

## Mathematical Operators

### Range: 2200–22FF

This file contains an excerpt from the character code tables and list of character names for the Unicode Standard, last updated for

*The Unicode Standard, Version 4.1.*

This file may be updated as necessary to reflect errata without notice. For an up-to-date list of errata, see

<http://www.unicode.org/errata/>

See <http://www.unicode.org/charts/PDF/Unicode-4.1/> for charts showing only the characters added in Unicode 4.1.

See <http://www.unicode.org/Public/4.1.0/charts/> for a complete archived file of character code charts for Unicode 4.1.

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These charts are provided as the on-line reference to the character contents of the Unicode Standard, Version 4.1 but do not provide all the information needed to fully support individual scripts using the Unicode Standard. For a complete understanding of the use of the characters contained in this excerpt file, please consult the appropriate sections of The Unicode Standard, Version 4.1, at <http://www.unicode.org/versions/Unicode4.1.0/>, including sections unchanged in The Unicode Standard, Version 4.0 (ISBN 0-321-18578-1), as well as Unicode Standard Annexes #9, #11, #14, #15, #24, #29, #31, and #34, the other Unicode Technical Reports and Standards, and the Unicode Character Database, which are available on-line.

See <http://www.unicode.org/ucd/> and <http://www.unicode.org/reports/>

A thorough understanding of the information contained in these additional sources is required for a successful implementation.

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See <http://www.unicode.org/pending/pending.html> and <http://www.unicode.org/alloc/Pipeline.html>.

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	220	221	222	223	224	225	226	227	228	229	22A	22B	22C	22D	22E	22F
0	2200	2210	2220	2230	2240	2250	2260	2270	2280	2290	22A0	22B0	22C0	22D0	22E0	22F0
1	2201	2211	2221	2231	2241	2251	2261	2271	2281	2291	22A1	22B1	22C1	22D1	22E1	22F1
2	2202	2212	2222	2232	2242	2252	2262	2272	2282	2292	22A2	22B2	22C2	22D2	22E2	22F2
3	2203	2213	2223	2233	2243	2253	2263	2273	2283	2293	22A3	22B3	22C3	22D3	22E3	22F3
4	2204	2214	2224	2234	2244	2254	2264	2274	2284	2294	22A4	22B4	22C4	22D4	22E4	22F4
5	2205	2215	2225	2235	2245	2255	2265	2275	2285	2295	22A5	22B5	22C5	22D5	22E5	22F5
6	2206	2216	2226	2236	2246	2256	2266	2276	2286	2296	22A6	22B6	22C6	22D6	22E6	22F6
7	2207	2217	2227	2237	2247	2257	2267	2277	2287	2297	22A7	22B7	22C7	22D7	22E7	22F7
8	2208	2218	2228	2238	2248	2258	2268	2278	2288	2298	22A8	22B8	22C8	22D8	22E8	22F8
9	2209	2219	2229	2239	2249	2259	2269	2279	2289	2299	22A9	22B9	22C9	22D9	22E9	22F9
A	220A	221A	222A	223A	224A	225A	226A	227A	228A	229A	22AA	22BA	22CA	22DA	22EA	22FA
B	220B	221B	222B	223B	224B	225B	226B	227B	228B	229B	22AB	22BB	22CB	22DB	22EB	22FB
C	220C	221C	222C	223C	224C	225C	226C	227C	228C	229C	22AC	22BC	22CC	22DC	22EC	22FC
D	220D	221D	222D	223D	224D	225D	226D	227D	228D	229D	22AD	22BD	22CD	22DD	22ED	22FD
E	220E	221E	222E	223E	224E	225E	226E	227E	228E	229E	22AE	22BE	22CE	22DE	22EE	22FE
F	220F	221F	222F	223F	224F	225F	226F	227F	228F	229F	22AF	22BF	22CF	22DF	22EF	22FF

