TECHNICAL REPORT

ISO/IEC TR 9573-13

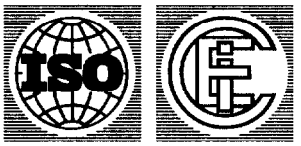
First edition
1991-07-01

Information technology — SGML support facilities — Techniques for using SGML —

Part 13:
Public entity sets for mathematics and science

Technologies de l'information — Facilités de support pour SGML — Techniques d'utilisation du SGML —

Partie 13: Ensembles d'entités publiques pour les domaines mathématique et scientifique



Reference number
ISO/IEC TR 9573-13:1991(E)

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The main task of technical committees is to prepare International Standards, but in exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

— type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;

— type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;

— type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/IEC/TR 9573-13, which is a Technical Report of type 3, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

ISO/IEC/TR 9573 consists of the following parts, under the general title *Information technology — SGML support facilities — Techniques for using SGML*:

— *Part 1: SGML tutorial*

— *Part 2: Basic techniques*

— *Part 3: Advanced techniques*

— *Part 4: Using short references for identifying markup*

— *Part 5: Using non-Latin alphabets*

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— *Part 6: Referencing and synchronisation*

— *Part 7: Mathematics and chemistry*

— *Part 8: Tables*

— *Part 9: Using SGML for computer to computer interchange*

— *Part 10: Designing application for database interfacing*

— *Part 11: Application at ISO/CS for International Standards and Technical Reports*

— *Part 12: Public entity sets for general and publishing symbols*

— *Part 13: Public entity sets for mathematics and sciences*

— *Part 14: Public entity sets for Latin based alphabets*

— *Part 15: Public entity sets for non-Latin based alphabets*

— *Part 16: Public entity sets for ideograms*

ISO/IEC/TR 9573 was first published in 1988 as a single volume. The material has undergone revision and expansion and some of the tutorial material of ISO 8879:1986 has been incorporated in some parts:

a) Part 1 replaces ISO 8879:1986 annexes B and C (in part);

b) Part 2 replaces ISO/IEC/TR 9573:1988 clauses 4, 5, 6, 7, 10, 13, and 14, and ISO 8879:1986 annex E (in part);

c) Part 3 replaces ISO 8879:1986 annexes C (in part), and D (in part);

d) Part 5 replaces ISO/IEC/TR 9573 clauses 11, 12, and 15;

e) Part 7 replaces ISO/IEC/TR 9573 clause 8;

f) Part 8 replaces ISO/IEC/TR 9573 clause 9;

g) Part 12 replaces ISO 8879:1986 annex D (in part);

h) Part 13 replaces ISO 8879:1986 annex D (in part);

i) Part 14 replaces ISO 8879:1986 annex D (in part);

j) Part 15 replaces ISO 8879:1986 annex D (in part);

Annex A of this part of ISO/IEC/TR 9573 is for information only.

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Introduction

ISO 8879, *Information processing — Text and office systems — Standard Generalized Markup Language (SGML)*, states the rules for the description and markup of documents for publishing and interchange. ISO/IEC TR 9573 complements ISO 8879 by providing additional tutorial information. It is not intended, and should not be regarded, as an extension, modification, or interpretation of ISO 8879.

ISO/IEC TR 9573 includes a tutorial on the basic components of the SGML language. It includes notes on the analysis of a document prior to the writing of a formal document type definition, and a series of examples illustrating the use of SGML in various situations together with a discussion of the advantages and disadvantages of different approaches. One example given is for a general document type, others of a general nature are for letter and memorandum, and the mixing of text and graphics. The special considerations that apply for use of SGML with non-Latin based languages, as well as linguistic applications, are discussed and examples shown. Other parts of ISO/IEC TR 9573 contain sample applications of a specialized nature, such as for mathematics, chemistry, and tables. Public entity sets covering a wide variety of widely used special graphic characters are defined.

The titles of the parts of ISO/IEC TR 9573 are listed in the foreword.

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Information technology — SGML support facilities — Techniques for using SGML —

Part 13:
Public entity sets for mathematics and science

1 Scope

Tens of thousands of graphic characters are used in the publishing of text, of which relatively few have been incorporated into standard coded character sets. Even where standard coded representations exist, however, there may be situations in which they cannot be keyboarded conveniently, or in which it is not possible to display the desired visual depiction of the characters.

To help overcome these barriers to successful interchange of SGML documents, this part of ISO/IEC TR 9573 defines character entity sets for some of the widely used special graphic characters. The entity repertoires are based on applicable published and proposed International Standards for coded character sets, and current industry and professional society practice.

NOTE 1 Entity repertoires are necessarily larger and more repetitious than character sets, as they deal in general with higher-level constructs. For example, unique entities have been defined for each accented Latin alphabetic character, while a character set might represent such characters as combinations of letters and diacritical mark characters. These public entity sets should therefore not be construed as requirements for new standard coded character sets.

In many instances upper- and lower-case is used to differentiate the names of different entities. It is thus assumed that a concrete syntax where entity names are case sensitive is used.

NOTE 2 In the reference concrete syntax, the entity names are case sensitive.

2 Reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO/IEC/TR 9573. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC/TR 9573 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 8879:1986, *Information processing — Text and office systems — Standard Generalized Markup Language (SGML).*

3 Definitions

For the purposes of this part of ISO/IEC/TR 9573, the definitions given in ISO 8879 apply.

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4 General considerations

This clause discusses design criteria applicable to the public entity sets included in this part of ISO/IEC TR 9573.

4.1 Format of Declarations

The entity sets published here are definitional; the entity text simply consists of the entity name in square brackets, and there is a comment describing the symbol, rather than (possibly) system-dependent data that would cause a visual depiction of it to be rendered:

```
<!ENTITY frac78 SDATA "[frac78]"--fraction seven-eighths-->
```

If, as in the following example, the comment includes a name (of any length) preceded by a solidus, the name is an identifier of a visual depiction of the character in *MathSci, an expansion of mathfile, Appendix D*, 1/90, published by the American Mathematical Society, 201 Charles St., Providence, RI 02904, U.S.A.

```
<!ENTITY frown  SDATA "[frown ]"--/frown R: down curve-->
```

NOTE 3 In the MathSci document, an identifier is preceded by a reverse solidus, rather than a solidus.

A comment can include a single upper-case letter, followed by a colon, as in the previous example. The letter indicates that the character belongs to a class whose glyphs are given special treatment in conventional mathematical typesetting. These characters are:

A Relation (arrow)

B Binary operator

C Closing delimiter

L Large operator

N Relation (negated)

O Opening delimiter

P Punctuation

R Relation

4.2 Corresponding Display Entity Sets

Each character has a characteristic visual depiction a "glyph". A system will need to provide corresponding display entity sets for the output devices it supports, in which the entity text is replaced by system data that will cause the glyph to be rendered. The entity name and descriptive comment would, of course, remain the same. For example, the declaration

```
<!ENTITY frac78 SDATA "7/8"--fraction seven-eighths-->
```

might be used in a display character entity set for output devices that did not support ISO 6937-2, while

```
<!ENTITY frac78 SDATA "&#223;"--fraction seven-eighths-->
```

might be used in an entity set for 8-bit coded devices that did. For a text formatter driving a photocomposer, a declaration like the following might be used:

```
<!ENTITY frac78 SDATA "AFII-glyph 00DF"--fraction 7/8-->
```


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NOTE 4 All of the entity declarations use the "SDATA" keyword as a reminder that the entity text could be system-specific character data that might require modification for different output devices and applications.

4.3 Entity Names

The entity names are derived from the English language. They were chosen for maximum mnemonic value, consistent with the logical and systematic use of abbreviations.

NOTE 5 Translations may be desired for other languages.

The entity names are case-sensitive, so the case of letters within the name can identify the case of the character, indicate the doubling of a line, or be used for some other convention.

The entity names employ only letters and numerals, so they can be used with a variety of concrete syntaxes.

NOTE 6 If shorter names are desired for frequently used entities, they can be defined in the documents where the frequent use occurs.

Some characters have different semantic connotations in different application contexts. Multiple entities were defined for some of them.

NOTE 7 If a different name would be more expressive in the context of a particular document, the entity can be redefined within the document.

As many technical symbols can be used in more than one context, the entity names in this category normally describe the character's usual glyph, rather than attempting to convey the semantic concept of the characters.

The following abbreviations are used with substantial consistency:

Prefixes:
- l=left; r=right; u=up; d=down; h=horizontal; v=vertical
- b=back, reversed
- cu=curly
- cw=clockwise; aw=anti-clockwise
- g=greater than; l=less than
- n=negated
- o=in circle
- s=small, short
- sq=square shaped
- thk=thick
- x=extended, long, big (large)

Bodies:
- ap=approx
- arr=arrow; har=harpoon
- pr=precedes; sc=succeeds
- sub=subset; sup=superset

Suffixes:
- b=boxed
- f=filled, black, solid
- e=single equals; E=double equals
- hk=hook
- s=slant
- t=tail
- v=variant
- w=wavy, squiggly
- 2=two of

An upper-case letter means "doubled" (or sometimes "two of") or upper-case;

4.4 Organization of Entity Sets

The entity sets were organized principally to reflect the structure of the ISO 6937 character sets, or to group large numbers of similar characters together. This organization is not likely to be optimal for most applications, which

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will normally require a mix of entities from a number of sets. Permission is granted to copy all or part of the public entity sets in clause 6 in any form for use with conforming SGML systems and applications, provided the ISO copyright notice (including the permission-to-copy text) is included in all copies. In particular, entities can be copied from a number of public sets to form a new set, provided the ISO copyright notice is included in the new set.

NOTE 8 If the same entity name occurs in more than one public set, and both are needed in a document, an entity with a different name should be declared for one of them within the document.

It should be noted, however, that permission is not granted to copy the tables in clause 5 illustrating the characteristic glyphs corresponding to the entities.

5 Entity names, characteristic glyph, registered glyph identifier, and short description

The columns of the table contain:

— the name of the entity (see also 4.3);

— a characteristic rendition ("glyph") of the character;

— a glyph identifier, registered in accordance with ISO/IEC 10036[1]. The glyph identifier is shown in decimal[2] and hexadecimal representation;

— a comment describing the character (see also 4.1).

5.1 Basic mathematical and scientific symbols

5.1.1 General

Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
acd	≂	DB3B	56123	ac current
aleph	ℵ	E140	57664	/aleph aleph, Hebrew
and	∧	22B2	8882	/wedge /land B: logical and
And	⩓	DB3C	56124	dbl logical and
andand	⩕	DB3D	56125	two logical and
andd	⩜	DB3E	56126	and, horizontal dash
andslope	⩘	DB3F	56127	sloping large and

1) Registrar designated by the Registration Authority: Association for Font Information Interchange, 2961 Copa de Oro, Los Alamitos, CA 90720, U.S.A.

2) This form is given to assist in the creation of ISO10036 glyph names. These are of the form "ISO/IEC 10036/RA//Glyphs::*nnnn*"; where *nnnn* is the decimal representation of the glyph identifier.

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
andv	⩚	DB40	56128	and with middle stem
angrt	∟	EEDD	61149	right (90 degree) angle
angsph	∢	EBDB	60379	/sphericalangle angle-spherical
angst	Å	F12A	61738	Angstrom capital A, ring
ap	≈	EF79	61305	/approx R: approximate
apacir	⩯	DB41	56129	approximate, circumflex accent
awconint	∳	EBC2	60354	contour integral, anti-clockwise
awint	⨑	DB42	56130	anti clock-wise integration
becaus	∵	EF6F	61295	/because R: because
bernou	ℬ	DB43	56131	Bernoulli function (script capital B)
bne	≌	DB44	56132	reverse not equal
bnequiv	≢	DB45	56133	reverse not equivalent
bnot	⌐	EE6A	61034	reverse not
bNot	⫭	DB46	56134	reverse not with two horizontal strokes
bottom	⊥	22AA	8874	/bot bottom
cap	∩	EF56	61270	/cap B: intersection
Cconint	∰	EB37	60215	triple contour integral operator
cirfnint	⨐	DB47	56135	circulation function

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
compfn	○	EB5A	60250	/circ B: composite function (small circle)
cong	≅	EF78	61304	/cong R: congruent with
conint	∮	EF76	61302	/oint L: contour integral operator
Conint	∯	EB36	60214	double contour integral operator
ctdot	⋯	DB48	56136	/cdots, three dots, centered
cup	∪	EF57	61271	/cup B: union or logical sum
cwconint	∲	EBC1	60353	contour integral, clockwise
cwint	∱	DB49	56137	clockwise integral
cylcty	⌭	EE4B	61003	cylindricity
disin	⋲	DB4A	56138	set membership, long horizontal stroke
Dot	¨	2322	8994	dieresis or umlaut mark
DotDot	⃜	EB5C	60252	four dots above
dsol	⧶	DB4B	56139	solidus, bar above
dtdot	⋱	DB4C	56140	/ddots, three dots, descending
dwangle	⦟	DB4D	56141	large downward pointing angle
elinters	⏧	DB4E	56142	electrical intersection
epar	⋕	DB4F	56143	parallel, equal; equal or parallel
eparsl	⧣	DB50	56144	parallel, slanted, equal; homothetically congruent to

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
equiv	≡	EF72	61298	/equiv R: identical with
eqvparsl	⫽	DB51	56145	equivalent, equal; congruent and parallel
exist	∃	EFB4	61364	/exists at least one exists
fltns	▱	EE4A	61002	flatness
fnof	*f*	EE54	61012	function of (italic small f)
forall	∀	EFB5	61365	/forall for all
fpartint	⨍	DB52	56146	finite part integral
ge	≥	2166	8550	/geq /ge R: greater-than-or-equal
hamilt	ℋ	EB22	60194	Hamiltonian (script capital H)
iff	⇔	2268	8808	/iff if and only if
iinfin	⧜	DB53	56147	infinity sign, incomplete
imped	Ƶ	EE39	60985	impedance
infin	∞	2167	8551	/infty infinity
infintie	⧝	DB54	56148	tie, infinity
int	∫	EF75	61301	/int L: integral operator
Int	∬	226A	8810	double integral operator
intlarhk	⨗	DB55	56149	integral, left arrow with hook
isin	∈	EF4A	61258	/in R: set membership

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
isindot	⋵	DB56	56150	set membership, dot above
isinE	⋹	DB57	56151	set membership, two horizontal strokes
isins	⋴	DB58	56152	set membership, vertical bar on horizontal stroke
isinsv	⋳	DB59	56153	large set membership, vertical bar on horizontal stroke
isinv	∈	DB5A	56154	set membership, variant
lagran	ℒ	EE44	60996	Lagrangian (script capital L)
lang	⟨	EF32	61234	/langle O: left angle bracket
Lang	⟪	2238	8760	left angle bracket, double
lArr	⇐	EF4D	61261	/Leftarrow A: is implied by
lbbrk	⎵	214C	8524	left broken bracket
le	≤	2165	8549	/leq /le R: less-than-or-equal
loang	⟬	2148	8520	left open angular bracket
lobrk	⟦	214A	8522	left open bracket
lopar	⦅	EB38	60216	left open parenthesis
lowast	*	EB5D	60253	low asterisk
minus	−	EE2D	60973	B: minus sign
mnplus	∓	EF7D	61309	/mp B: minus-or-plus sign

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
nabla	∇	EFB9	61369	/nabla del, Hamilton operator
ne	≠	2162	8546	/ne /neq R: not equal
nedot	≠̇	DB5B	56155	not equal, dot
nhpar	∦	DB5C	56156	not, horizontal, parallel
ni	∋	EF4C	61260	/ni /owns R: contains
nis	⋻	DB5D	56157	contains, vertical bar on horizontal stroke
nisd	⋺	DB5E	56158	contains, long horizontal stroke
niv	⋽	DB5F	56159	contains, variant
Not	⫬	DB60	56160	not with two horizontal strokes
notin	∉	EF4B	61259	/notin N: negated set membership
notindot	∉̇	DB61	56161	negated set membership, dot above
notinE	∉̈	DB62	56162	negated set membership, two horizontal strokes
notinva	∉	DB63	56163	negated set membership, variant
notinvb	∉	22BA	8890	negated set membership, variant
notinvc	∉	DB64	56164	negated set membership, variant
notni	∌	21F8	8696	negated contains
notniva	∌	EBBB	60347	negated contains, variant
notnivb	⋾	DB65	56165	contains, variant

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
notnivc	∌	DB66	56166	contains, variant
nparsl	⫽̸	DB67	56167	not parallel, slanted
npart	∂̸	DB68	56168	not partial differential
npolint	⨔	DB69	56169	line integration, not including the pole
nvinfin	⧞	DB6A	56170	not, vert, infinity
olcross	⦻	DB6B	56171	circle, cross
or	∨	22B3	8883	/vee /lor B: logical or
Or	⩔	DB6C	56172	dbl logical or
ord	⩝	DB6D	56173	or, horizontal dash
order	ℴ	DB6E	56174	order of (script small o)
oror	⩖	DB6F	56175	two logical or
orslope	⩗	DB70	56176	sloping large or
orv	⩛	DB71	56177	or with middle stem
par	∥	2142	8514	/parallel R: parallel
parsl	⫽	EF48	61256	parallel, slanted
part	∂	EFBA	61370	/partial partial differential
permil	‰	EF41	61249	per thousand
perp	⊥	EF70	61296	/perp R: perpendicular

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
pertenk	‰	223E	8766	per 10 thousand
phmmat	$\mathscr{M}$	EB5E	60254	physics M-matrix (script capital M)
pointint	∲	EB34	60212	integral around a point operator
prime	′	216C	8556	/prime prime or minute
Prime	″	216D	8557	double prime or second
profalar	⌮	EE4E	61006	all-around profile
profline	⌒	EE4C	61004	profile of a line
profsurf	⌓	EE4D	61005	profile of a surface
prop	∝	2279	8825	/propto R: is proportional to
qint	⨌	DB72	56178	/iiiint quadruple integral operator
qprime	⁗	DB74	56180	quadruple prime
quatint	⨖	EB35	60213	quaternion integral operator
radic	√	EF7C	61308	/surd radical
rang	〉	EF33	61235	/rangle C: right angle bracket
Rang	⟫	2239	8761	right angle bracket, double
rArr	⇒	EF4F	61263	/Rightarrow A: implies
rbbrk	❳	214D	8525	right broken bracket
roang	⟩	2149	8521	right open angular bracket

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
robrk	⟧	214B	8523	right open bracket
ropar	)	EB39	60217	right open parenthesis
rppolint	⨒	DB76	56182	line integration, rectangular path around pole
scpolint	⨓	DB77	56183	line integration, semi-circular path around pole
sim	∼	EE7E	61054	/sim R: similar
simdot	⩪	DB78	56184	similar, dot
sime	≃	EF77	61303	/simeq R: similar, equals
smeparsl	⧦	DB79	56185	similar, parallel, slanted, equal
square	□	2222	8738	/square, square
squarf	■	2223	8739	/blacksquare, square, filled
strns	¯	EE49	61001	straightness
sub	⊂	EF5B	61275	/subset R: subset or is implied by
sube	⊆	EF59	61273	/subseteq R: subset, equals
sup	⊃	EF5A	61274	/supset R: superset or implies
supe	⊇	EF58	61272	/supseteq R: superset, equals
tdot	⋯	EB5B	60251	three dots above
there4	∴	2168	8552	/therefore R: therefore
tint	∭	EB59	60249	/iiint triple integral operator

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
top	⊤	EE70	61040	/top top
topbot	⊥	EED3	61139	top and bottom
topcir	⊺	DB7A	56186	top, circle below
tprime	‴	216B	8555	triple prime
utdot	⋰	DB7B	56187	three dots, ascending
uwangle	⦡	DB7C	56188	large upward pointing angle
vangrt	⦜	DB7D	56189	right angle, variant
veeeq	≚	EE3E	60990	logical or, equals
Verbar	‖	2142	8514	/Vert dbl vertical bar
wedgeq	≙	EE3D	60989	/wedgeq R: corresponds to (wedge, equals)
xnis	⋻	DB7E	56190	large contains, vertical bar on horizontal stroke

5.1.2 Greek Symbols

This entity set defines the Greek character names for use as variable names in technical applications.

Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
alpha	α	2661	9825	/alpha small alpha, Greek
beta	β	2662	9826	/beta small beta, Greek
chi	χ	267B	9851	/chi small chi, Greek

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
delta	δ	2665	9829	/delta small delta, Greek
Delta	Δ	2645	9797	/Delta capital Delta, Greek
epsi	ϵ	FD5B	64859	/straightepsilon, small epsilon, Greek
epsiv	ε	2666	9830	/varepsilon
eta	η	266A	9834	/eta small eta, Greek
gamma	γ	2664	9828	/gamma small gamma, Greek
Gamma	Γ	2644	9796	/Gamma capital Gamma, Greek
gammad	F	2668	9832	/digamma
Gammad	F	2648	9800	capital digamma
iota	ι	266C	9836	/iota small iota, Greek
kappa	κ	266D	9837	/kappa small kappa, Greek
kappav	$\varkappa$	FD60	64864	/varkappa
lambda	λ	266E	9838	/lambda small lambda, Greek
Lambda	Λ	264E	9806	/Lambda capital Lambda, Greek
mu	μ	266F	9839	/mu small mu, Greek
nu	ν	2670	9840	/nu small nu, Greek
omega	ω	267D	9853	/omega small omega, Greek
Omega	Ω	265D	9821	/Omega capital Omega, Greek

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
phi	ϕ	267A	9850	/straightphi - small phi, Greek
Phi	Φ	265A	9818	/Phi capital Phi, Greek
phiv	φ	FD5F	64863	/varphi - curly or open phi
pi	π	2673	9843	/pi small pi, Greek
Pi	Π	2653	9811	/Pi capital Pi, Greek
piv	ϖ	FD5C	64860	/varpi
psi	ψ	267C	9852	/psi small psi, Greek
Psi	Ψ	265C	9820	/Psi capital Psi, Greek
rho	ρ	2675	9845	/rho small rho, Greek
rhov	ϱ	FD5E	64862	/varrho
sigma	σ	2676	9846	/sigma small sigma, Greek
Sigma	Σ	2656	9814	/Sigma capital Sigma, Greek
sigmav	ς	2677	9847	/varsigma
tau	τ	2678	9848	/tau small tau, Greek
theta	θ	266B	9835	/theta straight theta, small theta, Greek
Theta	Θ	264B	9803	/Theta capital Theta, Greek
thetav	ϑ	FD5D	64861	/vartheta - curly or open theta
upsi	υ	2679	9849	/upsilon small upsilon, Greek

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
Upsi	Υ	2659	9817	/Upsilon capital Upsilon, Greek
xi	ξ	2671	9841	/xi small xi, Greek
Xi	Ξ	2651	9809	/Xi capital Xi, Greek
zeta	ζ	2669	9833	/zeta small zeta, Greek

5.1.3 Alternative Greek Symbols

The characters in this entity set can be used in conjunction with the preceding one when a separate class of variables is required. By convention, they are displayed in a different font or style (usually emboldened).

Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
b.alpha	$\boldsymbol{\alpha}$	N/A	N/A	small alpha, Greek
b.beta	$\boldsymbol{\beta}$	N/A	N/A	small beta, Greek
b.chi	$\boldsymbol{\chi}$	N/A	N/A	small chi, Greek
b.delta	$\boldsymbol{\delta}$	N/A	N/A	small delta, Greek
b.Delta	$\boldsymbol{\Delta}$	N/A	N/A	capital Delta, Greek
b.epsi	$\boldsymbol{\epsilon}$	N/A	N/A	small epsilon, Greek
b.epsiv	$\boldsymbol{\varepsilon}$	N/A	N/A	variant epsilon
b.eta	$\boldsymbol{\eta}$	N/A	N/A	small eta, Greek
b.gamma	$\boldsymbol{\gamma}$	N/A	N/A	small gamma, Greek
b.Gamma	$\boldsymbol{\Gamma}$	N/A	N/A	capital Gamma, Greek

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
b.gammad	F	N/A	N/A	digamma
b.Gammad	F	N/A	N/A	capital digamma
b.iota	ι	N/A	N/A	small iota, Greek
b.kappa	κ	N/A	N/A	small kappa, Greek
b.kappav	$\varkappa$	N/A	N/A	variant kappa
b.lambda	λ	N/A	N/A	small lambda, Greek
b.Lambda	Λ	N/A	N/A	capital Lambda, Greek
b.mu	μ	N/A	N/A	small mu, Greek
b.nu	ν	N/A	N/A	small nu, Greek
b.omega	ω	N/A	N/A	small omega, Greek
b.Omega	Ω	N/A	N/A	capital Omega, Greek
b.phi	ϕ	N/A	N/A	straight phi, small phi, Greek
b.Phi	Φ	N/A	N/A	capital Phi, Greek
b.phiv	φ	N/A	N/A	variant phi - curly or open phi
b.pi	π	N/A	N/A	small pi, Greek
b.Pi	Π	N/A	N/A	capital Pi, Greek
b.piv	ϖ	N/A	N/A	variant pi
b.psi	ψ	N/A	N/A	small psi, Greek

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
b.Psi	Ψ	N/A	N/A	capital Psi, Greek
b.rho	ρ	N/A	N/A	small rho, Greek
b.rhov	ϱ	N/A	N/A	variant rho
b.sigma	σ	N/A	N/A	small sigma, Greek
b.Sigma	Σ	N/A	N/A	capital Sigma, Greek
b.sigmav	ς	N/A	N/A	variant sigma
b.tau	τ	N/A	N/A	small tau, Greek
b.theta	θ	N/A	N/A	straight theta, small theta, Greek
b.Theta	Θ	N/A	N/A	capital Theta, Greek
b.thetav	ϑ	N/A	N/A	variant theta - curly or open theta
b.upsi	υ	N/A	N/A	small upsilon, Greek
b.Upsi	Υ	N/A	N/A	capital Upsilon, Greek
b.xi	ξ	N/A	N/A	small xi, Greek
b.Xi	Ξ	N/A	N/A	capital Xi, Greek
b.zeta	ζ	N/A	N/A	small zeta, Greek

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5.2 Additional mathematical symbols

5.2.1 Ordinary Symbols

Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
ang		EF6C	61292	/angle - angle
ange		DBA1	56225	angle, equal
angmsd		EF6D	61293	/measuredangle - angle-measured
angmsdaa		DBA2	56226	angle-measured, arrow, up, right
angmsdab		DBA3	56227	angle-measured, arrow, up, left
angmsdac		DBA4	56228	angle-measured, arrow, down, right
angmsdad		DBA5	56229	angle-measured, arrow, down, left
angmsdae		DBA6	56230	angle-measured, arrow, right, up
angmsdaf		DBA7	56231	angle-measured, arrow, left, up
angmsdag		DBA8	56232	angle-measured, arrow, right, down
angmsdah		DBA9	56233	angle-measured, arrow, left, down
angrtvb		DBAA	56234	right angle-measured
angrtvbd		DBAB	56235	right angle-measured, dot
bbrk		2F32	12082	bottom square bracket
bbrktbrk		DBAC	56236	bottom above top square bracket
bemptyv		EEC4	61124	reversed circle, slash

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
beth		E141	57665	/beth - beth, Hebrew
boxbox		DBAD	56237	two joined squares
bprime		222B	8747	/backprime - reverse prime
bsemi		DBAE	56238	reverse semi-colon
cemptyv		DBAF	56239	circle, slash, small circle above
cirE		DBB0	56240	circle, two horizontal stroked to the right
cirscir		DBB1	56241	circle, small circle to the right
comp		EE69	61033	/complement - complement sign
daleth		E143	57667	/daleth - daleth, Hebrew
demptyv		DBB2	56242	circle, slash, bar above
ell		EF69	61289	/ell - cursive small l
empty		22A7	8871	/emptyset - zero, slash
emptyv		EF61	61281	/varnothing - circle, slash
gimel		E142	57666	/gimel - gimel, Hebrew
iiota		EBD0	60368	inverted iota
image		22A9	8873	/Im - imaginary
imath		00F5	245	/imath - small i, no dot
jmath		00E5	229	/jmath - small j, no dot

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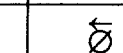
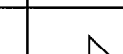
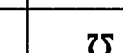
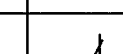
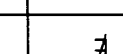
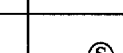
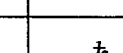
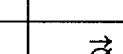
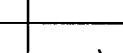
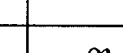
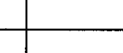
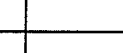
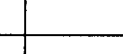
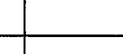
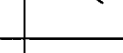
Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
laemptyv		D843	55363	circle, slash, left arrow above
lltri		DBB3	56243	lower left triangle
lrtri		DBB4	56244	lower right triangle
mho		227C	8828	/mho - conductance
nang		DBB5	56245	not, vert, angle
nexist		EE71	61041	/nexists - negated exists
oS		7653	30291	/circledS - capital S in circle
plank		EE2F	60975	/hbar - Planck's over 2pi
plankv		EF68	61288	/hslash - variant Planck's over 2pi
raemptyv		DBB6	56246	circle, slash, right arrow above
range		DBB7	56247	reverse angle, equal
real		22A8	8872	/Re - real
tbrk		2F31	12081	top square bracket
trpezium		DBB8	56248	trapezium
ultri		DBB9	56249	upper left triangle
urtri		DBBA	56250	upper right triangle
vzigzag		DBBB	56251	vertical zig-zag line
weierp		22A6	8870	/wp - Weierstrass p

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5.2.2 Binary and Large Operators

Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
ac	∾	EBC6	60358	most positive
acE	≋	DBBC	56252	most positive, two lines below
amalg	⨿	21AD	8621	/amalg B: amalgamation or coproduct
barvee	⊼	EBB9	60345	bar, vee
barwed	⊼	EECA	61130	/barwedge B: logical and, bar above
Barwed	⩞	EEDA	61146	/doublebarwedge B: log and, dbl bar above
bsolb	⧅	DBBD	56253	reverse solidus in square
Cap	⋒	EE62	61026	/Cap /doublecap B: dbl intersection
capand	⩄	DBBE	56254	intersection, and
capbrcup	⩉	DBBF	56255	intersection, bar, union
capcap	⩋	DBC0	56256	intersection, intersection, joined
capcup	⩇	DBC1	56257	intersection above union
capdot	⩀	DB30	56112	intersection, with dot
caps	∩	DBC2	56258	intersection, serifs
ccaps	⩍	DBC3	56259	closed intersection, serifs
ccups	⩏	DBC4	56260	closed union, serifs
ccupssm	⩐	DBC5	56261	closed union, serifs, smash product

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
coprod	∐	22B7	8887	/coprod L: coproduct operator
Cup	⋓	EE63	61027	/Cup /doublecup B: dbl union
cupbrcap	⩊	DBC6	56262	union, bar, intersection
cupcap	⩆	EBDA	60378	union above intersection
cupcup	⩊	DBC7	56263	union, union, joined
cupdot	⊍	EB32	60210	union, with dot
cupor	⩅	DBC8	56264	union, or
cups	∪	DBC9	56265	union, serifs
cuvee	⋎	EEEA	61162	/curlyvee B: curly logical or
cuwed	⋏	EEE9	61161	/curlywedge B: curly logical and
dagger	†	EF30	61232	/dagger B: dagger relation
Dagger	‡	EF31	61233	/ddagger B: double dagger relation
diam	◇	21AF	8623	/diamond B: open diamond
divonx	⋇	EE3F	60991	/divideontimes B: division on times
eplus	⩱	DBCA	56266	equal, plus
hercon	⊹	DBCB	56267	hermitian conjugate matrix
intcal	⊺	EEA1	61089	/intercal B: intercal
iprod	⨼	DBCC	56268	/intprod

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
loplus	⨭	DBCD	56269	plus sign in left half circle
lotimes	⨴	DBCE	56270	multiply sign in left half circle
lthree	⋋	EED8	61144	/leftthreetimes B:
ltimes	⋉	EED6	61142	/ltimes B: times sign, left closed
midast	*	EE7D	61053	/ast B: asterisk
minusb	⊟	2230	8752	/boxminus B: minus sign in box
minusd	∸	EE3B	60987	/dotminus B: minus sign, dot above
minusdu	⨪	DBCF	56271	minus sign, dot below
ncap	⩃	DBD0	56272	bar, intersection
ncup	⩂	DBD1	56273	bar, union
oast	⊛	2178	8568	/circledast B: asterisk in circle
ocir	⊚	22F5	8949	/circledcirc B: small circle in circle
odash	⊝	2177	8567	/circleddash B: hyphen in circle
odiv	⨸	DBD2	56274	divide in circle
odot	⊙	22BD	8893	/odot B: middle dot in circle
odsold	⦼	DBD3	56275	dot, solidus, dot in circle
ofcir	◉	DB3A	56122	filled circle in circle
ogt	⧁	DBD4	56276	greater-than in circle

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
ohbar		DBD5	56277	circle with horizontal bar
olcir		217D	8573	large circle in circle
olt		DBD6	56278	less-than in circle
omid		EEC3	61123	vertical bar in circle
ominus		2274	8820	/ominus B: minus sign in circle
opar		DBD7	56279	parallel in circle
operp		DBD8	56280	perpendicular in circle
oplus		2273	8819	/oplus B: plus sign in circle
osol		2276	8822	/oslash B: solidus in circle
otimes		2275	8821	/otimes B: multiply sign in circle
Otimes		DBD9	56281	multiply sign in double circle
otimesas		DBDA	56282	multiply sign in circle, circumflex accent
ovbar		EEC3	61123	circle with vertical bar
plusacir		DBDB	56283	plus, circumflex accent above
plusb		222F	8751	/boxplus B: plus sign in box
pluscir		DBDC	56284	plus, small circle above
plusdo		EE2B	60971	/dotplus B: plus sign, dot above
plusdu		DBDD	56285	plus sign, dot below

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
pluse	≛	DBDE	56286	plus, equals
plussim	⨦	DBDF	56287	plus, similar below
plustwo	⨧	DBE0	56288	plus, two; Nim-addition
prod	∏	EF7B	61307	/prod L: product operator
race	⧶	DBE1	56289	reverse most positive, line below
roplus	⨮	DBE2	56290	plus sign in right half circle
rotimes	⨵	DBE3	56291	multiply sign in right half circle
rthree	⋌	EED9	61145	/rightthreetimes B:
rtimes	⋊	EED7	61143	/rtimes B: times sign, right closed
sdot	·	EEB4	61108	/cdot B: small middle dot
sdotb	⊡	2232	8754	/dotsquare /boxdot B: small dot in box
setmn	∖	005C	92	/setminus B: reverse solidus
simplus	⨥	DBE4	56292	plus, similar above
smashp	⨳	DBE5	56293	smash product
solb	⧄	DBE6	56294	solidus in square
sqcap	⊓	22AE	8878	/sqcap B: square intersection
sqcaps	⊓	DBE7	56295	square intersection, serifs
sqcup	⊔	22AD	8877	/sqcup B: square union

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
sqcups	⊔	DBE8	56296	square union, serifs
ssetmn	∖	EE3C	60988	/smallsetminus B: sm reverse solidus
sstarf	★	226D	8813	/star B: small star, filled
subdot	⪽	EB33	60211	subset, with dot
sum	∑	EF7A	61306	/sum L: summation operator
supdot	⪾	DBE9	56297	superset, with dot
timesb	⊠	2231	8753	/boxtimes B: multiply sign in box
timesbar	⨲	DBEA	56298	multiply sign, bar below
timesd	⨰	DBEB	56299	times, dot
tridot	◬	DBEC	56300	dot in triangle
triminus	⨺	DBED	56301	minus in triangle
triplus	⨹	DBEE	56302	plus in triangle
trisb	⧋	DBEF	56303	triangle, serifs at bottom
tritime	⨻	DBF0	56304	multiply in triangle
uplus	⊎	22AB	8875	/uplus B: plus sign in union
veebar	⩒	EEDB	61147	/veebar B: logical or, bar below
wedbar	⩟	DBF1	56305	wedge, bar below
wreath	≀	227D	8829	/wr B: wreath product

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
xcap		EE56	61014	/bigcap L: intersection operator
xcirc		227E	8830	/bigcirc B: large circle
xcup		EE57	61015	/bigcup L: union operator
xdtri		2226	8742	/bigtriangledown B: big dn tri, open
xodot		22EC	8940	/bigodot L: circle dot operator
xoplus		22EA	8938	/bigoplus L: circle plus operator
xotime		22EB	8939	/bigotimes L: circle times operator
xsqcup		22B6	8886	/bigsqcup L: square union operator
xuplus		22AF	8879	/biguplus L:
xutri		2224	8740	/bigtriangleup B: big up tri, open
xvee		EFB7	61367	/bigvee L: logical and operator
xwedge		EFB6	61366	/bigwedge L: logical or operator

5.2.3 Relations

Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
ape		EE78	61048	/approxeq R: approximate, equals
apE		DBF2	56306	approximately equal or equal to

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
apid	≋	EB24	60196	approximately identical to
asymp	≍	2264	8804	/asymp R: asymptotically equal to
Barv	⫦	DBF3	56307	vert, dbl bar (over)
bcong	≌	21CB	8651	/backcong R: reverse congruent
bepsi	϶	22B9	8889	/backepsilon R: such that
bowtie	⋈	226C	8812	/bowtie R:
bsim	∽	22BE	8894	/backsim R: reverse similar
bsime	⋍	EEFD	61181	/backsimeq R: reverse similar, eq
bsolhsub	⟈	DBF4	56308	reverse solidus, subset
bump	≎	EE42	60994	/Bumpeq R: bumpy equals
bumpe	≏	EE79	61049	/bumpeq R: bumpy equals, equals
bumpE	⪮	DBF5	56309	bump, equals
cire	≗	21A9	8617	/circeq R: circle, equals
Colon	∷	EF6E	61294	/Colon, two colons
colone	≔	2254	8788	/coloneq R: colon, equals
Colone	⩴	DBF6	56310	double colon, equals
congdot	⩭	DBF7	56311	congruent, dot
csub	⫏	DBF8	56312	subset, closed

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
csube	⊆	DBF9	56313	subset, closed, equals
csup	⊃	DBFA	56314	superset, closed
csupe	⊇	DBFB	56315	superset, closed, equals
cuepr	⋞	2154	8532	/curlyeqprec R: curly eq, precedes
cuesc	⋟	2155	8533	/curlyeqsucc R: curly eq, succeeds
dashv	⊣	EF37	61239	/dashv R: dash, vertical
Dashv	⫤	EF39	61241	dbl dash, vertical
easter	⩮	DBFC	56316	equal, asterisk above
ecir	≖	21AA	8618	/eqcirc R: circle on equals sign
ecolon	≕	2255	8789	/eqcolon R: equals, colon
eDDot	⩷	DBFD	56317	/ddotseq R: equal with four dots
eDot	≑	21A8	8616	/doteqdot /Doteq R: eq, even dots
efDot	≒	2262	8802	/fallingdotseq R: eq, falling dots
eg	⋛	DBFE	56318	equal-or-greater
egs	⪖	2161	8545	/eqslantgtr R: equal-or-gtr, slanted
egsdot	⪘	D921	55585	equal-or-greater, slanted, dot inside
el	⋚	D922	55586	equal-or-less
els	⪕	2160	8544	/eqslantless R: eq-or-less, slanted

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
elsdot	⩗	D923	55587	equal-or-less, slanted, dot inside
equest	≟	EF74	61300	/questeq R: equal with questionmark
equivDD	⩸	D924	55588	equivalent, four dots above
erDot	≓	2263	8803	/risingdotseq R: eq, rising dots
esdot	≐	EF73	61299	/doteq R: equals, single dot above
esim	≃	EE68	61032	/esim R: equals, similar
Esim	⩳	D925	55589	equal, similar
fork	⋔	21AC	8620	/pitchfork R: pitchfork
forkv	⫙	DB2E	56110	fork, variant
frown	⌢	EFC0	61376	/frown R: down curve
gap	⪆	2164	8548	/gtrapprox R: greater, approximate
gE	≧	2171	8561	/geqq R: greater, double equals
gel	⋛	214F	8527	/gtreqless R: greater, equals, less
gEl	⪌	2175	8565	/gtreqqless R: gt, dbl equals, less
ges	⩾	2173	8563	/geqslant R: gt-or-equal, slanted
gescc	⪩	D926	55590	greater than, closed by curve, equal, slanted
gesdot	⪀	D927	55591	greater-than-or-equal, slanted, dot inside
gesdoto	⪂	D928	55592	greater-than-or-equal, slanted, dot above

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
gesdotol		D929	55593	greater-than-or-equal, slanted, dot above left
gesl		D92A	55594	greater, equal, slanted, less
gesles		D92B	55595	greater, equal, slanted, less, equal, slanted
Gg		2147	8519	/ggg /Gg /gggtr R: triple gtr-than
gl		EE6D	61037	/gtrless R: greater, less
gla		D92C	55596	greater, less, apart
glE		D92D	55597	greater, less, equal
glj		D92E	55598	greater, less, overlapping
gsim		EE6F	61039	/gtrsim R: greater, similar
gsime		D92F	55599	greater, similar, equal
gsiml		D930	55600	greater, similar, less
Gt		EF43	61251	/gg R: dbl greater-than sign
gtcc		D931	55601	greater than, closed by curve
gtcir		D932	55602	greater than, circle inside
gtdot		2141	8513	/gtrdot R: greater than, with dot
gtquest		D933	55603	greater than, questionmark above
gtrarr		D934	55604	greater than, right arrow
homtht		EBC7	60359	homothetic

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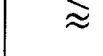
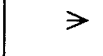
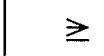
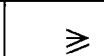
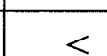
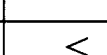
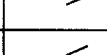
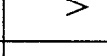
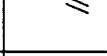
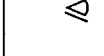
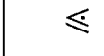
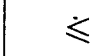
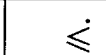
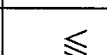
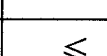
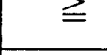
Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
lap		2163	8547	/lessapprox R: less, approximate
lat		D935	55605	larger than
late		D936	55606	larger than or equal
lates		D937	55607	larger than or equal, slanted
lE		2170	8560	/leqq R: less, double equals
leg		214E	8526	/lesseqgtr R: less, eq, greater
lEg		2174	8564	/lesseqqgtr R: less, dbl eq, greater
les		2172	8562	/leqslant R: less-than-or-eq, slant
lescc		D938	55608	less than, closed by curve, equal, slanted
lesdot		D939	55609	less-than-or-equal, slanted, dot inside
lesdoto		D93A	55610	less-than-or-equal, slanted, dot above
lesdotor		D93B	55611	less-than-or-equal, slanted, dot above right
lesg		D93C	55612	less, equal, slanted, greater
lesges		D93D	55613	less, equal, slanted, greater, equal, slanted
lg		EE6C	61036	/lessgtr R: less, greater
lgE		D93E	55614	less, greater, equal
Ll		2146	8518	/Ll /lll /llless R: triple less-than
lsim		EE6E	61038	/lesssim R: less, similar

