

# Pennstander fonts (*experimental*)

## User's Guide for LaTeX (v0.3a)

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### 1 What is Pennstander ?

Pennstander is a set of OpenType text and math fonts developed by Julius Ross, see [github.com/juliusross1](https://github.com/juliusross1) for more information.

Original font is from Tyler Finck, see this website for more information:

<https://etceteratype.co/grandstander>.

This package is based on v0.3 version of fonts.

The text and the math fonts are licensed under the SIL Open Font License, Version 1.1.

They require LuaTeX or XeTeX as engine and the `unicode-math` package<sup>1</sup>, if math fonts are required or just the `fontspec` package<sup>2</sup> otherwise.

A *variable*<sup>3</sup> version of the font, with optical sizing, is available.

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<sup>1</sup>Please read the documentation `unicode-math.pdf`.

<sup>2</sup>Please read the documentation `fontspec.pdf`.

<sup>3</sup>Please read the article <https://github.com/juliusross1/Pennstander/tree/main/docs>.

## 2 Usage

### 2.1 Loading text fonts and math fonts

Several weights are available, for text and/or math version:

thin / ExtraLight / Light / Regular / Medium / SemiBold / **Bold** / **ExtraBold** / **Black**

$$\cdot \sum_{n=1}^{+\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$$

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Files `Pennstander(math)-<weight>.fontspec` are provided to ensure that *Italic*, **Bold**, **BoldItalic** and (*fake*)*Slanted* variants are properly loaded.

### 2.2 Optical sizing

otf and ttf versions of Pennstander are provided:

- one `PennStanderVF.ttf` file, which provides *optical sizing* (`opsz`);
- several `Pennstander-<weight>-<shape>.otf` files.

With `opsz` loading, so with optical sizing features, it's possible that, with a size changing (large, small, tiny,...), the rendering may not be optimal, in which case a `setmainfont` may be necessary.

Therefore, loading otf fonts has been chosen as the default behavior.

### 2.3 Basic Call

A basic call for Pennstander text and math fonts could be:

```
\usepackage{pennstander-otf}
```

It loads:

- Pennstander-Regular as main font (without opsz version);
- PennstanderMath-Regular as math font.

It defines `\eff` for *florin math f*.

For optical sizing features, load Pennstander with opsz option:

```
\usepackage[opsz]{pennstander-otf}
```

### 2.4 First samples

**Theorem 1 (Residue Theorem).** Let  $f$  be analytic in the region  $G$  except for the isolated singularities  $a_1, a_2, \dots, a_m$ . If  $\gamma$  is a closed rectifiable curve in  $G$  which does not pass through any of the points  $a_k$  and if  $\gamma \approx 0$  in  $G$  then

$$\frac{1}{2\pi i} \int_{\gamma} f = \sum_{k=1}^m n(\gamma; a_k) \text{Res}(f; a_k).$$

**Theorem 2 (Maximum Modulus).** Let  $G$  be a bounded open set in  $\mathbb{C}$  and suppose that  $f$  is a continuous function on  $G^-$  which is analytic in  $G$ . Then

$$\max\{|f(z)| : z \in G^-\} = \max\{|f(z)| : z \in \partial G\}.$$

$$q = 4L \sin\left(\frac{\theta}{2}\right) \sqrt{\pi \epsilon_0 m g \tan\left(\frac{\theta}{2}\right)}$$

## 2.5 Options

Options can be given within the package:

- `Weight=...`  
`Thin/ExtraLight/Light/Regular/Medium/SemiBold/Bold/ExtraBold/Black;`
- or individual `WeightT=...,WeightM=...`
- the boolean `opsz` for loading pennstander with variable VF.ttf version;
- the boolean `no-text` for not loading pennstander as main font;
- the boolean `no-math` for not loading pennstander as math font;
- the boolean `no-macros` for not loading internal macros;
- the boolean `onlyconfig` for just loading .fontspec files (def. false);  
`with activated, no-text=true, no-math=true and no-macros=true`
- the boolean `altfour` for alternate version of 4;
- the boolean `frenchseven` for alternate version of 7 (with bar);
- `math-style=...` for unicode-math option;
- `bold-style=...` for unicode-math option;
- `StylisticSet=...` or `StylisticSetT=...,StylisticSetM=...;`
- `RawFeature=...` or `RawFeatureT=...,RawFeatureM=...;`
- `Scale=...` or `ScaleT=...,ScaleM=...`  
`Scale=<value>`: global scaling factor applied to both text and math fonts  
`ScaleT=<value>`: scaling factor for text font only (numeric value)  
`ScaleM=<value>`: scaling factor for math font only (numeric value or MatchLowercase...)

