2A7F	$\triangleleft$	LESS-THAN OR SLANTED EQUAL TO WITH DOT INSIDE
2A80	$\triangleright$	GREATER-THAN OR SLANTED EQUAL TO WITH DOT INSIDE
2A81	$\triangleleft$	LESS-THAN OR SLANTED EQUAL TO WITH DOT ABOVE
2A82	$\triangleright$	GREATER-THAN OR SLANTED EQUAL TO WITH DOT ABOVE
2A83	$\triangleleft$	LESS-THAN OR SLANTED EQUAL TO WITH DOT ABOVE RIGHT
2A84	$\triangleright$	GREATER-THAN OR SLANTED EQUAL TO WITH DOT ABOVE LEFT
2A85	$\triangleleft$	LESS-THAN OR APPROXIMATE
2A86	$\triangleright$	GREATER-THAN OR APPROXIMATE
2A87	$\triangleleft$	LESS-THAN AND SINGLE-LINE NOT EQUAL TO → 2268 $\triangleleft$ less-than but not equal to
2A88	$\triangleright$	GREATER-THAN AND SINGLE-LINE NOT EQUAL TO → 2269 $\triangleright$ greater-than but not equal to
2A89	$\triangleleft$	LESS-THAN AND NOT APPROXIMATE
2A8A	$\triangleright$	GREATER-THAN AND NOT APPROXIMATE
2A8B	$\doteq$	LESS-THAN ABOVE DOUBLE-LINE EQUAL ABOVE GREATER-THAN → 22DA $\doteq$ less-than equal to or greater-than
2A8C	$\doteq$	GREATER-THAN ABOVE DOUBLE-LINE EQUAL ABOVE LESS-THAN → 22DB $\doteq$ greater-than equal to or less-than
2A8D	$\doteq$	LESS-THAN ABOVE SIMILAR OR EQUAL
2A8E	$\doteq$	GREATER-THAN ABOVE SIMILAR OR EQUAL
2A8F	$\doteq$	LESS-THAN ABOVE SIMILAR ABOVE GREATER-THAN

2A90	$\gtrsim$	GREATER-THAN ABOVE SIMILAR ABOVE LESS-THAN
2A91	$\gtrless$	LESS-THAN ABOVE GREATER-THAN ABOVE DOUBLE-LINE EQUAL
2A92	$\gtrless$	GREATER-THAN ABOVE LESS-THAN ABOVE DOUBLE-LINE EQUAL
2A93	$\gtrless$	LESS-THAN ABOVE SLANTED EQUAL ABOVE GREATER-THAN ABOVE SLANTED EQUAL
2A94	$\gtrless$	GREATER-THAN ABOVE SLANTED EQUAL ABOVE LESS-THAN ABOVE SLANTED EQUAL
2A95	$\lessgtr$	SLANTED EQUAL TO OR LESS-THAN → 22DC $\lessgtr$ equal to or less-than
2A96	$\lessgtr$	SLANTED EQUAL TO OR GREATER-THAN → 22DD $\lessgtr$ equal to or greater-than
2A97	$\lessgtr$	SLANTED EQUAL TO OR LESS-THAN WITH DOT INSIDE
2A98	$\lessgtr$	SLANTED EQUAL TO OR GREATER-THAN WITH DOT INSIDE
2A99	$\lessgtr$	DOUBLE-LINE EQUAL TO OR LESS-THAN → 22DC $\lessgtr$ equal to or less-than
2A9A	$\lessgtr$	DOUBLE-LINE EQUAL TO OR GREATER-THAN → 22DD $\lessgtr$ equal to or greater-than
2A9B	$\lessgtr$	DOUBLE-LINE SLANTED EQUAL TO OR LESS-THAN
2A9C	$\lessgtr$	DOUBLE-LINE SLANTED EQUAL TO OR GREATER-THAN
2A9D	$\lessgtr$	SIMILAR OR LESS-THAN ~ 2A9D FE00 $\lessgtr$ with similar following the slant of the upper leg
2A9E	$\lessgtr$	SIMILAR OR GREATER-THAN ~ 2A9E FE00 $\lessgtr$ with similar following the slant of the upper leg
2A9F	$\lessgtr$	SIMILAR ABOVE LESS-THAN ABOVE EQUALS SIGN
2AA0	$\lessgtr$	SIMILAR ABOVE GREATER-THAN ABOVE EQUALS SIGN
2AA1	$\lll$	DOUBLE NESTED LESS-THAN = absolute continuity → 226A $\lll$ much less-than
2AA2	$\ggg$	DOUBLE NESTED GREATER-THAN → 226B $\ggg$ much greater-than
2AA3	$\lessgtr$	DOUBLE NESTED LESS-THAN WITH UNDERBAR
2AA4	$\lessgtr$	GREATER-THAN OVERLAPPING LESS-THAN
2AA5	$\times$	GREATER-THAN BESIDE LESS-THAN
2AA6	$\triangleleft$	LESS-THAN CLOSED BY CURVE
2AA7	$\triangleright$	GREATER-THAN CLOSED BY CURVE
2AA8	$\triangleleft$	LESS-THAN CLOSED BY CURVE ABOVE SLANTED EQUAL
2AA9	$\triangleright$	GREATER-THAN CLOSED BY CURVE ABOVE SLANTED EQUAL
2AAA	$\ll$	SMALLER THAN
2AAB	$\gg$	LARGER THAN
2AAC	$\leqslant$	SMALLER THAN OR EQUAL TO ~ 2AAC FE00 $\leqslant$ with slanted equal
2AAD	$\geqslant$	LARGER THAN OR EQUAL TO ~ 2AAD FE00 $\geqslant$ with slanted equal
2AAE	$\equiv$	EQUALS SIGN WITH BUMPY ABOVE → 224F $\equiv$ difference between
2AAF	$\preceq$	PRECEDES ABOVE SINGLE-LINE EQUALS SIGN → 227C $\preceq$ precedes or equal to
2AB0	$\succeq$	SUCCEEDS ABOVE SINGLE-LINE EQUALS SIGN → 227D $\succeq$ succeeds or equal to
2AB1	$\preceq$	PRECEDES ABOVE SINGLE-LINE NOT EQUAL TO
2AB2	$\succeq$	SUCCEEDS ABOVE SINGLE-LINE NOT EQUAL TO

