?≠ ?≤ ?≥ ?← ?→ ?⇒ ?∅ ?∀

exists ?∃

has ?∈

?√ ?∑

delta ?δ

?λ

intersect ?⋂

union ?⋃

and ?∧

or ?∨

not ?¬

?ƒ deƒ

booleans ?⊥ ?⊤

map ↦

greek α β γ δ ε ζ η θ ι κ λ μ ν ξ ο π ρ ς τ υ φ χ ψ ω

superscript t ⁰ ¹ ² ³ ⁴ ⁵ ⁶ ⁷ ⁸ ⁹ ⁺ ⁻ ⁼ ⁽ ⁾ ⁿ ⁱ

subscript ₀ ₁ ₂ ₃ ₄ ₅ ₆ ₇ ₈ ₉ ₊ ₋ ₌ ₍ ₎ ₐ ₑ ᵢ ⱼ ᵤ ᵥ ₓ ₔ ᵣ ᵣ

infinity ∞ ⧜ ⧝ ⧞

multiplication division × ✕ ✖ ÷

circled ⊕ ⊖ ⊗ ⊘ ⊙ ⊚ ⊛ ⊜ ⊝

squared ⊞ ⊟ ⊠ ⊡

random − ∕ ∗ ∘ ∙ ⋅ ⋆

empty set ∅

element of ∈ ∋ ∉ ∌ ⋶ ⋽ ⋲ ⋺ ⋳ ⋻

misc ∊ ∍ ⋷ ⋾ ⋴ ⋼ ⋵ ⋸ ⋹ ⫙ ⟒

binary relations of sets ⊂ ⊃ ⊆ ⊇ ⊈ ⊉ ⊊ ⊋ ⊄ ⊅ ⫅ ⫆ ⫋ ⫌ ⫃ ⫄ ⫇ ⫈ ⫉ ⫊ ⟃ ⟄ ⫏ ⫐ ⫑ ⫒ ⫓ ⫔ ⫕ ⫖ ⫘ ⋐ ⋑ ⟈ ⟉