## 2.6 Manual loading

It's also possible to load text and/or math fonts with `\setmainfont` and/or `\setmathfont`, thanks to `fontspec` files for example.

```
%with otf version
\usepackage{fontspec}
\usepackage{unicode-math}
\setmainfont{Pennstander-<weight>}[options]
\setmathfont{PennstanderMath-<weight>}[options]
```

```
%with ttf/opsz version
\usepackage[onlyconfig]{pennstander-otf}
\setmainfont{Pennstander-<weight>-opsz}[options]
\setmathfont{PennstanderMath-<weight>}[options]
```

## 2.7 Internal macros

By default, the packages load internal macros for *fontfamily*.

All macros are defined with `[Scale=MatchLowercase]`.

```
%fontfamily
\newfontfamily\pennstanderthin
\newfontfamily\pennstanderextralight
\newfontfamily\pennstanderlight
\newfontfamily\pennstander
\newfontfamily\pennstandermedium
\newfontfamily\pennstandersemibold
\newfontfamily\pennstanderbold
\newfontfamily\pennstanderextrabold
\newfontfamily\pennstanderblack

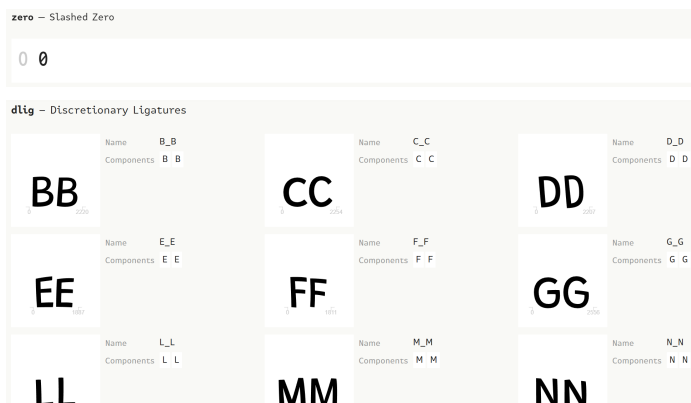
%mathfont
\setmathfontface\pennstandermaththin
\setmathfontface\pennstandermathextralight
\setmathfontface\pennstandermathlight
\setmathfontface\pennstandermath
\setmathfontface\pennstandermathmedium
\setmathfontface\pennstandermathsemibold
\setmathfontface\pennstandermathbold
\setmathfontface\pennstandermathextrabold
```

