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Elsevier Science Grid in Unicode

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1 Introduction

With the adoption of Unicode, the Elsevier Science Grid has (almost) lost its function. In SGML our Grid was the only solid way to document non-ascii symbols. In the SGML documents non-ascii symbols were entered as so-called SDATA entities. Here SDATA stands for System Data, meaning that the system should know what they mean because their meaning cannot be expressed otherwise. The grid with glyphs and descriptions gave a solid foundation to this “knowledge”.

Nowadays the same role is fulfilled by the Unicode standard, whose main deliverables are a book and a web site with code point assignments, example glyphs, descriptions and properties of characters. Therefore the role of our Grid, which has served us well in our pioneering years, has been taken over by standard bodies, and we may shelve it together with our previous DTDs.

The difference with the SGML era is that each character is no longer identified by an entity name but by a Unicode position. If there still is an entity name for a symbol, then it is merely an alias for that Unicode position.

Yet, there are at least as many entity names for symbols as there were in the SGML era. All ISO entities are declared by the MathML DTD. In addition MathML defines a number of extra entities. Nevertheless, our grid contained a number of symbols which do occur in Unicode, but for which there is no MathML entity. This is mainly due to the variety of symbols with identical meaning, e.g. symbols with a single or a double equal sign. We have defined extra entities for a number of such symbols. Especially all symbols of grid B have an entity name. Our entity definitions can be found in the file ESEextra.ent, which is read by the Common Element Pool as the last entity file. All these entity names have a prefix “z.” to indicate their private definition. Note, however, that only the entity *names* are private; their expansion to a Unicode point is in agreement with the official Unicode standard.

Unfortunately, not all Grid symbols have been adopted by Unicode. The MathML and STIX effort has had great success for mathematical symbols, which form the majority of our grid symbols. No such effort has yet been done for chemistry and linguistics, two other scientific areas that contribute symbols to the grid. For these symbols, we must maintain a small version of the grid.

It is not possible to define entities for such symbols, because the SDATA mechanism has been abandoned. We have adopted an approach which is similar to MathML’s `mglyph` element: We have created a `ce:glyph` element, which has a required name attribute. For each symbol which is not represented in Unicode we have devised a name by which it can be identified. The names are simply the DTD 4 entity names, without the prefix “z.” if there was one.

On the following pages we show the three tables of the ES grid (grids B, C, P). To aid the transition from our grid to Unicode, in the two sections following the tables we list the translation of all our grid symbols to Unicode (section 3), and of all our DTD4 entities to DTD5 entities (section 4).

2 Corrections

2.1 6 June 2003

On 6 June 2003 a corrected version was published. The corrections are as follows:

The grid points Pag, Pf2 and Pkr, which have DTD4 entity names `&z.pg;`, `&z.syllab;` and `&z.rtrfhr;`, respectively, were erroneously listed as symbols which should be marked as a glyph element. They are now listed with their correct Unicode point.

The following pairs of grid points had the same DTD4 entity name, but they have been assigned a different Unicode point:

- Cff and Pfo (`Œ`),
- Cdi and Pci (`ι`),
- Bso and Pbo (`⊙`),

- Cf9 and Pj2 (’),
- Ce9 and Pl2 (‘),
- Be4 and Pg2 (⌝),
- Bfm and Bl0 (★).

In order to remedy this situation, the entity name of the last named grid points of each of the first six pairs has been prefixed with ‘ph.’. This stands for phonetic because they are phonetic symbols.

In the last pair the entity name of the last named grid point has been modified to `&ssstarf;`, because this is a small star.

2.2 17 February 2004

On 17 February 2004 a corrected version was published. The following note was added:

In the CEP the glyph name `phktp` is erroneously included in the list of glyph names. It corresponds to grid point `Pdp`. This list correctly documents that the grid point `Pdp` corresponds to Unicode 001A5. This means that the glyph name `phktp` actually corresponds to Unicode 001A5. For reasons of backward compatibility we will not retract the glyph name `phktp` from the list of glyph names in de CEP.

2.3 15 July 2004

On 15 July 2004 a corrected version was published.

The assignment of the grid points `Cd4` and `Cdf` (the two forms of the Greek phi) to Unicode points was in error. `Cd4` corresponds to Unicode 003C6, the cursive phi, `Cdf` corresponds to Unicode 003D5, the straight phi. This is now corrected.

We have added section 5, a list of differences between the entity definitions in the CEP, MathML2 and MathML2, 2nd Ed. And we have added section 6, a short overview of the correct Unicode assignments and the corresponding entity names for the Greek epsilon and phi. These sections are for clarification only; they do not introduce changes.

The following glyph names defined in the CEP have now corresponding Unicode points. Sections 3 and 4 of this list correctly list the corresponding Unicode point for the grid points and for the DTD4 entity names, respectively.

glyph	Unicode point	grid	meaning
<code>hriss</code>	02E6--02E5	<code>Pc7</code>	high rising
<code>lriss</code>	02E9--02E8	<code>Pd7</code>	low rising
<code>risfls</code>	02E6--02E5--02E6	<code>Pe7</code>	rising–falling
<code>phktp</code>	01A5	<code>Pdp</code>	p hooktop

This means that in XML documents the Unicode points should be used instead of the glyph names. There are no entity names for these Unicode points. For reasons of backward compatibility we will not retract the glyph names from the list of glyph names in de CEP.

2.4 3 December 2004

The grid point Bk8 was assigned to the Unicode character 2217, whose Unicode name is ‘ASTERISK OPERATOR’ and whose Unicode category is ‘Symbol, Math’. This is not a correct assignment for a symbol that is used as a footnote symbol. For a while it was advocated that the keyboard asterisk *, Unicode 002A, be used as a footnote symbol, but that does not work well with the prescription that the label should be without and the cross-reference text should be with presentation tagging. The Unicode character 204E, ‘LOW ASTERISK’ is a suitable footnote symbol. By itself it is positioned at the height of a normal character, and it can be moved to a superior position by using the superscript tag. Therefore the grid point Bk8 is now assigned to this Unicode character. No entity has been defined for this character; it must be entered in an XML file as a character entity `⁎` or with its character code (in UTF-8).

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	
a	⇌	↷	↓	<	>	†	‡	&	∇	∑	<	∠	>	∠	∞	∞	∞	∞	×	+		a
b	⇌	↷	↓	≪	≫			¢	∃	∏	≠	≠	≠					x	+		b	
c	↔	↗	↓	∥	∥	§		\$	∅	∏	≠		≠		∩	∩	∩	∩	·	±	€	c
d	↔	↗	↓	()	¶		£	∩	∏	≠	≠	≠	≠	∩	∩	∩	∩	×	±		d
e	←	↶	↑			⊗		f		√	≠	≠	≠	≠		∩		∩	×	+		e
f	←	←	↑			↘	◇	¥	∩	∏	≠	≠	≠	≠		∩		∩	×	*		f
g	←	↶	↑			◇	◇	₤	∩	∏	≠	≠	≠	≠	∩	∩	∩	∩	<		ħ	g
h	←	↶	↑			◆	◇	€	∩	∏	≠	≠	≠	≠	∩	∩	∩	∩	×		h	h
i	↔		↗		+	♥	◆		∩	S	≠	≠	≠	≠	∩	∩	∩	∩	∩			i
j	↔	→	↘	∥	†	♠		ø	∩	∏	≠	≠	≠	≠	∩	∩	∩	∩				j
k	→	↗	↘		:	♣			∩	∏	≠	≠	≠	≠	∩	∩	∩	∩	⊕		⌘	k
l	→	↗	↘	∥	:	☆			∩	∏	≠		≠		∩	∩	∩	∩	⊖	-		l
m	→	↗	↘	∥	:	★		%	∩	∏	≠		≠		∩	∩	∩	∩	⊖	-		m
n	→	↗	↘		:	□	○	‰	∩	∏	≠	∩	≠				∩	∩	⊖	∩		n
o	→				:	■	●		∩	∏	≠	∩	≠		∩		∩	∩	⊖	∩		o
p	→	↗	↘	∥		▣	▤		∩	∏	≠	∩	≠		∩	∩	∩	∩	⊖	∩		p
q	→	↗	↘	∥		▣	▤		∩	∏	≠	∩	≠		∩	∩	∩	∩	⊖	-	●	q
r	↔	↔	↔	∥		▣	▤	©	∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	⊖	∩		r
s	↔	↔	↔	∥	∩	▣	▤	®	∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	⊖	∩		s
t	↔		↔	∥		▣	●	™	∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	⊖	∩		t
u	↔		↔	∥	∩	▣	●		∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	⊖	∩		u
v	←			∥	∩	▣	●		∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	⊖	∩		v
w	→	↗	↘	∥		▣	●	ℓ	∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	⊖	∩	Å	w
x	→		↘	∥	∩	▣	●		∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	⊖	∩		x
y	↔		↘	∥	∩	▣	●		∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	⊖	∩		y
z	↔		↘			▣		∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	∩	⊖	∩		z
1	→	↗	↘			△	△		∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	⊖	∩		1
2	→	↗	↘			▽	▽		∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	⊖	∩		2
3	→	↗	↘			▷		♀		∩	∏	≠	∩	≠	∩	∩	∩	∩	⊖	∩		3
4		↗	↘			△		♀	∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	⊖	∩		4
5		↗	↘			▲		♀	∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	⊖	∩		5
6				-	+	▼	▣	ℓ		∩		"		∩	∩	∩	∩	∩	⊖	∩		6
7				=	#	▼	▣	♂	∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	⊖	∩		7
8						▲	▣	♀	∩	∏	≠	*	*	∩	∩	∩	∩	∩	⊖	∩		8
9							▣	♀	∩	∏	≠	∩	≠	∩	∩	∩	∩	∩	⊖	∩		9
0								∩	∏	≠	*			∩	∩	∩	∩	∩	⊖	∩		0
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u		

Grid B: Symbols.

	A	B	C	D	E	F	G	H	I	J	
a	´	a	А	α	Λ	æ		⋈			a
b	`	б	Б	β	В	Æ		⋈		<i>B</i>	b
c	ˆ	ц	Ц	χ	Χ	ċ		τ			c
d	^	д	Д	δ	Δ	Ð		λ			d
e	¨	e	Е	ε	Ε	œ	i				e
f		ф	Ф	φ	Φ	Œ					f
g	°	г	Г	γ	Γ						g
h	˘	х	Х	η	Η	ı				<i>H</i>	h
i	˜	и	И	ι	Ι	J					i
j	ˇ	я	Я	ϑ	Θ						j
k	˘	к	К	κ	Κ						k
l	˘	л	Л	λ	Λ	ł				<i>L</i>	l
m	˘	м	М	μ	Μ	Ł				<i>M</i>	m
n	•	н	Н	ν	Ν						n
o	•	о	О	ο	Ο	ø				<i>O</i>	o
p	⋯	п	П	π	Π	Ø					p
q	⋯	ч	Ч	θ	Θ		ı				q
r		р	Р	ρ	Ρ						r
s		с	С	σ	Σ	ß					s
t		т	Т	τ	Τ						t
u		у	У	υ	Υ	ä					u
v		в	В	ς		ö					v
w		щ	Щ	ω	Ω						w
x	˘	ш	Ш	ξ	Ξ						x
y	´	ы	Ы	ψ	Ψ						y
z	/	з	З	ζ	Z						z
1		э	Э		∇						1
2		і	І	ϖ	Ϝ						2
3		й	Й	ε							3
4		ь	Ь	φ							4
5		ю	Ю	Ϝ							5
6		ъ	Ъ	ð							6
7		ж	Ж	β	<	>					7
8				κ	«	»					8
9				ρ	‘	’					9
0				ι	“	”					0
	A	B	C	D	E	F	G	H	I	J	

Grid C: Alphabets and accents.

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t		
a	a	æ	ɑ	ɒ	æ	ʌ	ʌ	ɑ														a
b	b	β	B	β	ḅ																	b
c	c	č	ç	ç	ç	ç																c
d	d	đ	đ	đ	đ	Đ	đ	Đ	đ													d
e	e	ə	ə	ə	E	ε	ɜ	ɜ	ɜ	ɛ												e
f	f																					f
g	g	ǵ	G	ǵ	ǵ	G																g
h	h	ħ	h	h	h	H	h	h	h													h
i	i	ı	ı	I	ı																	i
j	j	ǰ	J	j	j																	j
k	k	ķ	κ	κ																		k
l	l	ł	ł	ł	ł	L	λ	λ														l
m	m	ṃ	ṃ	ṃ	M																	m
n	n	ñ	ñ	ñ	ñ	N	η	η														n
o	o	⊙	ø	ø	œ	Œ	ɔ	ω	ω	ɔ	ω											o
p	p	ḑ	P	ḑ	ḑ																	p
q	q																					q
r	r	ṛ	ṛ	ṛ	ṛ	ṛ	ṛ	R	ṛ	ṛ	ṛ	ṛ										r
s	s	š	š	š	š	š																s
t	t	ṭ	ṭ	ṭ	ṭ	ṭ	ṭ	ṭ	ṭ													t
u	u	ṽ	ṽ	U																		u
v	v	v																				v
w	w	ṽ																				w
x	x	χ																				x
y	y	Ÿ	Ÿ																			y
z	z	ž	ž	ž	ž	ž	ž															z
0	?	?	?																			0
1	?	?	!	!	!	/	≠	≠				\										1
2	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	2
3	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	3
4	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	4
5	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	5
6	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	6
7	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	7
8	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	ˆ	8
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t		

Grid P: Phonetic alphabet and accents.

3 Character entities, ordered by coordinate

In the following table we list: 1. the grid position, 2. the Unicode point, 3. the valid entity names for this Unicode point, 4. the description of this symbol.

Column 3 lists the bare entity names; if they are used in an XML document, they should be encoded with the `&` and `;` delimiters. If the symbol has no Unicode point, column 3 lists the glyph name or the XML construct by which the symbol can be obtained (only for small cap symbols). If the DTD4 entity name is among the valid entity names, it is listed first.

The description of the symbol is that given in the documentation of DTD4.