unions ⩁ ⩂ ⩅ ⩌ ⩏ ⩐

Intersection ∩ ⩀ ⩃ ⩄ ⩍ ⩎

Binary operator on sets ∖ ⩆ ⩇ ⩈ ⩉ ⩊ ⩋ ⪽ ⪾ ⪿ ⫀ ⫁ ⫂ ⋒ ⋓

N-nary operator on sets ⋂ ⋃ ⊌ ⊍ ⊎ ⨃ ⨄ ⨅ ⨆

Joins ⨝ ⟕ ⟖ ⟗

Order

Precede and succeed ≺ ≻ ≼ ≽ ≾ ≿ ⊀ ⊁ ⋞ ⋟ ⋠ ⋡ ⋨ ⋩ ⪯ ⪰ ⪱ ⪲ ⪳ ⪴ ⪵ ⪶ ⪷ ⪸ ⪹ ⪺ ⪻ ⪼

less and greater < > ≮ ≯ ≤ ≥ ≰ ≱ ⪇ ⪈ ≦ ≧ ≨ ≩

less and greater 2 ⋜ ⋝ ⪙ ⪚ ≶ ≷ ≸ ≹ ⋚ ⋛ ⪋ ⪌ ⪑ ⪒ ⪓ ⪔

with approx ⪅ ⪆ ⪉ ⪊

less and greater with equivalence ≲ ≳ ⋦ ⋧ ≴ ≵

less and greater with similarity ⪝ ⪞ ⪟ ⪠ ⪍ ⪎ ⪏ ⪐

less and greater slanted ⩽ ⩾ ⫹ ⫺ ⪕ ⪖ ⪛ ⪜

less and greater misc ⪣ ⪤ ⪥ ⪦ ⪧ ⪨ ⪩ ⪪ ⪫ ⪬ ⪭ ⪡ ⪢ ⫷ ⫸ ⩹ ⩺ ⩻ ⩼ ≪ ≫ ⋘ ⋙ ≬

Order relation with dot ⋖ ⋗ ⩿ ⪀ ⪗ ⪘ ⪁ ⪂ ⪃ ⪄

Equality, Identity, Equivalence, Approx, Congruence

equality ≝ ≞ ≟ ≠ ∹ ≎ ≏ ⪮ ≐ ≑ ≒ ≓ ≔ ≕ ≖ ≗ ≘ ≙ ≚ ≛ ≜ ⩬ ⩭ ⩮ ⩱ ⩲ ⩦ ⩴ ⩵ ⩶ ⩷

Identity ≡ ≢ ⩧

Equivalence ≍ ≭ ≣ ⩸

Approx/almost/asymptotic equality ≁ ≂ ≃ ≄ ⋍ ≅ ≆ ≇ ≈ ≉ ≊ ≋ ≌ ⩯ ⩰

Misc equality ∻

Misc relations ⊏ ⊐ ⊑ ⊒ ⊓ ⊔ ⋢ ⋣ ⋤ ⋥ ⫴ ⫵

Normal subgroups ⊲ ⊳ ⊴ ⊵ ⋪ ⋫ ⋬ ⋭

Logic

Logic ¬ ⫬ ⫭ ⊨ ⊭ ∀ ∁ ∃ ∄ ∴ ∵ ⊦ ⊬ ⊧ ⊩ ⊮ ⊫ ⊯ ⊪ ⊰ ⊱

Logic binary ∧ ∨ ⊻ ⊼ ⊽ ⋎ ⋏ ⟑ ⟇ ⩑ ⩒ ⩓ ⩔ ⩕ ⩖ ⩗ ⩘ ⩙ ⩚ ⩛ ⩜ ⩝ ⩞ ⩟ ⩠ ⩢ ⩣ ⨇ ⨈

Logic n-nary ⋀ ⋁

Geometry

Geometry ∣ ∤ ⫮ ⌅ ⌆ ℓ ⫛

Ratio, proportion ∝ ∶ ∷ ∺

Parallel, perpendicular ∥ ∦ ⫲ ⫳ ⋕ ⟂ ⫡

Right angle ⦜ ∟ ⊾ ⦝ ⊿

Angles ∠ ∡ ⦛ ⦞ ⦟ ⦢ ⦣ ⦤ ⦥ ⦦ ⦧ ⦨ ⦩ ⦪ ⦫ ⦬ ⦭ ⦮ ⦯ ⦓ ⦔ ⦕ ⦖ ⟀

Spherical angle ∢ ⦠ ⦡

Operators

Bracket operators ⌈ ⌉ ⌊ ⌋ ⫍ ⫎

integrals ∫ ∬ ∭ ∮ ∯ ∰ ∱ ∲ ∳ ⨋ ⨌ ⨍ ⨎ ⨏ ⨐ ⨑ ⨒ ⨓ ⨔ ⨕ ⨖ ⨗ ⨘ ⨙ ⨚ ⨛ ⨜

Derivative ∂ ′ ″ ‴ ∆

vector ⨯ ∇ ⊹

Tilde Operators ∼ ∽ ⩪ ⩫ ⩳

Misc Operators ⋄ ⫶ ⫼ ⫾

Misc products ≀ ⨿ ⨼ ⨽ ⧢ ⋉ ⋊ ⋋ ⋌

n-nary sum ∑ ⨊ ⨁

n-nary product ⨀ ⨂ ∏ ∐ ⨉

Misc

Mathematica ⧴

Plus ⨢ ⨣ ⨤ ⨥ ⨦ ⨧ ⨨ ⨭ ⨮

∔ ⧺ ⧻

minus sign ∸ ⨩ ⨪ ⨫ ⨬

multiplication, product ⨰ ⨱ ⨲ ⨳

division ⋇ ⟌ ⟠

Misc indicators ∎ ± ∓ ⋮ ⋯ ⋰ ⋱

Misc symbols ∿

Tacks ⊣ ⊢ ⊥ ⊤ ⟘ ⟙ ⟛ ⟝ ⟞ ⟟ ⫧ ⫨ ⫩ ⫪ ⫫ ⫞ ⫟ ⫠

Turnstiles ⫢ ⫣ ⫤ ⫥ ⟚

Z notation ⦁ ⦂ ⨾ ⨟ ⨠ ⨡ ⩤ ⩥ ⦇ ⦈ ⦉ ⦊

Solidus, slash ⧵ ⧶ ⧷ ⧸ ⫽ ⫻ ⧹

maps, mapping, transform ⊶ ⊷ ⊸ ⟜ ⧟

empty set ⦰ ⦱ ⦲ ⦳ ⦴

Unsorted ⦵ ⦶ ⦷ ⦸ ⦹ ⦺ ⦻ ⨴ ⨵ ⨶ ⨷ ⨸ ⦼

Unsorted ⦽ ⧀ ⧁ ⧂ ⧃

Unsorted ⧡ ⧣ ⧤ ⧥ ⧦ ⧧

Unsorted ⧾ ⨞ ⧊ ⧋ ⧌ ⧍ ⨹ ⨺ ⨻

Unsorted ⧎ ⧏ ⧐ ⩡ ⩨ ⩩ ⫝̸ ⫝ ⫦

⫯ ⫰ ⫱

∾ ⊺ ⋔ ⫚ ⟊ ⟔ ⟓ ⟡ ⟢ ⟣ ⟤ ⟥

~ TILDE

∼ TILDE OPERATOR

∽ REVERSED TILDE

〜 WAVE DASH

∿ SINE WAVE

≈ ALMOST EQUAL TO

Another example:

⩳ EQUALS SIGN ABOVE TILDE OPERATOR

≌ ALL EQUAL TO

⩯ ALMOST EQUAL TO WITH CIRCUMFLEX ACCENT

⩰ APPROXIMATELY EQUAL OR EQUAL TO

ASCII: ( ) [ ] { }

Full width variant: （ ） ［ ］ ｛ ｝

White variants: ⦅ ⦆ 〚 〛 ⦃ ⦄

Common Western quotation: “ ” ‘ ’ ‹ › « »

Asian: 「 」 〈 〉 《 》 【 】 〔 〕 ⦗ ⦘ 〔➤ Intro to Chinese Punctuation〕

Asian white variant: 『 』 〖 〗 〘 〙

Half width variant: ｢ ｣

Math: ⟦ ⟧ ⟨ ⟩ ⟪ ⟫ ⟮ ⟯ ⟬ ⟭ ⌈ ⌉ ⌊ ⌋ ⦇ ⦈ ⦉ ⦊ 〔➤ Unicode: Math Symbols ∑ ∞ ∫ π ∈ ℝ²〕

Decorative: ❛ ❜ ❝ ❞ ❨ ❩ ❪ ❫ ❴ ❵ ❬ ❭ ❮ ❯ ❰ ❱ ❲ ❳

Vertical: ⏜ ⏝ ⎴ ⎵ ⏞ ⏟ ⏠ ⏡

Vertical representation form: ﹁ ﹂ ﹃ ﹄ ︹ ︺ ︻ ︼ ︗ ︘ ︿ ﹀ ︽ ︾ ﹇ ﹈ ︷ ︸

More angle brackets: 〈 〉 ⦑ ⦒ ⧼ ⧽

Small variants: ﹙ ﹚ ﹛ ﹜ ﹝ ﹞

superscript, subscript variants: ⁽ ⁾ ₍ ₎

Square bracket variants: ⦋ ⦌ ⦍ ⦎ ⦏ ⦐ ⁅ ⁆

⸢ ⸣ ⸤ ⸥

Misc brackets: ⟅ ⟆ ⦓ ⦔ ⦕ ⦖ ⸦ ⸧ ⸨ ⸩ ｟ ｠ ⧘ ⧙ ⧚ ⧛

Paraphrase: ⸜ ⸝ Omission: ⸌ ⸍ Substitution: ⸂ ⸃ ⸄ ⸅ Transposition: ⸉ ⸊

᚛ ᚜ ༺ ༻ ༼ ༽

MIDDLE DOT (interpunct) · HORIZONTAL ELLIPSIS …

EXCLAMATION MARK ! ¡ ‼ ❕

Inverted question mark ¿ Double question mark ⁇ ❓ ❔

Arabic question mark (right-to-left) ؟

Interrobang. Sacarsm mark. Rhetorical question mark. ‽

Curly quotation marks. ‘ ’ “ ”