2AB3	$\preceq$	PRECEDES ABOVE EQUALS SIGN
2AB4	$\succeq$	SUCCEEDS ABOVE EQUALS SIGN
2AB5	$\neq$	PRECEDES ABOVE NOT EQUAL TO
2AB6	$\neq$	SUCCEEDS ABOVE NOT EQUAL TO
2AB7	$\approx$	PRECEDES ABOVE ALMOST EQUAL TO
2AB8	$\approx$	SUCCEEDS ABOVE ALMOST EQUAL TO
2AB9	$\approx$	PRECEDES ABOVE NOT ALMOST EQUAL TO
2ABA	$\approx$	SUCCEEDS ABOVE NOT ALMOST EQUAL TO
2ABB	$\preceq$	DOUBLE PRECEDES
2ABC	$\succeq$	DOUBLE SUCCEEDS

**Subset and superset relations**

2ABD	$\subset$	SUBSET WITH DOT
2ABE	$\supset$	SUPERSET WITH DOT
2ABF	$\subset$	SUBSET WITH PLUS SIGN BELOW
2AC0	$\supset$	SUPERSET WITH PLUS SIGN BELOW
2AC1	$\subset$	SUBSET WITH MULTIPLICATION SIGN BELOW
2AC2	$\supset$	SUPERSET WITH MULTIPLICATION SIGN BELOW
2AC3	$\subset$	SUBSET OF OR EQUAL TO WITH DOT ABOVE
2AC4	$\supset$	SUPERSET OF OR EQUAL TO WITH DOT ABOVE
2AC5	$\subset$	SUBSET OF ABOVE EQUALS SIGN
2AC6	$\supset$	SUPERSET OF ABOVE EQUALS SIGN
2AC7	$\subset$	SUBSET OF ABOVE TILDE OPERATOR
2AC8	$\supset$	SUPERSET OF ABOVE TILDE OPERATOR
2AC9	$\subset$	SUBSET OF ABOVE ALMOST EQUAL TO
2ACA	$\supset$	SUPERSET OF ABOVE ALMOST EQUAL TO
2ACB	$\subset$	SUBSET OF ABOVE NOT EQUAL TO ~ 2ACB FE00 $\subset$ with stroke through bottom members
2ACC	$\supset$	SUPERSET OF ABOVE NOT EQUAL TO ~ 2ACC FE00 $\supset$ with stroke through bottom members
2ACD	$\sqsubset$	SQUARE LEFT OPEN BOX OPERATOR
2ACE	$\sqsupset$	SQUARE RIGHT OPEN BOX OPERATOR
2ACF	$\sqsubset$	CLOSED SUBSET → 2282 $\sqsubset$ subset of
2AD0	$\supset$	CLOSED SUPERSET → 2283 $\supset$ superset of
2AD1	$\sqsubset$	CLOSED SUBSET OR EQUAL TO
2AD2	$\sqsupset$	CLOSED SUPERSET OR EQUAL TO
2AD3	$\supset$	SUBSET ABOVE SUPERSET
2AD4	$\supset$	SUPERSET ABOVE SUBSET
2AD5	$\supset$	SUBSET ABOVE SUBSET
2AD6	$\supset$	SUPERSET ABOVE SUPERSET
2AD7	$\supset$	SUPERSET BESIDE SUBSET
2AD8	$\supset$	SUPERSET BESIDE AND JOINED BY DASH WITH SUBSET

**Forks**

2AD9	$\pitchfork$	ELEMENT OF OPENING DOWNWARDS → 2208 $\in$ element of → 27D2 $\pitchfork$ element of opening upwards
2ADA	$\pitchfork$	PITCHFORK WITH TEE TOP → 22D4 $\pitchfork$ pitchfork
2ADB	$\pitchfork$	TRANSVERSAL INTERSECTION → 22D4 $\pitchfork$ pitchfork
2ADC	$\pitchfork$	FORKING = not independent • an equational logic symbol, not a computing science symbol • non-independence (original concept) is related to forking $\equiv$ 2ADD $\pitchfork$ 0338 $\pitchfork$

2ADD  $\Downarrow$  NONFORKING  
 = independent  
 • an equational logic symbol, not a computing science symbol  
 • independence (original concept) is related to non-forking

**Tacks and turnstiles**

2ADE  $\dashv$  SHORT LEFT TACK  
 → 22A3  $\dashv$  left tack

2ADF  $\dashv$  SHORT DOWN TACK  
 → 22A4  $\dashv$  down tack

2AE0  $\dashv$  SHORT UP TACK  
 → 22A5  $\dashv$  up tack

2AE1  $\perp$  PERPENDICULAR WITH S

2AE2  $\vDash$  VERTICAL BAR TRIPLE RIGHT TURNSTILE  
 = ordinarily satisfies

2AE3  $\dashv$  DOUBLE VERTICAL BAR LEFT TURNSTILE  
 → 22A9  $\dashv$  forces

2AE4  $\vDash$  VERTICAL BAR DOUBLE LEFT TURNSTILE  
 → 22A8  $\vDash$  true

2AE5  $\vDash$  DOUBLE VERTICAL BAR DOUBLE LEFT TURNSTILE

2AE6  $\dashv$  LONG DASH FROM LEFT MEMBER OF DOUBLE VERTICAL  
 → 22A9  $\dashv$  forces

2AE7  $\dashv$  SHORT DOWN TACK WITH OVERBAR  
 → 22A4  $\dashv$  down tack  
 → 2351  $\dashv$  apl functional symbol up tack overbar

2AE8  $\dashv$  SHORT UP TACK WITH UNDERBAR  
 → 22A5  $\dashv$  up tack  
 → 234A  $\dashv$  apl functional symbol down tack underbar

2AE9  $\dashv$  SHORT UP TACK ABOVE SHORT DOWN TACK

2AEA  $\dashv$  DOUBLE DOWN TACK

2AEB  $\dashv$  DOUBLE UP TACK  
 = independence  
 • probability theory

2AEC  $\dashv$  DOUBLE STROKE NOT SIGN  
 → 00AC  $\dashv$  not sign

2AED  $\dashv$  REVERSED DOUBLE STROKE NOT SIGN  
 → 2310  $\dashv$  reversed not sign

