

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 3.2*.

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/unicode/uni2errata/UnicodeErrata.html>.

Disclaimer

These charts are provided as the on-line reference to the character contents of the Unicode Standard, Version 3.2 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 3.0* (ISBN 0-201-61633-5), as well as Unicode Standard Annexes #28 and #27, the other Unicode Technical Reports and the Unicode Character Database, which are available on-line.

See <http://www.unicode.org/Public/UNIDATA/UnicodeCharacterDatabase.html> and <http://www.unicode.org/unicode/reports>

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

Fonts

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See <http://www.unicode.org/unicode/uni2book/u2fonts.html> for a list.

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




























































































































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

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	220	221	222	223	224	225	226	227
0	∇ 2200	\sqcup 2210	\sphericalangle 2220	\mathfrak{F} 2230	\wr 2240	\doteq 2250	\neq 2260	$\not\approx$ 2270
1	\complement 2201	Σ 2211	Δ 2221	\mathfrak{f} 2231	\approx 2241	\div 2251	\equiv 2261	$\not\equiv$ 2271
2	∂ 2202	$-$ 2212	\nlessgtr 2222	\mathfrak{f} 2232	\approx 2242	\doteq 2252	\neq 2262	\approx 2272
3	\exists 2203	\mp 2213	$ $ 2223	\mathfrak{f} 2233	\approx 2243	\doteq 2253	\equiv 2263	\approx 2273
4	\cancel{A} 2204	\dagger 2214	\ddagger 2224	\ddots 2234	\neq 2244	\doteq 2254	\leq 2264	$\not\approx$ 2274
5	\emptyset 2205	$/$ 2215	\parallel 2225	\ddots 2235	\equiv 2245	\doteq 2255	\geq 2265	$\not\approx$ 2275
6	Δ 2206	\diagdown 2216	\mathfrak{K} 2226	$:$ 2236	\neq 2246	\mathfrak{H} 2256	\equiv 2266	\approx 2276
7	∇ 2207	$*$ 2217	\wedge 2227	\ddots 2237	\neq 2247	\doteq 2257	\equiv 2267	\approx 2277
8	\in 2208	\circ 2218	\vee 2228	$\dot{-}$ 2238	\approx 2248	\doteq 2258	\neq 2268	$\not\approx$ 2278
9	\notin 2209	\bullet 2219	\cap 2229	$\dot{-}$ 2239	\neq 2249	\triangleq 2259	\neq 2269	$\not\approx$ 2279
A	ϵ 220A	\surd 221A	\cup 222A	\doteq 223A	\approx 224A	\leq 225A	\ll 226A	\lessgtr 227A
B	\supset 220B	$\sqrt[3]{}$ 221B	\int 222B	\div 223B	\approx 224B	\star 225B	\gg 226B	\gtrless 227B
C	\cancel{A} 220C	$\sqrt[4]{}$ 221C	\iint 222C	\sim 223C	\equiv 224C	\triangleq 225C	\emptyset 226C	\lessgtr 227C
D	\ni 220D	∞ 221D	\iiint 222D	\sim 223D	\asymp 224D	$\stackrel{\text{def}}{=}$ 225D	\neq 226D	\approx 227D
E	\blacksquare 220E	∞ 221E	\mathfrak{f} 222E	\approx 223E	\mathfrak{P} 224E	\equiv 225E	\nlessgtr 226E	\approx 227E
F	\prod 220F	\perp 221F	\mathfrak{F} 222F	\approx 223F	\mathfrak{P} 224F	$\stackrel{?}{=}$ 225F	\nlessgtr 226F	\approx 227F