French quotation marks. ‹ › « »

brackets ( ) { } [ ] 〈 〉 《 》 「 」 『 』

hyphen-minus -, hyphen ‐, non-breaking hypen ‑, en dash –, figure dash ‒, em dash —, horizontal bar ―,

“low line” (aka underscore), wavy low line \_ ﹏

tilde, wave dash ~ 〜

feet, minutes. PRIME ′

inches, seconds. DOUBLE PRIME ″

TRIPLE PRIME ‴

〔➤ Unicode: Math Symbols ∑ ∞ ∫ π ∈ ℝ²〕

ditto mark 〃

APOSTROPHE ' MODIFIER LETTER TURNED COMMA ʻ MODIFIER LETTER DOUBLE APOSTROPHE ˮ ARMENIAN APOSTROPHE ՚ LATIN CAPITAL LETTER SALTILLO Ꞌ LATIN SMALL LETTER SALTILLO ꞌ

SOLIDUS / REVERSE SOLIDUS \ FRACTION SLASH ⁄ BROKEN BAR ¦ VERTICAL LINE |

Ampersand & ＆ ⅋ ﹠

bullets • ◦ ‣ ⦿ ⦾ ⁃ ◘ ❥

matching bullets ⁌ ⁍ ☙ ❧

Therefore mark ∴ Because mark ∵ 〔➤ Unicode: Math Symbols ∑ ∞ ∫ π ∈ ℝ²〕

Asian reference mark ※ (used in Chinese, Japanese)

reference mark ⁑ ⁕ ⁖ ⁘ ⁙ ⁛ ⁜

asterisks \* ⁎ ∗ 〔➤ Unicode: Stars, Crosses, Dingbats ★ ♥ ✜ ☪ ☯ ☺ ☠〕

ASTERISM (used as section mark) ⁂

dagger † ‡

paragraph, section ¶ §

caret ^ degree ° number sign, pound, hash # numero sign №

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ordinal indicator (masculine, feminine) º ª

PERCENT SIGN %

PER MILLE SIGN ‰

PER TEN THOUSAND SIGN ‱

tee ⊤ up tack ⊥ index/fist ☞ lozenge ◊ tie ⁀

① ② ③

☛ 9755

x261b

BLACK RIGHT POINTING INDEX

ks ✓ ✔ ✗ ✘ 𐄂 ⍻

BALLOT BOX ☐ ☑ ☒

decorative, ornamental ❦ ❡ ❗ ❢ ❣ ❤ ❥ 〔➤ Unicode: Stars, Crosses, Dingbats ★ ♥ ✜ ☪ ☯ ☺ ☠〕

pointing finger ☜ ☝ ☞ ☟ ☚ ☛

“ ” LEFT/RIGHT DOUBLE QUOTATION MARK Curly double quote

‘ ’ LEFT/RIGHT SINGLE QUOTATION MARK curly single quote

« » LEFT/RIGHT-POINTING DOUBLE ANGLE QUOTATION French double quote

‹ › SINGLE LEFT/RIGHT-POINTING ANGLE QUOTATION ◇

『 』 LEFT/RIGHT WHITE CORNER BRACKET Chinese double quote

「 」 LEFT/RIGHT CORNER BRACKET ◇

《 》 LEFT/RIGHT DOUBLE ANGLE BRACKET Chinese title bracket

〈 〉 LEFT/RIGHT ANGLE BRACKET ◇

〖 〗 LEFT/RIGHT WHITE LENTICULAR BRACKET Chinese brackets

【 】 LEFT/RIGHT BLACK LENTICULAR BRACKET ◇

‟ DOUBLE HIGH-REVERSED-9 QUOTATION MARK ◇

„ DOUBLE LOW-9 QUOTATION MARK ◇

‚ SINGLE LOW-9 QUOTATION MARK ◇

“ … ” UK, USA, Canada, Irish, …

” … ” Swedish, Finnish, …

„ … “ German, Bulgarian, Croatian, Czech, Estonian, Icelandic, Lithuanian, Romanian, Serbian, Slovak, Slovene, Sorbian, …

„ … ” Dutch, Polish, Hungarian, …

This glyph “ (U+201C) points upper-right. This glyph can be mirrored in a vertical line or horizontal line to create the matching variation, a total of 4 possibilities (think of p q b d).

Here are the different pointing curly quotes from Unicode: “ ” ‟.

QUOTATION MARK (ASCII 34; U+0022):" (double straight quote)

APOSTROPHE (ASCII 39; U+0027):' (single straight quote)

GRAVE ACCENT (ASCII 96; U+0060):` (backtick)

RIGHT SINGLE QUOTATION MARK (U+2019):’

APOSTROPHE (ASCII 39; U+0027):'