**Miscellaneous mathematical symbols**

- 2200  $\forall$  FOR ALL  
= universal quantifier
- 2201  $\complement$  COMPLEMENT  
→ 0297  $\complement$  latin letter stretched c
- 2202  $\partial$  PARTIAL DIFFERENTIAL
- 2203  $\exists$  THERE EXISTS  
= existential quantifier
- 2204  $\nexists$  THERE DOES NOT EXIST  
≡ 2203  $\exists$  0338  $\not\exists$
- 2205  $\emptyset$  EMPTY SET  
= 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  $\Delta$  INCREMENT  
= Laplace operator  
= forward difference  
→ 0394  $\Delta$  greek capital letter delta  
→ 25B3  $\Delta$  white up-pointing triangle
- 2207  $\nabla$  NABLA  
= backward difference  
= gradient, del  
• used for Laplacian operator (written with superscript 2)  
→ 25BD  $\nabla$  white down-pointing triangle

**Set membership**

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

**Miscellaneous mathematical symbol**

- 220E  $\blacksquare$  END OF PROOF  
= Q.E.D.  
→ 2023  $\blacktriangleright$  triangular bullet  
→ 25AE  $\blacksquare$  black vertical rectangle

**N-ary operators**

- 220F  $\prod$  N-ARY PRODUCT  
= product sign  
→ 03A0  $\Pi$  greek capital letter pi
- 2210  $\coprod$  N-ARY COPRODUCT  
= coproduct sign
- 2211  $\sum$  N-ARY SUMMATION  
= summation sign  
→ 03A3  $\Sigma$  greek capital letter sigma

**Operators**

- 2212  $-$  MINUS SIGN  
→ 002D  $-$  hyphen-minus

- 2213  $\mp$  MINUS-OR-PLUS SIGN  
→ 00B1  $\pm$  plus-minus sign
- 2214  $\dot{+}$  DOT PLUS
- 2215  $/$  DIVISION SLASH  
• generic division operator  
→ 002F  $/$  solidus  
→ 2044  $/$  fraction slash
- 2216  $\setminus$  SET MINUS  
→ 005C  $\setminus$  reverse solidus
- 2217  $*$  ASTERISK OPERATOR  
→ 002A  $*$  asterisk
- 2218  $\circ$  RING OPERATOR  
= composite function  
= APL jot  
→ 00B0  $^\circ$  degree sign  
→ 25E6  $\circ$  white bullet
- 2219  $\bullet$  BULLET OPERATOR  
→ 00B7  $\cdot$  middle dot  
→ 2022  $\bullet$  bullet  
→ 2024  $\cdot$  one dot leader
- 221A  $\surd$  SQUARE ROOT  
= radical sign  
→ 2713  $\surd$  check mark
- 221B  $\sqrt[3]{}$  CUBE ROOT
- 221C  $\sqrt[4]{}$  FOURTH ROOT
- 221D  $\propto$  PROPORTIONAL TO  
→ 03B1  $\alpha$  greek small letter alpha

**Miscellaneous mathematical symbols**

- 221E  $\infty$  INFINITY
- 221F  $\perp$  RIGHT ANGLE
- 2220  $\sphericalangle$  ANGLE
- 2221  $\sphericalangle$  MEASURED ANGLE
- 2222  $\sphericalangle$  SPHERICAL ANGLE  
= angle arc

**Operators**

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

**Logical and set operators**

- 2227  $\wedge$  LOGICAL AND  
= wedge, conjunction  
→ 22C0  $\wedge$  n-ary logical and  
→ 2303  $\wedge$  up arrowhead
- 2228  $\vee$  LOGICAL OR  
= vee, disjunction  
→ 22C1  $\vee$  n-ary logical or  
→ 2304  $\vee$  down arrowhead
- 2229  $\cap$  INTERSECTION  
= cap, hat  
→ 22C2  $\cap$  n-ary intersection