Position	Unicode	Entities / glyph	Description
Ba0	000A0	<code>&nbsp;</code> ; <code>&NonBreakingSpace;</code>	no break (required) space
Ba1	02933	<code>&rarr;</code>	curly arrow
Ba2	02942	<code>&z.Rlarr;</code>	long arrow right, short arrow left
Ba3	02944	<code>&z.rLarr;</code>	short arrow right, long arrow left
Ba9	02008	<code>&puncsp;</code>	Punctuation space; thousand separator
Baa	021CB	<code>&lrhar;</code> ; <code>&leftrightharpoons;</code> ; <code>&ReverseEquilibrium;</code>	left over right harpoon; reversible reaction
Bab	021CC	<code>&rlhar;</code> ; <code>&Equilibrium;</code> ; <code>&rightleftharpoons;</code>	right over left harpoon; reversible reaction
Bac	021C6	<code>&lrarr;</code> ; <code>&LeftArrowRightArrow;</code> ; <code>&leftrightharpoons;</code>	left over right arrow; reversible reaction
Bad	021C4	<code>&rlarr;</code> ; <code>&RightArrowLeftArrow;</code> ; <code>&rightleftarrows;</code>	right over left arrow; reversible reaction
Bae	021A9	<code>&larrhk;</code> ; <code>&hookleftarrow;</code>	left arrow-hooked
Baf	021BC	<code>&lharu;</code> ; <code>&leftharpoonup;</code> ; <code>&LeftVector;</code>	left harpoon-up
Bag	02190	<code>&larr;</code> ; <code>&slarr;</code> ; <code>&LeftArrow;</code> ; <code>&leftarrow;</code> ; <code>&ShortLeftArrow;</code>	left arrow; relata of a relation
Bah	021D0	<code>&lArr;</code> ; <code>&DoubleLeftArrow;</code> ; <code>&Leftarrow;</code>	left double arrow; is implied by
Bai	021AD	<code>&harr;</code> ; <code>&leftrightsquigarrow;</code>	left and right arrow-wavy
Baj	021DD	<code>&zigrarr;</code>	right arrow-wavy; functional relationship
Bak	021AA	<code>&rarrhk;</code> ; <code>&hookrightarrow;</code>	right arrow-hooked
Bal	021C0	<code>&rharu;</code> ; <code>&rightharpoonup;</code> ; <code>&RightVector;</code>	right harpoon, up
Bam	02192	<code>&rarr;</code> ; <code>&srarr;</code> ; <code>&RightArrow;</code> ; <code>&rightarrow;</code> ; <code>&ShortRightArrow;</code>	right arrow; approaches
Ban	021D2	<code>&rArr;</code> ; <code>&DoubleRightArrow;</code> ; <code>&Implies;</code> ; <code>&Rightarrow;</code>	right double arrow; implies
Bao	021A6	<code>&map;</code> ; <code>&mapsto;</code> ; <code>&RightTeeArrow;</code>	mapping; maps to
Bap	021DB	<code>&rAarr;</code> ; <code>&Rrightarrow;</code>	right triple arrow
Baq	021DA	<code>&lAarr;</code> ; <code>&Lleftarrow;</code>	left triple arrow
Bar	02194	<code>&harr;</code> ; <code>&LeftRightArrow;</code> ; <code>&leftrightarrow;</code>	left-right arrow; mutually implies
Bas	021D4	<code>&iff;</code> ; <code>&hArr;</code> ; <code>&DoubleLeftRightArrow;</code> ; <code>&Leftrightarrow;</code>	left-right dbl arrow; if and only if; mut. implies

Position	Unicode	Entities / glyph	Description
Bat	021C9	$\⇉$, $\&rightrightarrow;$	two right arrows
Bau	021C7	$\⇇$, $\↔$	two left arrows
Bav	0219E	$\↞$, $\↞$	two-head left arrow
Baw	021A0	$\↠$, $\↠$	two-head right arrow; on to map
Bax	02905	$\⤅$	two-head right arrow, ended
Bay	021A2	$\↢$, $\↢$	left arrow-tailed
Baz	021A3	$\↣$, $\⤚$, $\↣$	right arrow-tailed
Bb1	02933-00338	$\⤳̸$	slashed curly arrow
Bb2	02928	$\⤨$, $\⤨$	N-E, S-E arrows
Bb3	02929	$\⤩$, $\⤩$	S-E, S-W arrows
Bb4	0292A	$\&swnar;$	S-W, N-W arrows
Bb5	02927	$\⤧$	N-W, N-E arrows
Bba	02926	$\⤦$, $\⤦$	S-W arrow, hooked
Bbb	02925	$\⤥$, $\⤥$	S-E arrow, hooked
Bbc	02923	$\⤣$	N-W arrow, hooked
Bbd	02924	$\⤤$	N-E arrow, hooked
Bbe	021AB	$\↫$, $\↫$	left arrow, looped
Bbf	021BD	$\↽$, $\↽$, $\↽$	left harpoon, down
Bbg	0219A	$\↚$, $\↚$	not left arrow
Bbh	021CD	$\⇍$, $\⤂$, $\⇍$	not left double arrow; not implied by
Bbj	021C1	$\⇁$, $\⇁$, $\⇁$	right harpoon, down
Bbk	021AC	$\↬$, $\↬$	right arrow, looped
Bbl	02947	$\&z.rarrx;$	right arrow, crossed
Bbm	0219B	$\↛$, $\↛$	not right arrow; does not tend to
Bbn	021CF	$\⇏$, $\⤃$, $\↛$	not right double arrow; does not imply
Bbp	02940	$\&z.olarr;$	left arrow in circle
Bbq	02941	$\&z.orarr;$	right arrow in circle
Bbr	021F9	$\&z.nharr;$	not left-right arrow
Bbs	021CE	$\⇎$, $\⤄$, $\⇎$	not left-right dbl arrow; negation of mut. implies
Bbw	021B0	$\↰$, $\↰$	left hook arrow up
Bc1	0296F	$\⥯$, $\⥯$	harpoon down, up
Bc2	0296E	$\⥮$, $\⥮$	harpoon up, down
Bca	021C3	$\⇃$, $\⇃$, $\⇃$	down harpoon left
Bcb	021C2	$\⇂$, $\⇂$, $\⇂$	down harpoon right
Bcc	02193	$\↓$, $\↓$, $\↓$, $\↓$	downward arrow; decreases
Bcd	021D3	$\⇓$, $\⇓$, $\⇓$	down double arrow; implies
Bce	02191	$\↑$, $\↑$, $\↑$, $\↑$	upward arrow; increase; exponent
Bcf	021D1	$\⇑$, $\⇑$, $\⇑$	up double arrow; implies
Bcg	021BF	$\↿$, $\↿$, $\↿$	up harpoon left

Position	Unicode	Entities / glyph	Description
Bch	021BE	$\↾$, $\↾$, $\↾$	up harpoon right
Bci	02196	$\↖$, $\↖$, $\↖$	arrow, north-west
Bcj	02198	$\↘$, $\↘$, $\↘$	arrow, south-east; decays
Bck	02197	$\↗$, $\↗$, $\↗$	arrow, north-east; grows
Bcl	02199	$\↙$, $\↙$, $\↙$	arrow, south-west
Bcm	021C5	$\⇅$, $\⇅$	dbl arrow, left up, right down; anti-parallel to
Bcn	021F5	$\⇵$, $\⇵$	dbl arrow, left down, right up
Bcp	021B6	$\↶$, $\↶$	left curved arrow; anti-clockwise arrow
Bcq	021B7	$\↷$, $\↷$	right curved arrow; clockwise arrow
Bcr	02195	$\↕$, $\↕$, $\↕$	up-down arrow; vertical relationship
Bcs	021D5	$\⇕$, $\⇕$, $\⇕$	up and down double arrow; if and only if
Bct	021C8	$\⇈$, $\⇈$	two upward arrows
Bcu	021CA	$\⇊$, $\⇊$	two downward arrows
Bcw	021B1	$\↱$, $\↱$	right hook arrow up
Bcx	021B3	$\↳$	right hook, down
Bcy	02937	$\⤷$	rounded arrow down, right
Bcz	02936	$\⤶$	rounded arrow down, left
Bd1	0230A	$\&lflor;$, $\⌊$	left floor; topless left bracket
Bd2	02308	$\⌈$, $\⌈$	left ceiling; bottomless left bracket
Bd3	0231E	$\⌞$, $\⌞$	down left corner
Bd4	0231C	$\⌜$, $\⌜$	up left corner
Bd5	---	$\langle\text{ce:glyph name="dlcorn"}/\rangle$	left bottom corner, long
Bd6	---	$\langle\text{ce:glyph name="smid"}/\rangle$	shortmid (Height of small x)
Bd7	---	$\langle\text{ce:glyph name="spar"}/\rangle$	short parallel (Height small x)
Bda	02329	$\⟨$, $\&langl;$, $\⟨$	left angle bracket
Bdb	0300A	$\⟪$	left double angle bracket
Bdc	0301A	$\&llobrk;$, $\⟦$	left open bracket
Bdd	02985	$\($	left open angular bracket
Bdi	02223	$\∣$, $\∣$, $\∣$, $\∣$	divides; mid (Height of capital I)
Bdj	02225	$\∥$, $\∥$, $\∥$, $\∥$, $\∥$	parallel to (height of capital I)
Bdk	0007C	$\|$, $\|$, $\|$	single-rule fence
Bdl	02016	$\‖$, $\‖$	double-rule fence; norm of a matrix
Bdm	02980	$\&z.tfn;$	triple vertical-rule fence
Bdp	022A5	$\⊥$, $\⊥$, $\⊥$, $\⊥$	perpendicular; orthogonal to
Bdq	022A4	$\⊤$, $\⊤$	intercal; true
Bdr	02AEB	$\⫫$	double perpendicular
Bds	022A2	$\⊢$, $\⊢$	vertical, dash; assertion; reduced to
Bdt	022A3	$\⊣$, $\⊣$	dash, vertical; turnstile
Bdu	022A9	$\⊩$	double vertical, dash
Bdv	022AB	$\⊫$	double vertical, double dash

Position	Unicode	Entities / glyph	Description
Bdw	022AA	⊪	triple vertical, dash
Bdx	022A8	⊨, ⊨	vert., 2-dsh; models; statement is true; result in
Bdy	0297D	⥽	right fish tail; element precedes under relation;
Be1	0230B	⌋, ⌋	right floor; topless right bracket
Be2	02309	⌉, ⌉	right ceiling; bottomless right bracket
Be3	0231F	⌟, ⌟	down right corner
Be4	0231D	⌝, ⌝	up right corner
Be5	---	<ce:glyph name="drcorn"/>	right bottom corner, long
Be6	---	<ce:glyph name="nsmid"/>	nshortmid
Be7	---	<ce:glyph name="nspar"/>	not short parallel
Bea	0232A	⟩, ⟩, ⟩	right angle bracket
Beb	0300B	⟫	right double angle bracket
Bec	0301B	⟧, ⟧	right open bracket
Bed	02986	⦆	right open angular bracket
Bei	02224	∤, ∤, ∤, ∤	not mid
Bej	02226	∦, ∦, ∦, ∦, ∦	not parallel
Bek	02AF6	&z.tdcol;	triple dot colon
Bel	022EE	⋮	triple dot fence
Bem	02999	&z.ddfnc;	dotted fence
Ben	000A6	¦	broken vertical bar
Beo	02506	&z.dshfnc;	dashed fence
Bes	022AC	⊬	not vertical, dash
Beu	022AE	⊮	not double vertical, dash
Bev	022AF	⊯	not double vertical, double-dash
Bex	022AD	⊭	not vertical, double-dash
Bey	0297C	⥼	left fish tail
Bf1	025B5	▵, ▵	up triangle, open
Bf2	025BF	▿, ▿	down triangle, open
Bf3	025B7	&z.rtri;	right triangle, open
Bf4	025C1	&z.ltri;	left triangle, open
Bf5	025B4	▴, ▴	up triangle, filled
Bf6	025BE	▾, ▾	down triangle, filled
Bf7	025B6	&z.rtrif;	right triangle, filled
Bf8	025C0	&z.ltrif;	left triangle, filled
Bfa	02020	†, †	dagger
Bfc	000A7	§	section sign
Bfd	000B6	¶	paragraph sign; pilcrow
Bfe	02720	✠, ✠	Maltese cross
Bff	02713	✓, ✓	check mark; tick
Bfg	02662	&z.diam;	diamond
Bfh	02666	♦, ♦	diamondsuit; diamond, filled
Bfi	02665	&z.hearts;	heartsuit; heart, filled
Bfj	02660	♠, ♠	spadesuit; spade, filled
Bfk	02663	♣, ♣	clubsuit; club, filled
Bfl	02606	&z.star;	star, open
Bfm	02605	★, ★	big (5-point) star, filled
Bfn	025A1	□, □, □	square; D'Alembertian operator

Position	Unicode	Entities / glyph	Description
Bfo	025A0	&z.sqf;	square filled, end of proof; Halmos
Bfp	---	<ce:glyph name="sqfne"/>	square with filled N-E-corner
Bfq	025E9	&z.sqfnw;	square with filled N-W-corner
Bfr	---	<ce:glyph name="sqfsw"/>	square with filled S-W-corner
Bfs	025EA	&z.sqfse;	square with filled S-E-corner
Bft	025E7	&z.sqfl;	square, left filled
Bfu	025E8	&z.sqfr;	square, right filled
Bfv	---	<ce:glyph name="sqft"/>	square, top filled
Bfw	---	<ce:glyph name="sqfb"/>	square, bottom filled
Bg1	025B3	△, △	big up triangle open
Bg2	025BD	&xdttri;, ▽	big down triangle open
Bg6	025A9	&z.sqshd;	legend symbol; shaded box
Bg7	025D8	&z.rvbullet;	reversed video bullet
Bg8	02702	&z.scis;	scissor-symbol
Bg9	0260E	☎	telephone-symbol
Bga	02021	‡, ‡, ‡	double dagger; diesis
Bgf	025CA	◊, ◊	lozenge open; total mark
Bgg	---	<ce:glyph name="lozfl"/>	lozenge, left filled
Bgh	---	<ce:glyph name="lozfr"/>	lozenge, right filled
Bgi	---	<ce:glyph name="lozf"/>	lozenge, filled
Bgn	025CB	○	circle, open
Bgo	025CF	&z.cirf;	filled circle;
Bgp	025A4	&z.sqh;	legend symbol; horizontally striped box
Bgq	025A5	&z.sqv;	legend symbol; vertically striped box
Bgr	025A7	&z.sqhs;	legend symbol; south-west striped box
Bgs	025A8	&z.sqhne;	legend symbol; north-east striped box
Bgt	025D0	&z.cirfl;	circle, left filled
Bgu	025D1	&z.cirfr;	circle, right filled
Bgv	025D3	&z.cirft;	circle, top filled
Bgw	025D2	&z.cirfb;	circle, bottom filled
Bgx	025AD	▭	rectangle open, horizontal
Bgy	025AF	&z.vrecto;	rectangle open, vertical
Bgz	025B1	&z.parl;	parallelogram
Bh3	0263F	&z.merc;	Mercury
Bh4	02640	♀	Venus; female
Bh5	02643	&z.jup;	Jupiter
Bh6	02644	&z.sat;	Saturn
Bh7	02642	♂	Mars; male
Bh8	---	<ce:glyph name="herma"/>	hermaphrodite
Bh9	02646	&z.nept;	Neptune
Bha	00026	&	ampersand
Bhb	000A2	¢	cent sign
Bhc	00024	$	dollar sign
Bhd	000A3	£	pound sign
Bhe	00192	&z.hfl;, ƒ	guilders sign
Bhf	000A5	¥	yen sign
Bhg	020A7	&z.pes;	Pesetas sign
Bhh	020AC	&z.euro;	euro sign
Bhj	000F0	ð	eth
Bhm	02030	‰	per thousand; per mille
Bhn	02031	‱	per 10 000
Bhr	000A9	©	copyright sign (circled C)

Position	Unicode	Entities / glyph	Description
Bhs	000AE	®, ®	registered sign (circled R)
Bht	02122	™	trade mark sign
Bhw	0266D	♭	flat (music)
Bhx	0266F	♯	sharp (music)
Bhy	0266E	♮, ♮	natural (music)
Bi0	02994	⦔	right parenthesis, greater
Bi1	022B2	⊲, ⊲, ⊲	left elongated triangle; implied by
Bi2	022EB	&nrttri;, ⋫, ⋫	not right triangle
Bi4	022EA	⋪, ⋪, ⋪	not left triangle
Bi7	02993	⦓	left parenthesis, less than
Bi8	02222	∢	right parenthesis, less than
Bi9	029A0	&z.lpargt;	left parenthesis, gt
Bia	02200	∀, ∀	inverted capital A; for all
Bib	02203	∃, ∃	reversed cap. E; there exists; at least one exists
Bic	02204	∄, ∄, ∄	not rev. cap. E; not exists; there does not exist
Bid	02201	∁, ∁	complement
Bif	0222A	∪	sum or union of classes or sets; logical sum
Big	02229	∩	prod. of intrsctn of cl./sets; vee; small intrsctn
Bih	022D3	⋓	double union; (Cup)
Bii	022D2	⋒	double intersection; (Cap)
Bij	02294	⊔, ⨆, ⨆, ⊔	square union
Bik	02293	⊓, ⊓	square intersection
Bil	0228E	⊎, ⨄, ⨄, ⊎	plus sign in union
Bim	02228	∨, ∨	logical or; small supremum
Bin	02227	∧, ∧	logical and; small infimum; wedge
Bio	02A54	⩔	double logical or
Bip	02A53	⩓	double logical and
Biq	02A56	⩖	double supremum (conjunction); double logical or
Bir	02A55	⩕	double infimum (conjunction); double logical and
Bis	02A08	&z.Sup;	double supremum (cumulator)
Bit	02A07	&z.Inf;	double infimum (cumulator)
Biu	022CF	⋏, ⋏	curly logical and
Biv	022CE	⋎, ⋎	curly logical or
Biw	022BB	⊻	logical or, bar below; injective
Bix	022BC	⌅, ⌅	logical and, bar above; projective
Biy	02A63	&z.veeBar;	logical or, dbl bar below
Biz	02A5E	&z.Barwed;	double bar wedge; log and, dbl bar
Bj1	02233	∳, ∳	contour integral, anti-clockwise
Bj2	02232	∲, ∲	contour integral, clockwise
Bj3	02231	∱	clockwise integral