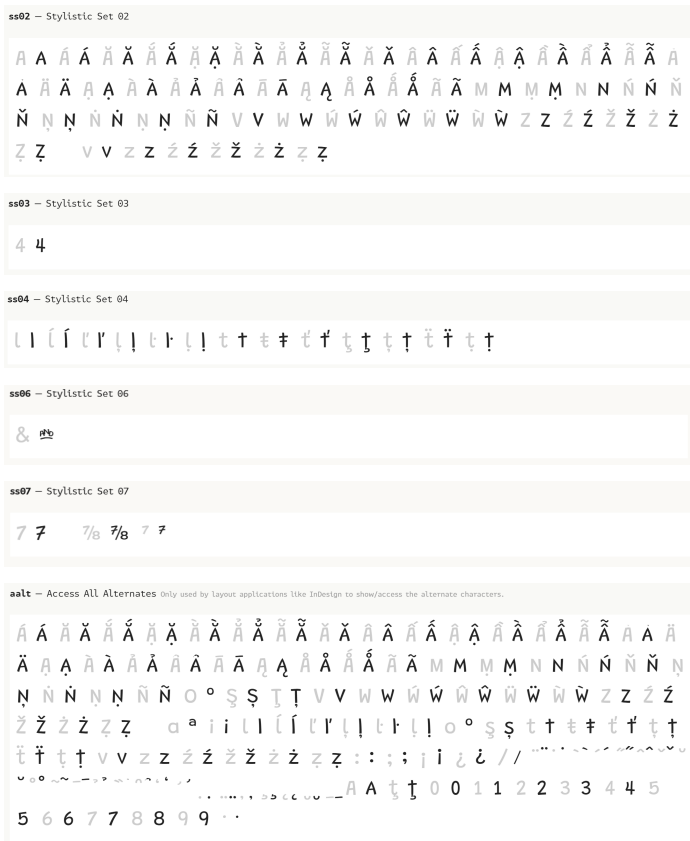
## 3 Openfeatures

### 3.1 For text font

Extra openfeatures for text font available are (screens are from fontdrop website):

- **aałt**: Access All Alternatives
- **ccmp**: Glyph Composition/Decomposition
- **łocl**: Localized Forms
- **supš**: Superscript
- **numr**: Numerators
- **dnom**: Denominators
- **frac**: Fractions
- **ordn**: Ordinals
- **pnum**: Proportional Figures
- **tnum**: Tabular Figures
- **case**: Case-Sensitive Forms
- **dłig**: Discretionary Ligatures
- **łiga**: Standard Ligatures
- **zero**: Slashed Zero
- **cpsp**: Capital Spacing
- **ss02**: Alternate A,M,N,Q,V,W,Z,v,z
- **ss03**: Alternate 4
- **ss04**: Alternate l,t
- **ss06**: Alternate ampersand
- **ss07**: Alternate 7





### 3.2 For math font

Extra openfeatures for math font available are:

- aalt: Access All Alternatives
- dtls: Dotless Forms
- zero: Slashed Zero
- frac: Fractions
- ss01: Alternate a,g,I,Iota
- ss02: Alternate A,M,N,Q,V,W,Z,v,z,Alpha,Mu,Rho,Zeta
- ss03: Alternate 4
- ss04: Alternate l,t
- ss05: Simplified Fraktur A,K,L,X,Y,Z,x,y
- ss06: Alternate ampersand
- ss07: Alternate 7

### 3.3 Unicode Private Use Area

Glyphs assigned to Unicode Private Use Area:

- Double-struck uppercase Greek letters: U+E1002–U+E1008
- Fraction Rule: U+E000
- Radical Rule: U+E001



## 4 List of glyphs

### 4.1 Text version

Table 1: Pennständer-Regular

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
<b>Basic Latin</b>																
U+0000-000F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U+0020-002F	!	”	#	\$	%	&	'	(	)	*	+	,	-	.	/	
U+0030-003F	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
U+0040-004F	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
U+0050-005F	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
U+0060-006F	'	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
U+0070-007F	p	q	r	s	t	u	v	w	x	y	z	{		}	~	-
<b>Latin-1 Supplement</b>																
U+00A0-00AF	ı	¢	£	¤	¥	¦	§	¨	©	ª	«	¬	-	®	-	-
U+00B0-00BF	°	±	²	³	´	µ	¶	·	¸	¹	º	»	¼	½	¾	¿
U+00C0-00CF	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
U+00D0-00DF	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
U+00E0-00EF	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
U+00F0-00FF	ð	ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	ý	þ	ÿ
<b>Latin Extended-A</b>																
U+0100-010F	Ā	ā	Ă	ă	Ą	ą	Ć	ć	Ĉ	ĉ	Ċ	ċ	Č	č	Ď	ď
U+0110-011F	Đ	đ	Ē	ē	Ĕ	ĕ	É	é	Ě	ě	Ĝ	ĝ	Ğ	ğ		
U+0120-012F	Ġ	ġ	Ģ	ģ	Ĥ	ĥ	Ħ	ħ	-	Ī	ī	Ĭ	ĭ	Į	į	İ
U+0130-013F	Ĵ	ĵ	-	-	Ĵ	ĵ	ķ	ķ	ķ	Ĺ	ĺ	Ł	ł	Ł	ł	Ł
U+0140-014F	ł	ł	ł	Ń	ń	Ņ	ņ	Ň	ň	-	Ŋ	ŋ	Ō	ō	Ŏ	ŏ
U+0150-015F	Ŕ	ŕ	Ŗ	ŗ	Ŗ	ŗ	Ř	ř	Ś	ś	Ŝ	ŝ	Ş	ş	Ş	ş
U+0160-016F	Š	š	Ţ	ţ	Ť	ť	Ŧ	ŧ	Ũ	ũ	Ū	ū	Ŭ	ŭ	Ů	ů
U+0170-017F	Ű	ű	Ų	ų	Ŵ	ŵ	Ŷ	ŷ	Ÿ	Ž	ž	Ž	ž	Ž	ž	-
<b>Latin Extended-B</b>																
U+0180-018F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ə
U+0190-019F	-	-	f	-	-	-	-	-	-	-	-	-	-	-	-	-
U+01A0-01AF	Œ	œ	-	-	-	-	-	-	-	-	-	-	-	-	-	Ů
U+01B0-01BF	Ų	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U+01C0-01CF	-	-	-	-	DŽ	Dž	dž	LJ	Lj	lj	NJ	Nj	nj	Ǻ	ǻ	Ǽ
U+01D0-01DF	ǿ	Ǿ	ǿ	Ǟ	ǟ	Ǡ	ǡ	Ǣ	ǣ	Ǥ	ǥ	Ǧ	ǧ	-	-	-
U+01E0-01EF	-	-	-	-	-	-	Ǫ	ǫ	-	-	Ƕ	Ƿ	-	-	-	-