- 222A  $\cup$  UNION  
 = cup  
 → 22C3  $\cup$  n-ary union

### Integrals

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

### Miscellaneous mathematical symbols

- 2234  $\therefore$  THEREFORE
- 2235  $\because$  BECAUSE

### Relations

- 2236  $:$  RATIO  
 → 003A  $:$  colon
- 2237  $::$  PROPORTION

### Operator

- 2238  $\dot{-}$  DOT MINUS  
 = symmetric difference

### Relation

- 2239  $:-$  EXCESS

### Operator

- 223A  $\cong$  GEOMETRIC PROPORTION

### Relations

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

### Miscellaneous mathematical symbol

- 223F  $\sim$  SINE WAVE  
 = alternating current

### Operator

- 2240  $\wr$  WREATH PRODUCT

### Relations

- 2241  $\napprox$  NOT TILDE  
 ≡ 223C  $\sim$  0338  $\not\sim$
- 2242  $\neq$  MINUS TILDE
- 2243  $\doteq$  ASYMPTOTICALLY EQUAL TO
- 2244  $\not\approx$  NOT ASYMPTOTICALLY EQUAL TO  
 ≡ 2243  $\doteq$  0338  $\not\approx$
- 2245  $\cong$  APPROXIMATELY EQUAL TO
- 2246  $\cong$  APPROXIMATELY BUT NOT ACTUALLY EQUAL TO
- 2247  $\not\cong$  NEITHER APPROXIMATELY NOR ACTUALLY EQUAL TO  
 ≡ 2245  $\cong$  0338  $\not\cong$
- 2248  $\approx$  ALMOST EQUAL TO  
 = asymptotic to
- 2249  $\not\approx$  NOT ALMOST EQUAL TO  
 ≡ 2248  $\approx$  0338  $\not\approx$
- 224A  $\approx$  ALMOST EQUAL OR EQUAL TO
- 224B  $\approx$  TRIPLE TILDE
- 224C  $\equiv$  ALL EQUAL TO  
 • reversed tilde and lazy S are glyph variants
- 224D  $\asymp$  EQUIVALENT TO
- 224E  $\doteq$  GEOMETRICALLY EQUIVALENT TO
- 224F  $\pm$  DIFFERENCE BETWEEN
- 2250  $\doteq$  APPROACHES THE LIMIT
- 2251  $\doteq$  GEOMETRICALLY EQUAL TO
- 2252  $\doteq$  APPROXIMATELY EQUAL TO OR THE IMAGE OF  
 = nearly equals
- 2253  $\doteq$  IMAGE OF OR APPROXIMATELY EQUAL TO
- 2254  $\doteq$  COLON EQUALS
- 2255  $\doteq$  EQUALS COLON
- 2256  $\doteq$  RING IN EQUAL TO
- 2257  $\doteq$  RING EQUAL TO  
 = approximately equal to
- 2258  $\doteq$  CORRESPONDS TO
- 2259  $\doteq$  ESTIMATES  
 = corresponds to
- 225A  $\doteq$  EQUIANGULAR TO
- 225B  $\doteq$  STAR EQUALS
- 225C  $\doteq$  DELTA EQUAL TO  
 = equiangular  
 = equal to by definition
- 225D  $\doteq$  EQUAL TO BY DEFINITION
- 225E  $\doteq$  MEASURED BY
- 225F  $\doteq$  QUESTIONED EQUAL TO
- 2260  $\doteq$  NOT EQUAL TO  
 → 003D = equals sign  
 → 01C2 † latin letter alveolar click  
 ≡ 003D = 0338  $\not\approx$
- 2261  $\doteq$  IDENTICAL TO
- 2262  $\doteq$  NOT IDENTICAL TO  
 ≡ 2261  $\doteq$  0338  $\not\approx$
- 2263  $\doteq$  STRICTLY EQUIVALENT TO