**Vertical line operators**

2AEE  $\dashv$  DOES NOT DIVIDE WITH REVERSED NEGATION SLASH  
 → 2224  $\dashv$  does not divide

2AEF  $\dashv$  VERTICAL LINE WITH CIRCLE ABOVE

2AF0  $\dashv$  VERTICAL LINE WITH CIRCLE BELOW

2AF1  $\dashv$  DOWN TACK WITH CIRCLE BELOW  
 = necessarily satisfies  
 → 27DF  $\dashv$  up tack with circle above

2AF2  $\dashv$  PARALLEL WITH HORIZONTAL STROKE  
 → 2226  $\dashv$  not parallel to  
 → 27CA  $\dashv$  vertical bar with horizontal stroke

2AF3  $\dashv$  PARALLEL WITH TILDE OPERATOR

2AF4  $\dashv$  TRIPLE VERTICAL BAR BINARY RELATION  
 = interleave  
 → 2980  $\dashv$  triple vertical bar delimiter

2AF5  $\dashv$  TRIPLE VERTICAL BAR WITH HORIZONTAL STROKE  
 → 27CA  $\dashv$  vertical bar with horizontal stroke

**Miscellaneous mathematical operator**

2AF6  $\dashv$  TRIPLE COLON OPERATOR  
 • logic  
 → 205D  $\dashv$  tricolon  
 → 22EE  $\dashv$  vertical ellipsis

**Relations**

2AF7  $\dashv$  TRIPLE NESTED LESS-THAN  
 → 22D8  $\dashv$  very much less-than

2AF8  $\dashv$  TRIPLE NESTED GREATER-THAN  
 → 22D9  $\dashv$  very much greater-than

2AF9  $\dashv$  DOUBLE-LINE SLANTED LESS-THAN OR EQUAL TO  
 → 2266  $\dashv$  less-than over equal to

2AFA  $\dashv$  DOUBLE-LINE SLANTED GREATER-THAN OR EQUAL TO  
 → 2267  $\dashv$  greater-than over equal to

2AFB  $\dashv$  TRIPLE SOLIDUS BINARY RELATION  
 → 2AF4  $\dashv$  triple vertical bar binary relation

**Operators**

















2AFC  $\dashv$  LARGE TRIPLE VERTICAL BAR OPERATOR  
 • often n-ary  
 → 2AF4  $\dashv$  triple vertical bar binary relation  
 → 2980  $\dashv$  triple vertical bar delimiter

2AFD  $\dashv$  DOUBLE SOLIDUS OPERATOR  
 → 2225  $\dashv$  parallel to

2AFE  $\dashv$  WHITE VERTICAL BAR  
 = Dijkstra choice

2AFF  $\dashv$  N-ARY WHITE VERTICAL BAR  
 = n-ary Dijkstra choice



Standardized Variation Sequences	
2A3C	 INTERIOR PRODUCT <small>2A3C</small>  tall variant with narrow foot <small>2A3C FE00</small>
2A3D	 RIGHTHAND INTERIOR PRODUCT <small>2A3D</small>  tall variant with narrow foot <small>2A3D FE00</small>
2A9D	 SIMILAR OR LESS-THAN <small>2A9D</small>  with similar following the slant of the upper leg <small>2A9D FE00</small>
2A9E	 SIMILAR OR GREATER-THAN <small>2A9E</small>  with similar following the slant of the upper leg <small>2A9E FE00</small>
2AAC	 SMALLER THAN OR EQUAL TO <small>2AAC</small>  with slanted equal <small>2AAC FE00</small>
2AAD	 LARGER THAN OR EQUAL TO <small>2AAD</small>  with slanted equal <small>2AAD FE00</small>
2ACB	 SUBSET OF ABOVE NOT EQUAL TO <small>2ACB</small>  with stroke through bottom members <small>2ACB FE00</small>
2ACC	 SUPERSET OF ABOVE NOT EQUAL TO <small>2ACC</small>  with stroke through bottom members <small>2ACC FE00</small>



	2B0	2B1	2B2	2B3	2B4	2B5	2B6	2B7	2B8	2B9	2BA	2BB	2BC	2BD	2BE	2BF	
0																	
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
A																	
B																	
C																	
D																	
E																	
F																	

