

Miscellaneous Mathematical Symbols-B

Range: 2980–29FF

This file contains an excerpt from the character code tables and list of character names for
The Unicode Standard, Version 14.0

This file may be changed at any time without notice to reflect errata or other updates to the Unicode Standard.
See <https://www.unicode.org/errata/> for an up-to-date list of errata.

See <https://www.unicode.org/charts/> for access to a complete list of the latest character code charts.
See <https://www.unicode.org/charts/PDF/Unicode-14.0/> for charts showing only the characters added in Unicode 14.0.
See <https://www.unicode.org/Public/14.0.0/charts/> for a complete archived file of character code charts for Unicode 14.0.

Disclaimer

These charts are provided as the online reference to the character contents of the Unicode Standard, Version 14.0 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 file, please consult the appropriate sections of The Unicode Standard, Version 14.0, online at <https://www.unicode.org/versions/Unicode14.0.0/>, as well as Unicode Standard Annexes #9, #11, #14, #15, #24, #29, #31, #34, #38, #41, #42, #44, #45, and #50, the other Unicode Technical Reports and Standards, and the Unicode Character Database, which are available online.

See <https://www.unicode.org/ucd/> and <https://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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





































































































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

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| | 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 |

Miscellaneous mathematical symbols

- 2980 \equiv TRIPLE VERTICAL BAR DELIMITER
 → 2AF4 \equiv triple vertical bar binary relation
 → 2AFC \equiv large triple vertical bar operator
- 2981 \bullet Z NOTATION SPOT
 • medium-small-sized black circle
 → 2219 \bullet bullet operator
 → 25CF \bullet black circle
- 2982 \colon Z NOTATION TYPE COLON
 → 0F7F \colon tibetan sign rnam bcad

Brackets

- 2983 $\{$ LEFT WHITE CURLY BRACKET
- 2984 $\}$ RIGHT WHITE CURLY BRACKET
- 2985 $($ LEFT WHITE PARENTHESIS
 → 2E28 $($ left double parenthesis
 → FF5F $($ fullwidth left white parenthesis
- 2986 $)$ RIGHT WHITE PARENTHESIS
 • used for Bourbakist intervals
 → 2E29 $)$ right double parenthesis
 → FF60 $)$ fullwidth right white parenthesis
- 2987 $[$ Z NOTATION LEFT IMAGE BRACKET
- 2988 $]$ Z NOTATION RIGHT IMAGE BRACKET
- 2989 \langle Z NOTATION LEFT BINDING BRACKET
- 298A \rangle Z NOTATION RIGHT BINDING BRACKET
- 298B \lfloor LEFT SQUARE BRACKET WITH UNDERBAR
- 298C \rfloor RIGHT SQUARE BRACKET WITH UNDERBAR

Brackets with ticks

For bidirectional processing, the brackets with ticks are paired on the basis of their left/right symmetric glyphs, rather than on the basis of an open/close pairing inferred from code point order.

- 298D \lceil LEFT SQUARE BRACKET WITH TICK IN TOP CORNER
- 298E \rceil RIGHT SQUARE BRACKET WITH TICK IN BOTTOM CORNER
- 298F \lfloor LEFT SQUARE BRACKET WITH TICK IN BOTTOM CORNER
- 2990 \rfloor RIGHT SQUARE BRACKET WITH TICK IN TOP CORNER

Brackets

- 2991 \lhd LEFT ANGLE BRACKET WITH DOT
- 2992 \rhd RIGHT ANGLE BRACKET WITH DOT
- 2993 \lless LEFT ARC LESS-THAN BRACKET
- 2994 \rgtr RIGHT ARC GREATER-THAN BRACKET
- 2995 \lthrc DOUBLE LEFT ARC GREATER-THAN BRACKET
- 2996 \rthrc DOUBLE RIGHT ARC LESS-THAN BRACKET
- 2997 \ulcorner LEFT BLACK TORTOISE SHELL BRACKET
 → 27EC \ulcorner mathematical left white tortoise shell bracket
 → 3014 \ulcorner left tortoise shell bracket
 → 3018 \ulcorner left white tortoise shell bracket
- 2998 \urcorner RIGHT BLACK TORTOISE SHELL BRACKET

Fences

- 2999 \vdots DOTTED FENCE
 • four close dots vertical
- 299A \zigzag VERTICAL ZIGZAG LINE
 → 2307 \zigzag wavy line

Angles

- 299B \sphericalangle MEASURED ANGLE OPENING LEFT
 → 2221 \sphericalangle measured angle