Position	Unicode	Entities / glyph	Description
Bj4	02A16	$\&\text{quatint};$	lattice-integral
Bj5	029CA	$\&z.\text{Lap};$	up triangle open with dot; Laplace operator
Bja	02211	$\&\text{sum};, \&\text{Sum};$	summation operator
Bjb	0220F	$\&\text{prod};, \&\text{Product};$	product operator
Bjc	02210	$\&\text{coprod};, \&\text{Coproduct};$	inverted product (cumulator)
Bjd	02A3F	$\&\text{amalg};$	inverted prod. (conjunction); amalgamation, coprod
Bje	0221A	$\&\text{radic};, \&\text{Sqrt};$	root; radical sign
Bjf	022C3	$\&\text{xcup};, \&\text{bigcup};, \&\text{Union};$	union of classes/sets; sum or sets between limits
Bjg	022C2	$\&\text{xcap};, \&\text{bigcap};, \&\text{Intersection};$	intersection of classes; prod.of cl/sets betw. lmt
Bjh	0211E	$\&\text{rx};$	cross ratio
Bji	---	$\langle\text{ce:glyph name="S"}\rangle$	S-sign
Bjj	02A06	$\&z.\text{xsqcup};$	big square union
Bjk	02A05	$\&z.\text{Thr};$	big square intersection
Bjl	02A04	$\&z.\text{xuplus};$	plus sign in big union
Bjm	022C1	$\&\text{xvee};, \&\text{bigvee};, \&\text{Vee};$	large supremum
Bjn	022C0	$\&\text{xwedge};, \&\text{bigwedge};, \&\text{Wedge};$	large infimum
Bjo	02118	$\&\text{weierp};, \&\text{wp};$	Weierstrass elliptic function
Bjp	0222B	$\&\text{int};, \&\text{Integral};$	integral operator
Bju	02A0D	$\&\text{fpaint};$	principal-value integral: cauchy integral
Bjv	0222E	$\&\text{conint};, \&\text{ContourIntegral};, \&\text{oint};$	contour integral; circuital integral
Bjw	0222F	$\&\text{Conint};, \&\text{DoubleContourIntegral};$	surface integral
Bjx	02230	$\&\text{Cconint};$	volume integral
Bjz	02A10	$\&\text{cirfnint};$	edge-integral
Bk1	02220	$\&\text{ang};, \&\text{angle};$	angle
Bk2	02221	$\&\text{angmsd};, \&\text{measuredangle};$	angle-measured
Bk3	02222	$\&\text{angsph};$	spherical angle
Bk4	02993	$\&\text{lparlt};$	angle and left parentheses
Bk5	0299C	$\&z.\text{ang90};$	right (90 degree) angle; factorial sign
Bk6	02A3C	$\&\text{iproduct};, \&\text{intprod};$	intprod
Bk7	000B0	$\&\text{deg};$	degree sign
Bk8	0204E	---	mid asterisk
Bk9	02218	$\&\text{compfn};, \&\text{SmallCircle};$	centered circle; composite function; convolution
Bka	0003C	$\&\text{lt};$	less than sign
Bkb	02A7D	$\&\text{les};, \&\text{leqslant};, \&\text{LessSlantEqual};$	less than or equal to, slanted
Bkc	02A95	$\&z.\text{els};$	equal-or-less, slanted
Bkd	02264	$\&\text{le};, \&\text{leq};$	less than or equal
Bke	02266	$\&\text{lE};, \&\text{leqq};, \&\text{LessFullEqual};$	less than or (double) equal
Bkf	02272	$\&\text{lsim};, \&\text{lap};, \&\text{lessapprox};, \&\text{lesssim};, \&\text{LessTilde};$	less than or similar to; less, approximate
Bkg	02A85	$\&z.\text{lap};$	less than and double approximate
Bkh	02A9D	$\&\text{siml};$	less than and approximately
Bki	02276	$\&\text{lg};, \&\text{LessGreater};, \&\text{lessgtr};$	less than or greater than

Position	Unicode	Entities / glyph	Description
Bkj	022DA	⋚, ⪋, ⋚, &lesseqqtr;, ⋚	less, equal, or greater
Bkk	02A8B	&z.lEg;	less, (double) equal, or greater
Bkl	02AA1	⪡	much less than (double)
Bkm	0226A	≪, ≪, ≪	much less than (double)
Bkn	022D8	⋘	much less than (triple)
Bko	022D6	<idot;, ⋖	less than, with dot
Bkp	02242	≂, ≂, ≂	equal, similar
Bkq	0227A	≺, ≺, ≺	precedes; has lower rank than; is dominated by
Bkr	0227E	≾, ⪷, ⪴, ⪷, ≾, ≾	precedes, similar; dominance; contained in, equiv.
Bks	02AB7	&z.prap;	precedes, approximate
Bkt	02AAF	⪯, ⪳, ⪯, ⪯	precedes, equals
Bku	0227C	≼, ≼, ≼	curly prec. equal; has rank lower than or equal to
Bkv	022DE	⋞, ⋞	curly equals (above), precedes
Bkz	029DC	⧜	infinity, incomplete
B10	022C6	⋆, ☆, ⋆	small (5-point) star, filled
B15	02035	‵, ‵	backprime; reverse prime
B18	0002A	*, *	pseudo-superscript asterisk (ASCII *)
B19	022C5	⋅	centered small circle, filled
Bla	0226E	≮, <⃒, ≮, ≮	not less than
B1b	02270	≰, ≰, ≰	neither less than nor equal to, slanted
B1d	02A87	&z.lne;	less than but not equals
B1e	02268	≨, ⪇, ⪇, ≨	less than but not (double) equal to
B1f	022E6	⋦	less than, not similar
B1g	02A89	⪉, ⪉	less than but not approximate
B1h	02274	≴, ≴	neither less than nor equivalent to
B1i	02278	≸, ≸	neither less than nor greater than
B1j	02270	≰, ≰, ≰	not less-than-or-equal
B1k	02266-00338	&z.nlE;	not less, double equals
B1n	0226C	≬, ≬	between
B1q	02280	⊀, ⊀, ⊀	does not precede
B1r	022E8	⋨, ⪹, ⪹, ⋨	precedes, not similar
B1s	02AB9	&z.prnep;	precedes, not approximately
B1t	02AB5	⪵, ⪵	precedes, not double equal
B1u	02AAF-00338	⪯̸, ⪯̸, ⪯̸	not precedes, equals
B1z	0221E	∞	infinity sign
Bm1	02323	⌣	up curve, smile
Bm2	02322	⌢	down curve, frown
Bm3	022D4	⋔, ⋔	pitchfork
Bm5	02032	′	prime; minutes; feet
Bm6	02033	″	double prime; seconds; inches
Bm7	02034	‴	triple prime
Bm8	02057	⁗	fourfold prime
Bm9	02026	…, …	triple dot

Position	Unicode	Entities / glyph	Description
Bma	0003E	>	greater than sign
Bmb	02A7E	⩾, ⩾, ⩾	greater than or equal to, slanted
Bmc	02A96	&z.egs;	equal-or-greater, slanted
Bmd	02265	≥, ≥, ≥	greater than or equal to
Bme	02267	≧, ≧, ≧	greater than or double equal to
Bmf	02273	≳, ⪆, ≳, ⪆, ≳	greater than or similar to; greater than approx.
Bmg	02A86	&z.gap;	greater than, approximately
Bmh	02A9E	∼	greater than, approximately
Bmi	02277	≷, ≷, ≷	greater than or less than
Bmj	022DB	⋛, ⪌, ⋛, ⋛, >reqqlless;	greater, equal, or less
Bmk	02A8C	&z.gEl;	greater, (double) equal, or less
Bml	02AA2	⪢	much greater than (double)
Bmm	0226B	≫, ≫, ≫	much greater than (double)
Bmn	022D9	⋙, ⋙	much greater than (triple)
Bmo	022D7	⋗, ⋗	greater than, with dot
Bmp	02242–020D2	&z.nesim;	not equal, similar
Bmq	0227B	≻, ≻, ≻	succeeds; has higher rank than; dominates
Bmr	0227F	≿, ⪸, ⪸, ≿, ≿	succeeds, similar
Bms	02AB8	&z.scap;	succeeds, approximate
Bmt	02AB0	&z.sce;	succeeds, equals
Bmu	0227D	&scce;, ⪰, ≽, ⪰, ≽, ⪰	succ., curly eq; has rank higher than or equal to
Bmv	022DF	⋟, ⋟	curly equals (above), succeeds
Bmz	0221D	∝, ∝, ∝, ∝, ∝	is proportional to; varies as
Bn3	---	<ce:glyph name="lbd2td"/>	2 bonds on the lefthand side, top double
Bn4	---	<ce:glyph name="lbd2bd"/>	2 bonds on the lefthand side, bottom double
Bn5	---	<ce:glyph name="rbd2td"/>	2 bonds on the righthand side, top double
Bn6	---	<ce:glyph name="rbd2bd"/>	2 bonds on the righthand side, bottom double
Bn9	022EF	⋯	triple dot, centered
Bna	0226F	≯, >⃒, ≯, ≯	not greater than
Bnb	02271	≱, ≱, ≱	neither greater than nor equal to, slanted
Bnd	02A88	&z.gne;	greater than, not equals to
Bne	02269	≩, ⪈, ⪈, ≩	greater than but not (double) equal to
Bnf	022E7	⋧	greater than but not similar to
Bng	02A8A	⪊, ⪊	greater than but not approximate
Bnh	02275	≵, ≵	neither greater than nor equivalent to
Bni	02279	≹, ≹	neither greater than nor less than

Position	Unicode	Entities / glyph	Description
Bnj	02271	$\≱$, $\≱$, $\≱$	not greater-than-or-equal
Bnk	02267-00338	$\&z.ngE;$	not greater, double equals
Bnq	02281	$\⊁$, $\⊁$, $\⊁$	does not succeed
Bnr	022E9	$\⋩$, $\⪺$, $\⪺$, $\⋩$	succeeds, not similar
Bns	02ABA	$\&z.scnap;$	succeeds, not approximate
Bnt	02AB6	$\⪶$, $\⪶$	succeeds but, not (double) equal to
Bnu	02AB0-00338	$\⪰̸$, $\⪰̸$, $\⪰̸$	not succeeds, equals
Bo0	---	$\langle ce:glyph name="rad"/\rangle$	radical dot
Bo1	---	$\langle ce:glyph name="pent"/\rangle$	pentagon
Bo2	02394	$\&z.hex;$	hexagon
Bo3	---	$\langle ce:glyph name="pbdtd"/\rangle$	partial double bond, top dashed
Bo4	02393	$\&z.pdbdbd;$	partial double bond, bottom dashed
Bo5	---	$\langle ce:glyph name="ptbtdtd"/\rangle$	partial triple bond, top dashed
Bo6	---	$\langle ce:glyph name="ptbdbd"/\rangle$	partial triple bond, bottom dashed
Bo7	---	$\langle ce:glyph name="sbn"/\rangle$	single bond
Bo8	---	$\langle ce:glyph name="pdbond"/\rangle$	Partial double bond
Bo9	022F0	$\⋰$	triple dot, diagonal SW-NE
Boa	02208	$\∈$, $\∈$, $\∈$, $\∈$	set membership; member
Boc	02282	$\⊂$, $\⊂$	subset; proper inclusion in set; is implied by
Bod	02286	$\⊆$, $\⫅$, $\⊆$, $\⫅$, $\⊆$	subset, equals; identity or inclusion in set
Bog	02AC5	$\&z.subE;$	subset, double equals
Boj	022D0	$\⋐$, $\⋐$	double subset
Bok	0228F	$\⊏$, $\⊏$, $\⊏$	square subset; image of
Bol	02291	$\⊑$, $\⊑$, $\⊑$	square subset, equals
Boo	022B8	$\⊸$, $\⊸$	multimap
Bop	022B7	$\⊷$	image of
Boq	---	$\langle ce:glyph name="dbnd"/\rangle$	double bond; length as m-dash
Bor	---	$\langle ce:glyph name="tbnd"/\rangle$	triple bond; length as m-dash
Bos	---	$\langle ce:glyph name="qbnd"/\rangle$	quadruple bond; length as m-dash
Bow	029F9	$\&z.drule;$	-45 degree rule
Box	029F8	$\&z.urule;$	+45 degree rule
Bp9	022F1	$\⋱$	triple dot, diagonal NW-SE
Bpa	02209	$\∉$, $\∉$, $\∉$	not an element of; is not a member of
Bpc	02284	$\⊄$, $\⊂⃒$, $\⊂⃒$, $\⊂⃒$	not subset; non-proper inclusion in set
Bpd	0228A	$\⊊$, $\⫋$, $\⊊$, $\⫋$	subset, not equals
Bpe	0228A-0FE00	$\⫋︀$, $\⊊︀$, $\⊊︀$, $\⫋︀$	not subset, not equals
Bpf	02288	$\⊈$, $\⫅̸$, $\⊈$, $\⊈$, $\⫅̸$	not subset, equals; not contained in or not eql to
Bpg	02ACB	$\&z.subnE;$	subset, not double equal

Position	Unicode	Entities / glyph	Description
Bph	0228A-0FE00	$\⫋︀$, $\⊊︀$, $\⊊︀$, $\⫋︀$	not subset, double equals
Bpi	02AC5-00338	$\&z.nsubE;$	not subset, double equals
Bpk	0228F-00338	$\⊏̸$	square not subset
Bpl	022E2	$\&nssqsube;$, $\⋢$	square not reflex subset
Bpm	022E4	$\&z.sqsbne;$	Square subset, not equal
Bpp	022B6	$\⊶$	original of
Bpq	---	$\langle ce:glyph name="dbnd6" \rangle$	6-point double bond; length half of m-dash
Bpr	---	$\langle ce:glyph name="tbnd6" \rangle$	6-point triple bond; length half of m-dash
Bps	---	$\langle ce:glyph name="qbnd6" \rangle$	six-point quadruple bond; length half of m-dash
Bpt	---	$\langle ce:glyph name="rbond3" \rangle$	3 bonds on the righthand side
Bpu	---	$\langle ce:glyph name="lbond3" \rangle$	3 bonds on the lefthand side
Bpv	---	$\langle ce:glyph name="rbond2" \rangle$	2 bonds on the righthand side
Bpw	---	$\langle ce:glyph name="lbond2" \rangle$	2 bonds on the lefthand side
Bpz	0223E	$\∾$	most positive
Bq0	0223B	$\∻$	homothetic
Bq1	0223C	$\∼$, $\∼$, $\∼$	similar; equivalent to; varies linearly with
Bq2	02243	$\≃$, $\≃$, $\≃$	similar, equals; asymptotically equal to
Bq3	02245	$\≅$, $\≅$	congruent with; similar to
Bq4	02248	$\≈$, $\≈$, $\≈$, $\≈$, $\≈$, $\≈$	approximate; asymptotic
Bq5	0224A	$\≊$, $\⩰$, $\&approxq;$	approximate, equals; asymptotic or equal to
Bq6	0224B	$\≋$	triple tilde; approximately identical to
Bq7	0223D	$\∽$, $\∽$	reverse mainline tilde; reverse similar
Bq8	022CD	$\⋍$, $\⋍$	reverse similar, equals
Bq9	0224C	$\≌$, $\≌$	reverse congruent
Bqa	0220B	$\∋$, $\∋$, $\∋$, $\∋$	contains; owns; includes
Bqc	02283	$\⊃$, $\⊃$, $\⊃$	superset; properly includes in set; implies
Bqd	02287	$\⊇$, $\⫆$, $\⊇$, $\⊇$, $\⫆$	superset, equals; ident. with or contains as subset
Bqg	02AC6	$\&z.supE;$	superset, double equals
Bqj	022D1	$\⋑$, $\⋑$	double superset
Bqk	02290	$\⊐$, $\⊐$, $\⊐$	square superset; original of
Bql	02292	$\⊒$, $\⊒$, $\⊒$	square superset, equals
Bqm	0225F	$\?$, $\≟$	equal, question mark
Bqn	02257	$\≗$, $\≗$	circle, equals
Bqo	02250	$\≐$, $\≐$, $\≐$	equals, dot above; approaches the limit
Bqp	02251	$\≑$, $\≑$	equals, even dots; approximately equal
Bqq	02259	$\≙$	estimates; corresponds to
Bqr	0225C	$\≜$, $\≜$	triangle, equal; equal by definition
Bqs	02256	$\≖$, $\≖$	circle in equals sign
Bqt	02254	$\≔$, $\≔$, $\≔$	colon, equals; is defined as