Table 1: Pennstander-Regular cont.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
U+01F0–01FF	-	-	-	-	-	-	-	-	-	-	Ǻ	ǻ	Æ	æ	Ǿ	ǿ
U+0200–020F	À	á	Â	â	É	è	Ê	ê	Ì	ì	Î	î	Ó	ó	Ô	ô
U+0210–021F	Ŕ	ŕ	Ŗ	ŗ	Ū	ū	Ŭ	ŭ	Ş	ş	Ț	ț	-	-	-	-
U+0220–022F	-	-	-	-	-	-	-	-	-	-	Ȫ	ȫ	Ȭ	ȭ	-	-
U+0230–023F	Ȯ	ȯ	Ȱ	ȱ	-	-	-	ȴ	-	-	-	-	-	-	-	-
<b>IPA Extensions</b>																
U+0250–025F	-	-	-	-	-	-	-	-	-	ə	-	-	-	-	-	-
<b>Spacing Modifier Letters</b>																
U+02B0–02BF	-	-	-	-	-	-	-	-	-	-	-	-	’	-	-	-
U+02C0–02CF	-	-	-	-	-	ˆ	˘	-	-	-	-	-	-	-	-	-
U+02D0–02DF	-	-	-	-	-	-	-	˙	˚	˛	˜	˝	-	-	-	-
<b>Combining Diacritical Marks</b>																
U+0300–030F	˘	˙	˚	˛	˜	˝	ˆ	˘	˙	˚	˛	˜	˝	-	-	˘
U+0310–031F	-	˘	˙	-	-	-	-	-	-	-	-	˘	-	-	-	-
U+0320–032F	-	-	-	˙	˚	-	˘	˙	˚	-	-	-	-	-	-	˘
U+0330–033F	-	-	-	-	-	-	/	/	-	-	-	-	-	-	-	˘
<b>Latin Extended Additional</b>																
U+1E00–1E0F	-	-	-	-	-	-	-	Ć	ć	-	-	Đ	đ	Ɖ	ɖ	-
U+1E10–1E1F	-	-	-	-	È	è	É	é	-	-	-	-	Ɔ	ɔ	-	-
U+1E20–1E2F	Ġ	ġ	-	-	Ĥ	ĥ	-	-	-	-	Ħ	ħ	-	-	İ	ı
U+1E30–1E3F	-	-	-	-	-	-	Ł	ł	-	-	Ł	ł	-	-	-	-
U+1E40–1E4F	-	-	Ṁ	ṁ	Ṃ	ṃ	Ṅ	ṅ	Ṇ	ṇ	-	-	Ȫ	ȫ	Ȭ	ȭ
U+1E50–1E5F	Ȯ	ȯ	Ȱ	ȱ	-	-	-	-	-	-	Ŕ	ŕ	-	-	Ŗ	ŗ
U+1E60–1E6F	Ś	ś	Ş	ş	Š	š	Š	š	Ş	ş	-	-	Ț	ț	Ț	ț
U+1E70–1E7F	-	-	-	-	-	-	-	Ū	ū	Ŭ	ŭ	-	-	-	-	-
U+1E80–1E8F	Ẁ	ẁ	Ẃ	ẃ	Ẅ	ẅ	-	-	-	-	-	-	-	-	Ẏ	ẏ
U+1E90–1E9F	-	-	Ẑ	ẑ	-	-	-	Ẕ	-	-	-	-	-	-	Ẓ	-
U+1EA0–1EAF	Ạ	ạ	Ả	ả	Ằ	ằ	Ẳ	ẳ	Ẵ	ẵ	Ặ	ẳ	Ẹ	ẹ	Ẹ	ẹ
U+1EB0–1EBF	Ằ	ằ	Ẳ	ẳ	Ẵ	ẵ	Ặ	ẳ	Ẹ	ẹ	Ẹ	ẹ	Ẹ	ẹ	Ẹ	ẹ
U+1EC0–1ECF	Ẹ	ẹ	Ẹ	ẹ	Ẹ	ẹ	Ẹ	ẹ	Ỉ	ỉ	Ị	ị	Ọ	ọ	Ỏ	ỏ
U+1ED0–1EDF	Ổ	ổ	Ổ	ổ	Ổ	ổ	Ổ	ổ	Ộ	ộ	Ớ	ớ	Ờ	ờ	Ở	ở
U+1EE0–1EEF	Ỗ	ỗ	Ỗ	ỗ	Ỗ	ỗ	Ỗ	ỗ	Ứ	ứ	Ừ	ừ	Ử	ử	Ử	ử
U+1EF0–1EFF	Ự	ự	Ỡ	ỡ	Ỡ	ỡ	Ỡ	ỡ	Ỡ	ỡ	-	-	-	-	-	-
<b>General Punctuation</b>																
U+2000–200F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 1: Pennstander-Regular cont.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
U+2010–201F	-	-	-	-	-	-	-	-	‘	’	,	-	“	”	”	-
U+2020–202F	†	‡	•	-	-	-	…	-	-	-	-	-	-	-	-	-
U+2030–203F	%	-	-	-	-	-	-	-	-	<	>	-	-	-	-	-
U+2040–204F	-	-	-	-	/	-	-	-	-	-	-	-	-	-	-	-