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
lsime		D93F	55615	less, similar, equal
lsimg		D940	55616	less, similar, greater
Lt		EF42	61250	/ll R: double less-than sign
ltcc		D941	55617	less than, closed by curve
ltcir		D942	55618	less than, circle inside
ltdot		2140	8512	/lessdot R: less than, with dot
ltlarr		D943	55619	less than, left arrow
ltquest		D944	55620	less than, questionmark above
ltrie		EEEB	61163	/trianglelefteq R: left triangle, eq
mcomma		D945	55621	minus, comma above
mDDot		EE64	61028	minus with four dots, geometric properties
mid		EF46	61254	/mid R:
mlcp		D946	55622	/mlcp
models		22AC	8876	/models R:
mstpos		D947	55623	most positive
pr		2150	8528	/prec R: precedes
Pr		D849	55369	dbl precedes
prap		21A3	8611	/precapprox R: precedes, approximate

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
prcue	≼	2152	8530	/preccurlyeq R: precedes, curly eq
pre	⪯	2265	8805	/preceq R: precedes, equals
prE	⪳	D84A	55370	precedes, dbl equals
prsim	≾	21A1	8609	/precsim R: precedes, similar
prurel	⊰	EBC8	60360	element precedes under relation
ratio	∶	EE34	60980	/ratio
rtrie	⊵	EEEC	61164	/trianglerighteq R: right tri, eq
rtriltri	⧎	D948	55624	right triangle above left triangle
sc	≻	2151	8529	/succ R: succeeds
Sc	≻≻	D949	55625	dbl succeeds
scap	≿	21A4	8612	/succapprox R: succeeds, approximate
sccue	≽	2153	8531	/succcurlyeq R: succeeds, curly eq
sce	⪰	2266	8806	/succeq R: succeeds, equals
scE	⪴	D94A	55626	succeeds, dbl equals
scsim	≿	21A2	8610	/succsim R: succeeds, similar
sdote	⩿	D94B	55627	equal, dot below
sfrown	⌢	21A6	8614	/smallfrown R: small down curve
simg	⪌	D94C	55628	similar, greater

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
simgE	⪴	D94D	55629	similar, greater, equal
siml	⪳	D94E	55630	similar, less
simlE	⪵	D94F	55631	similar, less, equal
smid	∣	21A7	8615	/shortmid R:
smile	⌣	226F	8815	/smile R: up curve
smt	⪪	D950	55632	smaller than
smte	⪬	D951	55633	smaller than or equal
smtes	⪬	D952	55634	smaller than or equal, slanted
spar	∥	2176	8566	/shortparallel R: short parallel
sqsub	⊏	EE52	61010	/sqsubset R: square subset
sqsube	⊑	22B0	8880	/sqsubseteq R: square subset, equals
sqsup	⊐	EE53	61011	/sqsupset R: square superset
sqsupe	⊒	22B1	8881	/sqsupseteq R: square superset, eq
ssmile	⌣	21A5	8613	/smallsmile R: small up curve
Sub	⋐	215E	8542	/Subset R: double subset
subE	⫅	215C	8540	/subseteqq R: subset, dbl equals
subedot	⫃	D953	55635	subset, equals, dot
submult	⫁	D954	55636	subset, multiply

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
subplus	⊂+	D955	55637	subset, plus
subrarr	⊂→	D956	55638	subset, right arrow
subsim	⊂≈	D957	55639	subset, similar
subsub	⫕	D958	55640	subset above subset
subsup	⫔	D959	55641	subset above superset
Sup	⋑	215F	8543	/Supset R: dbl superset
supdsub	⫘	D95A	55642	superset, subset, dash joining them
supE	⫆	215D	8541	/supseteqq R: superset, dbl equals
supedot	⫄	D95B	55643	superset, equals, dot
suphsol	⊃/	D95C	55644	superset, solidus
suphsub	⫗	D95D	55645	superset, subset
suplarr	⥻	D95E	55646	superset, left arrow
supmult	⫂	D95F	55647	superset, multiply
supplus	⫀	D960	55648	superset, plus
supsim	⫈	D961	55649	superset, similar
supsub	⫔	D962	55650	superset above subset
supsup	⫖	D963	55651	superset above superset
thkap	≈	2278	8824	/thickapprox R: thick approximate

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
thksim	∼	2277	8823	/thicksim R: thick similar
topfork	⫚	D964	55652	fork with top
trie	≜	21AB	8619	/triangleq R: triangle, equals
twixt	≬	EE30	60976	/between R: between
vBar	⫨	D965	55653	vert, dbl bar (under)
Vbar	⫫	DB34	56116	dbl vert, bar (under)
vBarv	⫩	D966	55654	dbl bar, vert over and under
vdash	⊢	EF36	61238	/vdash R: vertical, dash
vDash	⊨	EF38	61240	/vDash R: vertical, dbl dash
Vdash	⊩	2143	8515	/Vdash R: dbl vertical, dash
VDash	⊫	D967	55655	dbl vert, dbl dash
Vdashl	⫤	D968	55656	vertical, dash (long)
vltri	◁	EEB3	61107	/vartriangleleft R: l tri, open, var
vprop	∝	EF71	61297	/varpropto R: proportional, variant
vrtri	▷	EEB2	61106	/vartriangleright R: r tri, open, var
Vvdash	⊪	216F	8559	/Vvdash R: triple vertical, dash

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5.2.4 Negated Relations

Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
gnap	≩	21F7	8695	/gnapprox N: greater, not approximate
gne	≩	21E3	8675	/gneq N: greater, not equals
gnE	≩	21F3	8691	/gneqq N: greater, not dbl equals
gnsim	≵	21E5	8677	/gnsim N: greater, not similar
gvnE	≩	21F5	8693	/gvertneqq N: gt, vert, not dbl eq
lnap	≨	21F6	8694	/lnapprox N: less, not approximate
lne	≨	21E2	8674	/lneq N: less, not equals
lnE	≨	21F2	8690	/lneqq N: less, not double equals
lnsim	≴	21E4	8676	/lnsim N: less, not similar
lvnE	≨	21F4	8692	/lvertneqq N: less, vert, not dbl eq
nap	≉	21C0	8640	/napprox N: not approximate
napE	≉	D969	55657	not approximately equal or equal to
napid	≉	D96A	55658	not approximately identical to
ncong	≇	21CC	8652	/ncong N: not congruent with
ncongdot	≇	D96B	55659	not congruent, dot
nequiv	≢	EE72	61042	/nequiv N: not identical with
nge	≱	21E7	8679	/ngeq N: not greater-than-or-equal

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
ngE		21F1	8689	/ngeqq N: not greater, dbl equals
nges		21E1	8673	/ngeqslant N: not gt-or-eq, slanted
nGg		D96C	55660	not triple greater than
ngsim		21DA	8666	not greater, similar
ngt		21CA	8650	/ngtr N: not greater-than
nGt		D96D	55661	not, vert, much greater than
nGtv		D96E	55662	not much greater than, variant
nle		21E6	8678	/nleq N: not less-than-or-equal
nlE		21F0	8688	/nleqq N: not less, dbl equals
nles		21E0	8672	/nleqslant N: not less-or-eq, slant
nLl		D96F	55663	not triple less than
nlsim		21D9	8665	not less, similar
nlt		21C9	8649	/nless N: not less-than
nLt		D970	55664	not, vert, much less than
nltri		21BB	8635	/ntriangleleft N: not left triangle
nltrie		21BD	8637	/ntrianglelefteq N: not l tri, eq
nLtv		D971	55665	not much less than, variant
nmid		EF47	61255	/nmid

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
npar	∦	EF49	61257	/nparallel N: not parallel
npr	⊀	21D0	8656	/nprec N: not precedes
nprcue	⋠	21D6	8662	not curly precedes, eq
npre	⪯̸	21D2	8658	/npreceq N: not precedes, equals
nrtri	⋫	21BC	8636	/ntriangleright N: not rt triangle
nrtrie	⋭	21BE	8638	/ntrianglerighteq N: not r tri, eq
nsc	⊁	21D1	8657	/nsucc N: not succeeds
nsccue	⋡	D972	55666	not succeeds, curly eq
nsce	⪰̸	21D3	8659	/nsucceq N: not succeeds, equals
nsim	≁	21B0	8624	/nsim N: not similar
nsime	≄	21BF	8639	/nsimeq N: not similar, equals
nsmid	∤	21B5	8629	/nshortmid
nspar	∦	21B6	8630	/nshortparallel N: not short par
nsqsube	⋢	21EE	8686	not, square subset, equals
nsqsupe	⋣	21EF	8687	not, square superset, equals
nsub	⊄	D973	55667	not subset
nsube	⊈	D974	55668	/nsubseteq N: not subset, equals
nsubE	⫅̸	21C3	8643	/nsubseteqq N: not subset, dbl eq

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
nsup	⊅	D975	55669	not superset
nsupe	⊉	D976	55670	/nsupseteq N: not superset, equals
nsupE	⫆̸	21C4	8644	/nsupseteqq N: not superset, dbl eq
ntgl	≹	21E9	8681	not greater, less
ntlg	≸	21E8	8680	not less, greater
nvap	≉	D977	55671	not, vert, approximate
nvdash	⊬	21B7	8631	/nvdash N: not vertical, dash
nvDash	⊭	21B8	8632	/nvDash N: not vertical, dbl dash
nVdash	⊯	21B9	8633	/nVdash N: not dbl vertical, dash
nVDash	⊮	21BA	8634	/nVDash N: not dbl vert, dbl dash
nvge	≥⃒	EE66	61030	not, vert, greater-than-or-equal
nvgt	>⃒	EF45	61253	not, vert, greater-than
nvle	≤⃒	EE65	61029	not, vert, less-than-or-equal
nvlt	<⃒	EF44	61252	not, vert, less-than
nvltrie	⊴⃒	D978	55672	not, vert, left triangle, equals
nvrtrie	⊵⃒	D979	55673	not, vert, right triangle, equals
nvsim	∼⃒	EEFE	61182	not, vert, similar
parsim	⫳	D97A	55674	parallel, similar

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
prnap	⪹	21B3	8627	/precnapprox N: precedes, not approx
prnE	⪵	21D4	8660	/precneqq N: precedes, not dbl eq
prnsim	⋨	21B1	8625	/precnsim N: precedes, not similar
rnmid	⫮	D97B	55675	reverse /nmid
scnap	⪺	21B4	8628	/succnapprox N: succeeds, not approx
scnE	⪶	21D5	8661	/succneqq N: succeeds, not dbl eq
scnsim	⋩	21B2	8626	/succnsim N: succeeds, not similar
simne	≆	EBB7	60343	similar, not equals
solbar	⌿	EEC8	61128	solidus, bar through
subne	⫋	21C5	8645	/subsetneq N: subset, not equals
subnE	⫋	21C1	8641	/subsetneqq N: subset, not dbl eq
supne	⫌	21C6	8646	/supsetneq N: superset, not equals
supnE	⫌	21C2	8642	/supsetneqq N: superset, not dbl eq
vnsub	⊂⃒	EF5F	61279	/nsubset N: not subset, var
vnsup	⊃⃒	EF5E	61278	/nsupset N: not superset, var
vsubne	⫋	EF55	61269	/varsubsetneq N: subset, not eq, var

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
vsubnE	⫋̸	21C7	8647	/varsubsetneqq N: subset not dbl eq, var
vsupne	⫌	EF54	61268	/varsupsetneq N: superset, not eq, var
vsupnE	⫌̸	21C8	8648	/varsupsetneqq N: super not dbl eq, var

5.2.5 Arrow Relations

Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
angzarr	⍼	D97C	55676	angle with down zig-zag arrow
cirmid	⫯	D97D	55677	circle, mid below
cudarrl	⤸	EBCF	60367	left, curved, down arrow
cudarrr	⤹	EBCE	60366	right, curved, down arrow
cularr	↶	EEF2	61170	/curvearrowleft A: left curved arrow
cularrp	⤽	D97E	55678	curved left arrow with plus
curarr	↷	EEF3	61171	/curvearrowright A: rt curved arrow
curarrm	⤼	D9A1	55713	curved right arrow with minus
dArr	⇓	2261	8801	/Downarrow A: down dbl arrow
Darr	↡	D9A2	55714	down two-headed arrow
ddarr	⇊	2243	8771	/downdownarrows A: two down arrows

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
DDotrahd	⇢	D9A3	55715	right arrow with dotted stem
dfisht	⥿	D9A4	55716	down fish tail
dHar	⥥	D9A5	55717	down harpoon-left, down harpoon-right
dharl	⇃	2249	8777	/downharpoonleft A: dn harpoon-left
dharr	⇂	224B	8779	/downharpoonright A: down harpoon-rt
duarr	⇵	EB2F	60207	down arrow, up arrow
duhar	⥯	D9A6	55718	down harp, up harp
dzigrarr	⟿	EBCB	60363	right long zig-zag arrow
erarr	⥱	D9A7	55719	equal, right arrow below
harr	↔	EF52	61266	/leftrightarrow A: l&r arrow
hArr	⇔	EF4E	61262	/Leftrightarrow A: l&r dbl arrow
harrcir	⥈	D9A8	55720	left and right arrow with a circle
harrw	↭	2252	8786	/leftrightsquigarrow A: l&r arr-wavy
hoarr	⇿	D9A9	55721	horizontal open arrow
imof	⊷	EBC4	60356	image of
lAarr	⇚	2244	8772	/Lleftarrow A: left triple arrow
Larr	↞	2246	8774	/twoheadleftarrow A:
larrbfs	⤟	D9AA	55722	left arrow-bar, filled square

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
larrfs		D9AB	55723	left arrow, filled square
larrhk		225B	8795	/hookleftarrow A: left arrow-hooked
larrlp		224E	8782	/looparrowleft A: left arrow-looped
larrpl		D9AC	55724	left arrow, plus
larrsim		D9AD	55725	left arrow, similar
larrtl		224C	8780	/leftarrowtail A: left arrow-tailed
latail		D9AE	55726	left arrow-tail
lAtail		D9AF	55727	left double arrow-tail
lbarr		D9B0	55728	left broken arrow
lBarr		D9B1	55729	left doubly broken arrow
ldca		F0BE	61630	left down curved arrow
ldrdhar		D9B2	55730	left harpoon-down over right harpoon-down
ldrushar		D9B3	55731	left-down-right-up harpoon
ldsh		22EE	8942	left down angled arrow
lfisht		D9B4	55732	left fish tail
lHar		D9B5	55733	left harpoon-up over left harpoon-down
lhard		2257	8791	/leftharpoondown A: l harpoon-down
lharu		2256	8790	/leftharpoonup A: left harpoon-up

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
lharul	⥪	D9B6	55734	left harpoon-up over long dash
llarr	⇇	2240	8768	/leftleftarrows A: two left arrows
llhard	⥩	D9B7	55735	left harpoon-down below long dash
loarr	↞	D9B8	55736	left open arrow
lrarr	⇆	EF51	61265	/leftrightarrows A: l arr over r arr
lrhar	⇋	EEF6	61174	/leftrightharpoons A: l harp over r
lrhard	⥭	D9B9	55737	right harpoon-down below long dash
lsh	↰	2250	8784	/Lsh A:
lurdshar	⥊	D9BA	55738	left-up-right-down harpoon
luruhar	⥦	D9BB	55739	left harpoon-up over right harpoon-up
map	↦	226B	8811	/mapsto A:
Map	⤅	D9BC	55740	twoheaded mapsto
midcir	⫰	EBDC	60380	mid, circle below
mumap	⊸	2253	8787	/multimap A:
nearhk	⤤	D9BD	55741	NE arrow-hooked
nearr	↗	EF3E	61246	/nearrow A: NE pointing arrow
neArr	⇗	D9BE	55742	NE pointing dbl arrow
nesear	⤨	D9BF	55743	/toea A: NE & SE arrows

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
nharr		EEF9	61177	/nleftrightarrow A: not l&r arrow
nhArr		EEFC	61180	/nLeftrightarrow A: not l&r dbl arr
nlarr		EEF7	61175	/nleftarrow A: not left arrow
nlArr		EEFA	61178	/nLeftarrow A: not implied by
nrarr		EEF8	61176	/nrightarrow A: not right arrow
nrArr		EEFB	61179	/nRightarrow A: not implies
nrarrc		D9C0	55744	not right arrow-curved
nrarrw		D9C1	55745	not right arrow-wavy
nvHarr		D9C2	55746	not, vert, left and right double arrow
nvlArr		D9C3	55747	not, vert, left double arrow
nvrArr		D9C4	55748	not, vert, right double arrow
nwarhk		D9C5	55749	NW arrow-hooked
nwarr		EF3C	61244	/nwarrow A: NW pointing arrow
nwArr		D9C6	55750	NW pointing dbl arrow
nwnear		D9C7	55751	NW & NE arrows
olarr		EEF4	61172	/circlearrowleft A: l arr in circle
orarr		EEF5	61173	/circlearrowright A: r arr in circle
origof		D9C8	55752	original of

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
rAarr	⇉	2245	8773	/Rrightarrow A: right triple arrow
Rarr	↠	2247	8775	/twoheadrightarrow A:
rarrap	⥵	D9C9	55753	approximate, right arrow above
rarrbfs	⤞	D9CA	55754	right arrow-bar, filled square
rarrc	⤳	D9CB	55755	right arrow-curved
rarrfs	⤑	D9CC	55756	right arrow, filled square
rarrhk	↪	225A	8794	/hookrightarrow A: rt arrow-hooked
rarrlp	↬	224F	8783	/looparrowright A: rt arrow-looped
rarrpl	⥅	D9CD	55757	right arrow, plus
rarrsim	⥴	D9CE	55758	right arrow, similar
rarrtl	↣	224D	8781	/rightarrowtail A: rt arrow-tailed
Rarrtl	⤖	D9CF	55759	right two-headed arrow with tail
rarrw	⇝	EF53	61267	/rightsquigarrow A: rt arrow-wavy
ratail	⤙	D9D0	55760	right arrow-tail
rAtail	⤜	D9D1	55761	right double arrow-tail
rbarr	⤍	EB30	60208	/bkarow A: right broken arrow
rBarr	⤏	D9D2	55762	/dbkarow A: right doubly broken arrow
RBarr	⤐	D9D3	55763	/drbkarow A: twoheaded right broken arrow

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
rdca	⤷	D9D4	55764	right down curved arrow
rdldhar	⥯	D9D5	55765	right harpoon-down over left harpoon-down
rdsh	↳	22EF	8943	right down angled arrow
rfisht	⥽	D9D6	55766	right fish tail
rHar	⥤	D9D7	55767	right harpoon-up over right harpoon-down
rhard	⇁	2259	8793	/rightharpoondown A: rt harpoon-down
rharu	⇀	2258	8792	/rightharpoonup A: rt harpoon-up
rharul	⥬	D9D8	55768	right harpoon-up over long dash
rlarr	⥱	EE50	61008	/rightleftarrows A: r arr over l arr
rlhar	⥋	EF50	61264	/rightleftharpoons A: r harp over l
roarr	⇾	D9D9	55769	right open arrow
rrarr	⥅	2241	8769	/rightrightarrows A: two rt arrows
rsh	↱	2251	8785	/Rsh A:
ruluhar	⥨	D9DA	55770	right harpoon-up over left harpoon-up
searhk	⤥	D9DB	55771	/hksearow A: SE arrow-hooken
searr	↘	EF3D	61245	/searrow A: SE pointing arrow
seArr	⇘	D9DC	55772	SE pointing dbl arrow
seswar	⤨	D9DD	55773	/tosa A: SE & SW arrows

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
simrarr	⥲	2236	8758	similar, right arrow below
slarr	←	D9DE	55774	short left arrow
srarr	→	D9DF	55775	short right arrow
swarhk	⤢	D9E0	55776	/hkswarow A: SW arrow-hooked
swarr	↙	EF3F	61247	/swarrow A: SW pointing arrow
swArr	⇙	D9E1	55777	SW pointing dbl arrow
swnwar	⤪	D9E2	55778	SW & NW arrows
uArr	⇑	2260	8800	/Uparrow A: up dbl arrow
Uarr	↟	D9E3	55779	up two-headed arrow
Uarrocir	⥉	D9E4	55780	up two-headed arrow above circle
udarr	⇅	EB2E	60206	up arrow, down arrow
udhar	⥮	D9E5	55781	up harp, down harp
ufisht	⥾	D9E6	55782	up fish tail
uHar	⥣	D9E7	55783	up harpoon-left, up harpoon-right
uharl	↿	2248	8776	/upharpoonleft A: up harpoon-left
uharr	↾	224A	8778	/upharpoonright /restriction A: up harp-r
uuarr	⇈	2242	8770	/upuparrows A: two up arrows
varr	↕	EEB5	61109	/updownarrow A: up&down arrow

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
vArr	⇕	EE51	61009	/Updownarrow A: up&down dbl arrow
xharr	⟷	2267	8807	/longleftrightarrow A: long l&r arr
xhArr	⟺	2269	8809	/Longleftrightarrow A: long l&r dbl arr
xlarr	⟵	225C	8796	/longleftarrow A: long left arrow
xlArr	⟸	225E	8798	/Longleftarrow A: long l dbl arrow
xmap	⟼	D9E8	55784	/longmapsto A:
xrarr	⟶	225D	8797	/longrightarrow A: long right arrow
xrArr	⟹	225F	8799	/Longrightarrow A: long rt dbl arr
zigrarr	⇝	D9E9	55785	right zig-zag arrow

5.2.6 Opening and Closing Delimiters

Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
dlcorn	⌞	22F3	8947	/llcorner O: lower left corner
drcorn	⌟	22F4	8948	/lrcorner C: lower right corner
gtlPar	⸧	D9EA	55786	dbl left parenthesis, greater
langd	⟨·	D9EB	55787	left angle, dot
lbrke	⦋	D9EC	55788	left bracket, equal

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
lbrksld		D9ED	55789	left bracket, solidus bottom corner
lbrkslu		D9EE	55790	left bracket, solidus top corner
lceil		EFB0	61360	/lceil O: left ceiling
lfloor		EFB2	61362	/lfloor O: left floor
lmoust		EEE7	61159	/lmoustache
lparlt		D9EF	55791	O: left parenthesis, lt
ltrPar		D9F0	55792	dbl right parenthesis, less
rangd		D9F1	55793	right angle, dot
rbrke		D9F2	55794	right bracket, equal
rbrksld		D9F3	55795	right bracket, solidus bottom corner
rbrkslu		D9F4	55796	right bracket, solidus top corner
rceil		EFB1	61361	/rceil C: right ceiling
rfloor		EFB3	61363	/rfloor C: right floor
rmoust		EEE8	61160	/rmoustache
rpargt		D9F5	55797	C: right paren, gt
ulcorn		22F1	8945	/ulcorner O: upper left corner
urcorn		22F2	8946	/urcorner C: upper right corner

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5.3 Symbols based on the Latin alphabet

The entities in this subclause are intended to be used as symbols and not for text. Thus they have been limited to the upper- and lower-case letters of the English language. Complete sets, also including additional letters used in other languages, are included in ISO/IEC TR 9573-14.