	228	229	22A	22B	22C	22D	22E	22F
0	 2280	 2290	 22A0	 22B0	 22C0	 22D0	 22E0	 22F0
1	 2281	 2291	 22A1	 22B1	 22C1	 22D1	 22E1	 22F1
2	 2282	 2292	 22A2	 22B2	 22C2	 22D2	 22E2	 22F2
3	 2283	 2293	 22A3	 22B3	 22C3	 22D3	 22E3	 22F3
4	 2284	 2294	 22A4	 22B4	 22C4	 22D4	 22E4	 22F4
5	 2285	 2295	 22A5	 22B5	 22C5	 22D5	 22E5	 22F5
6	 2286	 2296	 22A6	 22B6	 22C6	 22D6	 22E6	 22F6
7	 2287	 2297	 22A7	 22B7	 22C7	 22D7	 22E7	 22F7
8	 2288	 2298	 22A8	 22B8	 22C8	 22D8	 22E8	 22F8
9	 2289	 2299	 22A9	 22B9	 22C9	 22D9	 22E9	 22F9
A	 228A	 229A	 22AA	 22BA	 22CA	 22DA	 22EA	 22FA
B	 228B	 229B	 22AB	 22BB	 22CB	 22DB	 22EB	 22FB
C	 228C	 229C	 22AC	 22BC	 22CC	 22DC	 22EC	 22FC
D	 228D	 229D	 22AD	 22BD	 22CD	 22DD	 22ED	 22FD
E	 228E	 229E	 22AE	 22BE	 22CE	 22DE	 22EE	 22FE
F	 228F	 229F	 22AF	 22BF	 22CF	 22DF	 22EF	 22FF

Mathematical operators

2200	\forall	FOR ALL	2215	/	DIVISION SLASH • generic division operator → 002F / solidus → 2044 / fraction slash
2201	\complement	COMPLEMENT → 0297 \complement latin letter stretched c	2216	\setminus	SET MINUS → 005C \setminus reverse solidus
2202	∂	PARTIAL DIFFERENTIAL	2217	*	ASTERISK OPERATOR → 002A * asterisk
2203	\exists	THERE EXISTS	2218	\circ	RING OPERATOR = composite function = APL jot → 00B0 \circ degree sign → 25E6 \circ white bullet
2204	\nexists	THERE DOES NOT EXIST ≡ 2203 \exists 0338 $\not\exists$	2219	\bullet	BULLET OPERATOR → 00B7 \bullet middle dot → 2022 \bullet bullet → 2024 \cdot one dot leader
2205	\emptyset	EMPTY SET = null set → 00D8 \emptyset latin capital letter o with stroke → 2300 \emptyset diameter sign	221A	\surd	SQUARE ROOT = radical sign → 2713 \surd check mark
2206	Δ	INCREMENT = Laplace operator = forward difference → 0394 Δ greek capital letter delta → 25B3 Δ white up-pointing triangle	221B	$\sqrt[3]{}$	CUBE ROOT
2207	∇	NABLA = Laplace operator (written with superscript 2) = backward difference = del → 25BD ∇ white down-pointing triangle	221C	$\sqrt[4]{}$	FOURTH ROOT
2208	\in	ELEMENT OF	221D	\propto	PROPORTIONAL TO → 03B1 \propto greek small letter alpha
2209	\notin	NOT AN ELEMENT OF ≡ 2208 \in 0338 $\not\in$	221E	∞	INFINITY
220A	\in	SMALL ELEMENT OF • originates in math pi fonts; not the straight epsilon → 03F5 \in greek lunate epsilon symbol	221F	\perp	RIGHT ANGLE
220B	\ni	CONTAINS AS MEMBER = such that	2220	\sphericalangle	ANGLE
220C	$\not\ni$	DOES NOT CONTAIN AS MEMBER ≡ 220B \ni 0338 $\not\ni$	2221	\sphericalangle	MEASURED ANGLE
220D	\ni	SMALL CONTAINS AS MEMBER → 03F6 \ni greek reversed lunate epsilon symbol	2222	\sphericalangle	SPHERICAL ANGLE = angle arc
220E	\blacksquare	END OF PROOF = Q.E.D. → 2023 \blacktriangleright triangular bullet → 25AE \blacksquare black vertical rectangle	2223		DIVIDES = such that = APL stile → 007C vertical line → 01C0 latin letter dental click
220F	\prod	N-ARY PRODUCT = product sign → 03A0 \prod greek capital letter pi	2224	\nmid	DOES NOT DIVIDE ≡ 2223 0338 $\not\mid$
2210	\coprod	N-ARY COPRODUCT = coproduct sign	2225		PARALLEL TO → 01C1 latin letter lateral click → 2016 double vertical line
2211	\sum	N-ARY SUMMATION = summation sign → 03A3 \sum greek capital letter sigma	2226	\nparallel	NOT PARALLEL TO ≡ 2225 0338 $\not\parallel$
2212	-	MINUS SIGN → 002D - hyphen-minus	2227	\wedge	LOGICAL AND = wedge, conjunction → 22C0 \wedge n-ary logical and → 2303 \wedge up arrowhead
2213	\mp	MINUS-OR-PLUS SIGN → 00B1 \pm plus-minus sign	2228	\vee	LOGICAL OR = vee, disjunction → 22C1 \vee n-ary logical or → 2304 \vee down arrowhead
2214	$\dot{+}$	DOT PLUS	2229	\cap	INTERSECTION = cap, hat → 22C2 \cap n-ary intersection
			222A	\cup	UNION = cup → 22C3 \cup n-ary union