**Superscripts and Subscripts**

U+2070–207F	0	-	-	-	4	5	6	7	8	9	-	-	-	-	-	-
-------------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

**Currency Symbols**

U+20A0–20AF	-	¢	-	₣	£	-	₤	₶	-	₸	-	₺	€	₹	-	-
U+20B0–20BF	-	₱	₲	-	₴	-	-	-	₹	₺	-	₼	₾	-	-	-

**Letterlike Symbols**

U+2110–211F	-	-	-	-	-	N <sup>o</sup>	-	-	-	-	-	-	-	-	-	-
U+2120–212F	-	-	™	-	-	-	-	-	-	-	-	-	-	-	-	-

**Number Forms**

U+2150–215F	-	-	-	-	-	-	-	-	-	-	-	½	¾	⅕	⅞	-
-------------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

**Mathematical Operators**

U+2200–220F	-	-	-	-	-	∅	-	-	-	-	-	-	-	-	-	□
U+2210–221F	-	-	-	-	-	/	-	-	-	•	-	-	-	-	-	-
U+2240–224F	-	-	-	-	-	-	-	-	≈	-	-	-	-	-	-	-
U+2260–226F	≠	-	-	-	≤	≥	-	-	-	-	-	-	-	-	-	-

**Geometric Shapes**

U+25C0–25CF	-	-	-	-	-	-	-	-	-	-	◊	-	-	-	-	-
-------------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

**Miscellaneous Shapes**

U+2660–266F	♠	♥	♦	♣	♠	♥	♦	♣	-	♩	♪	♫	♬	-	-	-
-------------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

**Alphabetic Presentation Forms**

U+FB00–FB0F	-	fi	fl	-	-	-	-	-	-	-	-	-	-	-	-	-
-------------	---	----	----	---	---	---	---	---	---	---	---	---	---	---	---	---