NOTE 9 These sets are enumerated lists of alphabetic glyphs from a writing system rendered in a particular type style. There are thus no specific glyph identifiers assigned.

5.3.1 Fraktur

Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
afr	𝔞	N/A	N/A	/frak a, lower case a
Afr	𝔄	N/A	N/A	/frak A, upper case a
bfr	𝔟	N/A	N/A	/frak b, lower case b
Bfr	𝔅	N/A	N/A	/frak B, upper case b
cfr	𝔠	N/A	N/A	/frak c, lower case c
Cfr	ℭ	N/A	N/A	/frak C, upper case c
dfr	𝔡	N/A	N/A	/frak d, lower case d
Dfr	𝔇	N/A	N/A	/frak D, upper case d
efr	𝔢	N/A	N/A	/frak e, lower case e
Efr	𝔈	N/A	N/A	/frak E, upper case e
ffr	𝔣	N/A	N/A	/frak f, lower case f
Ffr	𝔉	N/A	N/A	/frak F, upper case f
gfr	𝔤	N/A	N/A	/frak g, lower case g
Gfr	𝔊	N/A	N/A	/frak G, upper case g

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
hfr	𝔥	N/A	N/A	/frak h, lower case h
Hfr	ℌ	N/A	N/A	/frak H, upper case h
ifr	𝔦	N/A	N/A	/frak i, lower case i
Ifr	ℑ	N/A	N/A	/frak I, upper case i
jfr	𝔧	N/A	N/A	/frak j, lower case j
Jfr	𝔍	N/A	N/A	/frak J, upper case j
kfr	𝔨	N/A	N/A	/frak k, lower case k
Kfr	𝔎	N/A	N/A	/frak K, upper case k
lfr	𝔩	N/A	N/A	/frak l, lower case l
Lfr	𝔏	N/A	N/A	/frak L, upper case l
mfr	𝔪	N/A	N/A	/frak m, lower case m
Mfr	𝔐	N/A	N/A	/frak M, upper case m
nfr	𝔫	N/A	N/A	/frak n, lower case n
Nfr	𝔑	N/A	N/A	/frak N, upper case n
ofr	𝔬	N/A	N/A	/frak o, lower case o
Ofr	𝔒	N/A	N/A	/frak O, upper case o
pfr	𝔭	N/A	N/A	/frak p, lower case p
Pfr	𝔓	N/A	N/A	/frak P, upper case p

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
qfr	𝔮	N/A	N/A	/frak q, lower case q
Qfr	𝔔	N/A	N/A	/frak Q, upper case q
rfr	𝔯	N/A	N/A	/frak r, lower case r
Rfr	ℜ	N/A	N/A	/frak R, upper case r
sfr	𝔰	N/A	N/A	/frak s, lower case s
Sfr	𝔖	N/A	N/A	/frak S, upper case s
tfr	𝔱	N/A	N/A	/frak t, lower case t
Tfr	𝔗	N/A	N/A	/frak T, upper case t
ufr	𝔲	N/A	N/A	/frak u, lower case u
Ufr	𝔘	N/A	N/A	/frak U, upper case u
vfr	𝔳	N/A	N/A	/frak v, lower case v
Vfr	𝔙	N/A	N/A	/frak V, upper case v
wfr	𝔴	N/A	N/A	/frak w, lower case w
Wfr	𝔚	N/A	N/A	/frak W, upper case w
xfr	𝔵	N/A	N/A	/frak x, lower case x
Xfr	𝔛	N/A	N/A	/frak X, upper case x
yfr	𝔶	N/A	N/A	/frak y, lower case y

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
Yfr	𝔜	N/A	N/A	/frak Y, upper case y
zfr	𝔷	N/A	N/A	/frak z, lower case z
Zfr	ℨ	N/A	N/A	/frak Z, upper case z

5.3.2 Open Face (Blackboard Bold)

Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
Aopf	𝔸	N/A	N/A	/Bbb A, open face A
Bopf	𝔹	N/A	N/A	/Bbb B, open face B
Copf	ℂ	N/A	N/A	/Bbb C, open face C
Dopf	𝔻	N/A	N/A	/Bbb D, open face D
Eopf	𝔼	N/A	N/A	/Bbb E, open face E
Fopf	𝔽	N/A	N/A	/Bbb F, open face F
Gopf	𝔾	N/A	N/A	/Bbb G, open face G
Hopf	ℍ	N/A	N/A	/Bbb H, open face H
Iopf	𝕀	N/A	N/A	/Bbb I, open face I
Jopf	𝕁	N/A	N/A	/Bbb J, open face J
Kopf	𝕂	N/A	N/A	/Bbb K, open face K

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
Lopf	𝕃	N/A	N/A	/Bbb L, open face L
Mopf	𝕄	N/A	N/A	/Bbb M, open face M
Nopf	ℕ	N/A	N/A	/Bbb N, open face N
Oopf	𝕆	N/A	N/A	/Bbb O, open face O
Popf	ℙ	N/A	N/A	/Bbb P, open face P
Qopf	ℚ	N/A	N/A	/Bbb Q, open face Q
Ropf	ℝ	N/A	N/A	/Bbb R, open face R
Sopf	𝕊	N/A	N/A	/Bbb S, open face S
Topf	𝕋	N/A	N/A	/Bbb T, open face T
Uopf	𝕌	N/A	N/A	/Bbb U, open face U
Vopf	𝕍	N/A	N/A	/Bbb V, open face V
Wopf	𝕎	N/A	N/A	/Bbb W, open face W
Xopf	𝕏	N/A	N/A	/Bbb X, open face X
Yopf	𝕐	N/A	N/A	/Bbb Y, open face Y
Zopf	ℤ	N/A	N/A	/Bbb Z, open face Z

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5.3.3 Script

Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
ascr	$\mathscr{a}$	N/A	N/A	/scr a, script letter a
Ascr	$\mathscr{A}$	N/A	N/A	/scr A, script letter A
bscr	$\mathscr{b}$	N/A	N/A	/scr b, script letter b
Bscr	$\mathscr{B}$	N/A	N/A	/scr B, script letter B
cscr	$\mathscr{c}$	N/A	N/A	/scr c, script letter c
Cscr	$\mathscr{C}$	N/A	N/A	/scr C, script letter C
dscr	$\mathscr{d}$	N/A	N/A	/scr d, script letter d
Dscr	$\mathscr{D}$	N/A	N/A	/scr D, script letter D
escr	$\mathscr{e}$	N/A	N/A	/scr e, script letter e
Escr	$\mathscr{E}$	N/A	N/A	/scr E, script letter E
fscr	$\mathscr{f}$	N/A	N/A	/scr f, script letter f
Fscr	$\mathscr{F}$	N/A	N/A	/scr F, script letter F
gscr	$\mathscr{g}$	N/A	N/A	/scr g, script letter g
Gscr	$\mathscr{G}$	N/A	N/A	/scr G, script letter G
hscr	$\mathscr{h}$	N/A	N/A	/scr h, script letter h
Hscr	$\mathscr{H}$	N/A	N/A	/scr H, script letter H
iscr	$\mathscr{i}$	N/A	N/A	/scr i, script letter i

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Entity name	Character-istic glyph	Registered glyph identifier (hexa-decimal)	Registered glyph identifier (decimal)	Short description
Iscr	$\mathscr{I}$	N/A	N/A	/scr I, script letter I
jscr	$\mathscr{j}$	N/A	N/A	/scr j, script letter j
Jscr	$\mathscr{J}$	N/A	N/A	/scr J, script letter J
kscr	$\mathscr{k}$	N/A	N/A	/scr k, script letter k
Kscr	$\mathscr{K}$	N/A	N/A	/scr K, script letter K
lscr	$\mathscr{l}$	N/A	N/A	/scr l, script letter l
Lscr	$\mathscr{L}$	N/A	N/A	/scr L, script letter L
mscr	$\mathscr{m}$	N/A	N/A	/scr m, script letter m
Mscr	$\mathscr{M}$	N/A	N/A	/scr M, script letter M
nscr	$\mathscr{n}$	N/A	N/A	/scr n, script letter n
Nscr	$\mathscr{N}$	N/A	N/A	/scr N, script letter N
oscr	$\mathscr{o}$	N/A	N/A	/scr o, script letter o
Oscr	$\mathscr{O}$	N/A	N/A	/scr O, script letter O
pscr	$\mathscr{p}$	N/A	N/A	/scr p, script letter p
Pscr	$\mathscr{P}$	N/A	N/A	/scr P, script letter P
qscr	$\mathscr{q}$	N/A	N/A	/scr q, script letter q
Qscr	$\mathscr{Q}$	N/A	N/A	/scr Q, script letter Q
rscr	$\mathscr{r}$	N/A	N/A	/scr r, script letter r

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Entity name	Characteristic glyph	Registered glyph identifier (hexadecimal)	Registered glyph identifier (decimal)	Short description
Rscr	$\mathscr{R}$	N/A	N/A	/scr R, script letter R
sscr	$\mathscr{s}$	N/A	N/A	/scr s, script letter s
Sscr	$\mathscr{S}$	N/A	N/A	/scr S, script letter S
tscr	$\mathscr{t}$	N/A	N/A	/scr t, script letter t
Tscr	$\mathscr{T}$	N/A	N/A	/scr T, script letter T
uscr	$\mathscr{u}$	N/A	N/A	/scr u, script letter u
Uscr	$\mathscr{U}$	N/A	N/A	/scr U, script letter U
vscr	$\mathscr{v}$	N/A	N/A	/scr v, script letter v
Vscr	$\mathscr{V}$	N/A	N/A	/scr V, script letter V
wscr	$\mathscr{w}$	N/A	N/A	/scr w, script letter w
Wscr	$\mathscr{W}$	N/A	N/A	/scr W, script letter W
xscr	$\mathscr{x}$	N/A	N/A	/scr x, script letter x
Xscr	$\mathscr{X}$	N/A	N/A	/scr X, script letter X
yscr	$\mathscr{y}$	N/A	N/A	/scr y, script letter y
Yscr	$\mathscr{Y}$	N/A	N/A	/scr Y, script letter Y
zscr	$\mathscr{z}$	N/A	N/A	/scr z, script letter z
Zscr	$\mathscr{Z}$	N/A	N/A	/scr Z, script letter Z

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6 Public text

6.1 Basic mathematical and scientific symbols

6.1.1 General

```
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     ISO 8879, provided this notice is included in all copies.
-->
<!-- Character entity set. Typical invocation:
     <!ENTITY % ISOTECH  PUBLIC
       "ISO 9573-13:1991//ENTITIES General Technical //EN">
     %ISOTECH;
-->
<!ENTITY acd       SDATA "[acd     ]"--ac current-->
<!ENTITY aleph     SDATA "[aleph   ]"--/aleph aleph, Hebrew-->
<!ENTITY and       SDATA "[and     ]"--/wedge /land B: logical and-->
<!ENTITY And       SDATA "[And     ]"--dbl logical and-->
<!ENTITY andand    SDATA "[andand  ]"--two logical and-->
<!ENTITY andd      SDATA "[andd    ]"--and, horizontal dash-->
<!ENTITY andslope  SDATA "[andslope]"--sloping large and-->
<!ENTITY andv      SDATA "[andv    ]"--and with middle stem-->
<!ENTITY angrt     SDATA "[angrt   ]"--right (90 degree) angle-->
<!ENTITY angsph    SDATA "[angsph  ]"--/sphericalangle angle-spherical-->
<!ENTITY angst     SDATA "[angst   ]"--Angstrom capital A, ring-->
<!ENTITY ap        SDATA "[ap      ]"--/approx R: approximate-->
<!ENTITY apacir    SDATA "[apacir  ]"--approximate, circumflex accent-->
<!ENTITY awconint  SDATA "[awconint]"--contour integral, anti-clockwise-->
<!ENTITY awint     SDATA "[awint   ]"--anti clock-wise integration-->
<!ENTITY becaus    SDATA "[becaus  ]"--/because R: because-->
<!ENTITY bernou    SDATA "[bernou  ]"--Bernoulli function (script capital B)-->
<!ENTITY bne       SDATA "[bne     ]"--reverse not equal-->
<!ENTITY bnequiv   SDATA "[bnequiv ]"--reverse not equivalent-->
<!ENTITY bnot      SDATA "[bnot    ]"--reverse not-->
<!ENTITY bNot      SDATA "[bNot    ]"--reverse not with two horizontal strokes-->
<!ENTITY bottom    SDATA "[bottom  ]"--/bot bottom-->
<!ENTITY cap       SDATA "[cap     ]"--/cap B: intersection-->
<!ENTITY Cconint   SDATA "[Cconint ]"--triple contour integral operator-->
<!ENTITY cirfnint  SDATA "[cirfnint]"--circulation function-->
<!ENTITY compfn    SDATA "[compfn  ]"--/circ B: composite function (small circle)-->
<!ENTITY cong      SDATA "[cong    ]"--/cong R: congruent with-->
<!ENTITY conint    SDATA "[conint  ]"--/oint L: contour integral operator-->
<!ENTITY Conint    SDATA "[Conint  ]"--double contour integral operator-->
<!ENTITY ctdot     SDATA "[ctdot   ]"--/cdots, three dots, centered-->
<!ENTITY cup       SDATA "[cup     ]"--/cup B: union or logical sum-->
<!ENTITY cwconint  SDATA "[cwconint]"--contour integral, clockwise-->
<!ENTITY cwint     SDATA "[cwint   ]"--clockwise integral-->
<!ENTITY cylcty    SDATA "[cylcty  ]"--cylindricity-->
<!ENTITY disin     SDATA "[disin   ]"--set membership, long horizontal stroke-->
<!ENTITY Dot       SDATA "[Dot     ]"--dieresis or umlaut mark-->
<!ENTITY DotDot    SDATA "[DotDot  ]"--four dots above-->
<!ENTITY dsol      SDATA "[dsol    ]"--solidus, bar above-->
<!ENTITY dtdot     SDATA "[dtdot   ]"--/ddots, three dots, descending-->
<!ENTITY dwangle   SDATA "[dwangle ]"--large downward pointing angle-->
<!ENTITY elinters  SDATA "[elinters]"--electrical intersection-->
<!ENTITY epar      SDATA "[epar    ]"--parallel, equal; equal or parallel-->
<!ENTITY eparsl    SDATA "[eparsl  ]"--parallel, slanted, equal; homothetically
                                       congruent to-->
<!ENTITY equiv     SDATA "[equiv   ]"--/equiv R: identical with-->
<!ENTITY eqvparsl  SDATA "[eqvparsl]"--equivalent, equal; congruent and parallel-->
```


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```
<!ENTITY exist    SDATA "[exist   ]"--/exists at least one exists-->
<!ENTITY fltns    SDATA "[fltns   ]"--flatness-->
<!ENTITY fnof     SDATA "[fnof    ]"--function of (italic small f)-->
<!ENTITY forall   SDATA "[forall  ]"--/forall for all-->
<!ENTITY fpartint SDATA "[fpartint]"--finite part integral-->
<!ENTITY ge       SDATA "[ge      ]"--/geq /ge R: greater-than-or-equal-->
<!ENTITY hamilt   SDATA "[hamilt  ]"--Hamiltonian (script capital H)-->
<!ENTITY iff      SDATA "[iff     ]"--/iff if and only if-->
<!ENTITY iinfin   SDATA "[iinfin  ]"--infinity sign, incomplete-->
<!ENTITY imped    SDATA "[imped   ]"--impedance-->
<!ENTITY infin    SDATA "[infin   ]"--/infty infinity-->
<!ENTITY infintie SDATA "[infintie]"--tie, infinity-->
<!ENTITY int      SDATA "[int     ]"--/int L: integral operator-->
<!ENTITY Int      SDATA "[Int     ]"--double integral operator-->
<!ENTITY intlarhk SDATA "[intlarhk]"--integral, left arrow with hook-->
<!ENTITY isin     SDATA "[isin    ]"--/in R: set membership-->
<!ENTITY isindot  SDATA "[isindot ]"--set membership, dot above-->
<!ENTITY isinE    SDATA "[isinE   ]"--set membership, two horizontal strokes-->
<!ENTITY isins    SDATA "[isins   ]"--set membership, vertical bar on horizontal
                                      stroke-->
<!ENTITY isinsv   SDATA "[isinsv  ]"--large set membership, vertical bar on
                                      horizontal stroke-->
<!ENTITY isinv    SDATA "[isinv   ]"--set membership, variant-->
<!ENTITY lagran   SDATA "[lagran  ]"--Lagrangian (script capital L)-->
<!ENTITY lang     SDATA "[lang    ]"--/langle O: left angle bracket-->
<!ENTITY Lang     SDATA "[Lang    ]"--left angle bracket, double-->
<!ENTITY lArr     SDATA "[lArr    ]"--/Leftarrow A: is implied by-->
<!ENTITY lbbrk    SDATA "[lbbrk   ]"--left broken bracket-->
<!ENTITY le       SDATA "[le      ]"--/leq /le R: less-than-or-equal-->
<!ENTITY loang    SDATA "[loang   ]"--left open angular bracket-->
<!ENTITY lobrk    SDATA "[lobrk   ]"--left open bracket-->
<!ENTITY lopar    SDATA "[lopar   ]"--left open parenthesis-->
<!ENTITY lowast   SDATA "[lowast  ]"--low asterisk-->
<!ENTITY minus    SDATA "[minus   ]"--B: minus sign-->
<!ENTITY mnplus   SDATA "[mnplus  ]"--/mp B: minus-or-plus sign-->
<!ENTITY nabla    SDATA "[nabla   ]"--/nabla del, Hamilton operator-->
<!ENTITY ne       SDATA "[ne      ]"--/ne /neq R: not equal-->
<!ENTITY nedot    SDATA "[nedot   ]"--not equal, dot-->
<!ENTITY nhpar    SDATA "[nhpar   ]"--not, horizontal, parallel-->
<!ENTITY ni       SDATA "[ni      ]"--/ni /owns R: contains-->
<!ENTITY nis      SDATA "[nis     ]"--contains, vertical bar on horizontal stroke-->
<!ENTITY nisd     SDATA "[nisd    ]"--contains, long horizontal stroke-->
<!ENTITY niv      SDATA "[niv     ]"--contains, variant-->
<!ENTITY Not      SDATA "[Not     ]"--not with two horizontal strokes-->
<!ENTITY notin    SDATA "[notin   ]"--/notin N: negated set membership-->
<!ENTITY notindot SDATA "[notindot]"--negated set membership, dot above-->
<!ENTITY notinE   SDATA "[notinE  ]"--negated set membership, two horizontal
                                      strokes-->
<!ENTITY notinva  SDATA "[notinva ]"--negated set membership, variant-->
<!ENTITY notinvb  SDATA "[notinvb ]"--negated set membership, variant-->
<!ENTITY notinvc  SDATA "[notinvc ]"--negated set membership, variant-->
<!ENTITY notni    SDATA "[notni   ]"--negated contains-->
<!ENTITY notniva  SDATA "[notniva ]"--negated contains, variant-->
<!ENTITY notnivb  SDATA "[notnivb ]"--contains, variant-->
<!ENTITY notnivc  SDATA "[notnivc ]"--contains, variant-->
<!ENTITY nparsl   SDATA "[nparsl  ]"--not parallel, slanted-->
<!ENTITY npart    SDATA "[npart   ]"--not partial differential-->
<!ENTITY npolint  SDATA "[npolint ]"--line integration, not including the pole-->
<!ENTITY nvinfin  SDATA "[nvinfin ]"--not, vert, infinity-->
<!ENTITY olcross  SDATA "[olcross ]"--circle, cross-->
<!ENTITY or       SDATA "[or      ]"--/vee /lor B: logical or-->
<!ENTITY Or       SDATA "[Or      ]"--dbl logical or-->
```


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```
<!ENTITY ord      SDATA "[ord     ]"--or, horizontal dash-->
<!ENTITY order    SDATA "[order   ]"--order of (script small o)-->
<!ENTITY oror     SDATA "[oror    ]"--two logical or-->
<!ENTITY orslope  SDATA "[orslope ]"--sloping large or-->
<!ENTITY orv      SDATA "[orv     ]"--or with middle stem-->
<!ENTITY par      SDATA "[par     ]"--/parallel R: parallel-->
<!ENTITY parsl    SDATA "[parsl   ]"--parallel, slanted-->
<!ENTITY part     SDATA "[part    ]"--/partial partial differential-->
<!ENTITY permil   SDATA "[permil  ]"--per thousand-->
<!ENTITY perp     SDATA "[perp    ]"--/perp R: perpendicular-->
<!ENTITY pertenk  SDATA "[pertenk ]"--per 10 thousand-->
<!ENTITY phmmat   SDATA "[phmmat  ]"--physics M-matrix (script capital M)-->
<!ENTITY pointint SDATA "[pointint]"--integral around a point operator-->
<!ENTITY prime    SDATA "[prime   ]"--/prime prime or minute-->
<!ENTITY Prime    SDATA "[Prime   ]"--double prime or second-->
<!ENTITY profalar SDATA "[profalar]"--all-around profile-->
<!ENTITY profline SDATA "[profline]"--profile of a line-->
<!ENTITY profsurf SDATA "[profsurf]"--profile of a surface-->
<!ENTITY prop     SDATA "[prop    ]"--/propto R: is proportional to-->
<!ENTITY qint     SDATA "[qint    ]"--/iiiint quadruple integral operator-->
<!ENTITY qprime   SDATA "[qprime  ]"--quadruple prime-->
<!ENTITY quatint  SDATA "[quatint ]"--quaternion integral operator-->
<!ENTITY radic    SDATA "[radic   ]"--/surd radical-->
<!ENTITY rang     SDATA "[rang    ]"--/rangle C: right angle bracket-->
<!ENTITY Rang     SDATA "[Rang    ]"--right angle bracket, double-->
<!ENTITY rArr     SDATA "[rArr    ]"--/Rightarrow A: implies-->
<!ENTITY rbbrk    SDATA "[rbbrk   ]"--right broken bracket-->
<!ENTITY roang    SDATA "[roang   ]"--right open angular bracket-->
<!ENTITY robrk    SDATA "[robrk   ]"--right open bracket-->
<!ENTITY ropar    SDATA "[ropar   ]"--right open parenthesis-->
<!ENTITY rppolint SDATA "[rppolint]"--line integration, rectangular path around pole-->
<!ENTITY scpolint SDATA "[scpolint]"--line integration, semi-circular path around pole-->
<!ENTITY sim      SDATA "[sim     ]"--/sim R: similar-->
<!ENTITY simdot   SDATA "[simdot  ]"--similar, dot-->
<!ENTITY sime     SDATA "[sime    ]"--/simeq R: similar, equals-->
<!ENTITY smeparsl SDATA "[smeparsl]"--similar, parallel, slanted, equal-->
<!ENTITY square   SDATA "[square  ]"--/square, square-->
<!ENTITY squarf   SDATA "[squarf  ]"--/blacksquare, square, filled-->
<!ENTITY strns    SDATA "[strns   ]"--straightness-->
<!ENTITY sub      SDATA "[sub     ]"--/subset R: subset or is implied by-->
<!ENTITY sube     SDATA "[sube    ]"--/subseteq R: subset, equals-->
<!ENTITY sup      SDATA "[sup     ]"--/supset R: superset or implies-->
<!ENTITY supe     SDATA "[supe    ]"--/supseteq R: superset, equals-->
<!ENTITY tdot     SDATA "[tdot    ]"--three dots above-->
<!ENTITY there4   SDATA "[there4  ]"--/therefore R: therefore-->
<!ENTITY tint     SDATA "[tint    ]"--/iiint triple integral operator-->
<!ENTITY top      SDATA "[top     ]"--/top top-->
<!ENTITY topbot   SDATA "[topbot  ]"--top and bottom-->
<!ENTITY topcir   SDATA "[topcir  ]"--top, circle below-->
<!ENTITY tprime   SDATA "[tprime  ]"--triple prime-->
<!ENTITY utdot    SDATA "[utdot   ]"--three dots, ascending-->
<!ENTITY uwangle  SDATA "[uwangle ]"--large upward pointing angle-->
<!ENTITY vangrt   SDATA "[vangrt  ]"--right angle, variant-->
<!ENTITY veeeq    SDATA "[veeeq   ]"--logical or, equals-->
<!ENTITY Verbar   SDATA "[Verbar  ]"--/Vert dbl vertical bar-->
<!ENTITY wedgeq   SDATA "[wedgeq  ]"--/wedgeq R: corresponds to (wedge, equals)-->
<!ENTITY xnis     SDATA "[xnis    ]"--large contains, vertical bar on horizontal stroke--
```


