# A Template for Academic Manuscripts\*

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This is where the abstract of your paper goes. The abstract is an extremely brief summary of your paper and basically follows the same structure as the paper itself: background/motivation of your study, methods, results, discussion/conclusion. Each section, however, is covered in a single sentence or maybe two sentences instead of an entire section. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

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To switch it off, activate \PassOptionsToPackage {final}{changes} and \PassOptionsToPackage {disable}{todonotes} in the master file.

\*This footnote can be used for acknowledgments. This is where you can express your gratitude to referees, editors, and colleagues for their valuable feedback and suggestions that helped improve your manuscript. Financial support by third parties can also be mentioned here.

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#### 1 Introduction

"Most people can save a few dollars a day or even \$10 a day," she said. "That's doable. But if you say, 'Can you save \$300 a month or a couple of thousand dollars a year?' people will say, 'Whoa.' Avoiding that 'whoa,' which is the hesitancy that can derail planning, is what consultants like Ms. Davidson are trying to do."

-New York Times, March 27, 2016

This template uses the Charter typeface for the body text. Charter is a serif typeface and was designed in 1987 by Matthew Carter. By contrast, all headings, tables, and captions are set in a sans-serif typeface. The sans-serif typeface used in this document is Fira Sans, designed by Erik Spiekermann and collaborators.

[anonymous 1]

The math settings are adjusted in the preamble to the effect that mathematical formulas are automatically typeset in the same font as the surrounding text. That is, math in a serif environment will be set in a serif font, while math in a sans-serif environment will use the sans-serif font. This is an aesthetic choice that may not please everyone given that a sans-serif font may be used in mathematical formulas to express a particular meaning. These cases are, however, very rare.

Let us cite a couple of publications: Lisi (1995), Andersen et al. (2008), Andreoni and Sprenger (2012), and Balakrishnan, Haushofer, and Jakiela (2016). With the options set for BibLaTeX in the preamble, citations in the body text are sorted chronologically—irrespective of the order of the "citekeys" in your input. In the list of references, entries are sorted alphabetically by author surname. Let's cite Andersen et al. (2008) once more.

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Some additional references: See Sims (2003) and Gabaix (2014) for models of "rational inattention" or "goal-driven attention." See Bordalo, Gennaioli, and Shleifer (2012, 2013), Kőszegi and Szeidl (2013), Taubinsky (2014), and Bushong, Rabin, and Schwartzstein (2016) for models of "stimulus-driven attention."

After this fourth paragraph, we start a new paragraph sequence. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{a}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

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In Section 2, we describe the design of our study. We present the data analysis and our results in Section 3. In Section 4, we discuss the plausibility of potential alternative explanations. Section 5 concludes.

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We already included several

III. R. 2

Check whether there are more recent publications!

[Lou E. 2] Italics?

[Holger 3]

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[Lou E. 3]

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Let's use the present tense throughout.

#### 2 Methods

In this section, we first present the design of the experiment (2.1) and derive behavioral predictions (2.2).

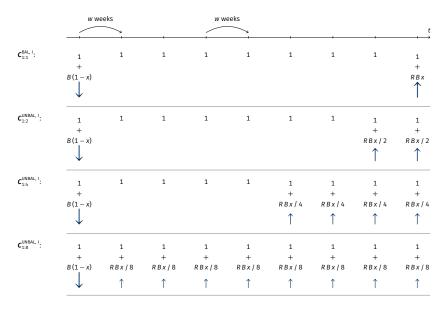
#### 2.1 Design of the Main Experiment

**2.1.1 General Features.** Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain *all letters of the alphabet* and it should be written in of the original language.  $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

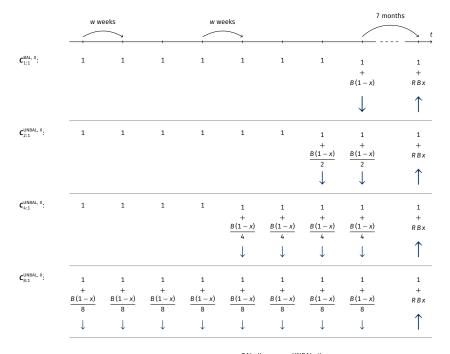
**2.1.2 More Specific Features.** Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain *all letters of the alphabet* and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{\frac{a}{b}}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