Position	Unicode	Entities / glyph	Description
Bqu	02255	$\≕$, $\≕$	equals, colon; defines
Bqv	02A77	$\⩷$, $\⩷$	equal, double dot above and under
Bqw	029CB	$\&z.defas;$	defined as
Bqx	02261	$\≡$, $\≡$	equivalent; identical with; triple equals
Bqy	02253	$\≓$, $\≓$	equal, rising dots
Bqz	02252	$\≒$, $\≒$	equals, falling dots; appr. equal to; image of
Br1	02241	$\≁$, $\≁$	not similar; not equivalent to
Br2	02244	$\≄$, $\≄$, $\≄$	not similar, equals; not asymptotically equal to
Br3	02247	$\≇$, $\≇$	not congruent with; neither appr. nor act. equal
Br4	02249	$\≉$, $\≉$, $\≉$	not approximate; not asymptotic to
Br6	0224B-00338	$\≋̸$	not approximately, double; dashed triple tilde
Bra	0220C	$\∌$, $\∌$, $\∌$	does not contain as a member
Brc	02285	$\⊅$, $\⊃⃒$, $\⊃⃒$, $\⊃⃒$	not superset; does not properly include in set
Brd	0228B	$\⊋$, $\⫌$, $\⊋$, $\⫌$	superset, not equals
Bre	0228B-0FE00	$\⫌︀$, $\⊋︀$, $\⊋︀$, $\⫌︀$	not superset, not equals
Brf	02289	$\⊉$, $\⫆̸$, $\⊉$, $\⊉$, $\⫆̸$	not superset, equals; does not contain as subset
Brg	02ACC	$\&z.supnE;$	superset, not double equals
Brh	0228B-0FE00	$\⫌︀$, $\⊋︀$, $\⊋︀$, $\⫌︀$	not superset, double equals
Bri	02AC6-00338	$\&z.nsupE;$	not superset, double equals
Brk	02290-00338	$\⊐̸$	square not superset
Brl	022E3	$\⋣$, $\⋣$	square not reflex superset
Brm	022E5	$\&z.sqspne;$	square superset, not equal
Brn	0224E-00338	$\≎̸$, $\≎̸$	not isomorphic
Bro	000AC	$\¬$	logical not sign
Brp	0224F	$\≏$, $\≏$, $\≏$	bumpy equals, equals; approximately equal to
Brq	0225A	$\≚$	equiangular; equals with hacek
Brr	0224E	$\≎$, $\≎$, $\≎$	bumpy equals; geometrically equiv. to; appr. equal
Brs	0224D	$\≍$, $\≍$	cupcap; asymptotically equal to
Brt	02235	$\∵$, $\∵$, $\∵$	because
Bru	02234	$\∴$, $\∴$, $\∴$	therefore
Brv	02260	$\≠$, $\≠$	not equal to
Brw	0226D	$\≭$	not asymptotically equivalent
Brx	02262	$\≢$, $\≢$	not equivalent, not identical with
Brz	02246	$\≆$	approximately but not actually equal to

Position	Unicode	Entities / glyph	Description
Bs1	02205	∅, ∅, ∅, ∅	solidus in circle; empty set; null set; diameter
Bs2	0229B	⊛, ⊛	circled asterisk
Bs3	029B5	⦵	circle and long bar; Plimsoll sign
Bs4	02316	⌖	crosshairs; circle and (big) plus sign
Bs6	0229F	⊟, ⊟	minus sign in box
Bs7	0229E	⊞, ⊞	plus sign in box
Bs8	022A0	⊠, ⊠	multiplication sign in box
Bsa	000D7	×	multiplication sign
Bsb	02A2F	⨯	vector multiplication
Bsc	000B7	·, ·, ·	center dot
Bsd	022C9	⋉	times sign, left closed
Bse	022CA	⋊	times sign, right closed
Bsf	022C8	⋈	bowtie
Bsg	022CC	⋌, ⋌	right three times
Bsh	022CB	⋋, ⋋	left three times
Bsi	02240	≀, ≀, ≀	wreath product
Bsk	02A38	⨸	circle divide
Bsl	0229D	⊝, ⊝	circled dash; hyphen in circle
Bsm	02298	⊘	solidus in circle
Bsn	0229A	⊚, ⊚	open dot in circle
Bso	02299	⊙, ⨀, ⨀, ⊙	middle dot in circle; sun-symbol; Tensor product
Bsp	02296	⊖, ⊖	minus sign in circle; symmetric difference
Bsq	029B6	⦶	circle, and vertical bar
Bsr	02295	⊕, ⨁, ⨁, ⊕	plus sign in circle; direct sum; earth sign
Bss	02297	⊗, ⨂, ⨂, ⊗	multiplication sign in circle; direct product
Bst	02A2D	&lplus;	semi-direct sum
Bsu	02A34	⨴	semi-direct product
Bsv	02A2E	⨮	semi-direct sum
Bsw	02A35	⨵	semi-direct product
Bta	02A25	⨥	plus sign, dot below; tight dotted plus
Btb	02214	∔, ∔	plus sign, dot above; direct sum
Btc	000B1	±, ±, ±	plus or minus sign
Btd	02213	∓, ∓, ∓	minus or plus sign
Bte	022B9	⊹	hermitian conjugative matrix
Btf	022C7	⋇, ⋇	division on times
Btl	02212	−	minus sign
Btm	02A2A	⨪	minus with dot beneath; tight dotted minus
Btn	02238	∸, ∸	minus with dot above; symmetric difference
Bto	000F7	÷, ÷	division sign
Btp	0223A	∺	geometric properties
Btq	02013	–	en dash (long hyphen), copymarked 1/N
Btr	02014	—	em dash, copymarked 1/M
Bts	02A5F	⩟	minus with hat
Btt	02237	∷, ∷	four dots in square; as

Position	Unicode	Entities / glyph	Description
Btu	022B4	⊴, ⊴, ⊴	left triangle, equal
Btv	022B5	⊵, ⊵, ⊵	right triangle, equal
Btw	022EC	⋬, ⋬, ⋬	not left triangle, equals
Btx	022ED	⋭, ⋭, ⋭	not right triangle, equals
Bu0	02205	∅, ∅, ∅, ∅	slashed zero; empty set
Buc	---	<ce:glyph name="camb"/>	Cambrian (era)
Bug	0210F	ℏ, ℏ, ℏ, ℏ	Planck's constant (italic)
Buh	0210F	ℏ, ℏ, ℏ, ℏ	Planck constant; h-bar (Dirac)
Buk	02113	ℓ, 𝓁	roman script-l
Buq	02022	•, •	bullet
Buw	0212B	Å	angstrom
Caa	00301	---	acute (accent)
Cab	00300	---	grave (accent)
Cac	0030B	---	double acute (accent)
Cad	00302	---	circumflex, Caret (accent)
Cae	00308	---	double dot, umlaut, diaeresis (accent)
Cag	0030A	---	circle (accent)
Cah	00326	---	Turkish hook (accent)
Cai	00303	---	tilde (accent)
Caj	00306	---	breve (accent)
Cak	0030C	---	Hacek (Czech.), caron, wedge (accent)
Cal	00327	---	cedilla (accent)
Cam	00304	---	overbar, macron (accent)
Can	---	<ce:glyph name="bigdot"/>	big dot above (accent)
Cao	00307	---	dot above (accent)
Cap	020DB	⃛, ⃛	triple dot (accent)
Caq	020DC	⃜	quadruple dot (accent)
Cax	00328	---	polish hook, Ogonek (accent)
Cay	00337	---	short slash (overlay)
Caz	00338	---	cancellation slash (overlay)
Cb1	0044D	э	eh – Cyrillic –
Cb2	00456	і	Ukrainian i – Cyrillic –
Cb3	00439	й	ee kratkoyeh – Cyrillic –
Cb4	0044C	ь	myakhkyy znak – Cyrillic –
Cb5	0044E	ю	u – Cyrillic –
Cb6	0044A	ъ	tyyordyy znak – Cyrillic –
Cb7	00436	&zncy;	zheh – Cyrillic –
Cba	00430	а	ah – Cyrillic –
Cbb	00431	б	beh – Cyrillic –
Cbc	00446	ц	tseh – Cyrillic –
Cbd	00434	д	deh – Cyrillic –
Cbe	00435	е	yeh – Cyrillic –
Cbf	00444	ф	ef – Cyrillic –
Cbg	00433	г	geh – Cyrillic –

Position	Unicode	Entities / glyph	Description
Cbh	00445	х	khah – Cyrillic –
Cbi	00438	и	ee – Cyrillic –
Cbj	0044F	я	yah – Cyrillic –
Cbk	0043A	к	kah – Cyrillic –
Cbl	0043B	л	el – Cyrillic –
Cbm	0043C	м	em – Cyrillic –
Cbn	0043D	н	en – Cyrillic –
Cbo	0043E	о	aw – Cyrillic –
Cbp	0043F	п	peh – Cyrillic –
Cbq	00447	ч	tcheh – Cyrillic –
Cbr	00440	р	ehr – Cyrillic –
Cbs	00441	с	es – Cyrillic –
Cbt	00442	т	teh – Cyrillic –
Cbu	00443	у	oo – Cyrillic –
Cbv	00432	в	veh – Cyrillic –
Cbw	00449	щ	shchah – Cyrillic –
Cbx	00448	ш	shah – Cyrillic –
Cby	0044B	ы	yery – Cyrillic –
Cbz	00437	з	zeh – Cyrillic –
Cc1	0042D	Э	Eh – Cyrillic –
Cc2	00406	І	Ukrainian I – Cyrillic –
Cc3	00419	Й	Ee kratkoyeh – Cyrillic –
Cc4	0042C	Ь	Myakhkyy znak – Cyrillic –
Cc5	0042E	Ю	U – Cyrillic –
Cc6	0042A	Ъ	Tvyordyy znak – Cyrillic –
Cc7	00416	Ж	Zheh – Cyrillic –
Cca	00410	А	Ah – Cyrillic –
Ccb	00411	Б	Beh – Cyrillic –
Ccc	00426	Ц	Tseh – Cyrillic –
Ccd	00414	Д	Deh – Cyrillic –
Cce	00415	Е	Yeh – Cyrillic –
Ccf	00424	Ф	Ef – Cyrillic –
Ccg	00413	Г	Geh – Cyrillic –
Cch	00425	Х	Khah – Cyrillic –
Cci	00418	И	Ee – Cyrillic –
Ccj	0042F	Я	Yah – Cyrillic –
Cck	0041A	К	Kah – Cyrillic –
Ccl	0041B	Л	El – Cyrillic –
Ccm	0041C	М	Em – Cyrillic –
Ccn	0041D	Н	En – Cyrillic –
Cco	0041E	О	Aw – Cyrillic –
Ccp	0041F	П	Peh – Cyrillic –
Ccq	00427	Ч	Tcheh – Cyrillic –
Ccr	00420	Р	Ehr – Cyrillic –
Ccs	00421	С	Es – Cyrillic –
Cct	00422	Т	Teh – Cyrillic –
Ccu	00423	У	Oo – Cyrillic –
Ccv	00412	В	Veh – Cyrillic –
Ccw	00429	Щ	Shchah – Cyrillic –
Ccx	00428	Ш	Shah – Cyrillic –
Ccy	0042B	Ы	Yery – Cyrillic –
Ccz	00417	З	Zeh – Cyrillic –
Cd0	02129	℩	inverted iota – Greek –

Position	Unicode	Entities / glyph	Description
Cd2	003D6	ϖ, ϖ	physicians' pi – Greek –
Cd3	003B5	&z. epsiv;, ε;, ϵ	epsilon (cursive) – Greek –
Cd4	003C6	ϕ, ϕ	phi (cursive, open) – Greek –
Cd5	003DD	&z. gammad;	digamma
Cd6	02202	∂, ∂	curly d; differential – Greek –
Cd7	003D0	&z. betav;	curly beta – Greek –
Cd8	003F0	ϰ, ϰ	kappa (cursive, rounded) – Greek –
Cd9	003F1	ϱ, ϱ	rho (cursive, round) – Greek –
Cda	003B1	α	alpha – Greek –
Cdb	003B2	β	beta – Greek –
Cdc	003C7	χ	chi – Greek –
Cdd	003B4	δ	delta – Greek –
Cde	003F5	&z. epsi;	epsilon (Porson) – Greek –
Cdf	003D5	φ, ϕ	phi – Greek –
Cdg	003B3	γ	gamma – Greek –
Cdh	003B7	η	eta – Greek –
Cdi	003B9	ι	iota – Greek –
Cdj	003D1	ϑ, &varthetaeta;	theta (cursive, rounded) – Greek –
Cdk	003BA	κ	kappa – Greek –
Cdl	003BB	λ	lambda – Greek –
Cdm	003BC	μ	mu – Greek –
Cdn	003BD	ν	nu – Greek –
Cdo	003BF	&z. omicr;	omicron – Greek –
Cdp	003C0	π	pi – Greek –
Cdq	003B8	θ	theta – Greek –
Cdr	003C1	ρ	rho – Greek –
Cds	003C3	σ	sigma – Greek –
Cdt	003C4	τ	tau – Greek –
Cdu	003C5	υ, υ	upsilon – Greek –
Cdv	003C2	ς, ς	sigma (final) – Greek –
Cdw	003C9	ω	omega – Greek –
Cdx	003BE	ξ	xi – Greek –
Cdy	003C8	ψ	psi – Greek –
Cdz	003B6	ζ	zeta – Greek –
Ce0	0201C	“, “	double quotation mark, left
Ce1	02207	∇, ∇	differential vector; nabla;
Ce2	02127	℧	mho
Ce7	02039	&z. lsquo;	open single guillemet
Ce8	000AB	«	open double guillemet; angle open quote
Ce9	02018	‘, ‘	single quotation mark, left
Cea	00391	---	capital alpha – Greek –
Ceb	00392	---	capital beta – Greek –
Cec	003A7	---	capital chi – Greek –
Ced	00394	Δ	delta (capital); increment – Greek –
Cee	00395	---	capital epsilon – Greek –
Cef	003A6	Φ	phi (capital) – Greek –
Ceg	00393	Γ	gamma (capital) – Greek –
Ceh	00397	---	capital eta – Greek –
Cei	00399	---	capital iota – Greek –
Cej	003F4	&z. Theta;	Theta (capital, round)

