

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 | \sphericalapprox 2241 | \doteqdot 2251 | \equiv 2261 | $\not\equiv$ 2271 |
| 2 | ∂ 2202 | $-$ 2212 | \nexists 2222 | \mathfrak{f} 2232 | \approx 2242 | \doteqdot 2252 | \neq 2262 | \sphericalapprox 2272 |
| 3 | \exists 2203 | \mp 2213 | $ $ 2223 | \mathfrak{f} 2233 | \approx 2243 | \doteqdot 2253 | \equiv 2263 | \sphericalapprox 2273 |
| 4 | \cancel{A} 2204 | \dagger 2214 | \ddagger 2224 | \ddots 2234 | $\not\approx$ 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 | \nparallel 2226 | $:$ 2236 | \nparallel 2246 | \mathfrak{H} 2256 | \equiv 2266 | \sphericalapprox 2276 |
| 7 | ∇ 2207 | $*$ 2217 | \wedge 2227 | \ddots 2237 | \nparallel 2247 | $\overset{\circ}{=}$ 2257 | \equiv 2267 | \sphericalapprox 2277 |
| 8 | \in 2208 | \circ 2218 | \vee 2228 | $\dot{-}$ 2238 | \approx 2248 | \equiv 2258 | \nparallel 2268 | $\not\approx$ 2278 |
| 9 | \notin 2209 | \bullet 2219 | \cap 2229 | $\dot{-}$ 2239 | \nparallel 2249 | \triangleq 2259 | \nparallel 2269 | $\not\approx$ 2279 |
| A | ϵ 220A | \surd 221A | \cup 222A | \doteq 223A | \equiv 224A | \leq 225A | \ll 226A | \sphericalapprox 227A |
| B | \supset 220B | $\sqrt[3]{}$ 221B | \int 222B | \div 223B | \equiv 224B | \star 225B | \gg 226B | \sphericalapprox 227B |
| C | \cancel{A} 220C | $\sqrt[4]{}$ 221C | \iint 222C | \sim 223C | \equiv 224C | \triangleq 225C | \emptyset 226C | \sphericalapprox 227C |
| D | \ni 220D | ∞ 221D | \iiint 222D | \sim 223D | \sphericalapprox 224D | $\stackrel{\text{def}}{=}$ 225D | \nparallel 226D | \sphericalapprox 227D |
| E | \blacksquare 220E | ∞ 221E | \mathfrak{f} 222E | \approx 223E | \mathfrak{H} 224E | \equiv 225E | \nparallel 226E | \sphericalapprox 227E |
| F | \prod 220F | \perp 221F | \mathfrak{F} 222F | \approx 223F | \mathfrak{H} 224F | $\stackrel{?}{=}$ 225F | \nparallel 226F | \sphericalapprox 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 | ϵ | SMALL ELEMENT OF • originates in math pi fonts; not the straight epsilon → 03F5 ϵ 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 | \cong | ALMOST EQUAL OR EQUAL TO |
| 222E | \oint | CONTOUR INTEGRAL | 224B | \equiv | 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 | \sim | REVERSED TILDE = lazy S • reversed tilde and lazy S are glyph variants | 225A | \doteq | EQUIANGULAR TO |
| 223E | \sim | 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 | \cong | APPROXIMATELY EQUAL TO | 2262 | \ncong | NOT IDENTICAL TO \equiv 2261 \equiv 0338 $\not\cong$ |
| 2246 | \cong | APPROXIMATELY BUT NOT ACTUALLY EQUAL TO | 2263 | \equiv | STRICTLY EQUIVALENT TO |
| 2247 | \ncong | NEITHER APPROXIMATELY NOR ACTUALLY EQUAL TO \equiv 2245 \cong 0338 $\not\cong$ | 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 | \times | LEFT SEMIDIRECT PRODUCT |
| 22AE | \nVdash | DOES NOT FORCE ≡ 22A9 \Vdash 0338 $\cancel{\neq}$ | 22CC | \rhd | RIGHT SEMIDIRECT PRODUCT → 2041 \surd caret insertion point |
| 22AF | \nVdash | NEGATED DOUBLE VERTICAL BAR DOUBLE RIGHT TURNSTILE ≡ 22AB \equiv 0338 $\cancel{\neq}$ | 22CD | \approx | 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 $\bar{\wedge}$ 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 | \approx | EQUAL TO OR GREATER-THAN |
| 22C0 | \wedge | N-ARY LOGICAL AND → 2227 \wedge logical and | 22DE | \approx | EQUAL TO OR PRECEDES |
| 22C1 | \vee | N-ARY LOGICAL OR → 2228 \vee logical or | 22DF | \approx | 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 \sqsubseteq 0338 $\cancel{\neq}$ |
| 22C5 | \cdot | DOT OPERATOR → 00B7 \cdot middle dot | 22E3 | \nsubseteq | NOT SQUARE ORIGINAL OF OR EQUAL TO ≡ 2292 \sqsupseteq 0338 $\cancel{\neq}$ |
| | | | 22E4 | \sqsubseteq | SQUARE IMAGE OF OR NOT EQUAL TO |
| | | | 22E5 | \sqsupseteq | SQUARE ORIGINAL OF OR NOT EQUAL TO |
| | | | 22E6 | \approx | LESS-THAN BUT NOT EQUIVALENT TO |
| | | | 22E7 | \approx | GREATER-THAN BUT NOT EQUIVALENT TO |
| | | | 22E8 | \approx | 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 |