PRIME (U+2032):′

Tab ↹ ⇄ ⇤ ⇥ ↤ ↦ ◁ ▷

space · ␣ ˽ ␠ ␢

paragraph, section, newline. ¶ § ␤ ↵ ↩ ⏎

placeholder, replacement: �

misc character, editing

ƒ ␥ ␦

Misc icons ⌗

Misc ⌜ ⌝ ⌞ ⌟ ⎔ ⎖ ⎁ ⎂ ⎃ ⎄ ⎅

checkmarks ✓ ✔ ✗ ✘ ☐ ☑ ☒ 𐄂 ⍻ ❍ ❏ ❐ ❑ ❒

OCR; Bank Check Symbols; Magnetic Ink Character Recognition

⑀ ⑁ ⑂ ⑃ ⑄ ⑅ ⑆ ⑇ ⑈ ⑉ ⑊

Return/Enter key ↵ ↩ ⏎

Arrow keys ↑ ↓ ← → ◀ ▶ ▲ ▼ ◁ ▷ △ ▽ ⇦ ⇨ ⇧ ⇩ ⬅ ➡ ⬆ ⬇

DOLLAR SIGN $

CENT SIGN ¢

EURO SIGN €

Japanese yen or Chinese Yuan ¥

EURO-CURRENCY SIGN ₠

POUND SIGN £

CURRENCY SIGN ¤

CEDI SIGN ₵

COLON SIGN ₡

AUSTRAL SIGN ₳

THAI CURRENCY SYMBOL BAHT ฿

CRUZEIRO SIGN ₢

DONG SIGN ₫

BENGALI RUPEE SIGN ৳

DRACHMA SIGN ₯

FRENCH FRANC SIGN ₣

GUARANI SIGN ₲

HRYVNIA SIGN ₴

KIP SIGN ₭

MILL SIGN ₥

NAIRA SIGN ₦

PESETA SIGN ₧

PESO SIGN ₱

GERMAN PENNY SIGN ₰

RUPEE SIGN ₨

NEW SHEQEL SIGN ₪

TUGRIK SIGN ₮

WON SIGN ₩

Circled Digits and Numbers

➀ ➁ ➂ ➃ ➄ ➅ ➆ ➇ ➈ ➉

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

➊ ➋ ➌ ➍ ➎ ➏ ➐ ➑ ➒ ➓

⓫ ⓬ ⓭ ⓮ ⓯ ⓰ ⓱ ⓲ ⓳ ⓴

digit with period 🄀 ⒈ ⒉ ⒊ ⒋ ⒌ ⒍ ⒎ ⒏ ⒐ ⒑ ⒒ ⒓ ⒔ ⒕ ⒖ ⒗ ⒘ ⒙ ⒚ ⒛

⑴ ⑵ ⑶ ⑷ ⑸ ⑹ ⑺ ⑻ ⑼ ⑽ ⑾ ⑿ ⒀ ⒁ ⒂ ⒃ ⒄ ⒅ ⒆ ⒇

double-circled numbers ⓵ ⓶ ⓷ ⓸ ⓹ ⓺ ⓻ ⓼ ⓽ ⓾

⓿

Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ Ⓖ Ⓗ Ⓘ Ⓙ Ⓚ Ⓛ Ⓜ Ⓝ Ⓞ Ⓟ Ⓠ Ⓡ Ⓢ Ⓣ Ⓤ Ⓥ Ⓦ Ⓧ Ⓨ Ⓩ

ⓐ ⓑ ⓒ ⓓ ⓔ ⓕ ⓖ ⓗ ⓘ ⓙ ⓚ ⓛ ⓜ ⓝ ⓞ ⓟ ⓠ ⓡ ⓢ ⓣ ⓤ ⓥ ⓦ ⓧ ⓨ ⓩ

⒜ ⒝ ⒞ ⒟ ⒠ ⒡ ⒢ ⒣ ⒤ ⒥ ⒦ ⒧ ⒨ ⒩ ⒪ ⒫ ⒬ ⒭ ⒮ ⒯ ⒰ ⒱ ⒲ ⒳ ⒴ ⒵

PARENTHESIZED LATIN CAPITAL LETTER

🄐 🄑 🄒 🄓 🄔 🄕 🄖 🄗 🄘 🄙 🄚 🄛 🄜 🄝 🄞 🄟 🄠 🄡 🄢 🄣 🄤 🄥 🄦 🄧 🄨 🄩

star ★ ☆ ⚝ ✩ ✪ ✫ ✬ ✭ ✮ ✯ ✰ ⭐ ⭑ ⭒

math related stars ⋆ ⍟ ≛ ⍣

arabic star (changes direction: right to left) ٭

pentagram ⛤ ⛥ ⛦ ⛧

{6, 8, 12} pointed stars ✶ ✴, ❂ ✵ ✷ ✸, ✹

asterisk \* ⁎ ⁑ ✱ ✲ ✻ ✼ ✽ ❃ ❉ ⧆ ꙳ ﹡ ＊

4-spoked asterisk ✢ ✣ ✤ ✥, 8 spoked asterisk ✳ ❊ ❋, 16-spoked asterisk ✺

math asterisk operator ∗ ⊛

sparkle ✨ ❇ ❈ snowflake ❄ ❅ ❆ florette ✿ ❀ ❁ ✾

crosses

Greek cross ✚ ✛ ✜ ✙ Latin cross ✝ ✞ ✟ ⛨ saltire cross ☓ ⛝ other cross ✠ ♰ ♱ ☩ ☦ ☨ ☧