2264	≤	LESS-THAN OR EQUAL TO
2265	≥	GREATER-THAN OR EQUAL TO
2266	≡	LESS-THAN OVER EQUAL TO
2267	≧	GREATER-THAN OVER EQUAL TO
2268	≢	LESS-THAN BUT NOT EQUAL TO
2269	≧	GREATER-THAN BUT NOT EQUAL TO
226A	≪	MUCH LESS-THAN → 00AB ≪ left-pointing double angle quotation mark
226B	≫	MUCH GREATER-THAN → 00BB ≻ right-pointing double angle quotation mark
226C	∅	BETWEEN = plaintiff, quantic
226D	≠	NOT EQUIVALENT TO ≡ 224D ≠ 0338 ∅
226E	≠	NOT LESS-THAN ≡ 003C < 0338 ∅
226F	≠	NOT GREATER-THAN ≡ 003E > 0338 ∅
2270	≠	NEITHER LESS-THAN NOR EQUAL TO ≡ 2264 ≤ 0338 ∅
2271	≠	NEITHER GREATER-THAN NOR EQUAL TO ≡ 2265 ≥ 0338 ∅
2272	≡	LESS-THAN OR EQUIVALENT TO
2273	≧	GREATER-THAN OR EQUIVALENT TO
2274	≠	NEITHER LESS-THAN NOR EQUIVALENT TO ≡ 2272 ≡ 0338 ∅
2275	≠	NEITHER GREATER-THAN NOR EQUIVALENT TO ≡ 2273 ≧ 0338 ∅
2276	≡	LESS-THAN OR GREATER-THAN
2277	≧	GREATER-THAN OR LESS-THAN
2278	≠	NEITHER LESS-THAN NOR GREATER-THAN ≡ 2276 ≡ 0338 ∅
2279	≠	NEITHER GREATER-THAN NOR LESS-THAN ≡ 2277 ≧ 0338 ∅
227A	<	PRECEDES = lower rank than → 22B0 ≪ precedes under relation
227B	>	SUCCEEDS = higher rank than → 22B1 ≻ succeeds under relation
227C	≤	PRECEDES OR EQUAL TO
227D	≥	SUCCEEDS OR EQUAL TO
227E	≡	PRECEDES OR EQUIVALENT TO
227F	≧	SUCCEEDS OR EQUIVALENT TO
2280	≠	DOES NOT PRECEDE ≡ 227A < 0338 ∅
2281	≠	DOES NOT SUCCEED ≡ 227B > 0338 ∅
2282	⊂	SUBSET OF = included in set
2283	⊃	SUPERSET OF = includes in set
2284	⊄	NOT A SUBSET OF ≡ 2282 ⊂ 0338 ∅
2285	⊄	NOT A SUPERSET OF ≡ 2283 ⊃ 0338 ∅
2286	⊆	SUBSET OF OR EQUAL TO

2287	⊇	SUPERSET OF OR EQUAL TO
2288	⊈	NEITHER A SUBSET OF NOR EQUAL TO ≡ 2286 ⊆ 0338 ∅
2289	⊇	NEITHER A SUPERSET OF NOR EQUAL TO ≡ 2287 ⊇ 0338 ∅
228A	⊆	SUBSET OF WITH NOT EQUAL TO
228B	⊇	SUPERSET OF WITH NOT EQUAL TO

## Operators

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

## Relations

228F	□	SQUARE IMAGE OF
2290	□	SQUARE ORIGINAL OF
2291	⊆	SQUARE IMAGE OF OR EQUAL TO
2292	⊆	SQUARE ORIGINAL OF OR EQUAL TO