Position	Unicode	Entities / glyph	Description
Cek	0039A	---	capital kappa – Greek –
Cel	0039B	Λ	lambda (capital) – Greek –
Cem	0039C	---	capital mu – Greek –
Cen	0039D	---	capital nu – Greek –
Ceo	0039F	---	capital omicron – Greek –
Cep	003A0	Π	pi (capital) – Greek –
Ceq	00398	Θ	theta (capital) – Greek –
Cer	003A1	---	capital rho – Greek –
Ces	003A3	Σ	sigma (capital) – Greek –
Cet	003A4	---	capital tau – Greek –
Ceu	003D2	ϒ	upsilon (capital) – Greek –
Cew	003A9	Ω	omega (capital) – Greek –
Cex	0039E	Ξ	xi (capital) – Greek –
Cey	003A8	Ψ	psi (capital) – Greek –
Cez	00396	---	capital zeta – Greek –
Cf0	0201D	”, ”, ”	double quotation mark, right
Cf7	0203A	&z.rsquo;	close single guillemet
Cf8	000BB	»	close double guillemet; angle close quote
Cf9	02019	’, ’, ’	single quotation mark, right
Cfa	000E6	æ	ligature ae
Cfb	000C6	Æ	ligature AE
Cfc	00111	đ	crossed l.c. d
Cfd	00110	Đ	crossed cap. D
Cfe	00153	œ	ligature oe
Cff	00152	Œ	ligature OE
Cfh	00131	ı, ı	undotted l.c. i
Cfi	---	<ce:glyph name="jnodot"/>	undotted l.c. j
Cfl	00142	&lstroke;	crossed l.c. l
Cfm	00141	&Lstroke;	crossed cap. L
Cfo	000F8	ø	small o, slashed
Cfp	000D8	Ø	capital O, slashed
Cfs	000DF	ß	es-zet (German)
Cfu	000AA	ª	a-underscore
Cfv	000BA	º	o-underscore
Cge	000A1	¡	inverted exclamation mark (Spanish)
Cgq	000BF	¿	inverted question mark (Spanish)
Cha	02135	ℵ	Aleph (Hebrew)
Chb	02136	ℶ	Beth (Hebrew)
Chc	02138	ℸ	Daleth (Hebrew)
Chd	02137	ℷ	Gimel (Hebrew)
Cjb	0212C	ℬ, ℬ, ℬ	B Bernoulli function
Cjh	0210B	ℋ, ℋ, ℋ	H Hamiltonian
Cjl	02112	ℒ, ℒ, &Laplacetrif;	L Lagrangian
Cjm	02133	ℳ, ℳ, ℳ	M physics M-matrix
Cjo	1D4AA	𝒪	O order of
Pa0	002A1	---	glottal stop, barred (phonetic symbol)
Pa1	00294	---	glottal stop (phonetic symbol)
Pa2	0032A	---	subscript bridge (phonetic symbol)
Pa3	0033B	---	laminal (phonetic symbol)

Position	Unicode	Entities / glyph	Description
Pa5	0033A	---	subscript bridge, turned (phonetic symbol)
Pa6	002BA	---	extra high, accent (phonetic symbol)
Pa7	002E5	---	extra high, symbol (phonetic symbol)
Pa8	---	<ce:glyph name="ht"/>	hooktop (phonetic symbol)
Paa	00061	---	lower-case a (phonetic symbol)
Pab	00062	---	lower-case b (phonetic symbol)
Pac	00063	---	lower-case c (phonetic symbol)
Pad	00064	---	lower-case d (phonetic symbol)
Pae	00065	---	lower-case e (phonetic symbol)
Paf	00066	---	lower-case f (phonetic symbol)
Pag	00261	---	lower-case 'script' g (phonetic symbol)
Pah	00068	---	lower-case h (phonetic symbol)
Pai	00069	---	lower-case i (phonetic symbol)
Paj	0006A	ȷ	lower-case j (phonetic symbol)
Pak	0006B	---	lower-case k (phonetic symbol)
Pal	0006C	---	lower-case l (phonetic symbol)
Pam	0006D	---	lower-case m (phonetic symbol)
Pan	0006E	---	lower-case n (phonetic symbol)
Pao	0006F	---	lower-case o (phonetic symbol)
Pap	00070	---	lower-case p (phonetic symbol)
Paq	00071	---	lower-case q (phonetic symbol)
Par	00072	---	lower-case r (phonetic symbol)
Pas	00073	---	lower-case s (phonetic symbol)
Pat	00074	---	lower-case t (phonetic symbol)
Pau	00075	---	lower-case u (phonetic symbol)
Pav	00076	---	lower-case v (phonetic symbol)
Paw	00077	---	lower-case w (phonetic symbol)
Pax	00078	---	lower-case x (phonetic symbol)
Pay	00079	---	lower-case y (phonetic symbol)
Paz	0007A	---	lower-case z (phonetic symbol)
Pb0	001BE	---	inverted glottal stop, crossed (phonetic symbol)
Pb1	00296	---	inverted glottal stop (phonetic symbol)
Pb2	002D4	---	raising sign (phonetic symbol)
Pb3	0032B	---	seagull, turned (phonetic symbol)
Pb4	001BB	---	crossed 2 (phonetic symbol)
Pb5	00336	---	bar (phonetic symbol)
Pb6	---	<ce:glyph name="ggrave"/>	extra low, accent (phonetic symbol)
Pb7	002E9	---	extra low, symbol (phonetic symbol)
Pb8	---	<ce:glyph name="ctl"/>	curly tail (phonetic symbol)
Pba	00250	---	turned a (phonetic symbol)
Pbb	00253	---	b hooktop (phonetic symbol)
Pbc	0010D	č	c wedge (phonetic symbol)
Pbd	00257	---	d hooktop (phonetic symbol)
Pbe	00259	---	schwa (phonetic symbol)
Pbg	00260	---	g hooktop (phonetic symbol)
Pbh	00127	ħ	crossed h (phonetic symbol)
Pbi	00268	---	barred i (phonetic symbol)
Pbj	001F0	---	j wedge (phonetic symbol)
Pbk	00199	---	k hooktop (phonetic symbol)
Pbl	0019A	---	barred l (phonetic symbol)

Position	Unicode	Entities / glyph	Description
Pbm	00271	---	m with leftward tail at right (phonetic symbol)
Pbn	000F1	ñ	tilde n (phonetic symbol)
Pbo	00298	---	bull's eye (phonetic symbol)
Pbp	000FE	þ	thorn (phonetic symbol)
Pbr	0027E	---	fish-hook r (phonetic symbol)
Pbs	00161	š	s wedge (phonetic symbol)
Pbt	001AB	---	left-hook t (phonetic symbol)
Pbu	00289	---	barred u (phonetic symbol)
Pbv	0028B	---	script v (phonetic symbol)
Pbw	0028D	---	inverted w (phonetic symbol)
Pbx	003C7	χ	chi (phonetic symbol)
Pby	0028E	---	turned y (phonetic symbol)
Pbz	0017E	ž	z wedge (phonetic symbol)
Pc0	002A2	---	glottal stop reversed, barred (phonetic symbol)
Pc1	00295	---	reversed glottal stop (phonetic symbol)
Pc2	002D5	---	lowering sign (phonetic symbol)
Pc3	---	<ce:glyph name="sbw"/>	subscript w (phonetic symbol)
Pc5	00335	---	cross, short horizontal line (phonetic symbol)
Pc6	---	<ce:glyph name="hris"/>	high rising, accent (phonetic symbol)
Pc7	002E6-002E5	---	high rising, symbol (phonetic symbol)
Pca	00251	---	script a (phonetic symbol)
Pcb	00299	---	small capital B (phonetic symbol)
Pcc	000E7	ç	c cedilla (phonetic symbol)
Pcd	00256	---	right-tail d (phonetic symbol)
Pce	0025A	---	right-hook schwa (phonetic symbol)
Pcg	00262	---	small capital G (phonetic symbol)
Pch	00266	---	h hooktop (phonetic symbol)
Pci	00269	---	iota (phonetic symbol)
Pcj	0025F	---	barred dotless j (phonetic symbol)
Pck	0029E	---	turned k (phonetic symbol)
Pcl	0026C	---	belted l (phonetic symbol)
Pcm	0026F	---	turned m (phonetic symbol)
Pcn	00272	---	n with left tail at left (phonetic symbol)
Pco	00275	---	barred o (phonetic symbol)
Pcp	000DE	Þ	THORN (phonetic symbol)
Pcr	0027C	---	r with long leg (phonetic symbol)
Pcs	00282	---	s with right tail (phonetic symbol)
Pct	00288	---	t with right tail (phonetic symbol)
Pcu	0028A	---	upsilon (phonetic symbol)
Pcy	0028F	---	small capital Y (phonetic symbol)
Pcz	00291	---	curly-tail z (phonetic symbol)
Pd1	001C3	---	exclamation point (phonetic symbol)
Pd2	002C8	---	vertical stroke (superior) (phonetic symbol)
Pd3	---	<ce:glyph name="hbar"/>	horizontal bar (phonetic symbol)
Pd6	---	<ce:glyph name="lris"/>	low rising, accent (phonetic symbol)
Pd7	002E9-002E8	---	low rising, symbol (phonetic symbol)
Pda	00252	---	turned script a (phonetic symbol)
Pdb	003B2	β	beta (phonetic symbol)
Pdc	00255	---	curly-tail c (phonetic symbol)

Position	Unicode	Entities / glyph	Description
Pdd	002A4	---	d-Yogh ligature (phonetic symbol)
Pde	00258	---	reversed e (phonetic symbol)
Pdg	00263	---	gamma (phonetic symbol)
Pdh	00267	---	heng hooktop (phonetic symbol)
Pdi	0026A	---	small capital I (phonetic symbol)
Pdj	00284	---	dotless j, bar hooktop (phonetic symbol)
Pdk	---	<ce:glyph name="resmck"/>	small capital K, reversed (phonetic symbol)
Pdl	0026D	---	l with right tail (phonetic symbol)
Pdm	00270	---	turned m with long right leg (phonetic symbol)
Pdn	0014B	ŋ	eng (phonetic symbol)
Pdo	000F8	ø	slashed o (phonetic symbol)
Pdp	001A5	---	p hooktop (phonetic symbol)
Pdr	0027D	---	r with right tail (phonetic symbol)
Pds	00283	---	esh (phonetic symbol)
Pdt	002A7	---	t-esh ligature (phonetic symbol)
Pdu	---	<ce:small-caps>u</ce:small-caps>	small capital U (phonetic symbol)
Pdz	00290	---	z with right tail (phonetic symbol)
Pe1	001C0	---	pipe (phonetic symbol)
Pe2	002CC	---	vertical stroke (inferior) (phonetic symbol)
Pe3	0033C	---	seagull (phonetic symbol)
Pe6	---	<ce:glyph name="risfla"/>	rising-falling, accent (phonetic symbol)
Pe7	002E6-002E5-002E6	---	rising-falling, symbol (phonetic symbol)
Pea	000E6	æ	ash (phonetic symbol)
Peb	00180	---	crossed b (phonetic symbol)
Pec	00297	---	stretched c (phonetic symbol)
Ped	000F0	ð	eth (phonetic symbol)
Pee	---	<ce:small-caps>e</ce:small-caps>	small capital E (phonetic symbol)
Peg	00264	---	baby gamma (phonetic symbol)
Peh	00265	---	turned h (phonetic symbol)
Pei	00131	ı, ı	i, undotted (phonetic symbol)
Pej	0029D	---	curly-tail j (phonetic symbol)
Pel	0026E	---	l-Yogh ligature (phonetic symbol)
Pem	0004D	---	capital M (phonetic symbol)
Pen	00273	---	n with right tail (phonetic symbol)
Peo	00153	œ	o-e ligature (phonetic symbol)
Pep	00278	---	phi (phonetic symbol)
Per	00279	---	turned r (phonetic symbol)
Pes	00286	---	curly-tail esh (phonetic symbol)
Pet	00287	---	turned t (phonetic symbol)
Pez	00292	---	yogh (phonetic symbol)
Pf1	0002F	/	slash (phonetic symbol)
Pf2	00329	---	syllabicity mark (phonetic symbol)
Pf3	00318	---	advanced tongue root (phonetic symbol)
Pf7	002E6	---	high, symbol (phonetic symbol)

Position	Unicode	Entities / glyph	Description
Pfa	---	<ce:small-caps>a</ce:small-caps>	small capital A (phonetic symbol)
Pfc	00188	---	c hooktop (phonetic symbol)
Pfd	000D0	Ð	ETH (phonetic symbol)
Pfe	0025B	ϵ, ϵ	epsilon (phonetic symbol)
Pfg	0029B	---	G small cap hooktop (phonetic symbol)
Pfh	0029C	---	capital H (phonetic symbol)
Pfj	---	<ce:glyph name="jnodot"/>	j, undotted (phonetic symbol)
Pfl	0004C	---	capital L (phonetic symbol)
Pfn	00274	---	small capital N (phonetic symbol)
Pfo	00276	---	small capital O-E ligature (phonetic symbol)
Pfr	0027B	---	turned r with right tail (phonetic symbol)
Pfs	001AA	---	esh reversed, top loop (phonetic symbol)
Pft	003B8	θ	theta (phonetic symbol)
Pfz	00293	---	curly-tail yogh (phonetic symbol)
Pg1	001C2	---	double-barred pipe (phonetic symbol)
Pg2	0031A	---	corner (phonetic symbol)
Pg3	00319	---	retracted tongue root (phonetic symbol)
Pg7	002E7	---	mid, symbol (phonetic symbol)
Pga	0028C	---	inverted v (phonetic symbol)
Pgd	00111	đ	crossed d (phonetic symbol)
Pge	0025C	---	reversed epsilon (phonetic symbol)
Pgh	---	<ce:glyph name="hrtrrh"/>	turned h, hook right tail (phonetic symbol)
Pgl	003BB	λ	lambda (phonetic symbol)
Pgn	0019E	---	n, long right leg (phonetic symbol)
Pgo	00254	---	open o (phonetic symbol)
Pgr	0027A	---	turned longlegged r (phonetic symbol)
Pgt	001AD	---	t hooktop (phonetic symbol)
Pgz	001BA	---	yogh, bent tail (phonetic symbol)
Ph1	02260	≠, ≠	double-barred slash (phonetic symbol) (variant of Pg1)
Ph2	002D1	---	half-length mark (phonetic symbol)
Ph7	002E8	---	low, symbol (phonetic symbol)
Pha	00251-002DE	---	script a, right hook (phonetic symbol)
Phd	00110	Đ	crossed D (phonetic symbol)
Phe	0025D	---	right hook reversed epsilon (phonetic symbol)
Phh	00195	---	h-v ligature (phonetic symbol)
Phl	0019B	---	lambda, crossed (phonetic symbol)
Phn	---	<ce:glyph name="ncurt"/>	curly-tail n (phonetic symbol)
Pho	003C9	ω	lower-case omega (phonetic symbol)
Phr	00280	---	small capital R (phonetic symbol)
Pht	---	<ce:glyph name="tcurt"/>	curly-tail t (phonetic symbol)
Pi1	001C1	---	double Pipe (phonetic symbol)
Pi2	002D0	---	length mark (phonetic symbol)
Pi7	002E9-002E5	---	rising, symbol (phonetic symbol)
Pid	---	<ce:glyph name="dcurt"/>	curly-tail d (phonetic symbol)

Position	Unicode	Entities / glyph	Description
Pie	0025E	---	closed reversed epsilon (phonetic symbol)
Pih	---	<ce:glyph name="heng"/>	heng (phonetic symbol)
Pio	00277	---	closed omega (phonetic symbol)
Pir	00281	---	inverted small capital R (phonetic symbol)
Pj1	---	<ce:glyph name="pSlash"/>	double Slash (phonetic symbol) (variant of Pi1)
Pj2	002BC	---	apostrophe (phonetic symbol)
Pj7	002E5-002E9	---	falling, symbol (phonetic symbol)
Pje	0025B-002DE	---	epsilon, upper right hook (phonetic symbol)
Pjo	00254-002DE	---	open o, upper right hook (phonetic symbol)
Pjr	0027F	---	fish-hook r, reversed (phonetic symbol)
Pk1	---	<ce:glyph name="trisola"/>	triple Slash (phonetic symbol)
Pk2	002BD	---	reversed apostrophe (phonetic symbol)
Pko	---	<ce:glyph name="trnomeg"/>	inverted omega (phonetic symbol)
Pkr	00285	---	reversed fish-hook r, right tail (phonetic symbol)
Pl1	0005C	\	small backslash (phonetic symbol)
Pl2	002BB	---	turned comma (phonetic symbol)
Plr	---	<ce:glyph name="refhrl"/>	reversed fish-hook r, long leg (phonetic symbol) (variant of Pjr)
Pm2	002D3	---	left half-ring (phonetic symbol)
Pn2	002D2	---	right half-ring (phonetic symbol)
Po2	00321	---	palatization hook (phonetic symbol)
Pp2	00322	---	right hook (phonetic symbol)
Pq2	00311	̑	round cap (phonetic symbol)
Pq3	0033D	---	mid centralized (phonetic symbol)
Pr2	0032F	---	subscript arch (phonetic symbol)
Ps2	00361	---	top ligature (phonetic symbol)
Pt2	---	<ce:glyph name="btmliq"/>	bottom ligature (phonetic symbol)

4 Character entities, ordered by entity

In the following table we list: 1. the DTD4 entity name, 2. the Unicode point, 3. the valid entity names for this Unicode point. See section 3 for remarks about column 3.