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<sup>1.</sup> Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

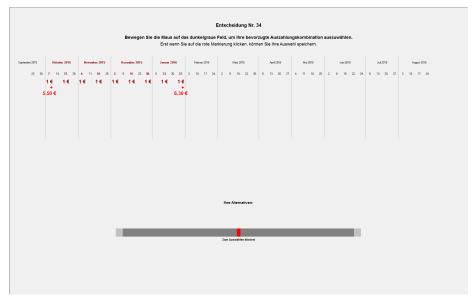


**Figure 1.** Budget Sets  $C_{1:1}^{\text{BAL, I}}$  and  $C_{1:n}^{\text{UNBAL, I}}$ 



**Figure 2.** Budget Sets  $\mathbf{C}_{1:1}^{\text{BAL, II}}$  and  $\mathbf{C}_{n:1}^{\text{UNBAL, II}}$ 

Notes: For the values of B, R, and w that we used, see Section 2.1.4. The savings rate x is individuals' choice variable: they choose some  $x \in \mathbf{X} = \{0, \frac{1}{100}, \frac{2}{100}, \dots, 1\}$  in each trial. The arrows indicate whether and in which direction payments at the respective payment dates change if x is increased.  $\sigma_{\varepsilon}$ ,  $c^{\alpha}$ . This figure was taken from Dertwinkel-Kalt et al. (2017).





**Figure 3.** Screenshots of a  $BAL_{1:1}^{I}$  Decision (Top) and an  $UNBAL_{1:8}^{I}$  Decision (Bottom)

Note: This figure was taken from Dertwinkel-Kalt et al. (2017).

Figure 3 shows an exemplary decision screen with B = €11 and  $r \approx 15\%$  for both BAL $_{1:1}^{\text{I}}$  (upper panel) and UNBAL $_{1:8}^{\text{I}}$  (lower panel). Through a slider, subjects choose their preferred  $x \in X$ . The slider position in Figure 3 indicates x = 0.5, i.e., the earliest payment is reduced by €5.50. Since  $r \approx 15\%$  in this example, this slider

<sup>2.</sup> The slider had no initial position—it appeared only after subjects first positioned the mouse cursor over the slider bar. This was done to avoid default effects.

position amounts to €6.30 that are paid at later payment dates. While these €6.30 are paid in a single bank transfer on the latest payment date in  $BAL_{1:1}^{I}$ , the amount is dispersed in equal parts over the last 8 payment dates in  $UNBAL_{1:8}^{I}$ —i.e., 8 consecutive payments of €0.79.<sup>3</sup>

**2.1.3** Some More Details. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain *all letters of the alphabet* and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{\frac{a}{b}}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

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<sup>3.</sup> We always rounded the second decimal place up so that the sum of the payments included in a dispersed payoff was always at least as great as the respective concentrated payoff.

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**2.1.4 Procedure.** Describe the sequence of events in your study. You could do this with the help of an enumerated list:

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#### 2.2 Predictions

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By discounted utility we understand any intertemporal utility function that (1) is time-separable and that (2) values a payment farther in the future at most as much as an equal-sized payment closer in the future. Importantly, the predictions derived below hold for all three frequently used types of discounting—exponential, hyperbolic, and quasi-hyperbolic.

In the following, we assume that individuals base their decisions on utility derived from receiving monetary payments  $c_t$  at various dates t. This is an assumption that is frequently made in experiments on intertemporal decision making. One way to justify this assumption is that individuals anticipate to consume the payments they receive within a short period around date t. Given that the maximum payment was below €20 and that any two payment dates were separated by at least two weeks, this assumption seems reasonable (see the arguments in favor of this view in Halevy, 2014). Kőszegi and Szeidl (2013) themselves make the same assumption of "money in the utility function": "in some applications we also assume that monetary transactions induce direct utility consequences, so that for instance an agent making a payment experiences an immediate utility loss. The idea that people experience monetary transactions as immediate utility is both intuitively compelling and supported in the literature: ... some evidence on individuals' attitudes toward money, such as narrow bracketing (...) and laboratory evidence on hyperbolic discounting (...), is difficult to explain without it." Last but not least, the papers by McClure et al. (2004) and McClure et al. (2007) demonstrate that brain activation, as measured by functional magnetic resonance imaging, is similar for primary and monetary rewards. Additionally, we make the standard assumption that utility from money is increasing in its argument but not convex:  $u'(c_t) \ge 0$  and  $u''(c_t) \le 0$ .