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6.1.2 Greek Symbols

```
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-->
<!-- Character entity set. Typical invocation:
     <!ENTITY % ISOGRK3  PUBLIC
       "ISO 9573-13:1991//ENTITIES Greek Symbols //EN">
     %ISOGRK3;
-->
<!ENTITY alpha    SDATA "[alpha   ]"--/alpha small alpha, Greek-->
<!ENTITY beta     SDATA "[beta    ]"--/beta small beta, Greek-->
<!ENTITY chi      SDATA "[chi     ]"--/chi small chi, Greek-->
<!ENTITY delta    SDATA "[delta   ]"--/delta small delta, Greek-->
<!ENTITY Delta    SDATA "[Delta   ]"--/Delta capital Delta, Greek-->
<!ENTITY epsi     SDATA "[epsi    ]"--/straightepsilon, small epsilon, Greek-->
<!ENTITY epsiv    SDATA "[epsiv   ]"--/varepsilon-->
<!ENTITY eta      SDATA "[eta     ]"--/eta small eta, Greek-->
<!ENTITY gamma    SDATA "[gamma   ]"--/gamma small gamma, Greek-->
<!ENTITY Gamma    SDATA "[Gamma   ]"--/Gamma capital Gamma, Greek-->
<!ENTITY gammad   SDATA "[gammad  ]"--/digamma-->
<!ENTITY Gammad   SDATA "[Gammad  ]"--capital digamma-->
<!ENTITY iota     SDATA "[iota    ]"--/iota small iota, Greek-->
<!ENTITY kappa    SDATA "[kappa   ]"--/kappa small kappa, Greek-->
<!ENTITY kappav   SDATA "[kappav  ]"--/varkappa-->
<!ENTITY lambda   SDATA "[lambda  ]"--/lambda small lambda, Greek-->
<!ENTITY Lambda   SDATA "[Lambda  ]"--/Lambda capital Lambda, Greek-->
<!ENTITY mu       SDATA "[mu      ]"--/mu small mu, Greek-->
<!ENTITY nu       SDATA "[nu      ]"--/nu small nu, Greek-->
<!ENTITY omega    SDATA "[omega   ]"--/omega small omega, Greek-->
<!ENTITY Omega    SDATA "[Omega   ]"--/Omega capital Omega, Greek-->
<!ENTITY phi      SDATA "[phi     ]"--/straightphi - small phi, Greek-->
<!ENTITY Phi      SDATA "[Phi     ]"--/Phi capital Phi, Greek-->
<!ENTITY phiv     SDATA "[phiv    ]"--/varphi - curly or open phi-->
<!ENTITY pi       SDATA "[pi      ]"--/pi small pi, Greek-->
<!ENTITY Pi       SDATA "[Pi      ]"--/Pi capital Pi, Greek-->
<!ENTITY piv      SDATA "[piv     ]"--/varpi-->
<!ENTITY psi      SDATA "[psi     ]"--/psi small psi, Greek-->
<!ENTITY Psi      SDATA "[Psi     ]"--/Psi capital Psi, Greek-->
<!ENTITY rho      SDATA "[rho     ]"--/rho small rho, Greek-->
<!ENTITY rhov     SDATA "[rhov    ]"--/varrho-->
<!ENTITY sigma    SDATA "[sigma   ]"--/sigma small sigma, Greek-->
<!ENTITY Sigma    SDATA "[Sigma   ]"--/Sigma capital Sigma, Greek-->
<!ENTITY sigmav   SDATA "[sigmav  ]"--/varsigma-->
<!ENTITY tau      SDATA "[tau     ]"--/tau small tau, Greek-->
<!ENTITY theta    SDATA "[theta   ]"--/theta straight theta, small theta, Greek-->
<!ENTITY Theta    SDATA "[Theta   ]"--/Theta capital Theta, Greek-->
<!ENTITY thetav   SDATA "[thetav  ]"--/vartheta - curly or open theta-->
<!ENTITY upsi     SDATA "[upsi    ]"--/upsilon small upsilon, Greek-->
<!ENTITY Upsi     SDATA "[Upsi    ]"--/Upsilon capital Upsilon, Greek-->
<!ENTITY xi       SDATA "[xi      ]"--/xi small xi, Greek-->
<!ENTITY Xi       SDATA "[Xi      ]"--/Xi capital Xi, Greek-->
<!ENTITY zeta     SDATA "[zeta    ]"--/zeta small zeta, Greek-->
```


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6.1.3 Alternative Greek Symbols

```
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     ISO 8879, provided this notice is included in all copies.
-->
<!-- Character entity set. Typical invocation:
     <!ENTITY % ISOGRK4  PUBLIC
       "ISO 9573-13:1991//ENTITIES Alternative Greek Symbols //EN">
     %ISOGRK4;
-->
<!ENTITY b.alpha  SDATA "[b.alpha ]"--small alpha, Greek-->
<!ENTITY b.beta   SDATA "[b.beta  ]"--small beta, Greek-->
<!ENTITY b.chi    SDATA "[b.chi   ]"--small chi, Greek-->
<!ENTITY b.delta  SDATA "[b.delta ]"--small delta, Greek-->
<!ENTITY b.Delta  SDATA "[b.Delta ]"--capital Delta, Greek-->
<!ENTITY b.epsi   SDATA "[b.epsi  ]"--small epsilon, Greek-->
<!ENTITY b.epsiv  SDATA "[b.epsiv ]"--variant epsilon-->
<!ENTITY b.eta    SDATA "[b.eta   ]"--small eta, Greek-->
<!ENTITY b.gamma  SDATA "[b.gamma ]"--small gamma, Greek-->
<!ENTITY b.Gamma  SDATA "[b.Gamma ]"--capital Gamma, Greek-->
<!ENTITY b.gammad SDATA "[b.gammad]"--digamma-->
<!ENTITY b.Gammad SDATA "[b.Gammad]"--capital digamma-->
<!ENTITY b.iota   SDATA "[b.iota  ]"--small iota, Greek-->
<!ENTITY b.kappa  SDATA "[b.kappa ]"--small kappa, Greek-->
<!ENTITY b.kappav SDATA "[b.kappav]"--variant kappa-->
<!ENTITY b.lambda SDATA "[b.lambda]"--small lambda, Greek-->
<!ENTITY b.Lambda SDATA "[b.Lambda]"--capital Lambda, Greek-->
<!ENTITY b.mu     SDATA "[b.mu    ]"--small mu, Greek-->
<!ENTITY b.nu     SDATA "[b.nu    ]"--small nu, Greek-->
<!ENTITY b.omega  SDATA "[b.omega ]"--small omega, Greek-->
<!ENTITY b.Omega  SDATA "[b.Omega ]"--capital Omega, Greek-->
<!ENTITY b.phi    SDATA "[b.phi   ]"--straight phi, small phi, Greek-->
<!ENTITY b.Phi    SDATA "[b.Phi   ]"--capital Phi, Greek-->
<!ENTITY b.phiv   SDATA "[b.phiv  ]"--variant phi - curly or open phi-->
<!ENTITY b.pi     SDATA "[b.pi    ]"--small pi, Greek-->
<!ENTITY b.Pi     SDATA "[b.Pi    ]"--capital Pi, Greek-->
<!ENTITY b.piv    SDATA "[b.piv   ]"--variant pi-->
<!ENTITY b.psi    SDATA "[b.psi   ]"--small psi, Greek-->
<!ENTITY b.Psi    SDATA "[b.Psi   ]"--capital Psi, Greek-->
<!ENTITY b.rho    SDATA "[b.rho   ]"--small rho, Greek-->
<!ENTITY b.rhov   SDATA "[b.rhov  ]"--variant rho-->
<!ENTITY b.sigma  SDATA "[b.sigma ]"--small sigma, Greek-->
<!ENTITY b.Sigma  SDATA "[b.Sigma ]"--capital Sigma, Greek-->
<!ENTITY b.sigmav SDATA "[b.sigmav]"--variant sigma-->
<!ENTITY b.tau    SDATA "[b.tau   ]"--small tau, Greek-->
<!ENTITY b.theta  SDATA "[b.theta ]"--straight theta, small theta, Greek-->
<!ENTITY b.Theta  SDATA "[b.Theta ]"--capital Theta, Greek-->
<!ENTITY b.thetav SDATA "[b.thetav]"--variant theta - curly or open theta-->
<!ENTITY b.upsi   SDATA "[b.upsi  ]"--small upsilon, Greek-->
<!ENTITY b.Upsi   SDATA "[b.Upsi  ]"--capital Upsilon, Greek-->
<!ENTITY b.xi     SDATA "[b.xi    ]"--small xi, Greek-->
<!ENTITY b.Xi     SDATA "[b.Xi    ]"--capital Xi, Greek-->
<!ENTITY b.zeta   SDATA "[b.zeta  ]"--small zeta, Greek-->
```


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6.2 Additional mathematical symbols

6.2.1 Ordinary Symbols

```
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     ISO 8879, provided this notice is included in all copies.
-->
<!-- Character entity set. Typical invocation:
     <!ENTITY % ISOAMSO  PUBLIC
       "ISO 9573-13:1991//ENTITIES Added Math Symbols: Ordinary //EN">
     %ISOAMSO;
-->
<!ENTITY ang      SDATA "[ang     ]"--/angle - angle-->
<!ENTITY ange     SDATA "[ange    ]"--angle, equal-->
<!ENTITY angmsd   SDATA "[angmsd  ]"--/measuredangle - angle-measured-->
<!ENTITY angmsdaa SDATA "[angmsdaa]"--angle-measured, arrow, up, right-->
<!ENTITY angmsdab SDATA "[angmsdab]"--angle-measured, arrow, up, left-->
<!ENTITY angmsdac SDATA "[angmsdac]"--angle-measured, arrow, down, right-->
<!ENTITY angmsdad SDATA "[angmsdad]"--angle-measured, arrow, down, left-->
<!ENTITY angmsdae SDATA "[angmsdae]"--angle-measured, arrow, right, up-->
<!ENTITY angmsdaf SDATA "[angmsdaf]"--angle-measured, arrow, left, up-->
<!ENTITY angmsdag SDATA "[angmsdag]"--angle-measured, arrow, right, down-->
<!ENTITY angmsdah SDATA "[angmsdah]"--angle-measured, arrow, left, down-->
<!ENTITY angrtvb  SDATA "[angrtvb ]"--right angle-measured-->
<!ENTITY angrtvbd SDATA "[angrtvbd]"--right angle-measured, dot-->
<!ENTITY bbrk     SDATA "[bbrk    ]"--bottom square bracket-->
<!ENTITY bbrktbrk SDATA "[bbrktbrk]"--bottom above top square bracket-->
<!ENTITY bemptyv  SDATA "[bemptyv ]"--reversed circle, slash-->
<!ENTITY beth     SDATA "[beth    ]"--/beth - beth, Hebrew-->
<!ENTITY boxbox   SDATA "[boxbox  ]"--two joined squares-->
<!ENTITY bprime   SDATA "[bprime  ]"--/backprime - reverse prime-->
<!ENTITY bsemi    SDATA "[bsemi   ]"--reverse semi-colon-->
<!ENTITY cemptyv  SDATA "[cemptyv ]"--circle, slash, small circle above-->
<!ENTITY cirE     SDATA "[cirE    ]"--circle, two horizontal stroked to the right-->
<!ENTITY cirscir  SDATA "[cirscir ]"--circle, small circle to the right-->
<!ENTITY comp     SDATA "[comp    ]"--/complement - complement sign-->
<!ENTITY daleth   SDATA "[daleth  ]"--/daleth - daleth, Hebrew-->
<!ENTITY demptyv  SDATA "[demptyv ]"--circle, slash, bar above-->
<!ENTITY ell      SDATA "[ell     ]"--/ell - cursive small l-->
<!ENTITY empty    SDATA "[empty   ]"--/emptyset - zero, slash-->
<!ENTITY emptyv   SDATA "[emptyv  ]"--/varnothing - circle, slash-->
<!ENTITY gimel    SDATA "[gimel   ]"--/gimel - gimel, Hebrew-->
<!ENTITY iiota    SDATA "[iiota   ]"--inverted iota-->
<!ENTITY image    SDATA "[image   ]"--/Im - imaginary-->
<!ENTITY imath    SDATA "[imath   ]"--/imath - small i, no dot-->
<!ENTITY jmath    SDATA "[jmath   ]"--/jmath - small j, no dot-->
<!ENTITY laemptyv SDATA "[laemptyv]"--circle, slash, left arrow above-->
<!ENTITY lltri    SDATA "[lltri   ]"--lower left triangle-->
<!ENTITY lrtri    SDATA "[lrtri   ]"--lower right triangle-->
<!ENTITY mho      SDATA "[mho     ]"--/mho - conductance-->
<!ENTITY nang     SDATA "[nang    ]"--not, vert, angle-->
<!ENTITY nexist   SDATA "[nexist  ]"--/nexists - negated exists-->
<!ENTITY oS       SDATA "[oS      ]"--/circledS - capital S in circle-->
<!ENTITY plank    SDATA "[plank   ]"--/hbar - Planck's over 2pi-->
<!ENTITY plankv   SDATA "[plankv  ]"--/hslash - variant Planck's over 2pi-->
<!ENTITY raemptyv SDATA "[raemptyv]"--circle, slash, right arrow above-->
<!ENTITY range    SDATA "[range   ]"--reverse angle, equal-->
<!ENTITY real     SDATA "[real    ]"--/Re - real-->
<!ENTITY tbrk     SDATA "[tbrk    ]"--top square bracket-->
<!ENTITY trpezium SDATA "[trpezium]"--trapezium-->
```


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```
<!ENTITY ultri    SDATA "[ultri   ]"--upper left triangle-->
<!ENTITY urtri    SDATA "[urtri   ]"--upper right triangle-->
<!ENTITY vzigzag  SDATA "[vzigzag ]"--vertical zig-zag line-->
<!ENTITY weierp   SDATA "[weierp  ]"--/wp - Weierstrass p-->
```

6.2.2 Binary and Large Operators