cultural ✡ ☪ ☫ ☬ ☭ ⚒ 卐 卍 ☸ ☥ ☘ ⚜ ⚘ ⚕ ⚚ ☤ ⚓

taoism, yinyang, trigram ☯ ☰ ☱ ☲ ☳ ☴ ☵ ☶ ☷ ⚊ ⚋ ⚌ ⚍ ⚎ ⚏

❤ 10084

x2764

HEAVY BLACK HEART

ecycle symbols ♲ ♳ ♴ ♵ ♶ ♷ ♸ ♹ ♺ ♻ ♼ ♽ ♾

hazards signs ⚛ ☠ ☢ ☣ ⚠ ⚡ ☡

signs

peace sign ☮ ☺ ☻ ☹ ✌ ♥ ❤

Squares

⬛ ⬜ ■ □ ◼ ◻ ◾ ◽ ▪ ▫

▢

⧆ ⧇

❏ ❐ ❑ ❒

⧈ ▣

▤ ▥ ▦ ▧ ▨ ▩

◰ ◱ ◲ ◳

◧ ◨ ◩ ◪

⧉ ⧠

◫ ⧄ ⧅

Circles

⬤ ◯ ● ○ ⚫ ⚪ ⚬ ◌ ❍

◴ ◵ ◶ ◷

◐ ◑ ◒ ◓ ◔

◕ ◖ ◗ ◘ ◙ ◚ ◛

◉ ◍ 🔴 🔵

fisheye ◉ bullseye ◎ 〔➤ Unicode: Punctuation ＆ Printer's Symbols † ¶ © ® ™ ☙〕

⚆ ⚇ ⚈ ⚉

Circle Arcs ◜ ◝ ◞ ◟ ◠ ◡

Rectangles

▬ ▮ ▭ ▯

Triangles

▲ ▼ ◀ ▶ △ ▽ ◁ ▷

Small triangles ▴ ▾ ◂ ▸ ▵ ▿ ◃ ▹

⛛

Pointers ◄ ► ◅ ▻

◸ ◹ ◺ ◿ ◢ ◣ ◤ ◥

◬ ⟁

◭ ◮ ⧨ ⧩

Diamond, lozenge, parallelogram ◆ ◇ ⧫ ◊ ▰ ▱ ⌑

pentagon, hexagon ⬟ ⬢ ⬣

⟡

╌ ╍ ╎ ╏

┄ ┅ ┆ ┇

┈ ┉ ┊ ┋

╭ ╮ ╯ ╰ ╱ ╲ ╳ ╴ ╵ ╶ ╷ ╸ ╹ ╺ ╻ ╼ ╽ ╾

Block Elements ▁ ▂ ▃ ▄ ▅ ▆ ▇ █

Block Elements ▉ ▊ ▋ ▌ ▍ ▎ ▏

Block Elements ▔ ▀ ▐ ░ ▒ ▓ ▕

quadrant ▖ ▗ ▘ ▝ ▚ ▞ ▙ ▟ ▛ ▜

⦀ ⦙ ⦚ ⧘ ⧙ ⧚ ⧛

APL Symbols in Unicode

Here's a complete list of APL symbols in Unicode.

¯ × ÷ ∘ ∣ ∼ ≠ ≤ ≥ ≬ ⌶ ⋆ ⌾ ⍟ ⌽ ⍉ ⍝ ⍦ ⍧ ⍪ ⍫ ⍬ ⍭ ← ↑ → ↓ ∆ ∇ ∧ ∨ ∩ ∪ ⌈ ⌊ ⊤ ⊥ ⊂ ⊃ ⌿ ⍀ ⍅ ⍆ ⍏ ⍖ ⍊ ⍑ ⍋ ⍒ ⍎ ⍕ ⍱ ⍲ ○