**2.2.1 Discounted Utility.** Individuals make their allocation decisions by comparing the aggregated consumption utility of each earnings sequence  $c \in C$ . Discounted utility assumes that the utility of each period enters overall utility additively. That is, utility derived from the payment to be received at future date t can be expressed

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the original language. There is no need for special contents, but the length of words should match the language.

as  $u_t(c_t) := D(t) \, u(c_t)$ . Here, D(t) denotes the individual's discount function for conversion of future utility into present utility. The discount function satisfies  $0 \le D(t)$  and  $D'(t) \le 0$ , such that a payment further in the future is valued at most as much as an equal-sized payment closer in the future.<sup>5</sup>

The utility of earnings sequence c with payments  $c_t$  in periods t = 1, ..., T is

$$U(\mathbf{c}) = \sum_{t=1}^{T} u_t(c_t) = \sum_{t=1}^{T} D(t) u(c_t).$$
 (1)

Individuals choose how much to allocate to the different periods by maximizing their utility over all possible earnings sequences available within a given budget set C, see equation (1). We use the superscript  $^{\mathrm{DU}}$  to indicate decisions based on discounted utility.

A Subparagraph. And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{a}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

After this fourth paragraph, we start a new paragraph sequence. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{a}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

**Another Subparagraph.** Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = 1$ 

<sup>5.</sup> Normalization such that  $D(t) \le 1$  is not necessary in our case. Provided that t is a metric time measure, where t=0 stands for the present, examples are  $D(t) := \delta^t$  with some  $\delta > 0$  for exponential discounting and  $D(t) := (1 + \alpha t)^{-\gamma/\alpha}$  with some  $\alpha, \gamma > 0$  for generalized hyperbolic discounting.

 $\sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

**2.2.2 Focus-Weighted Utility.** In this section, we extend the model of discounted utility through "focus weights," as proposed by Kőszegi and Szeidl (2013). Period-t weights  $g_t$  scale period-t consumption utility  $u_t$ . Individuals are assumed to maximize focus-weighted utility, which is defined as follows:

$$\tilde{U}(\boldsymbol{c}, \boldsymbol{C}) := \sum_{t=1}^{T} g_{t}(\boldsymbol{C}) u_{t}(c_{t}). \tag{2}$$

In contrast to discounted utility U(c), focus-weighted utility  $\tilde{U}(c, C)$  has two arguments: the earnings sequence c and the choice set c. The latter dependence is due to the weights  $g_t$ . These are given by a strictly increasing weighting function g that takes as its argument the difference between the maximum and the minimum attainable utility in period t over all possible earnings sequences in set c:

$$g_t(\mathbf{C}) := g[\Delta_t(\mathbf{C})] \quad \text{with} \quad \Delta_t(\mathbf{C}) := \max_{c \in \mathbf{C}} u_t(c_t) - \min_{c \in \mathbf{C}} u_t(c_t).$$
 (3)

If the underlying consumption utility function is characterized by discounted utility, then  $u_t(c_t) := D(t) u(c_t)$ . That is, focused thinkers put more weight on period t than on period t' if the discounted-utility distance between the best and worst alternative is larger for period t than for period t'.

**A Subparagraph.** Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain *all letters of the alphabet* and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{a}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

**Yet Another Subparagraph.** Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain *all letters of the alphabet* and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{a}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

**2.2.3 Hypotheses.** Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain *all letters of the alphabet* and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{a}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ . This gives rise to our first hypothesis:

**Hypothesis 1.** This environment can be used to clearly state your hypothesis and set them apart from the body text.

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{a}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ . Based on this, we can state our second hypothesis:

**Hypothesis 2.** This environment can be used to clearly state your hypothesis and set them apart from the body text.

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{a}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

# 3 Results

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A

Table 1. An Example Table

Dependent variable	â
Estimate	0.123*** (0.011)
Observations Subjects	750 250

Notes: Standard errors in parentheses, clustered on the subject level. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain *all letters of the alphabet* and it should be written in of the original language.  $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ . With this, we can test our hypotheses.

# 3.1 Test of Hypothesis 1

Our first result supports Hypothesis 1. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ . The analysis we conducted to obtain Result 1 is described in detail in Table 1. Let's reference a section, a subsection, and a figure from the appendices: Appendix C, Section A.2, Figure B.1.