	1D40	1D41	1D42	1D43	1D44	1D45	1D46	1D47	1D48	1D49	1D4A	1D4B	1D4C	1D4D	1D4E	1D4F
0	<b>A</b> 1D400	<b>Q</b> 1D410	<i>g</i> 1D420	<b>w</b> 1D430	<b>M</b> 1D440	<i>c</i> 1D450	<i>s</i> 1D460	<b>I</b> 1D470	<b>Y</b> 1D480	<i>o</i> 1D490		<i>U</i> 1D4B0	<i>k</i> 1D4C0	<b>A</b> 1D4D0	<b>Q</b> 1D4E0	<i>g</i> 1D4F0
1	<b>B</b> 1D401	<b>R</b> 1D411	<i>h</i> 1D421	<b>x</b> 1D431	<b>N</b> 1D441	<i>d</i> 1D451	<i>t</i> 1D461	<b>J</b> 1D471	<b>Z</b> 1D481	<i>p</i> 1D491		<i>V</i> 1D4B1	<i>l</i> 1D4C1	<b>B</b> 1D4D1	<b>R</b> 1D4E1	<i>h</i> 1D4F1
2	<b>C</b> 1D402	<b>S</b> 1D412	<i>i</i> 1D422	<i>y</i> 1D432	<b>O</b> 1D442	<i>e</i> 1D452	<i>u</i> 1D462	<b>K</b> 1D472	<i>a</i> 1D482	<i>q</i> 1D492	<b>G</b> 1D4A2	<i>W</i> 1D4B2	<i>m</i> 1D4C2	<b>C</b> 1D4D2	<b>S</b> 1D4E2	<i>i</i> 1D4F2
3	<b>D</b> 1D403	<b>T</b> 1D413	<i>j</i> 1D423	<b>z</b> 1D433	<b>P</b> 1D443	<i>f</i> 1D453	<i>v</i> 1D463	<b>L</b> 1D473	<i>b</i> 1D483	<i>r</i> 1D493		<i>X</i> 1D4B3	<i>n</i> 1D4C3	<b>D</b> 1D4D3	<b>T</b> 1D4E3	<i>j</i> 1D4F3
4	<b>E</b> 1D404	<b>U</b> 1D414	<i>k</i> 1D424	<b>A</b> 1D434	<b>Q</b> 1D444	<i>g</i> 1D454	<i>w</i> 1D464	<b>M</b> 1D474	<i>c</i> 1D484	<i>s</i> 1D494		<i>Y</i> 1D4B4		<b>E</b> 1D4D4	<b>U</b> 1D4E4	<i>k</i> 1D4F4
5	<b>F</b> 1D405	<b>V</b> 1D415	<i>l</i> 1D425	<b>B</b> 1D435	<b>R</b> 1D445		<i>x</i> 1D465	<b>N</b> 1D475	<i>d</i> 1D485	<i>t</i> 1D495	<b>J</b> 1D4A5	<b>L</b> 1D4B5	<i>p</i> 1D4C5	<b>F</b> 1D4D5	<b>V</b> 1D4E5	<i>l</i> 1D4F5
6	<b>G</b> 1D406	<b>W</b> 1D416	<i>m</i> 1D426	<b>C</b> 1D436	<b>S</b> 1D446	<i>i</i> 1D456	<i>y</i> 1D466	<b>O</b> 1D476	<i>e</i> 1D486	<i>u</i> 1D496	<b>K</b> 1D4A6	<i>a</i> 1D4B6	<i>q</i> 1D4C6	<b>G</b> 1D4D6	<b>W</b> 1D4E6	<i>m</i> 1D4F6
7	<b>H</b> 1D407	<b>X</b> 1D417	<i>n</i> 1D427	<b>D</b> 1D437	<b>T</b> 1D447	<i>j</i> 1D457	<i>z</i> 1D467	<b>P</b> 1D477	<i>f</i> 1D487	<i>v</i> 1D497		<i>l</i> 1D4B7	<i>r</i> 1D4C7	<b>H</b> 1D4D7	<b>X</b> 1D4E7	<i>n</i> 1D4F7
8	<b>I</b> 1D408	<b>Y</b> 1D418	<i>o</i> 1D428	<b>E</b> 1D438	<b>U</b> 1D448	<i>k</i> 1D458	<b>A</b> 1D468	<b>Q</b> 1D478	<i>g</i> 1D488	<i>w</i> 1D498		<i>c</i> 1D4B8	<i>s</i> 1D4C8	<b>J</b> 1D4D8	<b>Y</b> 1D4E8	<i>o</i> 1D4F8
9	<b>J</b> 1D409	<b>Z</b> 1D419	<i>p</i> 1D429	<b>F</b> 1D439	<b>V</b> 1D449	<i>l</i> 1D459	<b>B</b> 1D469	<b>R</b> 1D479	<i>h</i> 1D489	<i>x</i> 1D499	<b>N</b> 1D4A9	<i>d</i> 1D4B9	<i>t</i> 1D4C9	<b>J</b> 1D4D9	<b>Z</b> 1D4E9	<i>p</i> 1D4F9
A	<b>K</b> 1D40A	<i>a</i> 1D41A	<i>q</i> 1D42A	<b>G</b> 1D43A	<b>W</b> 1D44A	<i>m</i> 1D45A	<b>C</b> 1D46A	<b>S</b> 1D47A	<i>i</i> 1D48A	<i>y</i> 1D49A	<b>O</b> 1D4AA		<i>u</i> 1D4CA	<b>K</b> 1D4DA	<i>a</i> 1D4EA	<i>q</i> 1D4FA
B	<b>L</b> 1D40B	<i>b</i> 1D41B	<i>r</i> 1D42B	<b>H</b> 1D43B	<b>X</b> 1D44B	<i>n</i> 1D45B	<b>D</b> 1D46B	<b>T</b> 1D47B	<i>j</i> 1D48B	<i>z</i> 1D49B	<b>P</b> 1D4AB	<i>f</i> 1D4BB	<i>v</i> 1D4CB	<b>L</b> 1D4DB	<i>l</i> 1D4EB	<i>r</i> 1D4FB
C	<b>M</b> 1D40C	<i>c</i> 1D41C	<i>s</i> 1D42C	<b>I</b> 1D43C	<b>Y</b> 1D44C	<i>o</i> 1D45C	<b>E</b> 1D46C	<b>U</b> 1D47C	<i>k</i> 1D48C	<b>A</b> 1D49C	<b>Q</b> 1D4AC		<i>w</i> 1D4CC	<b>M</b> 1D4DC	<i>c</i> 1D4EC	<i>s</i> 1D4FC
D	<b>N</b> 1D40D	<i>d</i> 1D41D	<i>t</i> 1D42D	<b>J</b> 1D43D	<b>Z</b> 1D44D	<i>p</i> 1D45D	<b>F</b> 1D46D	<b>V</b> 1D47D	<i>l</i> 1D48D			<i>h</i> 1D4BD	<i>x</i> 1D4CD	<b>N</b> 1D4DD	<i>d</i> 1D4ED	<i>t</i> 1D4FD
E	<b>O</b> 1D40E	<i>e</i> 1D41E	<i>u</i> 1D42E	<b>K</b> 1D43E	<i>a</i> 1D44E	<i>q</i> 1D45E	<b>G</b> 1D46E	<b>W</b> 1D47E	<i>m</i> 1D48E	<b>C</b> 1D49E	<b>S</b> 1D4AE	<i>i</i> 1D4BE	<i>y</i> 1D4CE	<b>O</b> 1D4DE	<i>e</i> 1D4EE	<i>u</i> 1D4FE
F	<b>P</b> 1D40F	<i>f</i> 1D41F	<i>v</i> 1D42F	<b>L</b> 1D43F	<i>b</i> 1D44F	<i>r</i> 1D45F	<b>H</b> 1D46F	<b>X</b> 1D47F	<i>n</i> 1D48F	<b>D</b> 1D49F	<b>T</b> 1D4AF	<i>j</i> 1D4BF	<i>z</i> 1D4CF	<b>P</b> 1D4DF	<i>f</i> 1D4EF	<i>v</i> 1D4FF