## Operators

2293	⊐	SQUARE CAP → 2A05 ⊐ n-ary square intersection operator
2294	⊔	SQUARE CUP
2295	⊕	CIRCLED PLUS = direct sum = vector pointing into page → 2641 Ⓟ earth → 2A01 ⊕ n-ary circled plus operator
2296	⊖	CIRCLED MINUS = symmetric difference → 29B5 ⊖ circle with horizontal bar
2297	⊗	CIRCLED TIMES = tensor product = vector pointing into page → 2A02 ⊗ n-ary circled times operator
2298	⊘	CIRCLED DIVISION SLASH
2299	⊙	CIRCLED DOT OPERATOR = direct product = vector pointing out of page → 0298 ⊙ latin letter bilabial click → 2609 ⊙ sun → 2A00 ⊙ n-ary circled dot operator
229A	⊚	CIRCLED RING OPERATOR → 233E ⊚ apl functional symbol circle jot → 25CE ⊚ bullseye
229B	⊛	CIRCLED ASTERISK OPERATOR → 235F ⊛ apl functional symbol circle star
229C	⊜	CIRCLED EQUALS
229D	⊝	CIRCLED DASH
229E	⊞	SQUARED PLUS
229F	⊟	SQUARED MINUS
22A0	⊠	SQUARED TIMES → 2612 ⊠ ballot box with x
22A1	⊡	SQUARED DOT OPERATOR
22A2	⊢	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  
 22A5  $\perp$  UP TACK  
 = base, bottom  
 → 27C2  $\perp$  perpendicular

### Relations

- 22A6  $\vdash$  ASSERTION  
 = reduces to  
 22A7  $\vDash$  MODELS  
 22A8  $\models$  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  $\vdash$  0338  $\nVdash$   
 22AD  $\n\vDash$  NOT TRUE  
 $\equiv$  22A8  $\models$  0338  $\n\vDash$   
 22AE  $\nVdash$  DOES NOT FORCE  
 $\equiv$  22A9  $\Vdash$  0338  $\nVdash$   
 22AF  $\n\vDash$  NEGATED DOUBLE VERTICAL BAR DOUBLE RIGHT TURNSTILE  
 $\equiv$  22AB  $\equiv$  0338  $\n\vDash$   
 22B0  $\prec$  PRECEDES UNDER RELATION  
 → 227A  $<$  precedes  
 22B1  $\succ$  SUCCEEDS UNDER RELATION  
 → 227B  $>$  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  $\rightsquigarrow$  ORIGINAL OF  
 22B7  $\leftarrow$  IMAGE OF  
 22B8  $\multimap$  MULTIMAP  
 22B9  $\dagger$  HERMITIAN CONJUGATE MATRIX

### Operators

- 22BA  $\intercal$  INTERCALATE  
 22BB  $\nabla$  XOR  
 22BC  $\overline{\wedge}$  NAND  
 → 2305  $\overline{\wedge}$  projective  
 22BD  $\nabla$  NOR

### Miscellaneous mathematical symbols

- 22BE  $\lrcorner$  RIGHT ANGLE WITH ARC  
 22BF  $\triangle$  RIGHT TRIANGLE

### N-ary operators

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

### Operators

- 22C4  $\diamond$  DIAMOND OPERATOR  
 → 25C7  $\diamond$  white diamond  
 22C5  $\cdot$  DOT OPERATOR  
 → 00B7  $\cdot$  middle dot  
 22C6  $\star$  STAR OPERATOR  
 • APL  
 → 066D  $\star$  arabic five pointed star  
 → 2605  $\star$  black 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  $\ltimes$  LEFT SEMIDIRECT PRODUCT  
 22CC  $\rtimes$  RIGHT SEMIDIRECT PRODUCT  
 → 2041  $\lrcorner$  caret insertion point

### Relation

- 22CD  $\approx$  REVERSED TILDE EQUALS

### Logical operators

- 22CE  $\vee$  CURLY LOGICAL OR  
 22CF  $\wedge$  CURLY LOGICAL AND

### Relations

- 22D0  $\Subset$  DOUBLE SUBSET  
 22D1  $\Supset$  DOUBLE SUPERSET

### Operators

- 22D2  $\cap$  DOUBLE INTERSECTION  
 22D3  $\cup$  DOUBLE UNION

### Relations

- 22D4  $\pitchfork$  PITCHFORK  
 = proper intersection  
 22D5  $\#$  EQUAL AND PARALLEL TO  
 → 2317  $\#$  viewdata square  
 22D6  $\lessdot$  LESS-THAN WITH DOT  
 22D7  $\gtrdot$  GREATER-THAN WITH DOT  
 22D8  $\lll$  VERY MUCH LESS-THAN