**Result 1.** Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{\frac{a}{b}}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text,

you will get no information  $E=mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain *all letters of the alphabet* and it should be written in of the original language.  $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

# 3.2 Test of Hypothesis 2

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{a}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ . We thereby test Hypothesis 2.

**Result 2.** Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{\frac{a}{b}}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^n}b$ .

Our second result provides evidence in support of Hypothesis 2. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

#### 3.3 Heterogeneity

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will

get no information  $E=mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

$$\bar{x} = \frac{1}{n} \sum_{i=1}^{i=n} x_i = \frac{x_1 + x_2 + \dots + x_n}{n}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain *all letters of the alphabet* and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{a}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

$$\int_0^\infty e^{-\alpha x^2} dx = \frac{1}{2} \sqrt{\int_{-\infty}^\infty e^{-\alpha x^2}} dx \int_{-\infty}^\infty e^{-\alpha y^2} dy = \frac{1}{2} \sqrt{\frac{\pi}{\alpha}}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{a}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

$$\sum_{k=0}^{\infty} a_0 q^k = \lim_{n \to \infty} \sum_{k=0}^n a_0 q^k = \lim_{n \to \infty} a_0 \frac{1 - q^{n+1}}{1 - q} = \frac{a_0}{1 - q}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should

contain *all letters of the alphabet* and it should be written in of the original language.  $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-p \pm \sqrt{p^2 - 4q}}{2}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{a}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

$$\frac{\partial^2 \Phi}{\partial x^2} + \frac{\partial^2 \Phi}{\partial y^2} + \frac{\partial^2 \Phi}{\partial z^2} = \frac{1}{c^2} \frac{\partial^2 \Phi}{\partial t^2}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{a}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

#### 3.4 Structural Estimation

Inspect the variance–covariance matrix  $\Sigma$ :

$$\Sigma := \mathbf{Cov}(X) = \begin{bmatrix} \operatorname{Var}(X_1) & \cdots & \operatorname{Cov}(X_1, X_n) \\ \vdots & \ddots & \vdots \\ \operatorname{Cov}(X_n, X_1) & \cdots & \operatorname{Var}(X_n) \end{bmatrix}.$$

## 4 Discussion

#### 4.1 Some Limitations

Let's reference some tables: Table 2 and Table 3. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If

**Table 2.** Points Awarded in Our Typeface Competition—Basic Formatting Test Greek:  $\varepsilon$ ,  $\theta$ ,  $\phi$ 

	Utopia	Computer Modern	Charter	Times Roman	Palatino
Yoël	1	1	2	0	1
Çelik	2	0	2	1	0
Anità	1	2	1	2	0
Uğur	1	2	0	1	0
Håkan	1	0	2	0	1
Allison	2	0	1	2	1
Pía	1	0	2	1	0
David	1	0	2	1	1
Sum	10	5	12	8	4

you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

Table 3. Points Awarded in Our Typeface Competition—More Sophisticated Formatting

	Utopia <sup>a</sup>	Computer Modern <sup>b</sup>	Charter <sup>c</sup>	Times Roman <sup>d</sup>	Palatino <sup>e</sup>
Yoël	1	1	2	0	1
Çelik	2	0	2	1	0
Anità	1	2	1	2	0
Uğur	1	2	0	1	0
Håkan	1	0	2	0	1
Allison	2	0	1	2	1
Pía	1	0	2	1	0
David	1	0	2	1	1
Sum	10	5	12	8	4

a \usepackage{fourier}

 $<sup>^{\</sup>rm b}$  The  $\Xi T_{E}\!X$  standard serif font.

 $<sup>^{</sup>c} \setminus usepackage[charter] \{ mathdesign \}$ 

d \usepackage{newtxtext, newtxmath}

 $<sup>^{</sup>e} \setminus usepackage[sc]\{mathpazo\}$ 

#### 4.2 Utility from Money

In deriving our predictions (Section 2.2), we assume that subjects base their decisions on utility derived from receiving monetary payments  $c_t$  at various dates t. We also make the standard assumption that utility from money is increasing in its argument but not convex, i.e.,  $u'(c_t) \ge 0$  and  $u''(c_t) \le 0$ . Both assumptions are frequently made in studies on intertemporal decision making.

