

## 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 5.2*.

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

See <http://www.unicode.org/charts/> for access to a complete list of the latest character code charts. See <http://www.unicode.org/charts/PDF/Unicode-5.2/> for charts showing only the characters added in Unicode 5.2. See <http://www.unicode.org/Public/5.2.0/charts/> for a complete archived file of character code charts for Unicode 5.2.

### Disclaimer

These charts are provided as the online reference to the character contents of the Unicode Standard, Version 5.2 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 file, please consult the appropriate sections of The Unicode Standard, Version 5.2, online at <http://www.unicode.org/versions/Unicode5.2.0/>, as well as Unicode Standard Annexes #9, #11, #14, #15, #24, #29, #31, #34, #38, #41, #42, and #44, the other Unicode Technical Reports and Standards, and the Unicode Character Database, which are available online.

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/charts/fonts.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/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  $\textcircled{8}$  Z NOTATION TYPE COLON  
 → 0F7F  $\textcircled{8}$  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  $\langle$  Z NOTATION LEFT IMAGE BRACKET
- 2988  $\rangle$  Z NOTATION RIGHT IMAGE BRACKET
- 2989  $\langle$  Z NOTATION LEFT BINDING BRACKET
- 298A  $\rangle$  Z NOTATION RIGHT BINDING BRACKET
- 298B  $[$  LEFT SQUARE BRACKET WITH UNDERBAR
- 298C  $]$  RIGHT SQUARE BRACKET WITH UNDERBAR
- 298D  $[$  LEFT SQUARE BRACKET WITH TICK IN TOP CORNER
- 298E  $]$  RIGHT SQUARE BRACKET WITH TICK IN BOTTOM CORNER
- 298F  $[$  LEFT SQUARE BRACKET WITH TICK IN BOTTOM CORNER
- 2990  $]$  RIGHT SQUARE BRACKET WITH TICK IN TOP CORNER
- 2991  $\langle$  LEFT ANGLE BRACKET WITH DOT
- 2992  $\rangle$  RIGHT ANGLE BRACKET WITH DOT
- 2993  $\lessgtr$  LEFT ARC LESS-THAN BRACKET
- 2994  $\gtrless$  RIGHT ARC GREATER-THAN BRACKET
- 2995  $\lessgtr$  DOUBLE LEFT ARC GREATER-THAN BRACKET
- 2996  $\gtrless$  DOUBLE RIGHT ARC LESS-THAN BRACKET
- 2997  $\lrcorner$  LEFT BLACK TORTOISE SHELL BRACKET  
 → 27EC  $\lrcorner$  mathematical left white tortoise shell bracket  
 → 3014  $\lrcorner$  left tortoise shell bracket  
 → 3018  $\lrcorner$  left white tortoise shell bracket
- 2998  $\rlcorner$  RIGHT BLACK TORTOISE SHELL BRACKET

**Fences**

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

**Angles**

- 299B  $\sphericalangle$  MEASURED ANGLE OPENING LEFT  
 → 2221  $\sphericalangle$  measured angle
- 299C  $\text{L}$  RIGHT ANGLE VARIANT WITH SQUARE  
 → 221F  $\text{L}$  right angle
- 299D  $\text{R}$  MEASURED RIGHT ANGLE WITH DOT
- 299E  $\sphericalangle$  ANGLE WITH S INSIDE
- 299F  $\sphericalangle$  ACUTE 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  $\overset{\circ}{\emptyset}$  EMPTY SET WITH SMALL CIRCLE ABOVE
- 29B3  $\overset{\rightarrow}{\emptyset}$  EMPTY SET WITH RIGHT ARROW ABOVE
- 29B4  $\overset{\leftarrow}{\emptyset}$  EMPTY SET WITH LEFT ARROW ABOVE

**Circle symbols**

- 29B5  $\ominus$  CIRCLE WITH HORIZONTAL BAR  
 → 2296  $\ominus$  circled minus
- 29B6  $\textcircled{1}$  CIRCLED VERTICAL BAR
- 29B7  $\textcircled{\parallel}$  CIRCLED PARALLEL
- 29B8  $\textcircled{\text{S}}$  CIRCLED REVERSE SOLIDUS
- 29B9  $\textcircled{\perp}$  CIRCLED PERPENDICULAR
- 29BA  $\textcircled{\ominus}$  CIRCLE DIVIDED BY HORIZONTAL BAR AND TOP HALF DIVIDED BY VERTICAL BAR
- 29BB  $\textcircled{\otimes}$  CIRCLE WITH SUPERIMPOSED X  
 → 2297  $\textcircled{\otimes}$  circled times
- 29BC  $\textcircled{\div}$  CIRCLED ANTICLOCKWISE-ROTATED DIVISION SIGN
- 29BD  $\textcircled{\uparrow}$  UP ARROW THROUGH CIRCLE
- 29BE  $\textcircled{\bullet}$  CIRCLED WHITE BULLET  
 → 229A  $\textcircled{\bullet}$  circled ring operator  
 → 233E  $\textcircled{\bullet}$  apl functional symbol circle jot  
 → 25CE  $\textcircled{\bullet}$  bullseye
- 29BF  $\textcircled{\bullet}$  CIRCLED BULLET  
 • forms part of a graduated set of circles with enclosed black circle of different sizes  
 → 2299  $\textcircled{\bullet}$  circled dot operator  
 → 25C9  $\textcircled{\bullet}$  fisheye  
 → 2A00  $\textcircled{\bullet}$  n-ary circled dot operator
- 29C0  $\textcircled{<}$  CIRCLED LESS-THAN
- 29C1  $\textcircled{>}$  CIRCLED GREATER-THAN
- 29C2  $\textcircled{\circ}$  CIRCLE WITH SMALL CIRCLE TO THE RIGHT
- 29C3  $\textcircled{\text{—}}$  CIRCLE WITH TWO HORIZONTAL STROKES TO THE RIGHT