1D50 1D51 1D52 1D53 1D54 1D55 1D56 1D57 1D58 1D59 1D5A 1D5B 1D5C 1D5D 1D5E 1D5F

0	<i>w</i> 1D500	<i>M</i> 1D510	<i>c</i> 1D520	<i>s</i> 1D530	<i>I</i> 1D540	<i>Y</i> 1D550	<i>o</i> 1D560	<i>Œ</i> 1D570	<i>U</i> 1D580	<i>f</i> 1D590	<i>A</i> 1D5A0	<i>Q</i> 1D5B0	<i>g</i> 1D5C0	<i>w</i> 1D5D0	<i>M</i> 1D5E0	<i>c</i> 1D5F0
1	<i>x</i> 1D501	<i>N</i> 1D511	<i>d</i> 1D521	<i>t</i> 1D531	<i>J</i> 1D541		<i>p</i> 1D561	<i>Ɔ</i> 1D571	<i>B</i> 1D581	<i>I</i> 1D591	<i>B</i> 1D5A1	<i>R</i> 1D5B1	<i>h</i> 1D5C1	<i>x</i> 1D5D1	<i>N</i> 1D5E1	<i>d</i> 1D5F1
2	<i>y</i> 1D502	<i>D</i> 1D512	<i>e</i> 1D522	<i>u</i> 1D532	<i>K</i> 1D542	<i>a</i> 1D552	<i>q</i> 1D562	<i>Œ</i> 1D572	<i>W</i> 1D582	<i>m</i> 1D592	<i>C</i> 1D5A2	<i>S</i> 1D5B2	<i>i</i> 1D5C2	<i>y</i> 1D5D2	<i>O</i> 1D5E2	<i>e</i> 1D5F2
3	<i>z</i> 1D503	<i>P</i> 1D513	<i>f</i> 1D523	<i>v</i> 1D533	<i>L</i> 1D543	<i>b</i> 1D553	<i>r</i> 1D563	<i>Š</i> 1D573	<i>X</i> 1D583	<i>n</i> 1D593	<i>D</i> 1D5A3	<i>T</i> 1D5B3	<i>j</i> 1D5C3	<i>z</i> 1D5D3	<i>P</i> 1D5E3	<i>f</i> 1D5F3
4	<i>U</i> 1D504	<i>Q</i> 1D514	<i>g</i> 1D524	<i>w</i> 1D534	<i>M</i> 1D544	<i>c</i> 1D554	<i>s</i> 1D564	<i>Ɔ</i> 1D574	<i>Y</i> 1D584	<i>o</i> 1D594	<i>E</i> 1D5A4	<i>U</i> 1D5B4	<i>k</i> 1D5C4	<i>A</i> 1D5D4	<i>Q</i> 1D5E4	<i>g</i> 1D5F4
5	<i>B</i> 1D505		<i>h</i> 1D525	<i>Ɔ</i> 1D535		<i>d</i> 1D555	<i>t</i> 1D565	<i>Ɔ</i> 1D575	<i>3</i> 1D585	<i>p</i> 1D595	<i>F</i> 1D5A5	<i>V</i> 1D5B5	<i>I</i> 1D5C5	<i>B</i> 1D5D5	<i>R</i> 1D5E5	<i>h</i> 1D5F5
6		<i>Œ</i> 1D516	<i>i</i> 1D526	<i>ŋ</i> 1D536	<i>⊙</i> 1D546	<i>e</i> 1D556	<i>w</i> 1D566	<i>Ɔ</i> 1D576	<i>a</i> 1D586	<i>q</i> 1D596	<i>G</i> 1D5A6	<i>W</i> 1D5B6	<i>m</i> 1D5C6	<i>C</i> 1D5D6	<i>S</i> 1D5E6	<i>i</i> 1D5F6
7	<i>D</i> 1D507	<i>Z</i> 1D517	<i>j</i> 1D527	<i>z</i> 1D537		<i>f</i> 1D557	<i>v</i> 1D567	<i>Ɔ</i> 1D577	<i>b</i> 1D587	<i>r</i> 1D597	<i>H</i> 1D5A7	<i>X</i> 1D5B7	<i>n</i> 1D5C7	<i>D</i> 1D5D7	<i>T</i> 1D5E7	<i>j</i> 1D5F7
8	<i>Œ</i> 1D508	<i>U</i> 1D518	<i>f</i> 1D528	<i>A</i> 1D538		<i>g</i> 1D558	<i>w</i> 1D568	<i>M</i> 1D578	<i>c</i> 1D588	<i>s</i> 1D598	<i>I</i> 1D5A8	<i>Y</i> 1D5B8	<i>o</i> 1D5C8	<i>E</i> 1D5D8	<i>U</i> 1D5E8	<i>k</i> 1D5F8
9	<i>Ɔ</i> 1D509	<i>B</i> 1D519	<i>I</i> 1D529	<i>B</i> 1D539		<i>h</i> 1D559	<i>x</i> 1D569	<i>N</i> 1D579	<i>d</i> 1D589	<i>t</i> 1D599	<i>J</i> 1D5A9	<i>Z</i> 1D5B9	<i>p</i> 1D5C9	<i>F</i> 1D5D9	<i>V</i> 1D5E9	<i>I</i> 1D5F9
A	<i>Œ</i> 1D50A	<i>W</i> 1D51A	<i>m</i> 1D52A		<i>S</i> 1D54A	<i>i</i> 1D55A	<i>y</i> 1D56A	<i>D</i> 1D57A	<i>e</i> 1D58A	<i>u</i> 1D59A	<i>K</i> 1D5AA	<i>a</i> 1D5BA	<i>q</i> 1D5CA	<i>G</i> 1D5DA	<i>W</i> 1D5EA	<i>m</i> 1D5FA
B		<i>X</i> 1D51B	<i>n</i> 1D52B	<i>D</i> 1D53B	<i>T</i> 1D54B	<i>j</i> 1D55B	<i>z</i> 1D56B	<i>P</i> 1D57B	<i>f</i> 1D58B	<i>v</i> 1D59B	<i>L</i> 1D5AB	<i>b</i> 1D5BB	<i>r</i> 1D5CB	<i>H</i> 1D5DB	<i>X</i> 1D5EB	<i>n</i> 1D5FB
C		<i>Y</i> 1D51C	<i>o</i> 1D52C	<i>E</i> 1D53C	<i>U</i> 1D54C	<i>k</i> 1D55C	<i>U</i> 1D56C	<i>Q</i> 1D57C	<i>g</i> 1D58C	<i>w</i> 1D59C	<i>M</i> 1D5AC	<i>c</i> 1D5BC	<i>s</i> 1D5CC	<i>I</i> 1D5DC	<i>Y</i> 1D5EC	<i>o</i> 1D5FC
D	<i>Ɔ</i> 1D50D		<i>p</i> 1D52D	<i>F</i> 1D53D	<i>V</i> 1D54D	<i>I</i> 1D55D	<i>B</i> 1D56D	<i>R</i> 1D57D	<i>h</i> 1D58D	<i>Ɔ</i> 1D59D	<i>N</i> 1D5AD	<i>d</i> 1D5BD	<i>t</i> 1D5CD	<i>J</i> 1D5DD	<i>Z</i> 1D5ED	<i>p</i> 1D5FD
E	<i>Ɔ</i> 1D50E	<i>a</i> 1D51E	<i>q</i> 1D52E	<i>G</i> 1D53E	<i>W</i> 1D54E	<i>m</i> 1D55E	<i>Œ</i> 1D56E	<i>Œ</i> 1D57E	<i>i</i> 1D58E	<i>ŋ</i> 1D59E	<i>O</i> 1D5AE	<i>e</i> 1D5BE	<i>u</i> 1D5CE	<i>K</i> 1D5DE	<i>a</i> 1D5EE	<i>q</i> 1D5FE
F	<i>Ɔ</i> 1D50F	<i>b</i> 1D51F	<i>r</i> 1D52F		<i>X</i> 1D54F	<i>n</i> 1D55F	<i>D</i> 1D56F	<i>Z</i> 1D57F	<i>j</i> 1D58F	<i>z</i> 1D59F	<i>P</i> 1D5AF	<i>f</i> 1D5BF	<i>v</i> 1D5CF	<i>L</i> 1D5DF	<i>b</i> 1D5EF	<i>r</i> 1D5FF