Total number of glyphs shown from Pennstander-Regular: 671

## 4.2 Math version

Table 2: PennstanderMath-Regular

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
<b>Basic Latin</b>																
U+0000-000F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U+0020-002F		!	"	#	-	%	&	'	(	)	*	+	,	-	.	/
U+0030-003F	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
U+0040-004F	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
U+0050-005F	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
U+0060-006F	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
U+0070-007F	p	q	r	s	t	u	v	w	x	y	z	{		}	~	-
<b>Latin-1 Supplement</b>																
U+00A0-00AF		ı	-	-	-	-	ı	§	¨	©	ª	«	¬	-	®	-
U+00B0-00BF	°	±	²	³	´	µ	¶	·	¸	¹	º	»	-	-	-	¿
U+00D0-00DF	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-
U+00F0-00FF	ð	-	-	-	-	-	-	÷	-	-	-	-	-	-	-	-
<b>Latin Extended-A</b>																
U+0130-013F	-	ı	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Latin Extended-B</b>																
U+0180-018F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ø
U+0190-019F	-	-	f	-	-	-	-	-	-	-	-	-	-	-	-	-
U+0230-023F	-	-	-	-	-	-	-	J	-	-	-	-	-	-	-	-
<b>IPA Extensions</b>																
U+0250-025F	-	-	-	-	-	-	-	-	-	ə	-	-	-	-	-	-
<b>Spacing Modifier Letters</b>																
U+02B0-02BF	-	-	-	-	-	-	-	-	-	-	-	-	'	-	-	-
U+02C0-02CF	-	-	-	-	-	-	ˆ	˘	-	-	-	-	-	-	-	-
U+02D0-02DF	-	-	-	-	-	-	-	˙	˚	◦	-	˜	˝	-	-	-
<b>Combining Diacritical Marks</b>																
U+0300-030F	˘	ˆ	ˆ	˜	-	-	˘	˙	¨	˚	◦	˜	˘	-	-	˜
U+0310-031F	◌̣	◌̤	◌̥	-	-	-	-	-	-	-	-	◌̧	-	-	-	-
U+0320-032F	-	-	-	◌̣	◌̤	-	◌̥	◌̦	◌̧	-	-	-	-	-	-	-
U+0330-033F	-	◌̨	◌̩	-	-	-	-	/	/	-	-	-	-	-	-	-
U+0340-034F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	↔	-

Table 2: PennstanderMath-Regular cont.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
<b>Greek and Coptic</b>																
U+0390–039F	-	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ	Ι	Κ	Λ	Μ	Ν	Ξ	Ο
U+03A0–03AF	Π	Ρ	-	Σ	Τ	Υ	Φ	Χ	Ψ	Ω	-	-	-	-	-	-
U+03B0–03BF	-	α	β	γ	δ	ε	ζ	η	θ	ι	κ	λ	μ	ν	ξ	ο
U+03C0–03CF	π	ρ	ς	σ	τ	υ	φ	χ	ψ	ω	-	-	-	-	-	-
U+03D0–03DF	-	ϑ	-	-	-	ϕ	ϖ	-	-	-	-	-	-	-	-	-
U+03F0–03FF	κ	ϱ	-	-	Ϡ	ε	ε	-	-	-	-	-	-	-	-	-
<b>Phonetic Extensions Supplement</b>																
U+1DA0–1DAF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>General Punctuation</b>																
U+2000–200F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U+2010–201F	-	-	-	-	-	-		=	'	'	,	-	“	”	”	-
U+2020–202F	†	‡	•	-	-	-	…	-	-	-	-	-	-	-	-	-
U+2030–203F	‰	-	!	!!	!!!	! !	!!!	-	<	>	-	-	-	-	-	-
U+2040–204F	-	-	-	-	/	-	-	-	-	-	-	-	-	-	-	-
U+2050–205F	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
<b>Superscripts and Subscripts</b>																
U+2070–207F	0	-	-	-	4	5	6	7	8	9	-	-	-	-	-	-
<b>Combining Diacritical Marks for Symbols</b>																
U+20D0–20DF	←	→	-	-	-	-	←	→	-	-	-	…	…	-	-	-
U+20E0–20EF	-	↔	-	-	-	-	-	-	…	-	-	-	-	↗	↖	↙
U+20F0–20FF	*	-	-	-	-	-	-	-	-	-	-	-	-	↘	↗	↖
<b>Letterlike Symbols</b>																
U+2100–210F	-	-	©	-	-	-	-	-	-	-	-	ℋ	ℌ	ℍ	ℎ	ℏ
U+2110–211F	ℑ	ℐ	ℒ	ℓ	-	ℕ	№	-	-	ℙ	ℚ	℞	ℙ	ℙ	-	-
U+2120–212F	-	-	™	-	ℤ	-	-	ℰ	ℑ	-	-	ℙ	ℙ	ℙ	-	-
U+2130–213F	ℰ	ℱ	-	ℳ	-	-	-	-	-	-	-	-	-	-	ℙ	ℙ
U+2140–214F	Σ	-	-	-	-	ℙ	-	-	-	-	-	-	-	-	-	-
<b>Arrows</b>																
U+2190–219F	←	↑	→	↓	↔	↕	↗	↘	↙	↖	↗	↘	↙	↖	↗	↘
U+21A0–21AF	⇒	⇓	⇐	⇑	⇌	⇍	⇎	⇏	⇐	⇑	⇒	⇓	⇔	⇕	⇖	⇗
U+21B0–21BF	-	-	-	-	-	-	-	-	-	-	-	-	-	↖	↗	↘
U+21C0–21CF	→	↗	↘	↙	↕	↖	↗	↘	↙	↕	↖	↗	↘	↙	↕	↖
U+21D0–21DF	⇐	⇑	⇒	⇓	⇌	⇍	⇎	⇏	⇐	⇑	⇒	⇓	⇔	⇕	⇖	⇗
U+21E0–21EF	⇐	⇑	⇒	⇓	⇌	⇍	⇎	⇏	⇐	⇑	⇒	⇓	⇔	⇕	⇖	⇗