DTD4 entity	Unicode	Entities / glyph
Æ	00C6	Æ
⩓	02A55	⩕
⌆	02A5E	&z.Barwed;
Б	00411	Б
⋒	022D2	⋒
∷	02237	∷, ∷
⋓	022D3	⋓
‡	02021	‡, ‡, ‡
Д	00414	Д
Δ	00394	Δ
⃜	020DC	⃜
Ð	000D0	Ð
Э	0042D	Э
Ф	00424	Ф
Γ	00393	Γ
Г	00413	Г
⋙	022D9	⋙, ⋙
≫	02AA2	⪢
Ъ	0042A	Ъ
И	00418	И
Й	00419	Й
Х	00427	Ч
К	0041A	К
Λ	0039B	Λ
↞	0219E	↞, ↞
Л	0041B	Л
⋘	022D8	⋘
≪	02AA1	⪡
⤅	02905	⤅
Œ	00152	Œ
Ω	003A9	Ω
⩔	02A56	⩖
Ø	000D8	Ø
П	0041F	П
Φ	003A6	Φ
Π	003A0	Π
″	02033	″
Ψ	003A8	Ψ
↠	021A0	↠, ↠
Щ	00429	Щ
Ш	00428	Ш
Ь	0042C	Ь
Σ	003A3	Σ
⋐	022D0	⋐, ⋐
⋑	022D1	⋑, ⋑
Þ	000DE	Þ
Ц	00426	Ц

DTD4 entity	Unicode	Entities / glyph
Θ	00398	Θ
У	00423	У
ϒ	003D2	ϒ
⊫	022AB	⊫
⫫	02AEB	⫫
⊩	022A9	⊩
⊪	022AA	⊪
Ξ	0039E	Ξ
Я	0042F	Я
Ю	0042E	Ю
Ы	0042B	Ы
Ж	00416	Ж
З	00417	З
&acoint;	02233	∳, ∳
´	00301	---
æ	000E6	æ
ℵ	02135	ℵ
α	003B1	α
⨿	02A3F	⨿
&	00026	&
∧	02227	∧, ∧
&ang90;	0299C	&z.ang90;
∠	02220	∠, ∠
∡	02221	∡, ∡
∢	02222	∢
≈	02248	≈, ≈, ≈, ≈, ≈, ≈
≊	0224A	≊, ⩰, ≊
≋	0224B	≋
*	0204E	---
≈	0224D	≍, ≍
⌅	022BC	⌅, ⌅
≌	0224C	≌, ≌
б	00431	б
∵	02235	∵, ∵, ∵
β	003B2	β
ℶ	02136	ℶ
⋈	022C8	⋈
‵	02035	‵, ‵
˘	00306	---
¦	000A6	¦
∽	0223D	∽, ∽
⋍	022CD	⋍, ⋍
•	02022	•, •
≎	0224E	≎, ≎, ≎
≏	0224F	≏, ≏, ≏
∩	02229	∩
ˇ	0030C	---
&ccoint;	02232	∲, ∲
¸	00327	---
¢	000A2	¢
✓	02713	✓, ✓
χ	003C7	χ

DTD4 entity	Unicode	Entities / glyph
○	025CB	○
ˆ	00302	---
≗	02257	≗, ≗
♣	02663	♣, ♣
≔	02254	≔, ≔, ≔
∁	00297	---
∘	02218	∘, ∘
≅	02245	≅, ≅
∮	0222E	∮, ∮, ∮
∐	02210	∐, ∐
©	000A9	©
⋯	022EF	⋯
⋞	022DE	⋞, ⋞
⋟	022DF	⋟, ⋟
↶	021B6	↶, ↶
∪	0222A	∪
↷	021B7	↷, ↷
⋎	022CE	⋎, ⋎
⋏	022CF	⋏, ⋏
∱	02231	∱
⇓	021D3	⇓, ⇓, ⇓
†	02020	†, †
ℸ	02138	ℸ
&darr2;	021CA	⇊, &downarrowarrows;
↓	02193	↓, ↓, ↓, ↓
⊣	022A3	⊣, ⊣
˝	0030B	---
д	00434	д
°	000B0	°
δ	003B4	δ
⇃	021C3	⇃, ⇃, ⇃
⇂	021C2	⇂, ⇂, ⇂
⋄	02662	&z.diam;
♦	02666	♦, ♦
÷	000F7	÷, ÷
⋇	022C7	⋇, ⋇
⌞	0231E	⌞, ⌞
&dminus;	02A2A	⨪
&doplus;	02A25	⨥
˙	00307	---
⌟	0231F	⌟, ⌟
&dttdot;	022F1	&dttdot;
▿	025BF	▿, ▿
▾	025BE	▾, ▾
⩷	02A77	⩷, ⩷
≑	02251	≑, ≑
≖	02256	≖, ≖
≕	02255	≕, ≕
э	0044D	э
ė	02250	≐, ≐, ≐
≒	02252	≒, ≒
⪖	02A96	&z.egs;
ℓ	02113	ℓ, 𝓁

DTD4 entity	Unicode	Entities / glyph
⪕	02A95	&z.els;
∅	02205	∅, ∅, ∅, ∅
∅	02205	∅, ∅, ∅, ∅
ε	003F5	&z.epsi;
ϵ	003B5	&z.epsiv;, ε, ϵ
≟	0225F	≟, ≟
≡	02261	≡, ≡
≓	02253	≓, ≓
≂	02242	≂, ≂, ≂
η	003B7	η
ð	000F0	ð
€	020AC	&z.euro;
∃	02203	∃, ∃
ф	00444	ф
♀	02640	♀
♭	0266D	♭
∀	02200	∀, ∀
⋔	022D4	⋔, ⋔
⌢	02322	⌢
≧	02267	≧, ≧, ≧
⪌	02A8C	&z.gEl;
γ	003B3	γ
ϝ	003DD	&z.gammad;
⪆	02A86	&z.gap;
г	00433	г
ġ	022D7	⋗, ⋗
≥	02265	≥, ≥, ≥
⋛	022DB	⋛, ⪌, ⋛, ⋛, ⋛
⩾	02A7E	⩾, ⩾, ⩾
ℷ	02137	ℷ
≷	02277	≷, ≷, ≷
≩	02269	≩, ⪈, ⪈, ≩
⪊	02A8A	⪊, ⪊
⪈	02A88	&z.gne;
⋧	022E7	⋧
`	00300	---
≳	02273	≳, ⪆, ≳, ⪆, ≳
ъ	0044A	ъ
↔	02194	↔, ↔, &leftrightharrow;
↭	021AD	↭, ↭
♥	02665	&z.hearts;
…	02026	…, …
⊹	022B9	⊹
&homthr;	0223B	∻
и	00438	и
¡	000A1	¡
⇔	021D4	⇔, ⇔, ⇔, ⇔
⧜	029DC	⧜
℩	02129	℩
⊷	022B7	⊷
∞	0221E	∞

DTD4 entity	Unicode	Entities / glyph
ı	00131	ı, ı
∫	0222B	∫, ∫
⊺	022A4	⊤, ⊤
ι	003B9	ι
⨼	02A3C	⨼, ⨼
¿	000BF	¿
∈	02208	∈, ∈, ∈, ∈
й	00439	й
&jnodot;	0E2D4	<ce:glyph name="jnodot"/>
κ	003BA	κ
ϰ	003F0	ϰ, ϰ
к	0043A	к
х	00447	ч
⇚	021DA	⇚, ⇚
⇐	021D0	⇐, ⇐, ⇐
≦	02266	≦, ≦, ≦
⪋	02A8B	&z.lEg;
λ	003BB	λ
⟨	02329	⟨, ⟨, ⟨
⪅	02A85	&z.lap;
«	000AB	«
&larr2;	021C7	⇇, ⇇
←	02190	←, ←, ←, ←, &ShortLeft-Arrow;
↩	021A9	↩, ↩
↫	021AB	↫, ↫
↢	021A2	↢, ↢
⌈	02308	⌈, ⌈
л	0043B	л
&ldot;	022D6	⋖, ⋖
“	0201C	“, “
≤	02264	≤, ≤
⋚	022DA	⋚, ⪋, ⋚, ⪋, &LessEqual-Greater;
⩽	02A7D	⩽, ⩽, ⩽
⥼	0297C	⥼
⌊	0230A	⌊, ⌊
≶	02276	≶, ≶, ≶
↽	021BD	↽, ↽, ↽
↼	021BC	↼, ↼, ↼
≨	02268	≨, ⪇, ⪇, ≨
⪉	02A89	⪉, ⪉
⪇	02A87	&z.lne;
⋦	022E6	⋦
⟬	02985	⦅
&lbrk;	0301A	&lbrk;, ⟦
◊	025CA	◊, ◊
⧫	---	<ce:glyph name="lozf"/>
⦓	02993	⦓
&lrarr2;	021C6	⇆, ⇆, ↔
&lrhar2;	021CB	⇋, ⇋, ⇋
↰	021B0	↰, ↰
≲	02272	≲, ⪅, ⪅, ≲, ≲

DTD4 entity	Unicode	Entities / glyph
‘	02018	‘, ‘
<	0003C	<
⋋	022CB	⋋, ⋋
⋉	022C9	⋉
◃	025C1	&z.ltri;
⊴	022B4	⊴, ⊴, ⊴
◂	025C0	&z.ltrif;
∺	0223A	∺
¯	00304	---
♂	02642	♂
✠	02720	✠, ✠
↦	021A6	↦, ↦, ↦
м	0043C	м
—	02014	—
∣	02223	∣, ∣, ∣, ∣
·	000B7	·, ·, ·
−	02212	−
⊟	0229F	⊟, ⊟
∸	02238	∸, ∸
&mpplus;	02213	&mpplus;, ∓, ∓
μ	003BC	μ
⊸	022B8	⊸, ⊸
⊯	022AF	⊯
⊮	022AE	⊮
∇	02207	∇, ∇
≉	02249	≉, ≉, ≉
≋̸	0224B-00338	≋̸
♮	0266E	♮, ♮
 	000A0	 ,
≇	02247	≇, ≇
н	0043D	н
–	02013	–
≠	02260	≠, ≠
⤤	02924	⤤
↗	02197	↗, ↗, ↗
≢	02262	≢, ≢
⤨	02928	⤨, ⤨
∄	02204	∄, ∄, ∄
≧̸	02267-00338	&z.ngE;
≱	02271	≱, ≱, ≱
⩾̸	02271	≱, ≱, ≱
≯	0226F	≯, &nvgtr;, ≯, ≯
⇎	021CE	⇎, ⤄, ⇎
↮	021F9	&z.nharr;
∋	0220B	∋, ∋, ∋, ∋
⇍	021CD	⇍, ⤂, ⇍
≰	02266-00338	&z.nle;
↚	0219A	↚, ↚
≰	02270	≰, ≰, ≰
⩽̸	02270	≰, ≰, ≰
≮	0226E	≮, <⃒, ≮, ≮
⋪	022EA	⋪, ⋪, ⋪
⋬	022EC	⋬, ⋬, ⋬

DTD4 entity	Unicode	Entities / glyph
∤	02224	∤, ∤, ∤, ∤
¬	000AC	¬
∉	02209	∉, ∉, ∉
∌	0220C	∌, ∌, ∌
∦	02226	∦, ∦, ∦, ∦, ∦
⊀	02280	⊀, ⊀, ⊀
⪯̸	02AAF-00338	⪯̸, ⪯̸, ⪯̸
⇏	021CF	⇏, ⤃, ⇏
↛	0219B	↛, ↛
⋫	022EB	⋫, ⋫, ⋫
⋭	022ED	⋭, ⋭, ⋭
⊁	02281	⊁, ⊁, ⊁
⪰̸	02AB0-00338	⪰̸, ⪰̸, ⪰̸
≁	02241	≁, ≁
≄	02244	≄, ≄, ≄
∤	0E2AA	<ce:glyph name="nsmid"/>
∦	0E2AB	<ce:glyph name="nspar"/>
&nsb;	02284	&nsb;, ⊂⃒, ⊂⃒, &nsbset;
&nsbE;	02AC5-00338	&z.nsbE;
&nsbe;	02288	&nsbe;, &nsbE;, ⊈, &nsbseteq;, &nsbseteqq;
⊅	02285	⊅, ⊃⃒, ⊃⃒, ⊃⃒
⫆̸	02AC6-00338	&z.nsupE;
⊉	02289	⊉, ⫆̸, ⊉, ⊉, ⫆̸
ν	003BD	ν
⊭	022AD	⊭
⊬	022AC	⊬
⤣	02923	⤣
↖	02196	↖, ↖, ↖
⤧	02927	⤧
⊛	0229B	⊛, ⊛
⊚	0229A	⊚, ⊚
⊝	0229D	⊝, ⊝
⊙	02299	⊙, ⨀, ⨀, ⊙
œ	00153	œ
˛	00328	---
↺	02940	&z.olarr;
ω	003C9	ω
&omicr;	003BF	&z.omicr;
⊖	02296	⊖, ⊖
⊕	02295	⊕, ⨁, ⨁, ⊕
∨	02228	∨, ∨
↻	02941	&z.orarr;
⊶	022B6	⊶
ø	000F8	ø
⊘	02298	⊘
⊗	02297	⊗, ⨂, ⨂, ⊗
⌽	029B6	⦶
∥	02225	∥, ∥, ∥, ∥, ∥

DTD4 entity	Unicode	Entities / glyph
¶	000B6	¶
∂	02202	∂, ∂
п	0043F	п
‰	02030	‰
⊥	022A5	⊥, ⊥, ⊥, ⊥
&ph.OElig;	00276	---
&ph.iota;	00269	---
&ph.lsquo;	002BB	---
&ph.odot;	00298	---
&ph.rsquo;	002BC	---
&ph.urcorn;	0031A	---
φ	003D5	φ, ϕ
ϕ	003C6	ϕ, ϕ
☎	0260E	☎
π	003C0	π
ϖ	003D6	ϖ, ϖ
ℏ	0210F	ℏ, ℏ, ℏ, ℏ
⊞	0229E	⊞, ⊞
∔	02214	∔, ∔
±	000B1	±, ±, ±
£	000A3	£
≺	0227A	≺, ≺, ≺
⪷	02AB7	&z.prap;
≼	0227C	≼, ≼, ≼
⪯	02AAF	⪯, ⪳, ⪯, ⪯
′	02032	′
⪵	02AB5	⪵, ⪵
⪹	02AB9	&z.prnep;
⋨	022E8	⋨, ⪹, ⪹, ⋨
∏	0220F	∏, ∏
∝	0221D	∝, ∝, ∝, ∝, ∝
≾	0227E	≾, ⪷, ⪴, ⪷, ≾, ≾
ψ	003C8	ψ
 	02008	 
⇛	021DB	⇛, ⇛
⇒	021D2	⇒, ⇒, ⇒, ⇒
√	0221A	√, √
⟩	0232A	⟩, ⟩, ⟩
»	000BB	»
&rarr2;	021C9	⇉, &rightarrows;
→	02192	→, →, →, →, &Short- RightArrow;
↪	021AA	↪, ↪
↬	021AC	↬, ↬
↣	021A3	↣, &ratal; , ↣
↝	021DD	⇝
⌉	02309	⌉, ⌉
”	0201D	”, ”, ”
▭	025AD	▭
®	000AE	®, ®
⥽	0297D	⥽
⌋	0230B	⌋, ⌋