**Square symbols**

- 29C4  $\boxplus$  SQUARED RISING DIAGONAL SLASH  
→ 2341  $\boxplus$  apl functional symbol quad slash  
→ 303C  $\boxplus$  masu mark
- 29C5  $\boxminus$  SQUARED FALLING DIAGONAL SLASH  
→ 2342  $\boxminus$  apl functional symbol quad backslash
- 29C6  $\boxtimes$  SQUARED ASTERISK
- 29C7  $\boxcirc$  SQUARED SMALL CIRCLE  
→ 233B  $\boxcirc$  apl functional symbol quad jot
- 29C8  $\boxdot$  SQUARED SQUARE
- 29C9  $\boxplus$  TWO JOINED SQUARES

**Triangle symbols**

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

**Bowtie symbols**

- 29D1  $\bowtie$  BOWTIE WITH LEFT HALF BLACK  
→ 22C8  $\bowtie$  bowtie
- 29D2  $\bowtie$  BOWTIE WITH RIGHT HALF BLACK
- 29D3  $\bowtie$  BLACK BOWTIE
- 29D4  $\bowtie$  TIMES WITH LEFT HALF BLACK  
→ 22C9  $\bowtie$  left normal factor semidirect product
- 29D5  $\bowtie$  TIMES WITH RIGHT HALF BLACK  
→ 22CA  $\bowtie$  right normal factor semidirect product
- 29D6  $\bowtie$  WHITE HOURGLASS  
= vertical bowtie  
= white framus  
→ 231B  $\bowtie$  hourglass
- 29D7  $\bowtie$  BLACK HOURGLASS

**Fences**

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

**Miscellaneous mathematical symbols**

- 29DC  $\sim$  INCOMPLETE INFINITY  
= ISOtech entity &iinfin;  
→ 221E  $\infty$  infinity
- 29DD  $\infty$  TIE OVER INFINITY
- 29DE  $\infty$  INFINITY NEGATED WITH VERTICAL BAR
- 29DF  $\multimap$  DOUBLE-ENDED MULTIMAP  
→ 22B8  $\multimap$  multimap
- 29E0  $\square$  SQUARE WITH CONTOURED OUTLINE  
= D'Alembertian  
→ 274F  $\square$  lower right drop-shadowed white square
- 29E1  $\preceq$  INCREASES AS  
→ 22B4  $\preceq$  normal subgroup of or equal to
- 29E2  $\sqcup$  SHUFFLE PRODUCT  
→ 22FF  $\sqcup$  z notation bag membership

**Relations**

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

**Miscellaneous mathematical symbols**

- 29E7  $\neq$  THERMODYNAMIC  
• vertical bar crossed by two horizontals  
→ 2260  $\neq$  not equal to
- 29E8  $\blacktriangledown$  DOWN-POINTING TRIANGLE WITH LEFT HALF BLACK  
→ 25ED  $\blacktriangledown$  up-pointing triangle with left half black
- 29E9  $\blacktriangledown$  DOWN-POINTING TRIANGLE WITH RIGHT HALF BLACK  
→ 25EE  $\blacktriangledown$  up-pointing triangle with right half black
- 29EA  $\blacklozenge$  BLACK DIAMOND WITH DOWN ARROW
- 29EB  $\blacklozenge$  BLACK LOZENGE  
→ 25CA  $\blacklozenge$  lozenge
- 29EC  $\blacklozenge$  WHITE CIRCLE WITH DOWN ARROW
- 29ED  $\blacklozenge$  BLACK CIRCLE WITH DOWN ARROW

**Error bar symbols**

- 29EE  $\square$  ERROR-BARRED WHITE SQUARE
- 29EF  $\square$  ERROR-BARRED BLACK SQUARE
- 29F0  $\diamond$  ERROR-BARRED WHITE DIAMOND
- 29F1  $\blacklozenge$  ERROR-BARRED BLACK DIAMOND
- 29F2  $\circ$  ERROR-BARRED WHITE CIRCLE
- 29F3  $\bullet$  ERROR-BARRED BLACK CIRCLE

**Miscellaneous mathematical symbols**

- 29F4  $\Rightarrow$  RULE-DELAYED  
= colon right arrow
- 29F5  $\setminus$  REVERSE SOLIDUS OPERATOR  
→ 005C  $\setminus$  reverse solidus  
→ 2216  $\setminus$  set minus
- 29F6  $\overline{\setminus}$  SOLIDUS WITH OVERBAR
- 29F7  $\setminus$  REVERSE SOLIDUS WITH HORIZONTAL STROKE  
→ 2340  $\setminus$  apl functional symbol backslash bar

**Large operators**

- 29F8  $\big/$  BIG SOLIDUS  
→ 2215  $\big/$  division slash
- 29F9  $\big\setminus$  BIG REVERSE SOLIDUS  
= z notation schema hiding  
→ 2216  $\setminus$  set minus

**Specialized plus sign operators**

- 29FA  $\#$  DOUBLE PLUS
- 29FB  $\#$  TRIPLE PLUS

**Brackets**

- 29FC  $\langle$  LEFT-POINTING CURVED ANGLE BRACKET  
→ 227A  $\langle$  precedes  
→ 2329  $\langle$  left-pointing angle bracket
- 29FD  $\rangle$  RIGHT-POINTING CURVED ANGLE BRACKET  
→ 227B  $\rangle$  succeeds  
→ 232A  $\rangle$  right-pointing angle bracket

**Miscellaneous mathematical symbols**

29FE + TINY  
→ 002B + plus sign  
29FF - MINY  
→ 2212 - minus sign