Table 2: PennstanderMath-Regular cont.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
U+21F0-21FF	-	-	-	-	-	↕	-	←	→	↔	↔	↔	↔	-	-	-
<b>Mathematical Operators</b>																
U+2200-220F	∇	∮	∂	∃	∄	∅	-	∇	∈	∉	-	∃	∄	-	□	∏
U+2210-221F	∏	∑	-	∓	±	/	\	*	∘	⋅	√	∛	∜	α	∞	ℓ
U+2220-222F	∠	∠	∠		∥	≠	∧	∨	∩	∪	∫	∫∫	∫∫∫	∫	∫∫	
U+2230-223F	∫∫∫	∫	∫	∫	∴	∵	∶	∷	∸	∺	∻	-	≈	≈	≈	≈
U+2240-224F	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈
U+2250-225F	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈
U+2260-226F	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈
U+2270-227F	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈
U+2280-228F	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈
U+2290-229F	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈
U+22A0-22AF	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈
U+22B0-22BF	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈
U+22C0-22CF	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈
U+22D0-22DF	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈
U+22E0-22EF	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈	≈
U+22F0-22FF	≈	≈	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**Miscellaneous Technical**

U+2300-230F	-	-	-	-	-	¯	¯	-	[	]	[	]	-	-	-	-
U+2310-231F	⌈	-	-	-	-	-	-	-	⌈	-	-	-	⌈	⌈	⌈	⌈
U+2320-232F	⌈	⌈	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U+23A0-23AF	-	⌈	⌈	⌈	⌈	⌈	⌈	⌈	⌈	⌈	⌈	⌈	-	-	-	-
U+23B0-23BF	-	-	-	-	⌈	⌈	-	⌈	-	-	-	-	-	-	-	-
U+23D0-23DF	-	-	-	-	-	-	-	-	-	-	-	-	-	⌈	⌈	⌈

**Geometric Shapes**

U+25A0-25AF	-	□	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U+25C0-25CF	-	-	-	-	-	-	-	-	-	-	-	◇	-	-	-	-

**Miscellaneous Shapes**

U+2660-266F	♠	♥	♦	♣	♠	♥	♦	♣	-	♩	♪	♫	♬	b	n	#
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**Dingbats**

U+2710-271F	-	-	-	√	-	-	-	-	-	-	-	-	-	-	-	-
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**Miscellaneous Mathematical Symbols-A**