```
<!-- (C) International Organization for Standardization 1991
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-->
<!-- Character entity set. Typical invocation:
     <!ENTITY % ISOAMSB  PUBLIC
       "ISO 9573-13:1991//ENTITIES Added Math Symbols: Binary Operators //EN">
     %ISOAMSB;
-->
<!ENTITY ac       SDATA "[ac      ]"--most positive-->
<!ENTITY acE      SDATA "[acE     ]"--most positive, two lines below-->
<!ENTITY amalg    SDATA "[amalg   ]"--/amalg B: amalgamation or coproduct-->
<!ENTITY barvee   SDATA "[barvee  ]"--bar, vee-->
<!ENTITY barwed   SDATA "[barwed  ]"--/barwedge B: logical and, bar above-->
<!ENTITY Barwed   SDATA "[Barwed  ]"--/doublebarwedge B: log and, dbl bar above-->
<!ENTITY bsolb    SDATA "[bsolb   ]"--reverse solidus in square-->
<!ENTITY Cap      SDATA "[Cap     ]"--/Cap /doublecap B: dbl intersection-->
<!ENTITY capand   SDATA "[capand  ]"--intersection, and-->
<!ENTITY capbrcup SDATA "[capbrcup]"--intersection, bar, union-->
<!ENTITY capcap   SDATA "[capcap  ]"--intersection, intersection, joined-->
<!ENTITY capcup   SDATA "[capcup  ]"--intersection above union-->
<!ENTITY capdot   SDATA "[capdot  ]"--intersection, with dot-->
<!ENTITY caps     SDATA "[caps    ]"--intersection, serifs-->
<!ENTITY ccaps    SDATA "[ccaps   ]"--closed intersection, serifs-->
<!ENTITY ccups    SDATA "[ccups   ]"--closed union, serifs-->
<!ENTITY ccupssm  SDATA "[ccupssm ]"--closed union, serifs, smash product-->
<!ENTITY coprod   SDATA "[coprod  ]"--/coprod L: coproduct operator-->
<!ENTITY Cup      SDATA "[Cup     ]"--/Cup /doublecup B: dbl union-->
<!ENTITY cupbrcap SDATA "[cupbrcap]"--union, bar, intersection-->
<!ENTITY cupcap   SDATA "[cupcap  ]"--union above intersection-->
<!ENTITY cupcup   SDATA "[cupcup  ]"--union, union, joined-->
<!ENTITY cupdot   SDATA "[cupdot  ]"--union, with dot-->
<!ENTITY cupor    SDATA "[cupor   ]"--union, or-->
<!ENTITY cups     SDATA "[cups    ]"--union, serifs-->
<!ENTITY cuvee    SDATA "[cuvee   ]"--/curlyvee B: curly logical or-->
<!ENTITY cuwed    SDATA "[cuwed   ]"--/curlywedge B: curly logical and-->
<!ENTITY dagger   SDATA "[dagger  ]"--/dagger B: dagger relation-->
<!ENTITY Dagger   SDATA "[Dagger  ]"--/ddagger B: double dagger relation-->
<!ENTITY diam     SDATA "[diam    ]"--/diamond B: open diamond-->
<!ENTITY divonx   SDATA "[divonx  ]"--/divideontimes B: division on times-->
<!ENTITY eplus    SDATA "[eplus   ]"--equal, plus-->
<!ENTITY hercon   SDATA "[hercon  ]"--hermitian conjugate matrix-->
<!ENTITY intcal   SDATA "[intcal  ]"--/intercal B: intercal-->
<!ENTITY iprod    SDATA "[iprod   ]"--/intprod-->
<!ENTITY loplus   SDATA "[loplus  ]"--plus sign in left half circle-->
<!ENTITY lotimes  SDATA "[lotimes ]"--multiply sign in left half circle-->
<!ENTITY lthree   SDATA "[lthree  ]"--/leftthreetimes B:-->
<!ENTITY ltimes   SDATA "[ltimes  ]"--/ltimes B: times sign, left closed-->
<!ENTITY midast   SDATA "[midast  ]"--/ast B: asterisk-->
<!ENTITY minusb   SDATA "[minusb  ]"--/boxminus B: minus sign in box-->
<!ENTITY minusd   SDATA "[minusd  ]"--/dotminus B: minus sign, dot above-->
<!ENTITY minusdu  SDATA "[minusdu ]"--minus sign, dot below-->
<!ENTITY ncap     SDATA "[ncap    ]"--bar, intersection-->
```


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```
<!ENTITY ncup     SDATA "[ncup    ]"--bar, union-->
<!ENTITY oast     SDATA "[oast    ]"--/circledast B: asterisk in circle-->
<!ENTITY ocir     SDATA "[ocir    ]"--/circledcirc B: small circle in circle-->
<!ENTITY odash    SDATA "[odash   ]"--/circleddash B: hyphen in circle-->
<!ENTITY odiv     SDATA "[odiv    ]"--divide in circle-->
<!ENTITY odot     SDATA "[odot    ]"--/odot B: middle dot in circle-->
<!ENTITY odsold   SDATA "[odsold  ]"--dot, solidus, dot in circle-->
<!ENTITY ofcir    SDATA "[ofcir   ]"--filled circle in circle-->
<!ENTITY ogt      SDATA "[ogt     ]"--greater-than in circle-->
<!ENTITY ohbar    SDATA "[ohbar   ]"--circle with horizontal bar-->
<!ENTITY olcir    SDATA "[olcir   ]"--large circle in circle-->
<!ENTITY olt      SDATA "[olt     ]"--less-than in circle-->
<!ENTITY omid     SDATA "[omid    ]"--vertical bar in circle-->
<!ENTITY ominus   SDATA "[ominus  ]"--/ominus B: minus sign in circle-->
<!ENTITY opar     SDATA "[opar    ]"--parallel in circle-->
<!ENTITY operp    SDATA "[operp   ]"--perpendicular in circle-->
<!ENTITY oplus    SDATA "[oplus   ]"--/oplus B: plus sign in circle-->
<!ENTITY osol     SDATA "[osol    ]"--/oslash B: solidus in circle-->
<!ENTITY otimes   SDATA "[otimes  ]"--/otimes B: multiply sign in circle-->
<!ENTITY Otimes   SDATA "[Otimes  ]"--multiply sign in double circle-->
<!ENTITY otimesas SDATA "[otimesas]"--multiply sign in circle, circumflex accent-->
<!ENTITY ovbar    SDATA "[ovbar   ]"--circle with vertical bar-->
<!ENTITY plusacir SDATA "[plusacir]"--plus, circumflex accent above-->
<!ENTITY plusb    SDATA "[plusb   ]"--/boxplus B: plus sign in box-->
<!ENTITY pluscir  SDATA "[pluscir ]"--plus, small circle above-->
<!ENTITY plusdo   SDATA "[plusdo  ]"--/dotplus B: plus sign, dot above-->
<!ENTITY plusdu   SDATA "[plusdu  ]"--plus sign, dot below-->
<!ENTITY pluse    SDATA "[pluse   ]"--plus, equals-->
<!ENTITY plussim  SDATA "[plussim ]"--plus, similar below-->
<!ENTITY plustwo  SDATA "[plustwo ]"--plus, two; Nim-addition-->
<!ENTITY prod     SDATA "[prod    ]"--/prod L: product operator-->
<!ENTITY race     SDATA "[race    ]"--reverse most positive, line below-->
<!ENTITY roplus   SDATA "[roplus  ]"--plus sign in right half circle-->
<!ENTITY rotimes  SDATA "[rotimes ]"--multiply sign in right half circle-->
<!ENTITY rthree   SDATA "[rthree  ]"--/rightthreetimes B:-->
<!ENTITY rtimes   SDATA "[rtimes  ]"--/rtimes B: times sign, right closed-->
<!ENTITY sdot     SDATA "[sdot    ]"--/cdot B: small middle dot-->
<!ENTITY sdotb    SDATA "[sdotb   ]"--/dotsquare /boxdot B: small dot in box-->
<!ENTITY setmn    SDATA "[setmn   ]"--/setminus B: reverse solidus-->
<!ENTITY simplus  SDATA "[simplus ]"--plus, similar above-->
<!ENTITY smashp   SDATA "[smashp  ]"--smash product-->
<!ENTITY solb     SDATA "[solb    ]"--solidus in square-->
<!ENTITY sqcap    SDATA "[sqcap   ]"--/sqcap B: square intersection-->
<!ENTITY sqcaps   SDATA "[sqcaps  ]"--square intersection, serifs-->
<!ENTITY sqcup    SDATA "[sqcup   ]"--/sqcup B: square union-->
<!ENTITY sqcups   SDATA "[sqcups  ]"--square union, serifs-->
<!ENTITY ssetmn   SDATA "[ssetmn  ]"--/smallsetminus B: sm reverse solidus-->
<!ENTITY sstarf   SDATA "[sstarf  ]"--/star B: small star, filled-->
<!ENTITY subdot   SDATA "[subdot  ]"--subset, with dot-->
<!ENTITY sum      SDATA "[sum     ]"--/sum L: summation operator-->
<!ENTITY supdot   SDATA "[supdot  ]"--superset, with dot-->
<!ENTITY timesb   SDATA "[timesb  ]"--/boxtimes B: multiply sign in box-->
<!ENTITY timesbar SDATA "[timesbar]"--multiply sign, bar below-->
<!ENTITY timesd   SDATA "[timesd  ]"--times, dot-->
<!ENTITY tridot   SDATA "[tridot  ]"--dot in triangle-->
<!ENTITY triminus SDATA "[triminus]"--minus in triangle-->
<!ENTITY triplus  SDATA "[triplus ]"--plus in triangle-->
<!ENTITY trisb    SDATA "[trisb   ]"--triangle, serifs at bottom-->
<!ENTITY tritime  SDATA "[tritime ]"--multiply in triangle-->
<!ENTITY uplus    SDATA "[uplus   ]"--/uplus B: plus sign in union-->
<!ENTITY veebar   SDATA "[veebar  ]"--/veebar B: logical or, bar below-->
<!ENTITY wedbar   SDATA "[wedbar  ]"--wedge, bar below-->
```

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```
<!ENTITY wreath    SDATA "[wreath  ]"--/wr B: wreath product-->
<!ENTITY xcap      SDATA "[xcap    ]"--/bigcap L: intersection operator-->
<!ENTITY xcirc     SDATA "[xcirc   ]"--/bigcirc B: large circle-->
<!ENTITY xcup      SDATA "[xcup    ]"--/bigcup L: union operator-->
<!ENTITY xdtri     SDATA "[xdtri   ]"--/bigtriangledown B: big dn tri, open-->
<!ENTITY xodot     SDATA "[xodot   ]"--/bigodot L: circle dot operator-->
<!ENTITY xoplus    SDATA "[xoplus  ]"--/bigoplus L: circle plus operator-->
<!ENTITY xotime    SDATA "[xotime  ]"--/bigotimes L: circle times operator-->
<!ENTITY xsqcup    SDATA "[xsqcup  ]"--/bigsqcup L: square union operator-->
<!ENTITY xuplus    SDATA "[xuplus  ]"--/biguplus L:-->
<!ENTITY xutri     SDATA "[xutri   ]"--/bigtriangleup B: big up tri, open-->
<!ENTITY xvee      SDATA "[xvee    ]"--/bigvee L: logical and operator-->
<!ENTITY xwedge    SDATA "[xwedge  ]"--/bigwedge L: logical or operator-->
```

6.2.3 Relations

```
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-->
<!-- Character entity set. Typical invocation:
     <!ENTITY % ISOAMSR  PUBLIC
       "ISO 9573-13:1991//ENTITIES Added Math Symbols: Relations //EN">
     %ISOAMSR;
-->
<!ENTITY ape       SDATA "[ape     ]"--/approxeq R: approximate, equals-->
<!ENTITY apE       SDATA "[apE     ]"--approximately equal or equal to-->
<!ENTITY apid      SDATA "[apid    ]"--approximately identical to-->
<!ENTITY asymp     SDATA "[asymp   ]"--/asymp R: asymptotically equal to-->
<!ENTITY Barv      SDATA "[Barv    ]"--vert, dbl bar (over)-->
<!ENTITY bcong     SDATA "[bcong   ]"--/backcong R: reverse congruent-->
<!ENTITY bepsi     SDATA "[bepsi   ]"--/backepsilon R: such that-->
<!ENTITY bowtie    SDATA "[bowtie  ]"--/bowtie R:-->
<!ENTITY bsim      SDATA "[bsim    ]"--/backsim R: reverse similar-->
<!ENTITY bsime     SDATA "[bsime   ]"--/backsimeq R: reverse similar, eq-->
<!ENTITY bsolhsub  SDATA "[bsolhsub]"--reverse solidus, subset-->
<!ENTITY bump      SDATA "[bump    ]"--/Bumpeq R: bumpy equals-->
<!ENTITY bumpe     SDATA "[bumpe   ]"--/bumpeq R: bumpy equals, equals-->
<!ENTITY bumpE     SDATA "[bumpE   ]"--bump, equals-->
<!ENTITY cire      SDATA "[cire    ]"--/circeq R: circle, equals-->
<!ENTITY Colon     SDATA "[Colon   ]"--/Colon, two colons-->
<!ENTITY colone    SDATA "[colone  ]"--/coloneq R: colon, equals-->
<!ENTITY Colone    SDATA "[Colone  ]"--double colon, equals-->
<!ENTITY congdot   SDATA "[congdot ]"--congruent, dot-->
<!ENTITY csub      SDATA "[csub    ]"--subset, closed-->
<!ENTITY csube     SDATA "[csube   ]"--subset, closed, equals-->
<!ENTITY csup      SDATA "[csup    ]"--superset, closed-->
<!ENTITY csupe     SDATA "[csupe   ]"--superset, closed, equals-->
<!ENTITY cuepr     SDATA "[cuepr   ]"--/curlyeqprec R: curly eq, precedes-->
<!ENTITY cuesc     SDATA "[cuesc   ]"--/curlyeqsucc R: curly eq, succeeds-->
<!ENTITY dashv     SDATA "[dashv   ]"--/dashv R: dash, vertical-->
<!ENTITY Dashv     SDATA "[Dashv   ]"--dbl dash, vertical-->
<!ENTITY easter    SDATA "[easter  ]"--equal, asterisk above-->
<!ENTITY ecir      SDATA "[ecir    ]"--/eqcirc R: circle on equals sign-->
<!ENTITY ecolon    SDATA "[ecolon  ]"--/eqcolon R: equals, colon-->
<!ENTITY eDDot     SDATA "[eDDot   ]"--/ddotseq R: equal with four dots-->
<!ENTITY eDot      SDATA "[eDot    ]"--/doteqdot /Doteq R: eq, even dots-->
<!ENTITY efDot     SDATA "[efDot   ]"--/fallingdotseq R: eq, falling dots-->
<!ENTITY eg        SDATA "[eg      ]"--equal-or-greater-->
<!ENTITY egs       SDATA "[egs     ]"--/eqslantgtr R: equal-or-gtr, slanted-->
```


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```
<!ENTITY egsdot   SDATA "[egsdot  ]"--equal-or-greater, slanted, dot inside-->
<!ENTITY el       SDATA "[el      ]"--equal-or-less-->
<!ENTITY els      SDATA "[els     ]"--/eqslantless R: eq-or-less, slanted-->
<!ENTITY elsdot   SDATA "[elsdot  ]"--equal-or-less, slanted, dot inside-->
<!ENTITY equest   SDATA "[equest  ]"--/questeq R: equal with questionmark-->
<!ENTITY equivDD  SDATA "[equivDD ]"--equivalent, four dots above-->
<!ENTITY erDot    SDATA "[erDot   ]"--/risingdotseq R: eq, rising dots-->
<!ENTITY esdot    SDATA "[esdot   ]"--/doteq R: equals, single dot above-->
<!ENTITY esim     SDATA "[esim    ]"--/esim R: equals, similar-->
<!ENTITY Esim     SDATA "[Esim    ]"--equal, similar-->
<!ENTITY fork     SDATA "[fork    ]"--/pitchfork R: pitchfork-->
<!ENTITY forkv    SDATA "[forkv   ]"--fork, variant-->
<!ENTITY frown    SDATA "[frown   ]"--/frown R: down curve-->
<!ENTITY gap      SDATA "[gap     ]"--/gtrapprox R: greater, approximate-->
<!ENTITY gE       SDATA "[gE      ]"--/geqq R: greater, double equals-->
<!ENTITY gel      SDATA "[gel     ]"--/gtreqless R: greater, equals, less-->
<!ENTITY gEl      SDATA "[gEl     ]"--/gtreqqless R: gt, dbl equals, less-->
<!ENTITY ges      SDATA "[ges     ]"--/geqslant R: gt-or-equal, slanted-->
<!ENTITY gescc    SDATA "[gescc   ]"--greater than, closed by curve, equal,
                                       slanted-->
<!ENTITY gesdot   SDATA "[gesdot  ]"--greater-than-or-equal, slanted, dot inside-->
<!ENTITY gesdoto  SDATA "[gesdoto ]"--greater-than-or-equal, slanted, dot above-->
<!ENTITY gesdotol SDATA "[gesdotol]"--greater-than-or-equal, slanted,
                                       dot above left-->
<!ENTITY gesl     SDATA "[gesl    ]"--greater, equal, slanted, less-->
<!ENTITY gesles   SDATA "[gesles  ]"--greater, equal, slanted, less, equal,
                                       slanted-->
<!ENTITY Gg       SDATA "[Gg      ]"--/ggg /Gg /gggtr R: triple gtr-than-->
<!ENTITY gl       SDATA "[gl      ]"--/gtrless R: greater, less-->
<!ENTITY gla      SDATA "[gla     ]"--greater, less, apart-->
<!ENTITY glE      SDATA "[glE     ]"--greater, less, equal-->
<!ENTITY glj      SDATA "[glj     ]"--greater, less, overlapping-->
<!ENTITY gsim     SDATA "[gsim    ]"--/gtrsim R: greater, similar-->
<!ENTITY gsime    SDATA "[gsime   ]"--greater, similar, equal-->
<!ENTITY gsiml    SDATA "[gsiml   ]"--greater, similar, less-->
<!ENTITY Gt       SDATA "[Gt      ]"--/gg R: dbl greater-than sign-->
<!ENTITY gtcc     SDATA "[gtcc    ]"--greater than, closed by curve-->
<!ENTITY gtcir    SDATA "[gtcir   ]"--greater than, circle inside-->
<!ENTITY gtdot    SDATA "[gtdot   ]"--/gtrdot R: greater than, with dot-->
<!ENTITY gtquest  SDATA "[gtquest ]"--greater than, questionmark above-->
<!ENTITY gtrarr   SDATA "[gtrarr  ]"--greater than, right arrow-->
<!ENTITY homtht   SDATA "[homtht  ]"--homothetic-->
<!ENTITY lap      SDATA "[lap     ]"--/lessapprox R: less, approximate-->
<!ENTITY lat      SDATA "[lat     ]"--larger than-->
<!ENTITY late     SDATA "[late    ]"--larger than or equal-->
<!ENTITY lates    SDATA "[lates   ]"--larger than or equal, slanted-->
<!ENTITY lE       SDATA "[lE      ]"--/leqq R: less, double equals-->
<!ENTITY leg      SDATA "[leg     ]"--/lesseqgtr R: less, eq, greater-->
<!ENTITY lEg      SDATA "[lEg     ]"--/lesseqqgtr R: less, dbl eq, greater-->
<!ENTITY les      SDATA "[les     ]"--/leqslant R: less-than-or-eq, slant-->
<!ENTITY lescc    SDATA "[lescc   ]"--less than, closed by curve, equal, slanted-->
<!ENTITY lesdot   SDATA "[lesdot  ]"--less-than-or-equal, slanted, dot inside-->
<!ENTITY lesdoto  SDATA "[lesdoto ]"--less-than-or-equal, slanted, dot above-->
<!ENTITY lesdotor SDATA "[lesdotor]"--less-than-or-equal, slanted, dot above right-->
<!ENTITY lesg     SDATA "[lesg    ]"--less, equal, slanted, greater-->
<!ENTITY lesges   SDATA "[lesges  ]"--less, equal, slanted, greater, equal,
                                       slanted-->
<!ENTITY lg       SDATA "[lg      ]"--/lessgtr R: less, greater-->
<!ENTITY lgE      SDATA "[lgE     ]"--less, greater, equal-->
<!ENTITY Ll       SDATA "[Ll      ]"--/Ll /lll /llless R: triple less-than-->
<!ENTITY lsim     SDATA "[lsim    ]"--/lesssim R: less, similar-->
<!ENTITY lsime    SDATA "[lsime   ]"--less, similar, equal-->
```


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```
<!ENTITY lsimg    SDATA "[lsimg   ]"--less, similar, greater-->
<!ENTITY Lt       SDATA "[Lt      ]"--/ll R: double less-than sign-->
<!ENTITY ltcc     SDATA "[ltcc    ]"--less than, closed by curve-->
<!ENTITY ltcir    SDATA "[ltcir   ]"--less than, circle inside-->
<!ENTITY ltdot    SDATA "[ltdot   ]"--/lessdot R: less than, with dot-->
<!ENTITY ltlarr   SDATA "[ltlarr  ]"--less than, left arrow-->
<!ENTITY ltquest  SDATA "[ltquest ]"--less than, questionmark above-->
<!ENTITY ltrie    SDATA "[ltrie   ]"--/trianglelefteq R: left triangle, eq-->
<!ENTITY mcomma   SDATA "[mcomma  ]"--minus, comma above-->
<!ENTITY mDDot    SDATA "[mDDot   ]"--minus with four dots, geometric properties-->
<!ENTITY mid      SDATA "[mid     ]"--/mid R:-->
<!ENTITY mlcp     SDATA "[mlcp    ]"--/mlcp-->
<!ENTITY models   SDATA "[models  ]"--/models R:-->
<!ENTITY mstpos   SDATA "[mstpos  ]"--most positive-->
<!ENTITY pr       SDATA "[pr      ]"--/prec R: precedes-->
<!ENTITY Pr       SDATA "[Pr      ]"--dbl precedes-->
<!ENTITY prap     SDATA "[prap    ]"--/precapprox R: precedes, approximate-->
<!ENTITY prcue    SDATA "[prcue   ]"--/preccurlyeq R: precedes, curly eq-->
<!ENTITY pre      SDATA "[pre     ]"--/preceq R: precedes, equals-->
<!ENTITY prE      SDATA "[prE     ]"--precedes, dbl equals-->
<!ENTITY prsim    SDATA "[prsim   ]"--/precsim R: precedes, similar-->
<!ENTITY prurel   SDATA "[prurel  ]"--element precedes under relation-->
<!ENTITY ratio    SDATA "[ratio   ]"--/ratio-->
<!ENTITY rtrie    SDATA "[rtrie   ]"--/trianglerighteq R: right tri, eq-->
<!ENTITY rtriltri SDATA "[rtriltri]"--right triangle above left triangle-->
<!ENTITY sc       SDATA "[sc      ]"--/succ R: succeeds-->
<!ENTITY Sc       SDATA "[Sc      ]"--dbl succeeds-->
<!ENTITY scap     SDATA "[scap    ]"--/succapprox R: succeeds, approximate-->
<!ENTITY sccue    SDATA "[sccue   ]"--/succcurlyeq R: succeeds, curly eq-->
<!ENTITY sce      SDATA "[sce     ]"--/succeq R: succeeds, equals-->
<!ENTITY scE      SDATA "[scE     ]"--succeeds, dbl equals-->
<!ENTITY scsim    SDATA "[scsim   ]"--/succsim R: succeeds, similar-->
<!ENTITY sdote    SDATA "[sdote   ]"--equal, dot below-->
<!ENTITY sfrown   SDATA "[sfrown  ]"--/smallfrown R: small down curve-->
<!ENTITY simg     SDATA "[simg    ]"--similar, greater-->
<!ENTITY simgE    SDATA "[simgE   ]"--similar, greater, equal-->
<!ENTITY siml     SDATA "[siml    ]"--similar, less-->
<!ENTITY simlE    SDATA "[simlE   ]"--similar, less, equal-->
<!ENTITY smid     SDATA "[smid    ]"--/shortmid R:-->
<!ENTITY smile    SDATA "[smile   ]"--/smile R: up curve-->
<!ENTITY smt      SDATA "[smt     ]"--smaller than-->
<!ENTITY smte     SDATA "[smte    ]"--smaller than or equal-->
<!ENTITY smtes    SDATA "[smtes   ]"--smaller than or equal, slanted-->
<!ENTITY spar     SDATA "[spar    ]"--/shortparallel R: short parallel-->
<!ENTITY sqsub    SDATA "[sqsub   ]"--/sqsubset R: square subset-->
<!ENTITY sqsube   SDATA "[sqsube  ]"--/sqsubseteq R: square subset, equals-->
<!ENTITY sqsup    SDATA "[sqsup   ]"--/sqsupset R: square superset-->
<!ENTITY sqsupe   SDATA "[sqsupe  ]"--/sqsupseteq R: square superset, eq-->
<!ENTITY ssmile   SDATA "[ssmile  ]"--/smallsmile R: small up curve-->
<!ENTITY Sub      SDATA "[Sub     ]"--/Subset R: double subset-->
<!ENTITY subE     SDATA "[subE    ]"--/subseteqq R: subset, dbl equals-->
<!ENTITY subedot  SDATA "[subedot ]"--subset, equals, dot-->
<!ENTITY submult  SDATA "[submult ]"--subset, multiply-->
<!ENTITY subplus  SDATA "[subplus ]"--subset, plus-->
<!ENTITY subrarr  SDATA "[subrarr ]"--subset, right arrow-->
<!ENTITY subsim   SDATA "[subsim  ]"--subset, similar-->
<!ENTITY subsub   SDATA "[subsub  ]"--subset above subset-->
<!ENTITY subsup   SDATA "[subsup  ]"--subset above superset-->
<!ENTITY Sup      SDATA "[Sup     ]"--/Supset R: dbl superset-->
<!ENTITY supdsub  SDATA "[supdsub ]"--superset, subset, dash joining them-->
<!ENTITY supE     SDATA "[supE    ]"--/supseteqq R: superset, dbl equals-->
<!ENTITY supedot  SDATA "[supedot ]"--superset, equals, dot-->
```


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```
<!ENTITY suphsol  SDATA "[suphsol ]"--superset, solidus-->
<!ENTITY suphsub  SDATA "[suphsub ]"--superset, subset-->
<!ENTITY suplarr  SDATA "[suplarr ]"--superset, left arrow-->
<!ENTITY supmult  SDATA "[supmult ]"--superset, multiply-->
<!ENTITY supplus  SDATA "[supplus ]"--superset, plus-->
<!ENTITY supsim   SDATA "[supsim  ]"--superset, similar-->
<!ENTITY supsub   SDATA "[supsub  ]"--superset above subset-->
<!ENTITY supsup   SDATA "[supsup  ]"--superset above superset-->
<!ENTITY thkap    SDATA "[thkap   ]"--/thickapprox R: thick approximate-->
<!ENTITY thksim   SDATA "[thksim  ]"--/thicksim R: thick similar-->
<!ENTITY topfork  SDATA "[topfork ]"--fork with top-->
<!ENTITY trie     SDATA "[trie    ]"--/triangleq R: triangle, equals-->
<!ENTITY twixt    SDATA "[twixt   ]"--/between R: between-->
<!ENTITY vBar     SDATA "[vBar    ]"--vert, dbl bar (under)-->
<!ENTITY Vbar     SDATA "[Vbar    ]"--dbl vert, bar (under)-->
<!ENTITY vBarv    SDATA "[vBarv   ]"--dbl bar, vert over and under-->
<!ENTITY vdash    SDATA "[vdash   ]"--/vdash R: vertical, dash-->
<!ENTITY vDash    SDATA "[vDash   ]"--/vDash R: vertical, dbl dash-->
<!ENTITY Vdash    SDATA "[Vdash   ]"--/Vdash R: dbl vertical, dash-->
<!ENTITY VDash    SDATA "[VDash   ]"--dbl vert, dbl dash-->
<!ENTITY Vdashl   SDATA "[Vdashl  ]"--vertical, dash (long)-->
<!ENTITY vltri    SDATA "[vltri   ]"--/vartriangleleft R: l tri, open, var-->
<!ENTITY vprop    SDATA "[vprop   ]"--/varpropto R: proportional, variant-->
<!ENTITY vrtri    SDATA "[vrtri   ]"--/vartriangleright R: r tri, open, var-->
<!ENTITY Vvdash   SDATA "[Vvdash  ]"--/Vvdash R: triple vertical, dash-->
```