222B	\int	INTEGRAL → 0283 \int latin small letter esh	2248	\approx	ALMOST EQUAL TO = asymptotic to
222C	\iint	DOUBLE INTEGRAL \approx 222B \int 222B \int	2249	\napprox	NOT ALMOST EQUAL TO \equiv 2248 \approx 0338 $\not\approx$
222D	\iiint	TRIPLE INTEGRAL \approx 222B \int 222B \int 222B \int	224A	\approx	ALMOST EQUAL OR EQUAL TO
222E	\oint	CONTOUR INTEGRAL	224B	\approx	TRIPLE TILDE
222F	\oiint	SURFACE INTEGRAL \approx 222E \oint 222E \oint	224C	\equiv	ALL EQUAL TO • reversed tilde and lazy S are glyph variants
2230	\iiint	VOLUME INTEGRAL \approx 222E \oint 222E \oint 222E \oint	224D	\times	EQUIVALENT TO
2231	\int	CLOCKWISE INTEGRAL	224E	\simeq	GEOMETRICALLY EQUIVALENT TO
2232	\oint	CLOCKWISE CONTOUR INTEGRAL	224F	\triangleq	DIFFERENCE BETWEEN
2233	\oint	ANTICLOCKWISE CONTOUR INTEGRAL • clockwise or anticlockwise arrows do not reverse during layout mirroring	2250	\doteq	APPROACHES THE LIMIT
2234	\therefore	THEREFORE	2251	\doteq	GEOMETRICALLY EQUAL TO
2235	\because	BECAUSE	2252	\doteq	APPROXIMATELY EQUAL TO OR THE IMAGE OF = nearly equals
2236	:	RATIO → 003A : colon	2253	\doteq	IMAGE OF OR APPROXIMATELY EQUAL TO
2237	::	PROPORTION	2254	\doteq	COLON EQUALS
2238	$\dot{-}$	DOT MINUS = symmetric difference	2255	\doteq	EQUALS COLON
2239	\therefore	EXCESS	2256	\doteq	RING IN EQUAL TO
223A	\doteq	GEOMETRIC PROPORTION	2257	\doteq	RING EQUAL TO = approximately equal to
223B	\doteq	HOMOTHETIC	2258	\doteq	CORRESPONDS TO
223C	\sim	TILDE OPERATOR = varies with (proportional to) = difference between = similar to = not = cycle = APL tilde → 007E \sim tilde → 00AC \neg not sign → 02DC \sim small tilde	2259	\doteq	ESTIMATES = corresponds to
223D	\smile	REVERSED TILDE = lazy S • reversed tilde and lazy S are glyph variants	225A	\doteq	EQUIANGULAR TO
223E	\smile	INVERTED LAZY S = most positive	225B	\doteq	STAR EQUALS
223F	\sim	SINE WAVE = alternating current	225C	\doteq	DELTA EQUAL TO = equiangular = equal to by definition
2240	\wr	WREATH PRODUCT	225D	\doteq	EQUAL TO BY DEFINITION
2241	\napprox	NOT TILDE \equiv 223C \sim 0338 $\not\sim$	225E	\doteq	MEASURED BY
2242	\approx	MINUS TILDE	225F	\doteq	QUESTIONED EQUAL TO
2243	\approx	ASYMPTOTICALLY EQUAL TO	2260	\neq	NOT EQUAL TO → 003D = equals sign → 01C2 † latin letter alveolar click \equiv 003D = 0338 $\not\neq$
2244	\napprox	NOT ASYMPTOTICALLY EQUAL TO \equiv 2243 \approx 0338 $\not\approx$	2261	\equiv	IDENTICAL TO
2245	\equiv	APPROXIMATELY EQUAL TO	2262	\ncong	NOT IDENTICAL TO \equiv 2261 \equiv 0338 $\not\cong$
2246	\equiv	APPROXIMATELY BUT NOT ACTUALLY EQUAL TO	2263	\equiv	STRICTLY EQUIVALENT TO
2247	\ncong	NEITHER APPROXIMATELY NOR ACTUALLY EQUAL TO \equiv 2245 \equiv 0338 $\not\equiv$	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
			2269	\geq	GREATER-THAN BUT NOT EQUAL TO
			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	\diamond	BETWEEN = plaintiff, quantic