1D60 1D61 1D62 1D63 1D64 1D65 1D66 1D67 1D68 1D69 1D6A 1D6B 1D6C 1D6D 1D6E 1D6F

0	<b>s</b> 1D600	<b>I</b> 1D610	<b>Y</b> 1D620	<b>o</b> 1D630	<b>E</b> 1D640	<b>U</b> 1D650	<b>k</b> 1D660	<b>A</b> 1D670	<b>Q</b> 1D680	<b>g</b> 1D690	<b>w</b> 1D6A0	<b>I</b> 1D6B0	<b>Ω</b> 1D6C0	<b>o</b> 1D6D0	<b>q</b> 1D6E0	<b>O</b> 1D6F0
1	<b>t</b> 1D601	<b>J</b> 1D611	<b>Z</b> 1D621	<b>p</b> 1D631	<b>F</b> 1D641	<b>V</b> 1D651	<b>I</b> 1D661	<b>B</b> 1D671	<b>R</b> 1D681	<b>h</b> 1D691	<b>x</b> 1D6A1	<b>K</b> 1D6B1	<b>∇</b> 1D6C1	<b>π</b> 1D6D1	<b>ω</b> 1D6E1	<b>Π</b> 1D6F1
2	<b>u</b> 1D602	<b>K</b> 1D612	<b>a</b> 1D622	<b>q</b> 1D632	<b>G</b> 1D642	<b>W</b> 1D652	<b>m</b> 1D662	<b>C</b> 1D672	<b>S</b> 1D682	<b>i</b> 1D692	<b>y</b> 1D6A2	<b>Λ</b> 1D6B2	<b>α</b> 1D6C2	<b>ρ</b> 1D6D2	<b>A</b> 1D6E2	<b>P</b> 1D6F2
3	<b>v</b> 1D603	<b>L</b> 1D613	<b>b</b> 1D623	<b>r</b> 1D633	<b>H</b> 1D643	<b>X</b> 1D653	<b>n</b> 1D663	<b>D</b> 1D673	<b>T</b> 1D683	<b>j</b> 1D693	<b>z</b> 1D6A3	<b>M</b> 1D6B3	<b>β</b> 1D6C3	<b>ς</b> 1D6D3	<b>B</b> 1D6E3	<b>Θ</b> 1D6F3
4	<b>w</b> 1D604	<b>M</b> 1D614	<b>c</b> 1D624	<b>s</b> 1D634	<b>I</b> 1D644	<b>Y</b> 1D654	<b>o</b> 1D664	<b>E</b> 1D674	<b>U</b> 1D684	<b>k</b> 1D694	<b>l</b> 1D6A4	<b>N</b> 1D6B4	<b>γ</b> 1D6C4	<b>σ</b> 1D6D4	<b>Γ</b> 1D6E4	<b>Σ</b> 1D6F4
5	<b>x</b> 1D605	<b>N</b> 1D615	<b>d</b> 1D625	<b>t</b> 1D635	<b>J</b> 1D645	<b>Z</b> 1D655	<b>p</b> 1D665	<b>F</b> 1D675	<b>V</b> 1D685	<b>l</b> 1D695	<b>J</b> 1D6A5	<b>Ξ</b> 1D6B5	<b>δ</b> 1D6C5	<b>τ</b> 1D6D5	<b>Δ</b> 1D6E5	<b>T</b> 1D6F5
6	<b>y</b> 1D606	<b>O</b> 1D616	<b>e</b> 1D626	<b>u</b> 1D636	<b>K</b> 1D646	<b>a</b> 1D656	<b>q</b> 1D666	<b>G</b> 1D676	<b>W</b> 1D686	<b>m</b> 1D696		<b>O</b> 1D6B6	<b>ε</b> 1D6C6	<b>υ</b> 1D6D6	<b>E</b> 1D6E6	<b>Y</b> 1D6F6
7	<b>z</b> 1D607	<b>P</b> 1D617	<b>f</b> 1D627	<b>v</b> 1D637	<b>L</b> 1D647	<b>b</b> 1D657	<b>r</b> 1D667	<b>H</b> 1D677	<b>X</b> 1D687	<b>n</b> 1D697		<b>Π</b> 1D6B7	<b>ζ</b> 1D6C7	<b>φ</b> 1D6D7	<b>Z</b> 1D6E7	<b>Φ</b> 1D6F7