- 299C \blacksquare RIGHT ANGLE VARIANT WITH SQUARE
 → 221F \blacksquare right angle
- 299D \blacksquare MEASURED RIGHT ANGLE WITH DOT
- 299E \sphericalangle ANGLE WITH S INSIDE
- 299F \sphericalangle ACUTE ANGLE
 → 2220 \sphericalangle angle
- 29A0 \sphericalangle SPHERICAL ANGLE OPENING LEFT
 → 2222 \sphericalangle spherical angle
- 29A1 \sphericalangle SPHERICAL ANGLE OPENING UP
- 29A2 \sphericalangle TURNED ANGLE
 → 2220 \sphericalangle angle
- 29A3 \sphericalangle REVERSED ANGLE
- 29A4 \sphericalangle ANGLE WITH UNDERBAR
- 29A5 \sphericalangle REVERSED ANGLE WITH UNDERBAR
- 29A6 \sphericalangle OBLIQUE ANGLE OPENING UP
- 29A7 \sphericalangle OBLIQUE ANGLE OPENING DOWN
- 29A8 \sphericalangle MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING UP AND RIGHT
- 29A9 \sphericalangle MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING UP AND LEFT
- 29AA \sphericalangle MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING DOWN AND RIGHT
- 29AB \sphericalangle MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING DOWN AND LEFT
- 29AC \sphericalangle MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING RIGHT AND UP
- 29AD \sphericalangle MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING LEFT AND UP
- 29AE \sphericalangle MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING RIGHT AND DOWN
- 29AF \sphericalangle MEASURED ANGLE WITH OPEN ARM ENDING IN ARROW POINTING LEFT AND DOWN

Empty sets












- 29B0 \emptyset REVERSED EMPTY SET
 → 2205 \emptyset empty set
 → 2349 \emptyset apl functional symbol circle backslash
- 29B1 $\overline{\emptyset}$ EMPTY SET WITH OVERBAR
- 29B2 \smallcirc EMPTY SET WITH SMALL CIRCLE ABOVE
- 29B3 $\rightarrow\emptyset$ EMPTY SET WITH RIGHT ARROW ABOVE
- 29B4 $\leftarrow\emptyset$ EMPTY SET WITH LEFT ARROW ABOVE

Circle symbols









- 29B5 \ominus CIRCLE WITH HORIZONTAL BAR
 • used in superscripted form to mean standard state (chemistry)
 → 2296 \ominus circled minus
- 29B6 \mathbb{D} CIRCLED VERTICAL BAR
 → 1F715 \mathbb{D} alchemical symbol for nitre
- 29B7 \mathbb{O} CIRCLED PARALLEL
- 29B8 \mathbb{O} CIRCLED REVERSE SOLIDUS
- 29B9 \mathbb{O} CIRCLED PERPENDICULAR
- 29BA \mathbb{O} CIRCLE DIVIDED BY HORIZONTAL BAR AND TOP HALF DIVIDED BY VERTICAL BAR
- 29BB \mathbb{O} CIRCLE WITH SUPERIMPOSED X
 → 2297 \mathbb{O} circled times
- 29BC \mathbb{O} CIRCLED ANTICLOCKWISE-ROTATED DIVISION SIGN
- 29BD \mathbb{O} UP ARROW THROUGH CIRCLE
- 29BE \mathbb{O} CIRCLED WHITE BULLET
 → 229A \mathbb{O} circled ring operator
 → 233E \mathbb{O} apl functional symbol circle jot
 → 25CE \mathbb{O} bullseye

- 29BF  CIRCLED BULLET
 • forms part of a graduated set of circles with enclosed black circle of different sizes
 → 2299  circled dot operator
 → 25C9  fisheye
 → 2A00  n-ary circled dot operator
- 29C0  CIRCLED LESS-THAN
 29C1  CIRCLED GREATER-THAN
 29C2  CIRCLE WITH SMALL CIRCLE TO THE RIGHT
 29C3  CIRCLE WITH TWO HORIZONTAL STROKES TO THE RIGHT














Square symbols

- 29C4  SQUARED RISING DIAGONAL SLASH
 → 2341  apl functional symbol quad slash
 → 303C  masu mark
- 29C5  SQUARED FALLING DIAGONAL SLASH
 → 2342  apl functional symbol quad backslash
- 29C6  SQUARED ASTERISK
 29C7  SQUARED SMALL CIRCLE
 → 233B  apl functional symbol quad jot
- 29C8  SQUARED SQUARE
 29C9  TWO JOINED SQUARES
 → 2BBA  overlapping white squares






Triangle symbols

- 29CA  TRIANGLE WITH DOT ABOVE
 29CB  TRIANGLE WITH UNDERBAR
 29CC  S IN TRIANGLE
 29CD  TRIANGLE WITH SERIFS AT BOTTOM
 → 25B3  white up-pointing triangle
- 29CE  RIGHT TRIANGLE ABOVE LEFT TRIANGLE
 29CF  LEFT TRIANGLE BESIDE VERTICAL BAR
 29D0  VERTICAL BAR BESIDE RIGHT TRIANGLE