6.2.4 Negated Relations

```
<!-- (C) International Organization for Standardization 1991
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-->
<!-- Character entity set. Typical invocation:
     <!ENTITY % ISOAMSN  PUBLIC
       "ISO 9573-13:1991//ENTITIES Added Math Symbols: Negated Relations //EN">
     %ISOAMSN;
-->
<!ENTITY gnap     SDATA "[gnap    ]"--/gnapprox N: greater, not approximate-->
<!ENTITY gne      SDATA "[gne     ]"--/gneq N: greater, not equals-->
<!ENTITY gnE      SDATA "[gnE     ]"--/gneqq N: greater, not dbl equals-->
<!ENTITY gnsim    SDATA "[gnsim   ]"--/gnsim N: greater, not similar-->
<!ENTITY gvnE     SDATA "[gvnE    ]"--/gvertneqq N: gt, vert, not dbl eq-->
<!ENTITY lnap     SDATA "[lnap    ]"--/lnapprox N: less, not approximate-->
<!ENTITY lne      SDATA "[lne     ]"--/lneq N: less, not equals-->
<!ENTITY lnE      SDATA "[lnE     ]"--/lneqq N: less, not double equals-->
<!ENTITY lnsim    SDATA "[lnsim   ]"--/lnsim N: less, not similar-->
<!ENTITY lvnE     SDATA "[lvnE    ]"--/lvertneqq N: less, vert, not dbl eq-->
<!ENTITY nap      SDATA "[nap     ]"--/napprox N: not approximate-->
<!ENTITY napE     SDATA "[napE    ]"--not approximately equal or equal to-->
<!ENTITY napid    SDATA "[napid   ]"--not approximately identical to-->
<!ENTITY ncong    SDATA "[ncong   ]"--/ncong N: not congruent with-->
<!ENTITY ncongdot SDATA "[ncongdot]"--not congruent, dot-->
<!ENTITY nequiv   SDATA "[nequiv  ]"--/nequiv N: not identical with-->
<!ENTITY nge      SDATA "[nge     ]"--/ngeq N: not greater-than-or-equal-->
<!ENTITY ngE      SDATA "[ngE     ]"--/ngeqq N: not greater, dbl equals-->
<!ENTITY nges     SDATA "[nges    ]"--/ngeqslant N: not gt-or-eq, slanted-->
<!ENTITY nGg      SDATA "[nGg     ]"--not triple greater than-->
<!ENTITY ngsim    SDATA "[ngsim   ]"--not greater, similar-->
<!ENTITY ngt      SDATA "[ngt     ]"--/ngtr N: not greater-than-->
<!ENTITY nGt      SDATA "[nGt     ]"--not, vert, much greater than-->
```

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```
<!ENTITY nGtv     SDATA "[nGtv    ]"--not much greater than, variant-->
<!ENTITY nle      SDATA "[nle     ]"--/nleq N: not less-than-or-equal-->
<!ENTITY nlE      SDATA "[nlE     ]"--/nleqq N: not less, dbl equals-->
<!ENTITY nles     SDATA "[nles    ]"--/nleqslant N: not less-or-eq, slant-->
<!ENTITY nLl      SDATA "[nLl     ]"--not triple less than-->
<!ENTITY nlsim    SDATA "[nlsim   ]"--not less, similar-->
<!ENTITY nlt      SDATA "[nlt     ]"--/nless N: not less-than-->
<!ENTITY nLt      SDATA "[nLt     ]"--not, vert, much less than-->
<!ENTITY nltri    SDATA "[nltri   ]"--/ntriangleleft N: not left triangle-->
<!ENTITY nltrie   SDATA "[nltrie  ]"--/ntrianglelefteq N: not l tri, eq-->
<!ENTITY nLtv     SDATA "[nLtv    ]"--not much less than, variant-->
<!ENTITY nmid     SDATA "[nmid    ]"--/nmid-->
<!ENTITY npar     SDATA "[npar    ]"--/nparallel N: not parallel-->
<!ENTITY npr      SDATA "[npr     ]"--/nprec N: not precedes-->
<!ENTITY nprcue   SDATA "[nprcue  ]"--not curly precedes, eq-->
<!ENTITY npre     SDATA "[npre    ]"--/npreceq N: not precedes, equals-->
<!ENTITY nrtri    SDATA "[nrtri   ]"--/ntriangleright N: not rt triangle-->
<!ENTITY nrtrie   SDATA "[nrtrie  ]"--/ntrianglerighteq N: not r tri, eq-->
<!ENTITY nsc      SDATA "[nsc     ]"--/nsucc N: not succeeds-->
<!ENTITY nsccue   SDATA "[nsccue  ]"--not succeeds, curly eq-->
<!ENTITY nsce     SDATA "[nsce    ]"--/nsucceq N: not succeeds, equals-->
<!ENTITY nsim     SDATA "[nsim    ]"--/nsim N: not similar-->
<!ENTITY nsime    SDATA "[nsime   ]"--/nsimeq N: not similar, equals-->
<!ENTITY nsmid    SDATA "[nsmid   ]"--/nshortmid-->
<!ENTITY nspar    SDATA "[nspar   ]"--/nshortparallel N: not short par-->
<!ENTITY nsqsube  SDATA "[nsqsube ]"--not, square subset, equals-->
<!ENTITY nsqsupe  SDATA "[nsqsupe ]"--not, square superset, equals-->
<!ENTITY nsub     SDATA "[nsub    ]"--not subset-->
<!ENTITY nsube    SDATA "[nsube   ]"--/nsubseteq N: not subset, equals-->
<!ENTITY nsubE    SDATA "[nsubE   ]"--/nsubseteqq N: not subset, dbl eq-->
<!ENTITY nsup     SDATA "[nsup    ]"--not superset-->
<!ENTITY nsupe    SDATA "[nsupe   ]"--/nsupseteq N: not superset, equals-->
<!ENTITY nsupE    SDATA "[nsupE   ]"--/nsupseteqq N: not superset, dbl eq-->
<!ENTITY ntgl     SDATA "[ntgl    ]"--not greater, less-->
<!ENTITY ntlg     SDATA "[ntlg    ]"--not less, greater-->
<!ENTITY nvap     SDATA "[nvap    ]"--not, vert, approximate-->
<!ENTITY nvdash   SDATA "[nvdash  ]"--/nvdash N: not vertical, dash-->
<!ENTITY nvDash   SDATA "[nvDash  ]"--/nvDash N: not vertical, dbl dash-->
<!ENTITY nVdash   SDATA "[nVdash  ]"--/nVdash N: not dbl vertical, dash-->
<!ENTITY nVDash   SDATA "[nVDash  ]"--/nVDash N: not dbl vert, dbl dash-->
<!ENTITY nvge     SDATA "[nvge    ]"--not, vert, greater-than-or-equal-->
<!ENTITY nvgt     SDATA "[nvgt    ]"--not, vert, greater-than-->
<!ENTITY nvle     SDATA "[nvle    ]"--not, vert, less-than-or-equal-->
<!ENTITY nvlt     SDATA "[nvlt    ]"--not, vert, less-than-->
<!ENTITY nvltrie  SDATA "[nvltrie ]"--not, vert, left triangle, equals-->
<!ENTITY nvrtrie  SDATA "[nvrtrie ]"--not, vert, right triangle, equals-->
<!ENTITY nvsim    SDATA "[nvsim   ]"--not, vert, similar-->
<!ENTITY parsim   SDATA "[parsim  ]"--parallel, similar-->
<!ENTITY prnap    SDATA "[prnap   ]"--/precnapprox N: precedes, not approx-->
<!ENTITY prnE     SDATA "[prnE    ]"--/precneqq N: precedes, not dbl eq-->
<!ENTITY prnsim   SDATA "[prnsim  ]"--/precnsim N: precedes, not similar-->
<!ENTITY rnmid    SDATA "[rnmid   ]"--reverse /nmid-->
<!ENTITY scnap    SDATA "[scnap   ]"--/succnapprox N: succeeds, not approx-->
<!ENTITY scnE     SDATA "[scnE    ]"--/succneqq N: succeeds, not dbl eq-->
<!ENTITY scnsim   SDATA "[scnsim  ]"--/succnsim N: succeeds, not similar-->
<!ENTITY simne    SDATA "[simne   ]"--similar, not equals-->
<!ENTITY solbar   SDATA "[solbar  ]"--solidus, bar through-->
<!ENTITY subne    SDATA "[subne   ]"--/subsetneq N: subset, not equals-->
<!ENTITY subnE    SDATA "[subnE   ]"--/subsetneqq N: subset, not dbl eq-->
<!ENTITY supne    SDATA "[supne   ]"--/supsetneq N: superset, not equals-->
<!ENTITY supnE    SDATA "[supnE   ]"--/supsetneqq N: superset, not dbl eq-->
<!ENTITY vnsub    SDATA "[vnsub   ]"--/nsubset N: not subset, var-->
```


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```
<!ENTITY vnsup    SDATA "[vnsup   ]"--/nsupset N: not superset, var-->
<!ENTITY vsubne   SDATA "[vsubne  ]"--/varsubsetneq N: subset, not eq, var-->
<!ENTITY vsubnE   SDATA "[vsubnE  ]"--/varsubsetneqq N: subset not dbl eq, var-->
<!ENTITY vsupne   SDATA "[vsupne  ]"--/varsupsetneq N: superset, not eq, var-->
<!ENTITY vsupnE   SDATA "[vsupnE  ]"--/varsupsetneqq N: super not dbl eq, var-->
```

6.2.5 Arrow Relations

```
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-->
<!-- Character entity set. Typical invocation:
     <!ENTITY % ISOAMSA  PUBLIC
       "ISO 9573-13:1991//ENTITIES Added Math Symbols: Arrow Relations //EN">
     %ISOAMSA;
-->
<!ENTITY angzarr  SDATA "[angzarr ]"--angle with down zig-zag arrow-->
<!ENTITY cirmid   SDATA "[cirmid  ]"--circle, mid below-->
<!ENTITY cudarrl  SDATA "[cudarrl ]"--left, curved, down arrow-->
<!ENTITY cudarrr  SDATA "[cudarrr ]"--right, curved, down arrow-->
<!ENTITY cularr   SDATA "[cularr  ]"--/curvearrowleft A: left curved arrow-->
<!ENTITY cularrp  SDATA "[cularrp ]"--curved left arrow with plus-->
<!ENTITY curarr   SDATA "[curarr  ]"--/curvearrowright A: rt curved arrow-->
<!ENTITY curarrm  SDATA "[curarrm ]"--curved right arrow with minus-->
<!ENTITY dArr     SDATA "[dArr    ]"--/Downarrow A: down dbl arrow-->
<!ENTITY Darr     SDATA "[Darr    ]"--down two-headed arrow-->
<!ENTITY ddarr    SDATA "[ddarr   ]"--/downdownarrows A: two down arrows-->
<!ENTITY DDotrahd SDATA "[DDotrahd]"--right arrow with dotted stem-->
<!ENTITY dfisht   SDATA "[dfisht  ]"--down fish tail-->
<!ENTITY dHar     SDATA "[dHar    ]"--down harpoon-left, down harpoon-right-->
<!ENTITY dharl    SDATA "[dharl   ]"--/downharpoonleft A: dn harpoon-left-->
<!ENTITY dharr    SDATA "[dharr   ]"--/downharpoonright A: down harpoon-rt-->
<!ENTITY duarr    SDATA "[duarr   ]"--down arrow, up arrow-->
<!ENTITY duhar    SDATA "[duhar   ]"--down harp, up harp-->
<!ENTITY dzigrarr SDATA "[dzigrarr]"--right long zig-zag arrow-->
<!ENTITY erarr    SDATA "[erarr   ]"--equal, right arrow below-->
<!ENTITY harr     SDATA "[harr    ]"--/leftrightarrow A: l&r arrow-->
<!ENTITY hArr     SDATA "[hArr    ]"--/Leftrightarrow A: l&r dbl arrow-->
<!ENTITY harrcir  SDATA "[harrcir ]"--left and right arrow with a circle-->
<!ENTITY harrw    SDATA "[harrw   ]"--/leftrightsquigarrow A: l&r arr-wavy-->
<!ENTITY hoarr    SDATA "[hoarr   ]"--horizontal open arrow-->
<!ENTITY imof     SDATA "[imof    ]"--image of-->
<!ENTITY lAarr    SDATA "[lAarr   ]"--/Lleftarrow A: left triple arrow-->
<!ENTITY Larr     SDATA "[Larr    ]"--/twoheadleftarrow A:-->
<!ENTITY larrbfs  SDATA "[larrbfs ]"--left arrow-bar, filled square-->
<!ENTITY larrfs   SDATA "[larrfs  ]"--left arrow, filled square-->
<!ENTITY larrhk   SDATA "[larrhk  ]"--/hookleftarrow A: left arrow-hooked-->
<!ENTITY larrlp   SDATA "[larrlp  ]"--/looparrowleft A: left arrow-looped-->
<!ENTITY larrpl   SDATA "[larrpl  ]"--left arrow, plus-->
<!ENTITY larrsim  SDATA "[larrsim ]"--left arrow, similar-->
<!ENTITY larrtl   SDATA "[larrtl  ]"--/leftarrowtail A: left arrow-tailed-->
<!ENTITY latail   SDATA "[latail  ]"--left arrow-tail-->
<!ENTITY lAtail   SDATA "[lAtail  ]"--left double arrow-tail-->
<!ENTITY lbarr    SDATA "[lbarr   ]"--left broken arrow-->
<!ENTITY lBarr    SDATA "[lBarr   ]"--left doubly broken arrow-->
<!ENTITY ldca     SDATA "[ldca    ]"--left down curved arrow-->
<!ENTITY ldrdhar  SDATA "[ldrdhar ]"--left harpoon-down over right harpoon-down-->
<!ENTITY ldrushar SDATA "[ldrushar]"--left-down-right-up harpoon-->
<!ENTITY ldsh     SDATA "[ldsh    ]"--left down angled arrow-->
```