U+27C0-27CF	-	-	⊥	-	-	-	-	-	-	-	-	-	-	-	-	-
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Table 2: PennstanderMath-Regular cont.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
U+27D0–27DF	-	-	-	-	-	-	-	-	⊥	⊤	-	-	-	-	-	-
U+27E0–27EF	-	-	-	-	-	-	[	]	<	>	«	»	-	-	(	)
<b>Supplemental Arrows-A</b>																
U+27F0–27FF	-	-	-	-	-	-	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
<b>Supplemental Arrows-B</b>																
U+2900–290F	-	-	-	-	-	-	⇌	⇌	-	-	-	-	-	-	-	-
U+2920–292F	-	-	-	↖	↗	↘	↙	-	-	-	-	-	-	-	-	-
<b>Miscellaneous Mathematical Symbols-B</b>																
U+2980–298F		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U+29B0–29BF	-	-	-	-	-	⊖	⊕	⊗	⊘	⊙	⊚	⊛	⊜	⊝	⊞	⊟
U+29C0–29CF	⊠	⊡	-	-	⊢	⊣	⊤	⊥	⊦	⊧	-	-	-	-	-	-
U+29E0–29EF	-	-	⊷	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Supplemental Mathematical Operators</b>																
U+2A00–2A0F	⊙	⊕	⊗	∪	∩	∏	∏	-	-	×	∑	-	∫	∫	∫	∫
U+2A10–2A1F	-	∫	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U+2A20–2A2F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	×
U+2A30–2A3F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	∥
U+2A70–2A7F	-	-	-	-	≡	≡	≡	-	-	-	-	-	-	≤	≥	-
U+2A80–2A8F	-	-	-	-	-	≈	≈	-	-	≈	≈	-	-	-	-	-
U+2A90–2A9F	-	-	-	-	-	∠	∠	-	-	-	-	-	-	-	-	-
U+2AD0–2ADF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	†	†
U+2AE0–2AEF	‡	-	-	-	-	-	-	-	-	-	‡	-	-	-	-	-
<b>Private Use Area</b>																
U+E000–E00F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Total number of glyphs shown from PennstanderMath-Regular: 747

## 5 Alphabets

### 5.1 Text version

– Normal/**Bold**/*Italic*/**BoldItalic**/*Slanted*/**BoldSlanted**:

abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789

**abcdefghijklmnopqrstuvwx****y****z****ABCDEFGHIJKLMN****O****P****Q****R****S****T****U****V****W****X****Y****Z**0123456789

*abcdefghijklmnopqrstuvwx**y**z**ABCDEFGHIJKLMN**O**P**Q**R**S**T**U**V**W**X**Y**Z*0123456789

***abcdefghijklmnopqrstuvwx******y******z******ABCDEFGHIJKLMN******O******P******Q******R******S******T******U******V******W******X******Y******Z***0123456789

*abcdefghijklmnopqrstuvwx**y**z**ABCDEFGHIJKLMN**O**P**Q**R**S**T**U**V**W**X**Y**Z*0123456789

***abcdefghijklmnopqrstuvwx******y******z******ABCDEFGHIJKLMN******O******P******Q******R******S******T******U******V******W******X******Y******Z***0123456789

*Slanted version uses italic version.*

### 5.2 Math version

– Normal/**Bold**/*Italic*/**BoldItalic**:

abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789

**abcdefghijklmnopqrstuvwx****y****z****ABCDEFGHIJKLMN****O****P****Q****R****S****T****U****V****W****X****Y****Z**0123456789

*abcdefghijklmnopqrstuvwx**y**z**ABCDEFGHIJKLMN**O**P**Q**R**S**T**U**V**W**X**Y**Z*0123456789

***abcdefghijklmnopqrstuvwx******y******z******ABCDEFGHIJKLMN******O******P******Q******R******S******T******U******V******W******X******Y******Z***0123456789

–  $\mathcal{}$ / $\mathfrak{}$ / $\mathbb{}$ :

abcdefghijklmnopqrstuvwxABCDEFGHIJKLMNOPQRSTUVWXYZ

*abcdefghijklmnopqrstuvwx**y**z**ABCDEF**GHIJ**KLMNOP**QRST**UVWX**YZ*

**abcdefghijklmnopqrstuvwx****y****z****ABCDEF****GHIJ****KLMNOP****QRST****UVWX****YZ**