A second justification is consistency within the discipline: Halevy (2014) points out that "in the domain of risk and uncertainty ... preferences are often defined over payments." In line with this, Kőszegi and Szeidl (2013, p. 62) make the same assumption of "money in the utility function":

in some applications we also assume that monetary transactions induce *direct* utility consequences, so that for instance an agent making a payment experiences an immediate utility loss. The idea that people experience monetary transactions as immediate utility is both intuitively compelling and supported in the literature: ... some evidence on individuals' attitudes toward money, such as narrow bracketing (...) and laboratory evidence on hyperbolic discounting (...), is difficult to explain without it.

Last but not least, the papers by McClure et al. (2004) and McClure et al. (2007) demonstrate that brain activation, as measured by functional magnetic resonance imaging, is similar for primary and monetary rewards.

Let us now discuss the second assumption: that utility from money is nonconvex. We find that subjects allocate more money to the concentrated payoffs in the unbalanced than in the associated balanced budget sets—which we call concentration bias. One might argue that this relative preference for concentrated payoffs can be explained by the per-period utility function over money being convex.

Obtaining evidence on the shape of utility over money is nontrivial because it requires that at least two monetary amounts be compared with each other without the one clearly dominating the other. Thus, estimates of the curvature of the utility function over money can be obtained in two ways: the monetary amounts must be paid in different states of the world, i.e., comprise a lottery, or they have to be paid at different points in time.<sup>6</sup> Both methods entail particular theoretical assumptions.

<sup>6.</sup> As a matter of fact, the latter was the motivation behind Samuelson (1937): "Under the following four assumptions, it is believed possible to arrive theoretically at a precise measure of the marginal utility of *money income* ..." (p. 155; emphasis in the original).

Andersen et al. (2008) advocate the former approach and argue that when estimating time preference parameters, one should control for the curvature of the utility function through a measure of the curvature that is based on observed choices under risk. Their study and numerous other studies on risk attitudes consistently reveal that the vast majority of subjects is risk-averse even over small stakes. Hence, for the vast majority of subjects, utility over money is concave according to this methodology (ruling out probability weighting). Others, most notably Andreoni and Sprenger (2012), have argued that the degree of curvature measured via risky choices probably overstates the degree of curvature effective in intertemporal choices, but they also find that utility is concave (albeit close to linear). Given this unambiguous evidence from previous studies, it is implausible that our subjects exhibit convex utility over money.

#### 5 Conclusion

Cite some more papers (Yaari, 1965; Warner and Pleeter, 2001; Davidoff, Brown, and Diamond, 2005; Benartzi, Previtero, and Thaler, 2011). Let's cite a book: Luce (1959). Let's cite a contribution to a collected volume: Harrison and Rutström (2008) and a collection (an edited volume) itself: Kagel and Roth (2016). Now let's cite presentations at conferences: Vosgerau et al. (2008) and Beute and Kort (2012). Attema et al. (2016) propose a method for "measuring discounting without measuring utility".

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

<sup>7.</sup> The basic idea of their method is intriguingly simple: Imagine an individual who is indifferent between, say, Option A: \$10 today and Option B: \$10 in one year plus \$10 in two years. With a constant annual discount factor  $\delta$ , this indifference translates to  $u(\$10) = \delta u(\$10) + \delta^2 u(\$10)$ , so that u(\$10) cancels out, and  $\delta$  can be readily calculated as the solution to  $1 = \delta + \delta^2$ .

# Appendix A Put More Complicated Derivations and Proofs Here

#### A.1 Appendix Subsection

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.  $\sin^2(\alpha) + \cos^2(\beta) = 1$ . If you read this text, you will get no information  $E = mc^2$ . Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look.  $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$ . This text should contain all letters of the alphabet and it should be written in of the original language.  $\sqrt[n]{a} = \sqrt[n]{a}$ . There is no need for special contents, but the length of words should match the language.  $a\sqrt[n]{b} = \sqrt[n]{a^nb}$ .

- (1) First itemtext
  - a. First itemtext
    - i. First itemtext
    - ii. Second itemtext
    - iii. Last itemtext
    - iv. First itemtext
  - b. Second itemtext
  - c. Last itemtext
  - d. First itemtext
- (2) Second itemtext
- (3) Last itemtext
- (4) First itemtext

The typeset math below follows the ISO recommendations that only variables be set in italic. Note the use of upright shapes for "d," "e," and " $\pi$ ." (These are entered as  $\mathbf{d}$ , mathup{ $\mathbf{e}$ , and  $\mathbf{pi}$ , respectively.)