226D	≠	NOT EQUIVALENT TO ≡ 224D ≠ 0338 $\not\equiv$	228A	⊆	SUBSET OF WITH NOT EQUAL TO
226E	⋈	NOT LESS-THAN ≡ 003C < 0338 $\not\equiv$	228B	⊇	SUPERSET OF WITH NOT EQUAL TO
226F	⋉	NOT GREATER-THAN ≡ 003E > 0338 $\not\equiv$	228C	⊎	MULTISET
2270	≠	NEITHER LESS-THAN NOR EQUAL TO ≡ 2264 ≤ 0338 $\not\equiv$	228D	⊗	MULTISET MULTIPLICATION
2271	≧	NEITHER GREATER-THAN NOR EQUAL TO ≡ 2265 ≥ 0338 $\not\equiv$	228E	⊕	MULTISET UNION = z notation bag addition
2272	≦	LESS-THAN OR EQUIVALENT TO	228F	□	SQUARE IMAGE OF
2273	≧	GREATER-THAN OR EQUIVALENT TO	2290	◻	SQUARE ORIGINAL OF
2274	≠	NEITHER LESS-THAN NOR EQUIVALENT TO ≡ 2272 ≤ 0338 $\not\equiv$	2291	◻	SQUARE IMAGE OF OR EQUAL TO
2275	≧	NEITHER GREATER-THAN NOR EQUIVALENT TO ≡ 2273 ≥ 0338 $\not\equiv$	2292	◻	SQUARE ORIGINAL OF OR EQUAL TO
2276	≦	LESS-THAN OR GREATER-THAN	2293	◻	SQUARE CAP
2277	≧	GREATER-THAN OR LESS-THAN	2294	◻	SQUARE CUP
2278	≠	NEITHER LESS-THAN NOR GREATER- THAN ≡ 2276 ≤ 0338 $\not\equiv$	2295	⊕	CIRCLED PLUS = direct sum = vector pointing into page → 2641 ♂ earth
2279	≠	NEITHER GREATER-THAN NOR LESS- THAN ≡ 2277 ≥ 0338 $\not\equiv$	2296	⊖	CIRCLED MINUS = symmetric difference
227A	<	PRECEDES = lower rank than → 22B0 ⋈ precedes under relation	2297	⊗	CIRCLED TIMES = tensor product = vector pointing into page
227B	>	SUCCEEDS = higher rank than → 22B1 ⋉ succeeds under relation	2298	⊘	CIRCLED DIVISION SLASH
227C	≦	PRECEDES OR EQUAL TO	2299	⊙	CIRCLED DOT OPERATOR = direct product = vector pointing out of page → 0298 ⊙ latin letter bilabial click → 2609 ⊙ sun
227D	≧	SUCCEEDS OR EQUAL TO	229A	⊙	CIRCLED RING OPERATOR → 233E ⊙ apl functional symbol circle jot → 25CE ⊙ bullseye
227E	≦	PRECEDES OR EQUIVALENT TO	229B	⊗	CIRCLED ASTERISK OPERATOR
227F	≧	SUCCEEDS OR EQUIVALENT TO	229C	⊖	CIRCLED EQUALS
2280	⋈	DOES NOT PRECEDE ≡ 227A < 0338 $\not\equiv$	229D	⊖	CIRCLED DASH
2281	⋉	DOES NOT SUCCEED ≡ 227B > 0338 $\not\equiv$	229E	⊕	SQUARED PLUS
2282	⊆	SUBSET OF = included in set	229F	⊖	SQUARED MINUS
2283	⊇	SUPERSET OF = includes in set	22A0	⊗	SQUARED TIMES → 2612 ⊗ ballot box with x
2284	⊈	NOT A SUBSET OF ≡ 2282 ⊆ 0338 $\not\equiv$	22A1	⊖	SQUARED DOT OPERATOR
2285	⊉	NOT A SUPERSET OF ≡ 2283 ⊇ 0338 $\not\equiv$	22A2	⊢	RIGHT TACK = turnstile = proves, implies, yields = reducible
2286	⊆	SUBSET OF OR EQUAL TO	22A3	⊣	LEFT TACK = reverse turnstile = non-theorem, does not yield
2287	⊇	SUPERSET OF OR EQUAL TO	22A4	⊥	DOWN TACK = top
2288	⊈	NEITHER A SUBSET OF NOR EQUAL TO ≡ 2286 ⊆ 0338 $\not\equiv$	22A5	⊥	UP TACK = orthogonal to = perpendicular = base, bottom
2289	⊉	NEITHER A SUPERSET OF NOR EQUAL TO ≡ 2287 ⊇ 0338 $\not\equiv$	22A6	⊢	ASSERTION = reduces to
			22A7	⊢	MODELS