DTD4 entity	Unicode	Entities / glyph
⇁	021C1	⇁, ⇁, ⇁
⇀	021C0	⇀, ⇀, ⇀
ρ	003C1	ρ
ϱ	003F1	ϱ, ϱ
˚	0030A	---
&rlarr2;	021C4	⇄, ⇄, ⇄
&rlhar2;	021CC	⇌, ⇌, ⇌
⟭	02986	⦆
⟧	0301B	⟧, ⟧
⦔	02994	⦔
↱	021B1	↱, ↱
’	02019	’, ’, ’
⋌	022CC	⋌, ⋌
⋊	022CA	⋊
▹	025B7	&z.rtri;
⊵	022B5	⊵, ⊵, ⊵
▸	025B6	&z.rtrif;
≻	0227B	≻, ≻, ≻
⪸	02AB8	&z.scap;
≽	0227D	≽, ⪰, ≽, ⪰, ≽, ⪰
⪰	02AB0	&z.sce;
⪶	02AB6	⪶, ⪶
⪺	02ABA	&z.scnap;
⋩	022E9	⋩, ⪺, ⪺, ⋩
≿	0227F	≿, ⪸, ⪸, ≿, ≿
⤥	02925	⤥, ⤥
↘	02198	↘, ↘, ↘
§	000A7	§
⤩	02929	⤩, ⤩
♯	0266F	♯
щ	00449	щ
ш	00448	ш
σ	003C3	σ
ς	003C2	ς, ς
∼	0223C	∼, ∼, ∼
≃	02243	≃, ≃, ≃
⪞	02A9E	⪞
⪝	02A9D	⪝
∣	0E301	<ce:glyph name="smid"/>
⌣	02323	⌣
ь	0044C	ь
♠	02660	♠, ♠
∥	0E302	<ce:glyph name="spar"/>
⊓	02293	⊓, ⊓
⊔	02294	⊔, ⨆, ⨆, ⊔
⊏	0228F	⊏, ⊏, ⊏
⊑	02291	⊑, &sqsubseteqeq;, ⊑
⊐	02290	⊐, ⊐, ⊐
⊒	02292	⊒, ⊒, ⊒
□	025A1	□, □, □
&sqf;	025A0	&z.squf;

DTD4 entity	Unicode	Entities / glyph
&ssstarf;	022C6	&ssstarf;, ☆, ⋆
☆	02606	&z.star;
★	02605	★, ★
⊂	02282	⊂, ⊂
⫅	02AC5	&z.subE;
⊆	02286	⊆, ⫅, ⊆, ⫅, ⊆
⫋	02ACB	&z.subnE;
⊊	0228A	⊊, ⫋, ⊊, ⫋
∑	02211	∑, ∑
⊃	02283	⊃, ⊃, ⊃
⫆	02AC6	&z.supE;
⊇	02287	⊇, ⫆, ⊇, ⊇, ⫆
⫌	02ACC	&z.supnE;
⊋	0228B	⊋, ⫌, ⊋, ⫌
⤦	02926	⤦, ⤦
↙	02199	↙, ↙, ↙
⤪	0292A	⤪
ß	000DF	ß
τ	003C4	τ
т	00442	т
∴	02234	∴, ∴, ∴
θ	003B8	θ
ϑ	003D1	ϑ, ϑ
þ	000FE	þ
˜	00303	---
×	000D7	×
⊠	022A0	⊠, ⊠
‴	02034	‴
™	02122	™
≜	0225C	≜, ≜
ц	00446	ц
≬	0226C	≬, ≬
⇑	021D1	⇑, ⇑, ⇑
&uarr2;	021C8	⇈, ⇈
↑	02191	↑, ↑, ↑, ↑
↿	021BF	↿, ↿, ↿
↾	021BE	↾, ↾, ↾
⌜	0231C	⌜, ⌜
¨	00308	---
⊎	0228E	⊎, ⨄, ⨄, ⊎
υ	003C5	υ, υ
⌝	0231D	⌝, ⌝
▵	025B5	▵, ▵
▴	025B4	▴, ▴
⇕	021D5	⇕, ⇕, ⇕
⊨	022A8	⊨, ⊨
↕	02195	↕, ↕, ↕
в	00432	в
⊢	022A2	⊢, ⊢
⊻	022BB	⊻
≙	02259	≙
℘	02118	℘, ℘

DTD4 entity	Unicode	Entities / glyph
≀	02240	≀, ≀, ≀
⋂	022C2	⋂, ⋂, ⋂
⋃	022C3	⋃, ⋃, ⋃
▽	025BD	▽, ▽
ξ	003BE	ξ
&xscup;	02A06	&z.xscup;
⨄	02A04	&z.xuplus;
△	025B3	△, △
⋁	022C1	⋁, ⋁, ⋁
⋀	022C0	⋀, ⋀, ⋀
я	0044F	я
ы	0044B	ы
¥	000A5	¥
ю	0044E	ю
&z.And;	02A53	⩓
&z.Barpip;	001C2	---
&z.Cint;	02A0D	⨍
&z.Ehac;	0225A	≚
&z.Gt;	0226B	≫, ≫, ≫
&z.Inf;	02A07	&z.Inf;
&z.Lap;	029CA	&z.Lap;
&z.Lt;	0226A	≪, ≪, ≪
&z.Or;	02A54	⩔
&z.Rlarr;	02942	&z.Rlarr;
&z.S;	0E659	<ce:glyph name="S"/>
&z.Sup;	02A08	&z.Sup;
&z.Theta;	003F4	&z.Theta;
&z.Thr;	02A05	&z.Thr;
&z.Times;	02A2F	⨯
&z.Trkhk;	00326	---
&z.aacute;	002BA	---
&z.archs;	0032F	---
&z.arrdl;	02936	&lldca;
&z.rrdr;	02937	⤷
&z.atr;	00318	---
&z.ausco;	000AA	ª
&z.bar;	00336	---
&z.betav;	003D0	&z.betav;
&z.bigdot;	0E626	<ce:glyph name="bigdot"/>
&z.btdl;	0026C	---
&z.btmlig;	0E64C	<ce:glyph name="btmlig"/>
&z.btyogh;	001BA	---
&z.camb;	0E624	<ce:glyph name="camb"/>
&z.cansls;	00338	---
&z.ccirf;	022C5	⋅
&z.cirf;	025CF	&z.cirf;
&z.cirfb;	025D2	&z.cirfb;
&z.cirfl;	025D0	&z.cirfl;
&z.cirfr;	025D1	&z.cirfr;
&z.cirft;	025D3	&z.cirft;
&z.clomeg;	00277	---
&z.crepsv;	0025E	---
&z.ctl;	0E630	<ce:glyph name="ctl"/>

DTD4 entity	Unicode	Entities / glyph
&z.dbnd6;	0E605	<ce:glyph name="dbnd6"/>
&z.dbnd;	0E5FB	<ce:glyph name="dbnd"/>
&z.dcurt;	0E641	<ce:glyph name="dcurt"/>
&z.ddfnc;	02999	&z.ddfnc;
&z.defas;	029CB	&z.defas;
&z.dfnc;	02016	‖, ‖
&z.dlcorn;	0EC02	<ce:glyph name="dlcorn"/>
&z.drcorn;	0EC01	<ce:glyph name="drcorn"/>
&z.drule;	029F9	&z.drule;
&z.dshfnc;	02506	&z.dshfnc;
&z.duarr;	021F5	⇵, ⇵
&z.duhar2;	0296F	⥯, ⥯
&z.dyogh;	002A4	---
&z.eint;	02A10	⨐
&z.eng;	0014B	ŋ
&z.esh;	00283	---
&z.fals;	002E5-002E9	---
&z.fhr;	0027E	---
&z.ggrave;	0E680	<ce:glyph name="ggrave"/>
&z.glst;	00294	---
&z.gull;	0033C	---
&z.hbar;	0E634	<ce:glyph name="hbar"/>
&z.heng;	0E642	<ce:glyph name="heng"/>
&z.herma;	0E5BC	<ce:glyph name="herma"/>
&z.hex;	02394	&z.hex;
&z.hfl;	00192	&z.hfl;, ƒ
&z.highs;	002E6	---
&z.hlmrk;	002D1	---
&z.hris;	0E632	<ce:glyph name="hris"/>
&z.hriss;	002E6-002E5	---
&z.hrttrh;	0E63C	<ce:glyph name="hrttrh"/>
&z.ht;	0E62D	<ce:glyph name="ht"/>
&z.hvlig;	00195	---
&z.inglst;	00296	---
&z.invv;	0028C	---
&z.invw;	0028D	---
&z.jup;	02643	&z.jup;
&z.lam;	0033B	---
&z.lbd2bd;	0E5E8	<ce:glyph name="lbd2bd"/>
&z.lbd2td;	0E5E7	<ce:glyph name="lbd2td"/>
&z.lbond2;	0E60B	<ce:glyph name="lbond2"/>
&z.lbond3;	0E609	<ce:glyph name="lbond3"/>
&z.ldang;	0300A	⟪
&z.lmrk;	002D0	---
&z.low;	002D5	---
&z.lows;	002E8	---
&z.lozfl;	0E5B9	<ce:glyph name="lozfl"/>
&z.lozfr;	0E5BA	<ce:glyph name="lozfr"/>
&z.lpargt;	029A0	&z.lpargt;
&z.lris;	0E635	<ce:glyph name="lris"/>
&z.lriss;	002E9-002E8	---
&z.lsquo;	02039	&z.lsquo;
&z.ltlmr;	00271	---

DTD4 entity	Unicode	Entities / glyph
&z.ltl̄n;	00272	---
&z.ltril;	022B2	&vlttri;, ⊲, ⊲
&z.lyogh;	0026E	---
&z.mdc;	0033D	---
&z.merc;	0263F	&z.merc;
&z.mho;	02127	℧
&z.mids;	002E7	---
&z.minhat;	02A5F	⩟
&z.mstpos;	0223E	∾
&z.nasymp;	0226D	≭
&z.nbump;	0224E-00338	≎̸, ≎̸
&z.ncurt;	0E63E	<ce:glyph name="ncurt"/>
&z.nept;	02646	&z.nept;
&z.nesim;	02242-020D2	&z.nesim;
&z.nglpar;	02993	⦓
&z.ngtneq;	02275	≵, ≵
&z.ngtnlt;	02279	≹, ≹
&z.nlr;	0019E	---
&z.nltneq;	02274	≴, ≴
&z.nltngt;	02278	≸, ≸
&z.nrarrc;	02933-00338	⤳̸
&z.nsubE;	0228A-0FE00	⫋︀, ⊊︀, ⊊︀, ⫋︀
&z.nsubne;	0228A-0FE00	⫋︀, ⊊︀, ⊊︀, ⫋︀
&z.nsupE;	0228B-0FE00	⫌︀, ⊋︀, ⊋︀, ⫌︀
&z.nsupne;	0228B-0FE00	⫌︀, ⊋︀, ⊋︀, ⫌︀
&z.odiv;	02A38	⨸
&z.openo;	00254	---
&z.oplusl;	02A2D	⨭
&z.oplusr;	02A2E	⨮
&z.otimsl;	02A34	⨴
&z.otimsr;	02A35	⨵
&z.ousco;	000BA	º
&z.pSlash;	0E643	<ce:glyph name="pSlash"/>
&z.pa;	00061	---
&z.palh;	00321	---
&z.parl;	025B1	&z.parl;
&z.pbgam;	00264	---
&z.pdbdbd;	02393	&z.pdbdbd;
&z.pdbdtd;	0E5F4	<ce:glyph name="pdbdtd"/>
&z.pdbond;	0E5F9	<ce:glyph name="pdbond"/>
&z.pent;	0E5F2	<ce:glyph name="pent"/>
&z.pes;	020A7	&z.pes;
&z.pg;	00261	---
&z.pgamma;	00263	---
&z.phktp;	001A5	---
&z.plims;	029B5	⦵
&z.ppcnt;	02031	‱
&z.pphi;	00278	---
&z.pscra;	00251	---
&z.pscrv;	0028B	---
&z.ptbdbd;	0E5F7	<ce:glyph name="ptbdbd"/>
&z.ptbdtd;	0E5F6	<ce:glyph name="ptbdtd"/>
&z.pupsil;	0028A	---

DTD4 entity	Unicode	Entities / glyph
&z.qbnd6;	0E607	<ce:glyph name="qbnd6"/>
&z.qbnd;	0E5FD	<ce:glyph name="qbnd"/>
&z.qprime;	02057	⁗
&z.rLarr;	02944	&z.rLarr;
&z.rad;	---	<ce:glyph name="rad"/>
&z.rais;	002D4	---
&z.rarrc;	02933	⤳
&z.rarrx;	02947	&z.rarrx;
&z.rbd2bd;	0E5EA	<ce:glyph name="rbd2bd"/>
&z.rbd2td;	0E5E9	<ce:glyph name="rbd2td"/>
&z.rbond2;	0E60A	<ce:glyph name="rbond2"/>
&z.rbond3;	0E608	<ce:glyph name="rbond3"/>
&z.rdang;	0300B	⟫
&z.reapos;	002BD	---
&z.refhr;	0027F	---
&z.refhrl;	0E64B	<ce:glyph name="refhrl"/>
&z.reglst;	00295	---
&z.repsiv;	0025C	---
&z.reshtl;	001AA	---
&z.resmck;	0E637	<ce:glyph name="resmck"/>
&z.reve;	00258	---
&z.rh;	00322	---
&z.rhkd;	021B3	↳
&z.risfla;	0E638	<ce:glyph name="risfla"/>
&z.risfls;	002E6-002E5-002E6	---
&z.riss;	002E9-002E5	---
&z.rl;	0027C	---
&z.rndcap;	00311	̑
&z.rparlt;	02222	&angsp;
&z.rsquo;	0203A	&z.rsquo;
&z.rtld;	00256	---
&z.rttl;	0026D	---
&z.rtl;	00273	---
&z.rtlr;	0027D	---
&z.rtls;	00282	---
&z.rtl;	00288	---
&z.rtlz;	00290	---
&z.rtr;	00319	---
&z.rtrfhr;	00285	---
&z.rtrnr;	0027B	---
&z.rvbull;	025D8	&z.rvbull;
&z.sat;	02644	&z.sat;
&z.sbrg;	0032A	---
&z.sbrgt;	0033A	---
&z.sblhr;	002D3	---
&z.sbd;	0E5F8	<ce:glyph name="sbd"/>
&z.sbrhr;	002D2	---
&z.sbs;	0005C	\
&z.sbw;	0E631	<ce:glyph name="sbw"/>
&z.schwa;	00259	---
&z.scis;	02702	&z.scis;
&z.sfnc;	0007C	|, |, |
&z.shtsls;	00337	---