**Theorem 1 (Simplest form of the** *Central Limit Theorem***).** Let  $X_1, X_2, ..., X_n$  be a sequence of i.i.d. random variables with mean 0 and variance 1 on a probability space  $(\Omega, \mathcal{F}, \mathbb{P})$ . Then

$$\mathbb{P}\left(\frac{X_1 + \dots + X_n}{\sqrt{n}} \le y\right) \to \mathfrak{N}(y) := \int_{-\infty}^{y} \frac{\mathrm{e}^{-\nu^2/2}}{\sqrt{2\pi}} \,\mathrm{d}\nu \quad \text{as } n \to \infty,$$

or, equivalently, letting  $S_n := \sum_{1}^{n} X_k$ ,

$$\mathbb{E}f(S_n/\sqrt{n}) \to \int_{-\infty}^{\infty} f(\nu) \frac{\mathrm{e}^{-\nu^2/2}}{\sqrt{2\pi}} \,\mathrm{d}\nu \quad \text{as } n \to \infty, \text{ for every } f \in \mathrm{b}\mathscr{C}(\mathbb{R}).$$

#### A.2 Salience

Salience theory (Bordalo, Gennaioli, and Shleifer, 2012, 2013) represents a behavioral model according to which the most distinctive features of the available alternatives receive a particularly large share of attention and are therefore over-weighted. More precisely, a particular attribute out of all attributes of an alternative becomes the more salient, the more it differs from that attribute's average level over all available alternatives.

Formally, alternatives are assumed to be uniquely characterized by the values they take in  $T \geq 1$  attributes (or, "dimensions"). Utility is assumed to be additively separable in attributes, and salience attaches a decision weight to each attribute of each good which indicates how salient the respective attribute is for that good. Suppose an agent chooses one alternative from some finite choice set C. Let t index the T different attributes, and let t index the t available alternatives. Let t index the function which assigns utility to values in dimension t. Denote by t the level of attribute t of good t and define t index the t as the utility that dimension t of good t yields. Let t be the average utility level, across all t goods, of dimension t. The salience of each dimension of good t is determined by a symmetric and continuous salience function t0. That satisfies the following two properties:

(1) Ordering. Let  $\mu := \operatorname{sgn}(u_t^k - \overline{u}_t)$ . Then for any  $\varepsilon, \varepsilon' \ge 0$  with  $\varepsilon + \varepsilon' > 0$ , it holds that

$$\sigma(u_t^k + \mu \,\varepsilon, \overline{u}_t - \mu \,\varepsilon') > \sigma(u_t^k, \overline{u}_t). \tag{A.1}$$

(2) Diminishing sensitivity. For any  $u_t^k, \overline{u}_t \ge 0$  and all  $\varepsilon > 0$ , it holds that

$$\sigma(u_{t}^{k} + \varepsilon, \overline{u}_{t} + \varepsilon) < \sigma(u_{t}^{k}, \overline{u}_{t}). \tag{A.2}$$

Following the smooth salience characterization proposed in Bordalo, Gennaioli, and Shleifer (2012, p. 1255), each dimension t of good k receives weight  $\Delta^{-\sigma(u_t^k, \overline{u_t})}$ , where  $\Delta \in (0,1]$  is a constant that captures an agent's susceptibility to salience.  $\Delta=1$  gives rise to a rational decision maker, and the smaller  $\Delta$ , the stronger is the salience bias. We call an agent with  $\Delta<1$  a salient thinker.

A reference with a large number of authors is Henrich et al. (2005).