Bowtie symbols












- 29D1  BOWTIE WITH LEFT HALF BLACK
 → 22C8  bowtie
- 29D2  BOWTIE WITH RIGHT HALF BLACK
 29D3  BLACK BOWTIE
 → 1FB9B  left and right triangular half block
- 29D4  TIMES WITH LEFT HALF BLACK
 → 22C9  left normal factor semidirect product
- 29D5  TIMES WITH RIGHT HALF BLACK
 → 22CA  right normal factor semidirect product
- 29D6  WHITE HOURGLASS
 = vertical bowtie
 = white framus
 → 231B  hourglass
- 29D7  BLACK HOURGLASS
 → 1FB9A  upper and lower triangular half block

Fences








- 29D8  LEFT WIGGLY FENCE
 → FE34  presentation form for vertical wavy low line
- 29D9  RIGHT WIGGLY FENCE
 29DA  LEFT DOUBLE WIGGLY FENCE
 29DB  RIGHT DOUBLE WIGGLY FENCE

Miscellaneous mathematical symbols













- 29DC  INCOMPLETE INFINITY
 = ISOtech entity ⧜
 → 221E  infinity

- 29DD  TIE OVER INFINITY
 29DE  INFINITY NEGATED WITH VERTICAL BAR
 29DF  DOUBLE-ENDED MULTIMAP
 → 22B8  multimap
 → 1F73A  alchemical symbol for arsenic
- 29E0  SQUARE WITH CONTOURED OUTLINE
 = D'Alembertian
 → 274F  lower right drop-shadowed white square
- 29E1  INCREASES AS
 → 22B4  normal subgroup of or equal to
- 29E2  SHUFFLE PRODUCT
 → 22FF  z notation bag membership







Relations

- 29E3  # EQUALS SIGN AND SLANTED PARALLEL
 → 0023  number sign
 → 22D5  equal and parallel to
- 29E4  # EQUALS SIGN AND SLANTED PARALLEL WITH TILDE ABOVE
- 29E5  # IDENTICAL TO AND SLANTED PARALLEL
 → 2A68  triple horizontal bar with double vertical stroke
- 29E6  H GLEICH STARK
 = tautological equivalent









Miscellaneous mathematical symbols

- 29E7  ± THERMODYNAMIC
 = record mark
 • vertical bar crossed by two horizontals
 → 2260  not equal to
 → 2BD2  group mark
- 29E8  ▼ DOWN-POINTING TRIANGLE WITH LEFT HALF BLACK
 → 25ED  up-pointing triangle with left half black
- 29E9  ▼ DOWN-POINTING TRIANGLE WITH RIGHT HALF BLACK
 → 25EE  up-pointing triangle with right half black
- 29EA  ♦ BLACK DIAMOND WITH DOWN ARROW
 29EB  ♦ BLACK LOZENGE
 → 25CA  lozenge
- 29EC  ♀ WHITE CIRCLE WITH DOWN ARROW
 29ED  ♀ BLACK CIRCLE WITH DOWN ARROW

Error bar symbols

- 29EE  □ ERROR-BARRED WHITE SQUARE
 29EF  ■ ERROR-BARRED BLACK SQUARE
 29F0  ◇ ERROR-BARRED WHITE DIAMOND
 29F1  ◆ ERROR-BARRED BLACK DIAMOND
 29F2  ○ ERROR-BARRED WHITE CIRCLE
 29F3  ● ERROR-BARRED BLACK CIRCLE

Miscellaneous mathematical symbols

- 29F4  ⇨ RULE-DELAYED
 = colon right arrow
- 29F5  \ REVERSE SOLIDUS OPERATOR
 → 005C  reverse solidus
 → 2216  set minus
 → 27CD  mathematical falling diagonal
- 29F6  / SOLIDUS WITH OVERBAR
 29F7  \ REVERSE SOLIDUS WITH HORIZONTAL STROKE
 → 2340  apl functional symbol backslash bar

Large operators

29F8 / BIG SOLIDUS
 → 2215 / division slash

29F9 \ BIG REVERSE SOLIDUS
 = z notation schema hiding
 → 2216 \ set minus

Specialized plus sign operators

29FA ⦶ DOUBLE PLUS

29FB ⦶ TRIPLE PLUS

Brackets

29FC ⌢ LEFT-POINTING CURVED ANGLE BRACKET
 → 227A ⌢ precedes
 → 2329 ⌢ left-pointing angle bracket

29FD ⌣ RIGHT-POINTING CURVED ANGLE BRACKET
 → 227B ⌣ succeeds
 → 232A ⌣ right-pointing angle bracket

Symbols used in game theory

TINY (pronounced "teenie") and MINY (pronounced "meenie") are symbols that yield infinitesimal values when applied to numbers in combinatorial game theory.

29FE + TINY
 → 002B + plus sign

29FF − MINY
 → 2212 − minus sign