⍳ ⍴ ⍵ ⍺

⍶ ⍷ ⍸ ⍹ ⍘ ⍙ ⍚ ⍛ ⍜ ⍮

¨ ⍡ ⍢ ⍣ ⍤ ⍥ ⍨ ⍩

⎕ ⍞ ⍠ ⍯ ⍰ ⍌ ⍍ ⍐ ⍓ ⍔ ⍗ ⌷ ⌸ ⌹ ⌺ ⌻ ⌼ ⍁ ⍂ ⍃ ⍄ ⍇ ⍈

as ℝ ℜ ℑ ⅇ ⅈ ⅉ

Lowercase

normal bold italic bold

italic sans-

serif

bold sans-

serif

bold

italic

α 𝛂 𝛼 𝜶 𝝰 𝞪

β 𝛃 𝛽 𝜷 𝝱 𝞫

γ 𝛄 𝛾 𝜸 𝝲 𝞬

δ 𝛅 𝛿 𝜹 𝝳 𝞭

ε 𝛆 𝜀 𝜺 𝝴 𝞮

ζ 𝛇 𝜁 𝜻 𝝵 𝞯

η 𝛈 𝜂 𝜼 𝝶 𝞰

θ 𝛉 𝜃 𝜽 𝝷 𝞱

ι 𝛊 𝜄 𝜾 𝝸 𝞲

κ 𝛋 𝜅 𝜿 𝝹 𝞳

λ 𝛌 𝜆 𝝀 𝝺 𝞴

μ 𝛍 𝜇 𝝁 𝝻 𝞵

ν 𝛎 𝜈 𝝂 𝝼 𝞶

ξ 𝛏 𝜉 𝝃 𝝽 𝞷

ο 𝛐 𝜊 𝝄 𝝾 𝞸

π 𝛑 𝜋 𝝅 𝝿 𝞹

ρ 𝛒 𝜌 𝝆 𝞀 𝞺

ς 𝛓 𝜍 𝝇 𝞁 𝞻

σ 𝛔 𝜎 𝝈 𝞂 𝞼

τ 𝛕 𝜏 𝝉 𝞃 𝞽

υ 𝛖 𝜐 𝝊 𝞄 𝞾

φ 𝛗 𝜑 𝝋 𝞅 𝞿

χ 𝛘 𝜒 𝝌 𝞆 𝟀

ψ 𝛙 𝜓 𝝍 𝞇 𝟁

ω 𝛚 𝜔 𝝎 𝞈 𝟂

∂ 𝛛 𝜕 𝝏 𝞉 𝟃

ϵ 𝛜 𝜖 𝝐 𝞊 𝟄

ϑ 𝛝 𝜗 𝝑 𝞋 𝟅

ϰ 𝛞 𝜘 𝝒 𝞌 𝟆

ϕ 𝛟 𝜙 𝝓 𝞍 𝟇

ϱ 𝛠 𝜚 𝝔 𝞎 𝟈

ϖ 𝛡 𝜛 𝝕 𝞏 𝟉

digamma Ϝ 𝟊 ϝ 𝟋

Upper Case

normal bold italic bold

italic sans-

serif

bold sans-

serif

bold

italic

Α 𝚨 𝛢 𝜜 𝝖 𝞐

Β 𝚩 𝛣 𝜝 𝝗 𝞑

Γ 𝚪 𝛤 𝜞 𝝘 𝞒

Δ 𝚫 𝛥 𝜟 𝝙 𝞓

Ε 𝚬 𝛦 𝜠 𝝚 𝞔

Ζ 𝚭 𝛧 𝜡 𝝛 𝞕

Η 𝚮 𝛨 𝜢 𝝜 𝞖

Θ 𝚯 𝛩 𝜣 𝝝 𝞗

Ι 𝚰 𝛪 𝜤 𝝞 𝞘

Κ 𝚱 𝛫 𝜥 𝝟 𝞙

Λ 𝚲 𝛬 𝜦 𝝠 𝞚

Μ 𝚳 𝛭 𝜧 𝝡 𝞛

Ν 𝚴 𝛮 𝜨 𝝢 𝞜

Ξ 𝚵 𝛯 𝜩 𝝣 𝞝

Ο 𝚶 𝛰 𝜪 𝝤 𝞞

Π 𝚷 𝛱 𝜫 𝝥 𝞟

Ρ 𝚸 𝛲 𝜬 𝝦 𝞠

ϴ 𝚹 𝛳 𝜭 𝝧 𝞡

Σ 𝚺 𝛴 𝜮 𝝨 𝞢

Τ 𝚻 𝛵 𝜯 𝝩 𝞣

Υ 𝚼 𝛶 𝜰 𝝪 𝞤

Φ 𝚽 𝛷 𝜱 𝝫 𝞥

Χ 𝚾 𝛸 𝜲 𝝬 𝞦

Ψ 𝚿 𝛹 𝜳 𝝭 𝞧

Ω 𝛀 𝛺 𝜴 𝝮 𝞨

∇ 𝛁 𝛻 𝜵 𝝯 𝞩

Mathematical Double-Struck

Double Struck (aka Blackboard bold, double stroke):

𝔸 𝔹 ℂ 𝔻 𝔼 𝔽 𝔾 ℍ 𝕀 𝕁 𝕂 𝕃 𝕄 ℕ 𝕆 ℙ ℚ ℝ 𝕊 𝕋 𝕌 𝕍 𝕎 𝕏 𝕐 ℤ

𝕒 𝕓 𝕔 𝕕 𝕖 𝕗 𝕘 𝕙 𝕚 𝕛 𝕜 𝕝 𝕞 𝕟 𝕠 𝕡 𝕢 𝕣 𝕤 𝕥 𝕦 𝕧 𝕨 𝕩 𝕪 𝕫

𝟘 𝟙 𝟚 𝟛 𝟜 𝟝 𝟞 𝟟 𝟠 𝟡

Mathematical Fraktur

(aka Gothic, Blackletter, Fraktur)