22D9	≫	VERY MUCH GREATER-THAN	22FD	⊃̄	CONTAINS WITH OVERBAR
22DA	⩾	LESS-THAN EQUAL TO OR GREATER-THAN	22FE	⊃̄	SMALL CONTAINS WITH OVERBAR
22DB	⩿	GREATER-THAN EQUAL TO OR LESS-THAN	22FF	⊃̄	Z NOTATION BAG MEMBERSHIP
22DC	⩵	EQUAL TO OR LESS-THAN			
22DD	⩶	EQUAL TO OR GREATER-THAN			
22DE	⩴	EQUAL TO OR PRECEDES			
22DF	⩵	EQUAL TO OR SUCCEEDS			
22E0	⩹	DOES NOT PRECEDE OR EQUAL ≡ 227C ≰ 0338 $\not\phi$			
22E1	⩺	DOES NOT SUCCEED OR EQUAL ≡ 227D ≧ 0338 $\not\phi$			
22E2	⊄̄	NOT SQUARE IMAGE OF OR EQUAL TO ≡ 2291 ⊄̄ 0338 $\not\phi$			
22E3	⊈̄	NOT SQUARE ORIGINAL OF OR EQUAL TO ≡ 2292 ⊈̄ 0338 $\not\phi$			
22E4	⊄̄	SQUARE IMAGE OF OR NOT EQUAL TO			
22E5	⊈̄	SQUARE ORIGINAL OF OR NOT EQUAL TO			
22E6	⩷	LESS-THAN BUT NOT EQUIVALENT TO			
22E7	⩸	GREATER-THAN BUT NOT EQUIVALENT TO			
22E8	⩶	PRECEDES BUT NOT EQUIVALENT TO			
22E9	⩵	SUCCEEDS BUT NOT EQUIVALENT TO			
22EA	⊈̄	NOT NORMAL SUBGROUP OF ≡ 22B2 ⊈̄ 0338 $\not\phi$			
22EB	⊈̄	DOES NOT CONTAIN AS NORMAL SUBGROUP ≡ 22B3 ⊈̄ 0338 $\not\phi$			
22EC	⊈̄	NOT NORMAL SUBGROUP OF OR EQUAL TO ≡ 22B4 ⊈̄ 0338 $\not\phi$			
22ED	⊈̄	DOES NOT CONTAIN AS NORMAL SUBGROUP OR EQUAL ≡ 22B5 ⊈̄ 0338 $\not\phi$			
22EE	:	VERTICAL ELLIPSIS • these four ellipses are used for matrix row/column elision → 205D : tricolon → 2026 ... horizontal ellipsis → FE19 ⋮ presentation form for vertical horizontal ellipsis			
22EF	⋯	MIDLINE HORIZONTAL ELLIPSIS			
22F0	⋱	UP RIGHT DIAGONAL ELLIPSIS			
22F1	⋰	DOWN RIGHT DIAGONAL ELLIPSIS			
22F2	⊃̄	ELEMENT OF WITH LONG HORIZONTAL STROKE			
22F3	⊃̄	ELEMENT OF WITH VERTICAL BAR AT END OF HORIZONTAL STROKE			
22F4	⊃̄	SMALL ELEMENT OF WITH VERTICAL BAR AT END OF HORIZONTAL STROKE			
22F5	⊃̄	ELEMENT OF WITH DOT ABOVE			
22F6	⊃̄	ELEMENT OF WITH OVERBAR			
22F7	⊃̄	SMALL ELEMENT OF WITH OVERBAR			
22F8	⊃̄	ELEMENT OF WITH UNDERBAR			
22F9	⊃̄	ELEMENT OF WITH TWO HORIZONTAL STROKES			
22FA	⊃̄	CONTAINS WITH LONG HORIZONTAL STROKE			
22FB	⊃̄	CONTAINS WITH VERTICAL BAR AT END OF HORIZONTAL STROKE			
22FC	⊃̄	SMALL CONTAINS WITH VERTICAL BAR AT END OF HORIZONTAL STROKE			