8	<b>A</b> 1D608	<b>Q</b> 1D618	<b>g</b> 1D628	<b>w</b> 1D638	<b>M</b> 1D648	<b>c</b> 1D658	<b>s</b> 1D668	<b>I</b> 1D678	<b>Y</b> 1D688	<b>o</b> 1D698	<b>A</b> 1D6A8	<b>P</b> 1D6B8	<b>η</b> 1D6C8	<b>χ</b> 1D6D8	<b>H</b> 1D6E8	<b>X</b> 1D6F8
9	<b>B</b> 1D609	<b>R</b> 1D619	<b>h</b> 1D629	<b>x</b> 1D639	<b>N</b> 1D649	<b>d</b> 1D659	<b>t</b> 1D669	<b>J</b> 1D679	<b>Z</b> 1D689	<b>p</b> 1D699	<b>B</b> 1D6A9	<b>Θ</b> 1D6B9	<b>θ</b> 1D6C9	<b>ψ</b> 1D6D9	<b>Θ</b> 1D6E9	<b>Ψ</b> 1D6F9
A	<b>C</b> 1D60A	<b>S</b> 1D61A	<b>i</b> 1D62A	<b>y</b> 1D63A	<b>O</b> 1D64A	<b>e</b> 1D65A	<b>u</b> 1D66A	<b>K</b> 1D67A	<b>a</b> 1D68A	<b>q</b> 1D69A	<b>Γ</b> 1D6AA	<b>Σ</b> 1D6BA	<b>ι</b> 1D6CA	<b>ω</b> 1D6DA	<b>I</b> 1D6EA	<b>Ω</b> 1D6FA
B	<b>D</b> 1D60B	<b>T</b> 1D61B	<b>j</b> 1D62B	<b>z</b> 1D63B	<b>P</b> 1D64B	<b>f</b> 1D65B	<b>v</b> 1D66B	<b>L</b> 1D67B	<b>b</b> 1D68B	<b>r</b> 1D69B	<b>Δ</b> 1D6AB	<b>T</b> 1D6BB	<b>κ</b> 1D6CB	<b>ð</b> 1D6DB	<b>K</b> 1D6EB	<b>∇</b> 1D6FB
C	<b>E</b> 1D60C	<b>U</b> 1D61C	<b>k</b> 1D62C	<b>A</b> 1D63C	<b>Q</b> 1D64C	<b>g</b> 1D65C	<b>w</b> 1D66C	<b>M</b> 1D67C	<b>c</b> 1D68C	<b>s</b> 1D69C	<b>E</b> 1D6AC	<b>Υ</b> 1D6BC	<b>λ</b> 1D6CC	<b>ε</b> 1D6DC	<b>Λ</b> 1D6EC	<b>α</b> 1D6FC
D	<b>F</b> 1D60D	<b>V</b> 1D61D	<b>I</b> 1D62D	<b>B</b> 1D63D	<b>R</b> 1D64D	<b>h</b> 1D65D	<b>x</b> 1D66D	<b>N</b> 1D67D	<b>d</b> 1D68D	<b>t</b> 1D69D	<b>Z</b> 1D6AD	<b>Φ</b> 1D6BD	<b>μ</b> 1D6CD	<b>ϑ</b> 1D6DD	<b>M</b> 1D6ED	<b>β</b> 1D6FD
E	<b>G</b> 1D60E	<b>W</b> 1D61E	<b>m</b> 1D62E	<b>C</b> 1D63E	<b>S</b> 1D64E	<b>i</b> 1D65E	<b>y</b> 1D66E	<b>O</b> 1D67E	<b>e</b> 1D68E	<b>u</b> 1D69E	<b>H</b> 1D6AE	<b>X</b> 1D6BE	<b>ν</b> 1D6CE	<b>κ</b> 1D6DE	<b>N</b> 1D6EE	<b>γ</b> 1D6FE
F	<b>H</b> 1D60F	<b>X</b> 1D61F	<b>n</b> 1D62F	<b>D</b> 1D63F	<b>T</b> 1D64F	<b>j</b> 1D65F	<b>z</b> 1D66F	<b>P</b> 1D67F	<b>f</b> 1D68F	<b>v</b> 1D69F	<b>Θ</b> 1D6AF	<b>Ψ</b> 1D6BF	<b>ξ</b> 1D6CF	<b>φ</b> 1D6DF	<b>Ξ</b> 1D6EF	<b>δ</b> 1D6FF