𝔄 𝔅 ℭ 𝔇 𝔈 𝔉 𝔊 ℌ ℑ 𝔍 𝔎 𝔏 𝔐 𝔑 𝔒 𝔓 𝔔 ℜ 𝔖 𝔗 𝔘 𝔙 𝔚 𝔛 𝔜 ℨ

𝔞 𝔟 𝔠 𝔡 𝔢 𝔣 𝔤 𝔥 𝔦 𝔧 𝔨 𝔩 𝔪 𝔫 𝔬 𝔭 𝔮 𝔯 𝔰 𝔱 𝔲 𝔳 𝔴 𝔵 𝔶 𝔷

Mathematical Bold Fraktur

𝕬 𝕭 𝕮 𝕯 𝕰 𝕱 𝕲 𝕳 𝕴 𝕵 𝕶 𝕷 𝕸 𝕹 𝕺 𝕻 𝕼 𝕽 𝕾 𝕿 𝖀 𝖁 𝖂 𝖃 𝖄 𝖅

𝖆 𝖇 𝖈 𝖉 𝖊 𝖋 𝖌 𝖍 𝖎 𝖏 𝖐 𝖑 𝖒 𝖓 𝖔 𝖕 𝖖 𝖗 𝖘 𝖙 𝖚 𝖛 𝖜 𝖝 𝖞 𝖟

Mathematical Bold

𝐀 𝐁 𝐂 𝐃 𝐄 𝐅 𝐆 𝐇 𝐈 𝐉 𝐊 𝐋 𝐌 𝐍 𝐎 𝐏 𝐐 𝐑 𝐒 𝐓 𝐔 𝐕 𝐖 𝐗 𝐘 𝐙

𝐚 𝐛 𝐜 𝐝 𝐞 𝐟 𝐠 𝐡 𝐢 𝐣 𝐤 𝐥 𝐦 𝐧 𝐨 𝐩 𝐪 𝐫 𝐬 𝐭 𝐮 𝐯 𝐰 𝐱 𝐲 𝐳

𝟎 𝟏 𝟐 𝟑 𝟒 𝟓 𝟔 𝟕 𝟖 𝟗

Mathematical Italic

𝐴 𝐵 𝐶 𝐷 𝐸 𝐹 𝐺 𝐻 𝐼 𝐽 𝐾 𝐿 𝑀 𝑁 𝑂 𝑃 𝑄 𝑅 𝑆 𝑇 𝑈 𝑉 𝑊 𝑋 𝑌 𝑍

𝑎 𝑏 𝑐 𝑑 𝑒 𝑓 𝑔 ℎ 𝑖 𝑗 𝑘 𝑙 𝑚 𝑛 𝑜 𝑝 𝑞 𝑟 𝑠 𝑡 𝑢 𝑣 𝑤 𝑥 𝑦 𝑧

Mathematical Bold Italic

𝑨 𝑩 𝑪 𝑫 𝑬 𝑭 𝑮 𝑯 𝑰 𝑱 𝑲 𝑳 𝑴 𝑵 𝑶 𝑷 𝑸 𝑹 𝑺 𝑻 𝑼 𝑽 𝑾 𝑿 𝒀 𝒁

𝒂 𝒃 𝒄 𝒅 𝒆 𝒇 𝒈 𝒉 𝒊 𝒋 𝒌 𝒍 𝒎 𝒏 𝒐 𝒑 𝒒 𝒓 𝒔 𝒕 𝒖 𝒗 𝒘 𝒙 𝒚 𝒛

Mathematical Script

𝒜 ℬ 𝒞 𝒟 ℰ ℱ 𝒢 ℋ ℐ 𝒥 𝒦 ℒ ℳ 𝒩 𝒪 𝒫 𝒬 ℛ 𝒮 𝒯 𝒰 𝒱 𝒲 𝒳 𝒴 𝒵

𝒶 𝒷 𝒸 𝒹 ℯ 𝒻 ℊ 𝒽 𝒾 𝒿 𝓀 𝓁 𝓂 𝓃 ℴ 𝓅 𝓆 𝓇 𝓈 𝓉 𝓊 𝓋 𝓌 𝓍 𝓎 𝓏

Mathematical Bold Script

𝓐 𝓑 𝓒 𝓓 𝓔 𝓕 𝓖 𝓗 𝓘 𝓙 𝓚 𝓛 𝓜 𝓝 𝓞 𝓟 𝓠 𝓡 𝓢 𝓣 𝓤 𝓥 𝓦 𝓧 𝓨 𝓩

𝓪 𝓫 𝓬 𝓭 𝓮 𝓯 𝓰 𝓱 𝓲 𝓳 𝓴 𝓵 𝓶 𝓷 𝓸 𝓹 𝓺 𝓻 𝓼 𝓽 𝓾 𝓿 𝔀 𝔁 𝔂 𝔃

Mathematical Sans-Serif

𝖠 𝖡 𝖢 𝖣 𝖤 𝖥 𝖦 𝖧 𝖨 𝖩 𝖪 𝖫 𝖬 𝖭 𝖮 𝖯 𝖰 𝖱 𝖲 𝖳 𝖴 𝖵 𝖶 𝖷 𝖸 𝖹

𝖺 𝖻 𝖼 𝖽 𝖾 𝖿 𝗀 𝗁 𝗂 𝗃 𝗄 𝗅 𝗆 𝗇 𝗈 𝗉 𝗊 𝗋 𝗌 𝗍 𝗎 𝗏 𝗐 𝗑 𝗒 𝗓

𝟢 𝟣 𝟤 𝟥 𝟦 𝟧 𝟨 𝟩 𝟪 𝟫

Mathematical Sans-Serif Bold

𝗔 𝗕 𝗖 𝗗 𝗘 𝗙 𝗚 𝗛 𝗜 𝗝 𝗞 𝗟 𝗠 𝗡 𝗢 𝗣 𝗤 𝗥 𝗦 𝗧 𝗨 𝗩 𝗪 𝗫 𝗬 𝗭

𝗮 𝗯 𝗰 𝗱 𝗲 𝗳 𝗴 𝗵 𝗶 𝗷 𝗸 𝗹 𝗺 𝗻 𝗼 𝗽 𝗾 𝗿 𝘀 𝘁 𝘂 𝘃 𝘄 𝘅 𝘆 𝘇

𝟬 𝟭 𝟮 𝟯 𝟰 𝟱 𝟲 𝟳 𝟴 𝟵

Mathematical Sans-Serif Italic

𝘈 𝘉 𝘊 𝘋 𝘌 𝘍 𝘎 𝘏 𝘐 𝘑 𝘒 𝘓 𝘔 𝘕 𝘖 𝘗 𝘘 𝘙 𝘚 𝘛 𝘜 𝘝 𝘞 𝘟 𝘠 𝘡

𝘢 𝘣 𝘤 𝘥 𝘦 𝘧 𝘨 𝘩 𝘪 𝘫 𝘬 𝘭 𝘮 𝘯 𝘰 𝘱 𝘲 𝘳 𝘴 𝘵 𝘶 𝘷 𝘸 𝘹 𝘺 𝘻

Mathematical Sans-Serif Bold Italic

𝘼 𝘽 𝘾 𝘿 𝙀 𝙁 𝙂 𝙃 𝙄 𝙅 𝙆 𝙇 𝙈 𝙉 𝙊 𝙋 𝙌 𝙍 𝙎 𝙏 𝙐 𝙑 𝙒 𝙓 𝙔 𝙕

𝙖 𝙗 𝙘 𝙙 𝙚 𝙛 𝙜 𝙝 𝙞 𝙟 𝙠 𝙡 𝙢 𝙣 𝙤 𝙥 𝙦 𝙧 𝙨 𝙩 𝙪 𝙫 𝙬 𝙭 𝙮 𝙯

Mathematical Monospace

𝙰 𝙱 𝙲 𝙳 𝙴 𝙵 𝙶 𝙷 𝙸 𝙹 𝙺 𝙻 𝙼 𝙽 𝙾 𝙿 𝚀 𝚁 𝚂 𝚃 𝚄 𝚅 𝚆 𝚇 𝚈 𝚉

𝚊 𝚋 𝚌 𝚍 𝚎 𝚏 𝚐 𝚑 𝚒 𝚓 𝚔 𝚕 𝚖 𝚗 𝚘 𝚙 𝚚 𝚛 𝚜 𝚝 𝚞 𝚟 𝚠 𝚡 𝚢 𝚣

𝟶 𝟷 𝟸 𝟹 𝟺 𝟻 𝟼 𝟽 𝟾 𝟿

This page lists Unicode arrow symbols.