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```
<!ENTITY lfisht   SDATA "[lfisht  ]"--left fish tail-->
<!ENTITY lHar     SDATA "[lHar    ]"--left harpoon-up over left harpoon-down-->
<!ENTITY lhard    SDATA "[lhard   ]"--/leftharpoondown A: l harpoon-down-->
<!ENTITY lharu    SDATA "[lharu   ]"--/leftharpoonup A: left harpoon-up-->
<!ENTITY lharul   SDATA "[lharul  ]"--left harpoon-up over long dash-->
<!ENTITY llarr    SDATA "[llarr   ]"--/leftleftarrows A: two left arrows-->
<!ENTITY llhard   SDATA "[llhard  ]"--left harpoon-down below long dash-->
<!ENTITY loarr    SDATA "[loarr   ]"--left open arrow-->
<!ENTITY lrarr    SDATA "[lrarr   ]"--/leftrightarrows A: l arr over r arr-->
<!ENTITY lrhar    SDATA "[lrhar   ]"--/leftrightharpoons A: l harp over r-->
<!ENTITY lrhard   SDATA "[lrhard  ]"--right harpoon-down below long dash-->
<!ENTITY lsh      SDATA "[lsh     ]"--/Lsh A:-->
<!ENTITY lurdshar SDATA "[lurdshar]"--left-up-right-down harpoon-->
<!ENTITY luruhar  SDATA "[luruhar ]"--left harpoon-up over right harpoon-up-->
<!ENTITY map      SDATA "[map     ]"--/mapsto A:-->
<!ENTITY Map      SDATA "[Map     ]"--twoheaded mapsto-->
<!ENTITY midcir   SDATA "[midcir  ]"--mid, circle below-->
<!ENTITY mumap    SDATA "[mumap   ]"--/multimap A:-->
<!ENTITY nearhk   SDATA "[nearhk  ]"--NE arrow-hooked-->
<!ENTITY nearr    SDATA "[nearr   ]"--/nearrow A: NE pointing arrow-->
<!ENTITY neArr    SDATA "[neArr   ]"--NE pointing dbl arrow-->
<!ENTITY nesear   SDATA "[nesear  ]"--/toea A: NE & SE arrows-->
<!ENTITY nharr    SDATA "[nharr   ]"--/nleftrightarrow A: not l&r arrow-->
<!ENTITY nhArr    SDATA "[nhArr   ]"--/nLeftrightarrow A: not l&r dbl arr-->
<!ENTITY nlarr    SDATA "[nlarr   ]"--/nleftarrow A: not left arrow-->
<!ENTITY nlArr    SDATA "[nlArr   ]"--/nLeftarrow A: not implied by-->
<!ENTITY nrarr    SDATA "[nrarr   ]"--/nrightarrow A: not right arrow-->
<!ENTITY nrArr    SDATA "[nrArr   ]"--/nRightarrow A: not implies-->
<!ENTITY nrarrc   SDATA "[nrarrc  ]"--not right arrow-curved-->
<!ENTITY nrarrw   SDATA "[nrarrw  ]"--not right arrow-wavy-->
<!ENTITY nvHarr   SDATA "[nvHarr  ]"--not, vert, left and right double arrow-->
<!ENTITY nvlArr   SDATA "[nvlArr  ]"--not, vert, left double arrow-->
<!ENTITY nvrArr   SDATA "[nvrArr  ]"--not, vert, right double arrow-->
<!ENTITY nwarhk   SDATA "[nwarhk  ]"--NW arrow-hooked-->
<!ENTITY nwarr    SDATA "[nwarr   ]"--/nwarrow A: NW pointing arrow-->
<!ENTITY nwArr    SDATA "[nwArr   ]"--NW pointing dbl arrow-->
<!ENTITY nwnear   SDATA "[nwnear  ]"--NW & NE arrows-->
<!ENTITY olarr    SDATA "[olarr   ]"--/circlearrowleft A: l arr in circle-->
<!ENTITY orarr    SDATA "[orarr   ]"--/circlearrowright A: r arr in circle-->
<!ENTITY origof   SDATA "[origof  ]"--original of-->
<!ENTITY rAarr    SDATA "[rAarr   ]"--/Rrightarrow A: right triple arrow-->
<!ENTITY Rarr     SDATA "[Rarr    ]"--/twoheadrightarrow A:-->
<!ENTITY rarrap   SDATA "[rarrap  ]"--approximate, right arrow above-->
<!ENTITY rarrbfs  SDATA "[rarrbfs ]"--right arrow-bar, filled square-->
<!ENTITY rarrc    SDATA "[rarrc   ]"--right arrow-curved-->
<!ENTITY rarrfs   SDATA "[rarrfs  ]"--right arrow, filled square-->
<!ENTITY rarrhk   SDATA "[rarrhk  ]"--/hookrightarrow A: rt arrow-hooked-->
<!ENTITY rarrlp   SDATA "[rarrlp  ]"--/looparrowright A: rt arrow-looped-->
<!ENTITY rarrpl   SDATA "[rarrpl  ]"--right arrow, plus-->
<!ENTITY rarrsim  SDATA "[rarrsim ]"--right arrow, similar-->
<!ENTITY rarrtl   SDATA "[rarrtl  ]"--/rightarrowtail A: rt arrow-tailed-->
<!ENTITY Rarrtl   SDATA "[Rarrtl  ]"--right two-headed arrow with tail-->
<!ENTITY rarrw    SDATA "[rarrw   ]"--/rightsquigarrow A: rt arrow-wavy-->
<!ENTITY ratail   SDATA "[ratail  ]"--right arrow-tail-->
<!ENTITY rAtail   SDATA "[rAtail  ]"--right double arrow-tail-->
<!ENTITY rbarr    SDATA "[rbarr   ]"--/bkarow A: right broken arrow-->
<!ENTITY rBarr    SDATA "[rBarr   ]"--/dbkarow A: right doubly broken arrow-->
<!ENTITY RBarr    SDATA "[RBarr   ]"--/drbkarow A: twoheaded right broken arrow-->
<!ENTITY rdca     SDATA "[rdca    ]"--right down curved arrow-->
<!ENTITY rdldhar  SDATA "[rdldhar ]"--right harpoon-down over left harpoon-down-->
<!ENTITY rdsh     SDATA "[rdsh    ]"--right down angled arrow-->
<!ENTITY rfisht   SDATA "[rfisht  ]"--right fish tail-->
```


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```
<!ENTITY rHar     SDATA "[rHar    ]"--right harpoon-up over right harpoon-down-->
<!ENTITY rhard    SDATA "[rhard   ]"--/rightharpoondown A: rt harpoon-down-->
<!ENTITY rharu    SDATA "[rharu   ]"--/rightharpoonup A: rt harpoon-up-->
<!ENTITY rharul   SDATA "[rharul  ]"--right harpoon-up over long dash-->
<!ENTITY rlarr    SDATA "[rlarr   ]"--/rightleftarrows A: r arr over l arr-->
<!ENTITY rlhar    SDATA "[rlhar   ]"--/rightleftharpoons A: r harp over l-->
<!ENTITY roarr    SDATA "[roarr   ]"--right open arrow-->
<!ENTITY rrarr    SDATA "[rrarr   ]"--/rightrightarrows A: two rt arrows-->
<!ENTITY rsh      SDATA "[rsh     ]"--/Rsh A:-->
<!ENTITY ruluhar  SDATA "[ruluhar ]"--right harpoon-up over left harpoon-up-->
<!ENTITY searhk   SDATA "[searhk  ]"--/hksearow A: SE arrow-hooken-->
<!ENTITY searr    SDATA "[searr   ]"--/searrow A: SE pointing arrow-->
<!ENTITY seArr    SDATA "[seArr   ]"--SE pointing dbl arrow-->
<!ENTITY seswar   SDATA "[seswar  ]"--/tosa A: SE & SW arrows-->
<!ENTITY simrarr  SDATA "[simrarr ]"--similar, right arrow below-->
<!ENTITY slarr    SDATA "[slarr   ]"--short left arrow-->
<!ENTITY srarr    SDATA "[srarr   ]"--short right arrow-->
<!ENTITY swarhk   SDATA "[swarhk  ]"--/hkswarow A: SW arrow-hooked-->
<!ENTITY swarr    SDATA "[swarr   ]"--/swarrow A: SW pointing arrow-->
<!ENTITY swArr    SDATA "[swArr   ]"--SW pointing dbl arrow-->
<!ENTITY swnwar   SDATA "[swnwar  ]"--SW & NW arrows-->
<!ENTITY uArr     SDATA "[uArr    ]"--/Uparrow A: up dbl arrow-->
<!ENTITY Uarr     SDATA "[Uarr    ]"--up two-headed arrow-->
<!ENTITY Uarrocir SDATA "[Uarrocir]"--up two-headed arrow above circle-->
<!ENTITY udarr    SDATA "[udarr   ]"--up arrow, down arrow-->
<!ENTITY udhar    SDATA "[udhar   ]"--up harp, down harp-->
<!ENTITY ufisht   SDATA "[ufisht  ]"--up fish tail-->
<!ENTITY uHar     SDATA "[uHar    ]"--up harpoon-left, up harpoon-right-->
<!ENTITY uharl    SDATA "[uharl   ]"--/upharpoonleft A: up harpoon-left-->
<!ENTITY uharr    SDATA "[uharr   ]"--/upharpoonright /restriction A: up harp-r-->
<!ENTITY uuarr    SDATA "[uuarr   ]"--/upuparrows A: two up arrows-->
<!ENTITY varr     SDATA "[varr    ]"--/updownarrow A: up&down arrow-->
<!ENTITY vArr     SDATA "[vArr    ]"--/Updownarrow A: up&down dbl arrow-->
<!ENTITY xharr    SDATA "[xharr   ]"--/longleftrightarrow A: long l&r arr-->
<!ENTITY xhArr    SDATA "[xhArr   ]"--/Longleftrightarrow A: long l&r dbl arr-->
<!ENTITY xlarr    SDATA "[xlarr   ]"--/longleftarrow A: long left arrow-->
<!ENTITY xlArr    SDATA "[xlArr   ]"--/Longleftarrow A: long l dbl arrow-->
<!ENTITY xmap     SDATA "[xmap    ]"--/longmapsto A:-->
<!ENTITY xrarr    SDATA "[xrarr   ]"--/longrightarrow A: long right arrow-->
<!ENTITY xrArr    SDATA "[xrArr   ]"--/Longrightarrow A: long rt dbl arr-->
<!ENTITY zigrarr  SDATA "[zigrarr ]"--right zig-zag arrow-->
```

6.2.6 Opening and Closing Delimiters

```
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-->
<!-- Character entity set. Typical invocation:
     <!ENTITY % ISOAMSC  PUBLIC
       "ISO 9573-13:1991//ENTITIES Added Math Symbols: Delimiters //EN">
     %ISOAMSC;
-->
<!ENTITY dlcorn   SDATA "[dlcorn  ]"--/llcorner O: lower left corner-->
<!ENTITY drcorn   SDATA "[drcorn  ]"--/lrcorner C: lower right corner-->
<!ENTITY gtlPar   SDATA "[gtlPar  ]"--dbl left parenthesis, greater-->
<!ENTITY langd    SDATA "[langd   ]"--left angle, dot-->
<!ENTITY lbrke    SDATA "[lbrke   ]"--left bracket, equal-->
<!ENTITY lbrksld  SDATA "[lbrksld ]"--left bracket, solidus bottom corner-->
<!ENTITY lbrkslu  SDATA "[lbrkslu ]"--left bracket, solidus top corner-->
```


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```
<!ENTITY lceil    SDATA "[lceil   ]"--/lceil O: left ceiling-->
<!ENTITY lfloor   SDATA "[lfloor  ]"--/lfloor O: left floor-->
<!ENTITY lmoust   SDATA "[lmoust  ]"--/lmoustache-->
<!ENTITY lparlt   SDATA "[lparlt  ]"--O: left parenthesis, lt-->
<!ENTITY ltrPar   SDATA "[ltrPar  ]"--dbl right parenthesis, less-->
<!ENTITY rangd    SDATA "[rangd   ]"--right angle, dot-->
<!ENTITY rbrke    SDATA "[rbrke   ]"--right bracket, equal-->
<!ENTITY rbrksld  SDATA "[rbrksld ]"--right bracket, solidus bottom corner-->
<!ENTITY rbrkslu  SDATA "[rbrkslu ]"--right bracket, solidus top corner-->
<!ENTITY rceil    SDATA "[rceil   ]"--/rceil C: right ceiling-->
<!ENTITY rfloor   SDATA "[rfloor  ]"--/rfloor C: right floor-->
<!ENTITY rmoust   SDATA "[rmoust  ]"--/rmoustache-->
<!ENTITY rpargt   SDATA "[rpargt  ]"--C: right paren, gt-->
<!ENTITY ulcorn   SDATA "[ulcorn  ]"--/ulcorner O: upper left corner-->
<!ENTITY urcorn   SDATA "[urcorn  ]"--/urcorner C: upper right corner-->
```

6.3 Symbols based on the Latin alphabet

6.3.1 Fraktur

```
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-->
<!-- Character entity set. Typical invocation:
     <!ENTITY % ISOMFRK  PUBLIC
       "ISO 9573-13:1991//ENTITIES Math Alphabets: Fraktur //EN">
     %ISOMFRK;
-->
<!ENTITY afr      SDATA "[afr     ]"--/frak a, lower case a-->
<!ENTITY Afr      SDATA "[Afr     ]"--/frak A, upper case a-->
<!ENTITY bfr      SDATA "[bfr     ]"--/frak b, lower case b-->
<!ENTITY Bfr      SDATA "[Bfr     ]"--/frak B, upper case b-->
<!ENTITY cfr      SDATA "[cfr     ]"--/frak c, lower case c-->
<!ENTITY Cfr      SDATA "[Cfr     ]"--/frak C, upper case c-->
<!ENTITY dfr      SDATA "[dfr     ]"--/frak d, lower case d-->
<!ENTITY Dfr      SDATA "[Dfr     ]"--/frak D, upper case d-->
<!ENTITY efr      SDATA "[efr     ]"--/frak e, lower case e-->
<!ENTITY Efr      SDATA "[Efr     ]"--/frak E, upper case e-->
<!ENTITY ffr      SDATA "[ffr     ]"--/frak f, lower case f-->
<!ENTITY Ffr      SDATA "[Ffr     ]"--/frak F, upper case f-->
<!ENTITY gfr      SDATA "[gfr     ]"--/frak g, lower case g-->
<!ENTITY Gfr      SDATA "[Gfr     ]"--/frak G, upper case g-->
<!ENTITY hfr      SDATA "[hfr     ]"--/frak h, lower case h-->
<!ENTITY Hfr      SDATA "[Hfr     ]"--/frak H, upper case h-->
<!ENTITY ifr      SDATA "[ifr     ]"--/frak i, lower case i-->
<!ENTITY Ifr      SDATA "[Ifr     ]"--/frak I, upper case i-->
<!ENTITY jfr      SDATA "[jfr     ]"--/frak j, lower case j-->
<!ENTITY Jfr      SDATA "[Jfr     ]"--/frak J, upper case j-->
<!ENTITY kfr      SDATA "[kfr     ]"--/frak k, lower case k-->
<!ENTITY Kfr      SDATA "[Kfr     ]"--/frak K, upper case k-->
<!ENTITY lfr      SDATA "[lfr     ]"--/frak l, lower case l-->
<!ENTITY Lfr      SDATA "[Lfr     ]"--/frak L, upper case l-->
<!ENTITY mfr      SDATA "[mfr     ]"--/frak m, lower case m-->
<!ENTITY Mfr      SDATA "[Mfr     ]"--/frak M, upper case m-->
<!ENTITY nfr      SDATA "[nfr     ]"--/frak n, lower case n-->
<!ENTITY Nfr      SDATA "[Nfr     ]"--/frak N, upper case n-->
<!ENTITY ofr      SDATA "[ofr     ]"--/frak o, lower case o-->
<!ENTITY Ofr      SDATA "[Ofr     ]"--/frak O, upper case o-->
<!ENTITY pfr      SDATA "[pfr     ]"--/frak p, lower case p-->
```


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```
<!ENTITY Pfr      SDATA "[Pfr     ]"--/frak P, upper case p-->
<!ENTITY qfr      SDATA "[qfr     ]"--/frak q, lower case q-->
<!ENTITY Qfr      SDATA "[Qfr     ]"--/frak Q, upper case q-->
<!ENTITY rfr      SDATA "[rfr     ]"--/frak r, lower case r-->
<!ENTITY Rfr      SDATA "[Rfr     ]"--/frak R, upper case r-->
<!ENTITY sfr      SDATA "[sfr     ]"--/frak s, lower case s-->
<!ENTITY Sfr      SDATA "[Sfr     ]"--/frak S, upper case s-->
<!ENTITY tfr      SDATA "[tfr     ]"--/frak t, lower case t-->
<!ENTITY Tfr      SDATA "[Tfr     ]"--/frak T, upper case t-->
<!ENTITY ufr      SDATA "[ufr     ]"--/frak u, lower case u-->
<!ENTITY Ufr      SDATA "[Ufr     ]"--/frak U, upper case u-->
<!ENTITY vfr      SDATA "[vfr     ]"--/frak v, lower case v-->
<!ENTITY Vfr      SDATA "[Vfr     ]"--/frak V, upper case v-->
<!ENTITY wfr      SDATA "[wfr     ]"--/frak w, lower case w-->
<!ENTITY Wfr      SDATA "[Wfr     ]"--/frak W, upper case w-->
<!ENTITY xfr      SDATA "[xfr     ]"--/frak x, lower case x-->
<!ENTITY Xfr      SDATA "[Xfr     ]"--/frak X, upper case x-->
<!ENTITY yfr      SDATA "[yfr     ]"--/frak y, lower case y-->
<!ENTITY Yfr      SDATA "[Yfr     ]"--/frak Y, upper case y-->
<!ENTITY zfr      SDATA "[zfr     ]"--/frak z, lower case z-->
<!ENTITY Zfr      SDATA "[Zfr     ]"--/frak Z, upper case z-->
```

6.3.2 Open Face (Blackboard Bold)

```
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-->
<!-- Character entity set. Typical invocation:
     <!ENTITY % ISOMOPF  PUBLIC
       "ISO 9573-13:1991//ENTITIES Math Alphabets: Open Face //EN">
     %ISOMOPF;
-->
<!ENTITY Aopf     SDATA "[Aopf    ]"--/Bbb A, open face A-->
<!ENTITY Bopf     SDATA "[Bopf    ]"--/Bbb B, open face B-->
<!ENTITY Copf     SDATA "[Copf    ]"--/Bbb C, open face C-->
<!ENTITY Dopf     SDATA "[Dopf    ]"--/Bbb D, open face D-->
<!ENTITY Eopf     SDATA "[Eopf    ]"--/Bbb E, open face E-->
<!ENTITY Fopf     SDATA "[Fopf    ]"--/Bbb F, open face F-->
<!ENTITY Gopf     SDATA "[Gopf    ]"--/Bbb G, open face G-->
<!ENTITY Hopf     SDATA "[Hopf    ]"--/Bbb H, open face H-->
<!ENTITY Iopf     SDATA "[Iopf    ]"--/Bbb I, open face I-->
<!ENTITY Jopf     SDATA "[Jopf    ]"--/Bbb J, open face J-->
<!ENTITY Kopf     SDATA "[Kopf    ]"--/Bbb K, open face K-->
<!ENTITY Lopf     SDATA "[Lopf    ]"--/Bbb L, open face L-->
<!ENTITY Mopf     SDATA "[Mopf    ]"--/Bbb M, open face M-->
<!ENTITY Nopf     SDATA "[Nopf    ]"--/Bbb N, open face N-->
<!ENTITY Oopf     SDATA "[Oopf    ]"--/Bbb O, open face O-->
<!ENTITY Popf     SDATA "[Popf    ]"--/Bbb P, open face P-->
<!ENTITY Qopf     SDATA "[Qopf    ]"--/Bbb Q, open face Q-->
<!ENTITY Ropf     SDATA "[Ropf    ]"--/Bbb R, open face R-->
<!ENTITY Sopf     SDATA "[Sopf    ]"--/Bbb S, open face S-->
<!ENTITY Topf     SDATA "[Topf    ]"--/Bbb T, open face T-->
<!ENTITY Uopf     SDATA "[Uopf    ]"--/Bbb U, open face U-->
<!ENTITY Vopf     SDATA "[Vopf    ]"--/Bbb V, open face V-->
<!ENTITY Wopf     SDATA "[Wopf    ]"--/Bbb W, open face W-->
<!ENTITY Xopf     SDATA "[Xopf    ]"--/Bbb X, open face X-->
<!ENTITY Yopf     SDATA "[Yopf    ]"--/Bbb Y, open face Y-->
<!ENTITY Zopf     SDATA "[Zopf    ]"--/Bbb Z, open face Z-->
```

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6.3.3 Script

```
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-->
<!-- Character entity set. Typical invocation:
     <!ENTITY % ISOMSCR  PUBLIC
       "ISO 9573-13:1991//ENTITIES Math Alphabets: Script //EN">
     %ISOMSCR;
-->
<!ENTITY ascr     SDATA "[ascr    ]"--/scr a, script letter a-->
<!ENTITY Ascr     SDATA "[Ascr    ]"--/scr A, script letter A-->
<!ENTITY bscr     SDATA "[bscr    ]"--/scr b, script letter b-->
<!ENTITY Bscr     SDATA "[Bscr    ]"--/scr B, script letter B-->
<!ENTITY cscr     SDATA "[cscr    ]"--/scr c, script letter c-->
<!ENTITY Cscr     SDATA "[Cscr    ]"--/scr C, script letter C-->
<!ENTITY dscr     SDATA "[dscr    ]"--/scr d, script letter d-->
<!ENTITY Dscr     SDATA "[Dscr    ]"--/scr D, script letter D-->
<!ENTITY escr     SDATA "[escr    ]"--/scr e, script letter e-->
<!ENTITY Escr     SDATA "[Escr    ]"--/scr E, script letter E-->
<!ENTITY fscr     SDATA "[fscr    ]"--/scr f, script letter f-->
<!ENTITY Fscr     SDATA "[Fscr    ]"--/scr F, script letter F-->
<!ENTITY gscr     SDATA "[gscr    ]"--/scr g, script letter g-->
<!ENTITY Gscr     SDATA "[Gscr    ]"--/scr G, script letter G-->
<!ENTITY hscr     SDATA "[hscr    ]"--/scr h, script letter h-->
<!ENTITY Hscr     SDATA "[Hscr    ]"--/scr H, script letter H-->
<!ENTITY iscr     SDATA "[iscr    ]"--/scr i, script letter i-->
<!ENTITY Iscr     SDATA "[Iscr    ]"--/scr I, script letter I-->
<!ENTITY jscr     SDATA "[jscr    ]"--/scr j, script letter j-->
<!ENTITY Jscr     SDATA "[Jscr    ]"--/scr J, script letter J-->
<!ENTITY kscr     SDATA "[kscr    ]"--/scr k, script letter k-->
<!ENTITY Kscr     SDATA "[Kscr    ]"--/scr K, script letter K-->
<!ENTITY lscr     SDATA "[lscr    ]"--/scr l, script letter l-->
<!ENTITY Lscr     SDATA "[Lscr    ]"--/scr L, script letter L-->
<!ENTITY mscr     SDATA "[mscr    ]"--/scr m, script letter m-->
<!ENTITY Mscr     SDATA "[Mscr    ]"--/scr M, script letter M-->
<!ENTITY nscr     SDATA "[nscr    ]"--/scr n, script letter n-->
<!ENTITY Nscr     SDATA "[Nscr    ]"--/scr N, script letter N-->
<!ENTITY oscr     SDATA "[oscr    ]"--/scr o, script letter o-->
<!ENTITY Oscr     SDATA "[Oscr    ]"--/scr O, script letter O-->
<!ENTITY pscr     SDATA "[pscr    ]"--/scr p, script letter p-->
<!ENTITY Pscr     SDATA "[Pscr    ]"--/scr P, script letter P-->
<!ENTITY qscr     SDATA "[qscr    ]"--/scr q, script letter q-->
<!ENTITY Qscr     SDATA "[Qscr    ]"--/scr Q, script letter Q-->
<!ENTITY rscr     SDATA "[rscr    ]"--/scr r, script letter r-->
<!ENTITY Rscr     SDATA "[Rscr    ]"--/scr R, script letter R-->
<!ENTITY sscr     SDATA "[sscr    ]"--/scr s, script letter s-->
<!ENTITY Sscr     SDATA "[Sscr    ]"--/scr S, script letter S-->
<!ENTITY tscr     SDATA "[tscr    ]"--/scr t, script letter t-->
<!ENTITY Tscr     SDATA "[Tscr    ]"--/scr T, script letter T-->
<!ENTITY uscr     SDATA "[uscr    ]"--/scr u, script letter u-->
<!ENTITY Uscr     SDATA "[Uscr    ]"--/scr U, script letter U-->
<!ENTITY vscr     SDATA "[vscr    ]"--/scr v, script letter v-->
<!ENTITY Vscr     SDATA "[Vscr    ]"--/scr V, script letter V-->
<!ENTITY wscr     SDATA "[wscr    ]"--/scr w, script letter w-->
<!ENTITY Wscr     SDATA "[Wscr    ]"--/scr W, script letter W-->
<!ENTITY xscr     SDATA "[xscr    ]"--/scr x, script letter x-->
<!ENTITY Xscr     SDATA "[Xscr    ]"--/scr X, script letter X-->
<!ENTITY yscr     SDATA "[yscr    ]"--/scr y, script letter y-->
<!ENTITY Yscr     SDATA "[Yscr    ]"--/scr Y, script letter Y-->
```


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```
<!ENTITY zscr     SDATA "[zscr    ]"--/scr z, script letter z-->
<!ENTITY Zscr     SDATA "[Zscr    ]"--/scr Z, script letter Z-->
```


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Annex A
(informative)

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3) To be published.

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UDC 681.3.06:655.53

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