22A8	\models	TRUE = statement is true, valid = is a tautology = satisfies = results in	22C6	*	STAR OPERATOR • APL → 066D * arabic five pointed star → 2605 ★ black star
22A9	\Vdash	FORCES	22C7	\div	DIVISION TIMES
22AA	\equiv	TRIPLE VERTICAL BAR RIGHT TURNSTILE	22C8	\bowtie	BOWTIE → 2445 ⚭ ocr bow tie
22AB	\equiv	DOUBLE VERTICAL BAR DOUBLE RIGHT TURNSTILE	22C9	\ltimes	LEFT NORMAL FACTOR SEMIDIRECT PRODUCT
22AC	\nVdash	DOES NOT PROVE ≡ 22A2 \vdash 0338 $\cancel{\neq}$	22CA	\rtimes	RIGHT NORMAL FACTOR SEMIDIRECT PRODUCT
22AD	\nVdash	NOT TRUE ≡ 22A8 \models 0338 $\cancel{\neq}$	22CB	\succ	LEFT SEMIDIRECT PRODUCT
22AE	\nVdash	DOES NOT FORCE ≡ 22A9 \Vdash 0338 $\cancel{\neq}$	22CC	\succcurlyeq	RIGHT SEMIDIRECT PRODUCT → 2041 \sphericalangle caret insertion point
22AF	\nVdash	NEGATED DOUBLE VERTICAL BAR DOUBLE RIGHT TURNSTILE ≡ 22AB \equiv 0338 $\cancel{\neq}$	22CD	\doteq	REVERSED TILDE EQUALS
22B0	\prec	PRECEDES UNDER RELATION → 227A $<$ precedes	22CE	\vee	CURLY LOGICAL OR
22B1	\succ	SUCCEEDS UNDER RELATION → 227B $>$ succeeds	22CF	\wedge	CURLY LOGICAL AND
22B2	\triangleleft	NORMAL SUBGROUP OF → 25C5 \triangleleft white left-pointing pointer	22D0	\subseteq	DOUBLE SUBSET
22B3	\triangleleft	CONTAINS AS NORMAL SUBGROUP → 25BB \triangleright white right-pointing pointer	22D1	\supseteq	DOUBLE SUPERSET
22B4	\trianglelefteq	NORMAL SUBGROUP OF OR EQUAL TO	22D2	\cap	DOUBLE INTERSECTION
22B5	\trianglerighteq	CONTAINS AS NORMAL SUBGROUP OR EQUAL TO	22D3	\cup	DOUBLE UNION
22B6	\leftrightarrow	ORIGINAL OF	22D4	\pitchfork	PITCHFORK = proper intersection
22B7	\leftrightarrow	IMAGE OF	22D5	$\#$	EQUAL AND PARALLEL TO → 2317 $\#$ viewdata square
22B8	\rightarrow	MULTIMAP	22D6	$<$	LESS-THAN WITH DOT
22B9	\dagger	HERMITIAN CONJUGATE MATRIX	22D7	$>$	GREATER-THAN WITH DOT
22BA	\intercal	INTERCALATE	22D8	\ll	VERY MUCH LESS-THAN
22BB	$\underline{\vee}$	XOR	22D9	\gg	VERY MUCH GREATER-THAN