# Appendix B Some Additional Figures

	W W	veeks					w w	eeks	
		<u>,                                     </u>						<del>-</del>	— → t
<b>c</b> <sub>CL</sub> <sup>BAL</sup> (1):	1 + B	1	1	1	1	1	1	1	1
<b>c</b> <sub>CL</sub> <sup>BAL</sup> (2):	1	1 + B+i	1	1	1	1	1	1	1
<b>c</b> <sub>CL</sub> (3):	1	1	1 + B + 2i	1	1	1	1	1	1
<b>c</b> <sub>CL</sub> <sup>BAL</sup> (4):	1	1	1	1 + B+3i	1	1	1	1	1
<b>c</b> <sub>CL</sub> <sup>BAL</sup> (5):	1	1	1	1	1 + B + 4i	1	1	1	1
<b>c</b> <sub>CL</sub> <sup>BAL</sup> (6):	1	1	1	1	1	1 + B + 5i	1	1	1
<b>c</b> <sub>CL</sub> (7):	1	1	1	1	1	1	1 + B + 6i	1	1
<b>c</b> <sub>CL</sub> (8):	1	1	1	1	1	1	1	1 + B + 7i	1
<b>c</b> <sub>CL</sub> <sup>BAL</sup> (9):	1	1	1	1	1	1	1	1	1 + B + 8i

**Figure B.1.** Earnings Sequences Included in Choice List  $\mathbf{C}_{\mathrm{CL}}^{\mathrm{BAL}}$ 

Notes: For the values of B, i, and w that we used see Section 2. Figure taken from Dertwinkel-Kalt et al. (2017).

	w w	eeks					w w	eeks	
								<u></u>	
<b>c</b> <sub>CL</sub> <sup>UNBAL, I</sup> (1):	1 + B	1	1	1	1	1	1	1	1
<b>c</b> <sub>CL</sub> <sup>UNBAL, I</sup> (2):	1 + <u>B+i</u> 2	1 + B+i 2	1	1	1	1	1	1	1
<b>c</b> <sub>CL</sub> <sup>UNBAL, I</sup> (3):	1 + B+2i 3	$\begin{array}{c} 1\\+\\\frac{B+2i}{3} \end{array}$	$\begin{array}{c} 1 \\ + \\ \frac{B+2i}{3} \end{array}$	1	1	1	1	1	1
<b>c</b> <sub>CL</sub> <sup>UNBAL, I</sup> (4):	1 + B+3i 4	1 + <u>B+3i</u> 4	1 + B+3i 4	1 + B+3i 4	1	1	1	1	1
<b>c</b> <sub>CL</sub> <sup>UNBAL, I</sup> (5):	1 + B+4i 5	1 + <u>B+4i</u> 5	1 + B+4i 5	1 + B+4i 5	1 + B+4i 5	1	1	1	1
<b>c</b> <sub>CL</sub> <sup>UNBAL, I</sup> (6):	1 + B+5i 6	1 + <u>B+5i</u> 6	1 + <u>B+5i</u> 6	1 + B+5i 6	1 + <u>B+5i</u> 6	1 + B+5i 6	1	1	1
<b>c</b> <sub>CL</sub> <sup>UNBAL, I</sup> (7):	1 + B+6i 7	1 + B+6i 7	1 + B+6i 7	1 + B+6i 7	1 + B+6i 7	1 + B+6i 7	$\begin{array}{c} 1 \\ + \\ \frac{B+6i}{7} \end{array}$	1	1
<b>c</b> <sub>CL</sub> <sup>UNBAL, I</sup> (8):	1 + B+7i 8	$\begin{array}{c} 1\\+\\\frac{B+7i}{8} \end{array}$	1 + B+7i 8	1 + B+7i 8	1 + B+7i 8	1 + B+7i 8	1 + B+7i 8	1 + <u>B+7i</u> 8	1
<b>c</b> <sub>CL</sub> <sup>UNBAL, I</sup> (9):	1 + <u>B+8i</u> 9	1 + <u>B+8i</u> 9	1 + <u>B+8i</u> 9	1 + <u>B+8i</u> 9	1 + <u>B+8i</u> 9	1 + B+8i 9	1 + B+8i 9	1 + <u>B+8i</u> 9	1 + <u>B+8i</u> 9

**Figure B.2.** Earnings Sequences Included in Choice List  $m{c}_{\text{CL}}^{\text{UNBAL,I}}$ 

Notes: For the values of B, i, and w that we used see Section 2. Figure taken from Dertwinkel-Kalt et al. (2017).