← → ↑ ↓ ↔ ↕ ↖ ↗ ↘ ↙ ↚ ↛ ↮ ⟵ ⟶ ⟷

⇐ ⇒ ⇑ ⇓ ⇔ ⇕ ⇖ ⇗ ⇘ ⇙ ⇍ ⇏ ⇎ ⟸ ⟹ ⟺

⇦ ⇨ ⇧ ⇩ ⬄ ⇳ ⬀ ⬁ ⬂ ⬃

⬅ ( ⮕ ➡ ) ⬆ ⬇ ⬈ ⬉ ⬊ ⬋ ⬌ ⬍

⇆ ⇄ ⇅ ⇵ ⇈ ⇊ ⇇ ⇉

⬱ ⇶

⇠ ⇢ ⇡ ⇣

⇚ ⇛ ⤊ ⤋ ⭅ ⭆ ⟰ ⟱

↢ ↣

↼ ⇀ ↽ ⇁ ↿ ↾ ⇃ ⇂

⇋ ⇌

⟻ ⟼

⇽ ⇾ ⇿

⇜ ⇝

⬳ ⟿

⥊ ⥋ ⥌ ⥍ ⥎ ⥏ ⥐ ⥑

⥒ ⥓ ⥔ ⥕ ⥖ ⥗ ⥘ ⥙

⥚ ⥛ ⥜ ⥝ ⥞ ⥟ ⥠ ⥡

⥢ ⥤ ⥣ ⥥ ⥦ ⥨ ⥧ ⥩ ⥮ ⥯

⥪ ⥬ ⥫ ⥭

↤ ↦ ↥ ↧

⇤ ⇥ ⤒ ⤓ ↨

↞ ↠ ↟ ↡

⇷ ⇸ ⤉ ⤈ ⇹

⇺ ⇻ ⇞ ⇟ ⇼

⬴ ⤀ ⬵ ⤁

⬹ ⤔

⬺ ⤕

⤂ ⤃ ⤄

⬶ ⤅

⬻ ⤖

⬷ ⤐

⬼ ⤗ ⬽ ⤘

⤆ ⤇

⤌ ⤍ ⤎ ⤏

⬸ ⤑

⤝ ⤞ ⤟ ⤠

⤙ ⤚ ⤛ ⤜

⤡ ⤢ ⤣ ⤤ ⤥ ⤦ ⤪ ⤨ ⤧ ⤩ ⤭ ⤮ ⤯ ⤰ ⤱ ⤲ ⤫ ⤬

↰ ↱ ↲ ↳ ⬐ ⬎ ⬑ ⬏ ↴ ↵

⤶ ⤷ ⤴ ⤵

↩ ↪ ↫ ↬

⥼ ⥽ ⥾ ⥿

⥂ ⥃ ⥄ ⭀ ⥱ ⥶ ⥸ ⭂ ⭈ ⭊ ⥵ ⭁ ⭇ ⭉ ⥲ ⭋ ⭌ ⥳ ⥴ ⥆ ⥅

⥹ ⥻

⬰ ⇴ ⥈ ⬾ ⥇ ⬲ ⟴

⥷ ⭃ ⥺ ⭄

⇱ ⇲

↸ ↹ ↯ ↭ ⥉ ⥰

⬿ ⤳

↜ ↝

⤼ ⤽

↶ ↷ ⤾ ⤿ ⤸ ⤹ ⤺ ⤻

↺ ↻ ⥀ ⥁ ⟲ ⟳

Decorative Arrows

⇪ ⇫ ⇬ ⇭ ⇮ ⇯

➳ ➴ ➵ ➶ ➷ ➸ ➹

➔ ➘ ➙ ➚

➩ ➪ ➫ ➬ ➭ ➮ ➯ ➱

⇰ ➛ ➜ ➝ ➞ ➟ ➠ ➢ ➣ ➤ ➥ ➦ ➧ ➨ ➲ ➾

➺ ➻ ➼ ➽

◄ ► ◅ ▻

☚ ☛ ☜ ☞ ☝ ☟

👆 👇 👈 👉

🔙 🔚 🔛 🔜 🔝

▲ ▼ ◀ ▶

For example, here's some arrows and their names:

Unicode Hex Char Name Date Added

U+2B05 ⬅ LEFTWARDS BLACK ARROW Unicode 4 (2003)

U+2B06 ⬆ UPWARDS BLACK ARROW Unicode 4 (2003)

U+2B07 ⬇ DOWNWARDS BLACK ARROW Unicode 4 (2003)

However, there was no “RIGHTWARDS BLACK ARROW” for about 10 years. The closest is this:

Unicode Hex Char Name Date Added

U+27A1 ➡ BLACK RIGHTWARDS ARROW

(old name: BLACK RIGHT ARROW) Unicode 1 (1991)

Missing Symmetric Versions

Also, lots of these arrows are from math. When mathematicians use a arrow-like glyph in their notation, usually they are not doing it in any formal way in the sense of formalism or formal languages, so their notation use is very sloppy. They are usually not concerned whether a symbol is a operator or just a glyph to convey a concept. So, in Unicode, the arrows gets into one of these blocks: “Miscellaneous Mathematical Symbols-B”, “Supplemental Mathematical Operators”, “Miscellaneous Symbols and Arrows”. Often, the left/right pair are in different blocks, or the up/down version are not even in a math category.

Here's a example: ⇺ ⇻ ⇼ ⇞ ⇟. There does not seem to have a vertical version of ⇼. The chars ⇞ ⇟ are in category “Symbol, other”, while ⇺ ⇻ ⇼ are in category “Symbol, Math”.

Another example: ⥂ ⥃ ⥄. Note that there does not seem to have a right pointing version of ⥄.

Many arrows do not have symmetric versions. Symmetry here can be reflection thru vertical or horizontal axes, or n\*90° rotation, or combination of them. The following are some set of chars missing symmetric versions: ↴ ↵ ↸ ↹ ⤺ ⤻ ⤼ ⤽ ⤪ ⤨ ⤧ ⤩ ⤭ ⤮ ⤯ ⤰ ⤱ ⤲.

Ordering Problem

Also, when trying to order them, i ran into the problem of devising a ordering scheme. For example, usually i order them by left right up down, like this:. ← → ↑ ↓. But now look at these: ⇆ ⇄ ⇅ ⇵. For the vertical pair, which should come first?

Here's another example of the complexity. There are these chars:

Character Unicode Name

↶ ANTICLOCKWISE TOP SEMICIRCLE ARROW

↷ CLOCKWISE TOP SEMICIRCLE ARROW

⤾ LOWER RIGHT SEMICIRCULAR CLOCKWISE ARROW

⤿ LOWER LEFT SEMICIRCULAR ANTICLOCKWISE ARROW

⤸ RIGHT-SIDE ARC CLOCKWISE ARROW

⤹ LEFT-SIDE ARC ANTICLOCKWISE ARROW

⤺ TOP ARC ANTICLOCKWISE ARROW

⤻ BOTTOM ARC ANTICLOCKWISE ARROW

Font Problems

Note that some left/right pairs looks very different, even in the same font. For example:

Character Unicode Name

⬾ LEFTWARDS ARROW THROUGH X

⥇ RIGHTWARDS ARROW THROUGH X

⬲ LEFT ARROW WITH CIRCLED PLUS

⟴ RIGHT ARROW WITH CIRCLED PLUS

⬳ LONG LEFTWARDS SQUIGGLE ARROW

⟿ LONG RIGHTWARDS SQUIGGLE ARROW

⬱ THREE LEFTWARDS ARROWS

⇶ THREE RIGHTWARDS ARROWS