22BC	$\overline{\wedge}$	NAND → 2305 $\overline{\wedge}$ projective	22DA	\equiv	LESS-THAN EQUAL TO OR GREATER- THAN
22BD	∇	NOR	22DB	\equiv	GREATER-THAN EQUAL TO OR LESS- THAN
22BE	\sphericalangle	RIGHT ANGLE WITH ARC	22DC	\approx	EQUAL TO OR LESS-THAN
22BF	\triangle	RIGHT TRIANGLE	22DD	\asymp	EQUAL TO OR GREATER-THAN
22C0	\wedge	N-ARY LOGICAL AND → 2227 \wedge logical and	22DE	\leq	EQUAL TO OR PRECEDES
22C1	\vee	N-ARY LOGICAL OR → 2228 \vee logical or	22DF	\geq	EQUAL TO OR SUCCEEDS
22C2	\cap	N-ARY INTERSECTION = z notation generalised intersection → 2229 \cap intersection	22E0	\napprox	DOES NOT PRECEDE OR EQUAL ≡ 227C \leq 0338 $\cancel{\neq}$
22C3	\cup	N-ARY UNION = z notation generalised union → 222A \cup union	22E1	\napprox	DOES NOT SUCCEED OR EQUAL ≡ 227D \geq 0338 $\cancel{\neq}$
22C4	\diamond	DIAMOND OPERATOR → 25C7 \diamond white diamond	22E2	\nsubseteq	NOT SQUARE IMAGE OF OR EQUAL TO ≡ 2291 \subseteq 0338 $\cancel{\neq}$
22C5	\cdot	DOT OPERATOR → 00B7 \cdot middle dot	22E3	\nsubseteq	NOT SQUARE ORIGINAL OF OR EQUAL TO ≡ 2292 \subseteq 0338 $\cancel{\neq}$
			22E4	\sqsubseteq	SQUARE IMAGE OF OR NOT EQUAL TO
			22E5	\sqsubseteq	SQUARE ORIGINAL OF OR NOT EQUAL TO
			22E6	\approx	LESS-THAN BUT NOT EQUIVALENT TO
			22E7	\gtrsim	GREATER-THAN BUT NOT EQUIVALENT TO
			22E8	\preceq	PRECEDES BUT NOT EQUIVALENT TO

22E9	⋈	SUCCEEDS BUT NOT EQUIVALENT TO
22EA	⊈	NOT NORMAL SUBGROUP OF ≡ 22B2 ≪ 0338 ⚭
22EB	⊉	DOES NOT CONTAIN AS NORMAL SUBGROUP ≡ 22B3 ≫ 0338 ⚭
22EC	⊈	NOT NORMAL SUBGROUP OF OR EQUAL TO ≡ 22B4 ≲ 0338 ⚭
22ED	⊉	DOES NOT CONTAIN AS NORMAL SUBGROUP OR EQUAL ≡ 22B5 ≳ 0338 ⚭
22EE	:	VERTICAL ELLIPSIS • these four ellipses are used for matrix row/column elision → 2026 ... 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
22FD	⊘	CONTAINS WITH OVERBAR
22FE	⊙	SMALL CONTAINS WITH OVERBAR
22FF	⊚	Z NOTATION BAG MEMBERSHIP