	1D70	1D71	1D72	1D73	1D74	1D75	1D76	1D77	1D78	1D79	1D7A	1D7B	1D7C	1D7D	1D7E	1D7F
0	$\epsilon$ 1D700	$\upsilon$ 1D710	$E$ 1D720	$Y$ 1D730	$\lambda$ 1D740	$\epsilon$ 1D750	$\Lambda$ 1D760	$\alpha$ 1D770	$\rho$ 1D780	$A$ 1D790	$P$ 1D7A0	$\eta$ 1D7B0	$\chi$ 1D7C0	$2$ 1D7D0	$8$ 1D7E0	$4$ 1D7F0
1	$\zeta$ 1D701	$\varphi$ 1D711	$Z$ 1D721	$\Phi$ 1D731	$\mu$ 1D741	$\vartheta$ 1D751	$M$ 1D761	$\beta$ 1D771	$\varsigma$ 1D781	$B$ 1D791	$\Theta$ 1D7A1	$\theta$ 1D7B1	$\psi$ 1D7C1	$3$ 1D7D1	$9$ 1D7E1	$5$ 1D7F1
2	$\eta$ 1D702	$\chi$ 1D712	$H$ 1D722	$X$ 1D732	$\nu$ 1D742	$\kappa$ 1D752	$N$ 1D762	$\gamma$ 1D772	$\sigma$ 1D782	$\Gamma$ 1D792	$\Sigma$ 1D7A2	$\iota$ 1D7B2	$\omega$ 1D7C2	$4$ 1D7D2	$0$ 1D7E2	$6$ 1D7F2
3	$\theta$ 1D703	$\psi$ 1D713	$\Theta$ 1D723	$\Psi$ 1D733	$\xi$ 1D743	$\phi$ 1D753	$\Xi$ 1D763	$\delta$ 1D773	$\tau$ 1D783	$\Delta$ 1D793	$T$ 1D7A3	$\kappa$ 1D7B3	$\vartheta$ 1D7C3	$5$ 1D7D3	$1$ 1D7E3	$7$ 1D7F3
4	$\iota$ 1D704	$\omega$ 1D714	$I$ 1D724	$\Omega$ 1D734	$o$ 1D744	$\rho$ 1D754	$O$ 1D764	$\epsilon$ 1D774	$\upsilon$ 1D784	$E$ 1D794	$Y$ 1D7A4	$\lambda$ 1D7B4	$\epsilon$ 1D7C4	$6$ 1D7D4	$2$ 1D7E4	$8$ 1D7F4
5	$\kappa$ 1D705	$\vartheta$ 1D715	$K$ 1D725	$\nabla$ 1D735	$\pi$ 1D745	$\varpi$ 1D755	$\Pi$ 1D765	$\zeta$ 1D775	$\varphi$ 1D785	$Z$ 1D795	$\Phi$ 1D7A5	$\mu$ 1D7B5	$\vartheta$ 1D7C5	$7$ 1D7D5	$3$ 1D7E5	$9$ 1D7F5
6	$\lambda$ 1D706	$\epsilon$ 1D716	$\Lambda$ 1D726	$\alpha$ 1D736	$\rho$ 1D746	$A$ 1D756	$P$ 1D766	$\eta$ 1D776	$\chi$ 1D786	$H$ 1D796	$X$ 1D7A6	$\nu$ 1D7B6	$\kappa$ 1D7C6	$8$ 1D7D6	$4$ 1D7E6	$0$ 1D7F6
7	$\mu$ 1D707	$\vartheta$ 1D717	$M$ 1D727	$\beta$ 1D737	$\varsigma$ 1D747	$B$ 1D757	$\Theta$ 1D767	$\theta$ 1D777	$\psi$ 1D787	$\Theta$ 1D797	$\Psi$ 1D7A7	$\xi$ 1D7B7	$\phi$ 1D7C7	$9$ 1D7D7	$5$ 1D7E7	$1$ 1D7F7
8	$\nu$ 1D708	$\kappa$ 1D718	$N$ 1D728	$\gamma$ 1D738	$\sigma$ 1D748	$\Gamma$ 1D758	$\Sigma$ 1D768	$\iota$ 1D778	$\omega$ 1D788	$I$ 1D798	$\Omega$ 1D7A8	$o$ 1D7B8	$\rho$ 1D7C8	$0$ 1D7D8	$6$ 1D7E8	$2$ 1D7F8
9	$\xi$ 1D709	$\phi$ 1D719	$\Xi$ 1D729	$\delta$ 1D739	$\tau$ 1D749	$\Delta$ 1D759	$T$ 1D769	$\kappa$ 1D779	$\vartheta$ 1D789	$K$ 1D799	$\nabla$ 1D7A9	$\pi$ 1D7B9	$\varpi$ 1D7C9	$1$ 1D7D9	$7$ 1D7E9	$3$ 1D7F9
A	$o$ 1D70A	$\rho$ 1D71A	$O$ 1D72A	$\epsilon$ 1D73A	$\upsilon$ 1D74A	$E$ 1D75A	$Y$ 1D76A	$\lambda$ 1D77A	$\epsilon$ 1D78A	$\Lambda$ 1D79A	$\alpha$ 1D7AA	$\rho$ 1D7BA	$F$ 1D7CA	$2$ 1D7DA	$8$ 1D7EA	$4$ 1D7FA
B	$\pi$ 1D70B	$\varpi$ 1D71B	$\Pi$ 1D72B	$\zeta$ 1D73B	$\varphi$ 1D74B	$Z$ 1D75B	$\Phi$ 1D76B	$\mu$ 1D77B	$\vartheta$ 1D78B	$M$ 1D79B	$\beta$ 1D7AB	$\varsigma$ 1D7BB	$F$ 1D7CB	$3$ 1D7DB	$9$ 1D7EB	$5$ 1D7FB
C	$\rho$ 1D70C	$A$ 1D71C	$P$ 1D72C	$\eta$ 1D73C	$\chi$ 1D74C	$H$ 1D75C	$X$ 1D76C	$\nu$ 1D77C	$\kappa$ 1D78C	$N$ 1D79C	$\gamma$ 1D7AC	$\sigma$ 1D7BC		$4$ 1D7DC	$0$ 1D7EC	$6$ 1D7FC
D	$\varsigma$ 1D70D	$B$ 1D71D	$\Theta$ 1D72D	$\theta$ 1D73D	$\psi$ 1D74D	$\Theta$ 1D75D	$\Psi$ 1D76D	$\xi$ 1D77D	$\phi$ 1D78D	$\Xi$ 1D79D	$\delta$ 1D7AD	$\tau$ 1D7BD		$5$ 1D7DD	$1$ 1D7ED	$7$ 1D7FD
E	$\sigma$ 1D70E	$\Gamma$ 1D71E	$\Sigma$ 1D72E	$\iota$ 1D73E	$\omega$ 1D74E	$I$ 1D75E	$\Omega$ 1D76E	$o$ 1D77E	$\rho$ 1D78E	$O$ 1D79E	$\epsilon$ 1D7AE	$\upsilon$ 1D7BE	$0$ 1D7CE	$6$ 1D7DE	$2$ 1D7EE	$8$ 1D7FE
F	$\tau$ 1D70F	$\Delta$ 1D71F	$T$ 1D72F	$\kappa$ 1D73F	$\vartheta$ 1D74F	$K$ 1D75F	$\nabla$ 1D76F	$\pi$ 1D77F	$\varpi$ 1D78F	$\Pi$ 1D79F	$\zeta$ 1D7AF	$\varphi$ 1D7BF	$1$ 1D7CF	$7$ 1D7DF	$3$ 1D7EF	$9$ 1D7FF