DTD4 entity	Unicode	Entities / glyph
&z.simne;	02246	≆
&z.sint;	0222F	∯, ∯
&z.sqfb;	0E5B7	<ce:glyph name="sqfb"/>
&z.sqfl;	025E7	&z.sqfl;
&z.sqfne;	0E5B4	<ce:glyph name="sqfne"/>
&z.sqfnw;	025E9	&z.sqfnw;
&z.sqfr;	025E8	&z.sqfr;
&z.sqfse;	025EA	&z.sqfse;
&z.sqfsw;	0E5B5	<ce:glyph name="sqfsw"/>
&z.sqft;	0E5B6	<ce:glyph name="sqft"/>
&z.sqh;	025A4	&z.sqh;
&z.sqint;	02A16	⨖
&z.sqne;	025A8	&z.sqhne;
&z.sqnrsb;	022E2	&nssqsube;, ⋢
&z.sqnrsp;	022E3	&nssqsupe;, ⋣
&z.sqnsub;	0228F-00338	⊏̸
&z.sqnsup;	02290-00338	⊐̸
&z.sqsbne;	022E4	&z.sqsbne;
&z.sqshd;	025A9	&z.sqshd;
&z.sqspne;	022E5	&z.sqspne;
&z.sqsw;	025A7	&z.sqsw;
&z.sqv;	025A5	&z.sqv;
&z.syllab;	00329	---
&z.tDot;	020DB	⃛, ⃛
&z.tbnd6;	0E606	<ce:glyph name="tbnd6"/>
&z.tbnd;	0E5FC	<ce:glyph name="tbnd"/>
&z.tcurt;	0E63F	<ce:glyph name="tcurt"/>
&z.tdcol;	02AF6	&z.tdcol;
&z.tdfnc;	022EE	⋮
&z.tesh;	002A7	---
&z.tfnc;	02980	&z.tfnc;
&z.toplig;	00361	---
&z.trgull;	0032B	---
&z.trisla;	0E647	<ce:glyph name="trisla"/>
&z.trna;	00250	---
&z.trnh;	00265	---
&z.trnk;	0029E	---
&z.trnm;	0026F	---
&z.trnmlr;	00270	---
&z.trnomeg;	0E648	<ce:glyph name="trnomeg"/>
&z.trnr;	00279	---
&z.trnrl;	0027A	---
&z.trnsa;	00252	---
&z.trnt;	00287	---
&z.trny;	0028E	---
&z.udarr;	021C5	⇅, ⇅
&z.udhar2;	0296E	⥮, ⥮
&z.urule;	029F8	&z.urule;
&z.utdot;	022F0	⋰
&z.veeBar;	02A63	&z.veeBar;
&z.verti;	002CC	---
&z.verts;	002C8	---
&z.vint;	02230	∰

DTD4 entity	Unicode	Entities / glyph
&z.vrecto;	025AF	&z.vrecto;
&z.xhair;	02316	⌖
&z.xhighs;	002E5	---
&z.xl;	00335	---
&z.xlows;	002E9	---
&z.xrat;	0211E	℞
&z.yogh;	00292	---
з	00437	з
ζ	003B6	ζ
&zncy;	00436	&zncy;

5 Entity definitions in CEP, MathML2 and MathML2, 2nd Ed.

The definition of a number of MathML entities has been modified between the release of MathML2 on 19 February 2001 and the release of MathML2, 2nd Ed. on 21 October 2003. The MathML entity definitions that are part of Elsevier's Common Element Pool, are based on the update of MathML2 published on 28 August 2002. The different definitions of a certain entity select different variants of a mathematical symbol. They do not select a really different symbol.

We would like to recall that the meaning of entities used in an XML file is determined by the DTD of that file. When an XML file is read, the parser reads the DTD and expands the entities according to the entity definitions found therein.

In the following table we list: 1. the MathML entity name, 2. the Unicode point according to MathML2, 3. the Unicode point according to the CEP, 4. the Unicode point according to MathML2, 2nd Ed. The symbol \square denotes a space.

Entity	MathML2	MathML2 Elsevier	MathML2 2nd Ed.
⃜	020DC	020DC	\square 020DC
⟸	0F579	027F8	027F8
⟺	0F57B	027FA	027FA
⟹	0F57A	027F9	027F9
̑	00311	00311	\square 00311
◻	025FD	025FB	025FB
▫	0F59C	025AB	025AB
◼	025FE	025FC	025FC
▪	0F59B	025AA	025AA
^	00302	0005E	0005E
⁣	0200B	02063	02063
⟵	0F576	027F5	027F5
⟷	0F578	027F7	027F7
⟶	0F577	027F6	027F6
⟸	0F579	027F8	027F8
&Longlefttrightharpoon;	0F57B	027FA	027FA
⟹	0F57A	027F9	027F9
​	0205F-0FE00	0200B	0200B
​	02005-0FE00	0200B	0200B
​	02009-0FE00	0200B	0200B

Entity	MathML2	MathML2 Elsevier	MathML2 2nd Ed.
<code>&NegativeVeryThinSpace;</code>	0200A-0FE00	0200B	0200B
<code>&NoBreak;</code>	0FEFF	02060	02060
<code>&NotGreaterEqual;</code>	02271-020E5	02271	02271
<code>&NotGreaterFullEqual;</code>	02270	02A7D-00338	02266-00338
<code>&NotGreaterGreater;</code>	0226B-00338-0FE00	0226B-00338	0226B-00338
<code>&NotGreaterSlantEqual;</code>	02271	02A7E-00338	02A7E-00338
<code>&NotLessEqual;</code>	02270-020E5	02270	02270
<code>&NotLessLess;</code>	0226A-00338-0FE00	0226A-00338	0226A-00338
<code>&NotLessSlantEqual;</code>	02270	02A7D-00338	02A7D-00338
<code>&NotNestedGreaterGreater;</code>	024A2-00338	02AA2-00338	02AA2-00338
<code>&NotNestedLessLess;</code>	024A1-00338	02AA1-00338	02AA1-00338
<code>&NotSubset;</code>	02284	02284	02282-020D2
<code>&NotSuperset;</code>	02285	02285	02283-020D2
<code>&ShortDownArrow;</code>	02304-0FE00	02193	02193
<code>&ShortLeftArrow;</code>	02190-0FE00	02190	02190
<code>&ShortRightArrow;</code>	02192-0FE00	02192	02192
<code>&ShortUpArrow;</code>	02303-0FE00	02191	02191
<code>&SucceedsEqual;</code>	0227D	0227D	02AB0
<code>&TripleDot;</code>	020DB	020DB	□020DB
<code>&UnderBar;</code>	00332	00332	□00332
<code>&Upsilon;</code>	003D2	003A5	003A5
<code>&ac;</code>	0290F	0290F	0223E
<code>&acE;</code>	029DB	029DB	0223E-00333
<code>&angrtvb;</code>	0299D-0FE00	022BE	022BE
<code>&apE;</code>	0224A	0224A	02A70
<code>&asymp;</code>	0224D	02248	02248
<code>&asympeq;</code>	---	0224D	0224D
<code>&barwed;</code>	022BC	022BC	02305
<code>&barwedge;</code>	022BC	022BC	02305
<code>&bbrktbrk;</code>	---	---	023B6
<code>&bigodot;</code>	02299	02299	02A00
<code>&bigoplus;</code>	02295	02295	02A01
<code>&bigotimes;</code>	02297	02297	02A02
<code>&bigsqcup;</code>	02294	02294	02A06
<code>&biguplus;</code>	0228E	0228E	02A04
<code>&circ;</code>	0005E	002C6	002C6
<code>&digamma;</code>	003DC	003DC	003DD
<code>&dzigrarr;</code>	0F5A2	027FF	027FF
<code>&easter;</code>	0225B	0225B	02A6E
<code>&egs;</code>	022DD	022DD	02A96
<code>&elinters;</code>	---	---	0FFFDD
<code>&els;</code>	022DC	022DC	02A95
<code>&empty;</code>	02205-0FE00	02205	02205
<code>&emptyset;</code>	02205-0FE00	02205	02205
<code>&epsi;</code>	003B5	003B5	003F5
<code>&epsiv;</code>	0025B	0025B	003B5
<code>&eqslantgtr;</code>	022DD	022DD	02A96
<code>&eqslantless;</code>	022DC	022DC	02A95
<code>&fltns;</code>	---	---	025B1
<code>&gEl;</code>	022DB	022DB	02A8C
<code>&gammad;</code>	003DC	003DC	003DD
<code>&gap;</code>	02273	02273	02A86
<code>&gne;</code>	02269	02269	02A88

Entity	MathML2	MathML2 Elsevier	MathML2 2nd Ed.
⪈	02269	02269	02A88
⪆	02273	02273	02A86
⪌	022DB	022DB	02A8C
ℏ	0210F-0FE00	0210F	0210F
♥	---	---	02665
♥	02661	02661	02665
⁣	0200B	02063	02063
Ƶ	1D543	1D543	001B5
⧝	---	---	029DD
ȷ	0006A-0FE00	0006A	0006A
⪋	022DA	022DA	02A8B
⪅	02272	02272	02A85
⪅	02272	02272	02A85
⪋	022DA	022DA	02A8B
⪇	02268	02268	02A87
⪇	02268	02268	02A87
⟬	0F558	02989	03018
⟵	0F576	027F5	027F5
⟵	0F578	027F7	027F7
⟼	0F57D	027FC	027FC
⟶	0F577	027F6	027F6
⦅	03018	02985	02985
𝓁	02113	02113	1D4C1
≫⃒	0226B-00338	0226B-020D2	0226B-020D2
≫̸	0226B-00338-0FE00	0226B-00338	0226B-00338
≪⃒	0226A-00338	0226A-020D2	0226A-020D2
≪̸	0226A-00338-0FE00	0226A-00338	0226A-00338
∠⃒	02220-00338	02220-020D2	02220-020D2
≐̸	02260-0FE00	02260-00307	02250-00338
≱	02271	02A7E-00338	02267-00338
≱	02271-020E5	02271	02271
≱	02271-020E5	02271	02271
≧̸	02271	02A7E-00338	02267-00338
⩾̸	02271	02A7E-00338	02A7E-00338
⩾̸	02271	02A7E-00338	02A7E-00338
≰	02270	02A7D-00338	02266-00338
≰	02270-020E5	02270	02270
≰	02270-020E5	02270	02270
≦̸	02270	02A7D-00338	02266-00338
⩽̸	02270	02A7D-00338	02A7D-00338
⩽̸	02270	02A7D-00338	02A7D-00338
⋹̸	---	---	022F9-00338
⋹̸	022F6-0FE00	02209-00307	022F5-00338
∉	02209-00338	02209	02209
∦sl;	02225-0FE00-020E5	02225-0FE00-020E5	02AFD-020E5
∤	02224-0FE00	02224	02224
∦	02226-0FE00	02226	02226
∤	02224-0FE00	02224	02224
∦	02226-0FE00	02226	02226
&nsu;E;	02288	02288	02AC5-00338
&nsu;E;	02284	02284	02282-020D2
&nsu;E;	02288	02288	02AC5-00338
&nsu;E;	02289	02289	02AC6-00338

Entity	MathML2	MathML2 Elsevier	MathML2 2nd Ed.
⊃⃒	02285	02285	02283-020D2
⫆̸	02289	02289	02AC6-00338
⤄	021CE	021CE	02904
≍⃒	02249-00338	0224D-020D2	0224D-020D2
≥⃒	02271	02A7E-00338	02265-020D2
>⃒	0226F	0226F	0003E-020D2
⤂	021CD	021CD	02902
≤⃒	02270	02A7D-00338	02264-020D2
<⃒	0226E	0226E	0003C-020D2
⊴⃒	022EC-00338	022B4-020D2	022B4-020D2
⤃	021CF	021CF	02903
⊵⃒	022ED-00338	022B5-020D2	022B5-020D2
∼⃒	02241-00338	0223C-020D2	0223C-020D2
⫽	02225-0FE00	02225-0FE00	02AFD
φ	003C6	003D5	003D5
ϕ	003D5	003C6	003C6
ℏ	0210F-0FE00	0210F	0210F
⪳	02AAF	02AAF	02AB3
⪷	0227E	0227E	02AB7
⪷	0227E	0227E	02AB7
⪹	022E8	022E8	02AB9
⪹	022E8	022E8	02AB9
⤚	021A3	021A3	0291A
⟭	0F559	0298A	03019
⦆	03019	02986	02986
⪴	0227E	0227E	02AB4
⪸	0227F	0227F	02AB8
⪰	0227D	0227D	02AB0
⪺	022E9	022E9	02ABA
⌢	---	---	02322
∣	02223-0FE00	02223	02223
∥	02225-0FE00	02225	02225
←	02190-0FE00	02190	02190
∖	02216-0FE00	02216	02216
∣	02223-0FE00	02223	02223
∥	02225-0FE00	02225	02225
→	02192-0FE00	02192	02192
∖	02216-0FE00	02216	02216
⌣	---	---	02323
☆	022C6	022C6	02606
ϵ	003B5	003B5	003F5
ϕ	003C6	003D5	003D5
¯	---	---	000AF
⫅	02286	02286	02AC5
⫋	0228A	0228A	02ACB
⫅	02286	02286	02AC5
⫋	0228A	0228A	02ACB
⪸	0227F	0227F	02AB8
⪰	0227D	0227D	02AB0
⪺	022E9	022E9	02ABA
⫆	02287	02287	02AC6
⟉	02283-0002F	02283-00338	02283-0002F
⫌	0228B	0228B	02ACC

Entity	MathML2	MathML2 Elsevier	MathML2 2nd Ed.
⫆	02287	02287	02AC6
⫌	0228B	0228B	02ACC
⃛	020DB	020DB	⊐020DB
≈	02248-0FE00	02248	02248
∼	0223C-0FE00	0223C	0223C
≈	02248-0FE00	02248	02248
∼	0223C-0FE00	---	0223C
⏢	---	---	0FFFD
⦜	022BE	022BE	0299C
ϵ	0025B	0025B	003B5
ϕ	003D5	003C6	003C6
⫋︀	0228A-0FE00	0228A-0FE00	02ACB-0FE00
⫌︀	0228B-0FE00	0228B-0FE00	02ACC-0FE00
⊂⃒	02284	02284	02282-020D2
⊃⃒	02285	02285	02283-020D2
⫋︀	0228A-0FE00	0228A-0FE00	02ACB-0FE00
⫌︀	0228B-0FE00	0228B-0FE00	02ACC-0FE00
⟺	0F57B	027FA	027FA
⟷	0F578	027F7	027F7
⟸	0F579	027F8	027F8
⟵	0F576	027F5	027F5
⟼	0F57D	027FC	027FC
⨀	02299	02299	02A00
⨁	02295	02295	02A01
⨂	02297	02297	02A02
⟹	0F57A	027F9	027F9
⟶	0F577	027F6	027F6
&xscup;	02294	02294	02A06
⨄	0228E	0228E	02A04

6 The Greek epsilon and phi

The situation regarding the Greek epsilon and phi is somewhat confusing due to the fact that Unicode has changed its definitions at some time. The correct situation can be seen in the online [Unicode charts](#).

U+03B5 is the cursive or curly epsilon, corresponding to ES grid Cd3.

U+03F5 is the straight epsilon, corresponding to ES grid Cde.

U+025B has been used for the curly epsilon, but it is a less fortunate choice; it is not quite right.

Despite possible errors, the entity names are always as defined in the entity files of the DTD:

```
z.epsiv = Cd3 = U+03B5 = epsi = straightepsilon
z.epsi  = Cde = U+03F5
          U+025B = epsiv = varepsilon
```

It is seen that the MathML entity names map to the wrong characters; this is because they still correspond to the old Unicode definitions. This has been corrected in the last recommendation for MathML, MathML2 2nd Ed., but that does not change our DTD. Our private names `z.epsiv` and `z.epsi` map to the correct characters.

The \TeX symbol `\varepsilon` (ε) maps to `U+03B5 = z.epsiv`, `\epsilon` (ϵ) maps to `U+03F5 = z.epsi`.

U+03C6 is the cursive or curly phi, corresponding to ES grid Cd4.

U+03D5 is the straight phi, corresponding to ES grid Cdf.

The entity names are:

```
U+03C6 = phiv = varphi
U+03D5 = phi = straightphi
```

It is seen that the MathML entity names are correct. This is due to the fact that we use the entity definitions of the first update published after MathML2.

The \TeX symbol `\varphi` (φ) maps to `U+03C6 = varphi`, `\phi` (ϕ) maps to `U+03D5 = phi`,