	w w	eeks					w we	eeks	
-			-					<del></del>	
<b>c</b> <sub>CL</sub> <sup>UNBAL,II</sup> (1):	1 + B/9	1 + B 9	1 + B 9	1 + B 9	1 + B 9	1 + B 9	1 + B/9	1 + B 9	1 + B 9
<b>c</b> <sub>CL</sub> <sup>UNBAL, II</sup> (2):	1	1 + <u>B+i</u> 8	1 + <u>B+i</u> 8	$\begin{array}{c} 1\\+\\\frac{B+i}{8} \end{array}$	$\begin{array}{c} 1\\+\\\frac{B+i}{8} \end{array}$	$\begin{array}{c} 1\\+\\\frac{B+i}{8} \end{array}$	$\begin{array}{c} 1\\+\\\frac{B+i}{8} \end{array}$	1 + <u>B+i</u> 8	1 + B+i 8
<b>c</b> <sub>CL</sub> <sup>UNBAL, II</sup> (3):	1	1	$\begin{array}{c} 1\\+\\\frac{B+2i}{7} \end{array}$	1 + B+2i 7	$\begin{array}{c} 1\\+\\\frac{B+2i}{7} \end{array}$	$\begin{array}{c} 1\\+\\\frac{B+2i}{7} \end{array}$	$\begin{array}{c} 1\\+\\\frac{B+2i}{7} \end{array}$	$\begin{array}{c} 1\\+\\\frac{B+2i}{7} \end{array}$	1 + B+2i 7
<b>c</b> <sub>CL</sub> <sup>UNBAL, II</sup> (4):	1	1	1	1 + <u>B+3i</u> 6	1 + <u>B+3i</u> 6	1 + <u>B+3i</u> 6	1 + <u>B+3i</u> 6	1 + <u>B+3i</u> 6	1 + B+3i 6
<b>c</b> <sub>CL</sub> <sup>UNBAL, II</sup> (5):	1	1	1	1	1 + B+4i 5	1 + <u>B+4i</u> 5	1 + <u>B+4i</u> 5	1 + B+4i 5	1 + B+4i 5
<b>c</b> <sub>CL</sub> <sup>UNBAL, II</sup> (6):	1	1	1	1	1	1 + <u>B+5i</u>	1 + <u>B+5i</u> 4	1 + B+5i 4	1 + B+5i 4
<b>c</b> <sub>CL</sub> <sup>UNBAL, II</sup> (7):	1	1	1	1	1	1	$\begin{array}{c} 1\\+\\\frac{B+6i}{3} \end{array}$	$\begin{array}{c} 1\\+\\\frac{B+6i}{3} \end{array}$	$\begin{array}{c} 1\\+\\\frac{B+6i}{3} \end{array}$
<b>c</b> <sub>CL</sub> <sup>UNBAL, II</sup> (8):	1	1	1	1	1	1	1	$\begin{array}{c} 1\\+\\\frac{B+7i}{2} \end{array}$	1 + <u>B+7i</u> 2
<b>c</b> <sub>CL</sub> <sup>UNBAL, II</sup> (9):	1	1	1	1	1	1	1	1	1 + B + 8i

**Figure B.3.** Earnings Sequences Included in Choice List  $\mathbf{C}_{\mathrm{CL}}^{\mathrm{UNBAL},\,\mathrm{II}}$ 

Notes: For the values of B, i, and w that we used see Section 2. Figure taken from Dertwinkel-Kalt et al. (2017).

# Appendix C siunitx and xltabular Example Tables

**Table C.1.** An Example of a Regression Table (Adapted from Gerhardt, Schildberg-Hörisch, and Willrodt, 2017). Never Forget to Mention the Dependent Variable!

	(1)	(2)	(3)	(4)	(5)
Treatment	-0.390	-0.228	-0.729*	-0.449*	-0.453**
	(+0.352)	(-0.205)	[+0.377]	[-0.245]	{+0.204}
Female	0.948***	0.061	0.188	0.305	0.385*
	(0.354)	(0.233)	(0.372)	(0.226)	(0.222)
Female $\times$ Treatment	0.169	0.251	0.892*	0.454	0.439
	(0.514)	(0.325)	(0.533)	(0.341)	(0.307)
Final high school grade	-0.101	0.013	0.076	0.117	0.039
	(0.198)	(0.144)	(0.224)	(0.146)	(0.133)
Trait self-control	-0.016	0.002	-0.016	-0.000	-0.007
	(0.016)	(0.010)	(0.015)	(0.010)	(0.009)
Constant	2.357***	1.512***	-0.322	2.158***	1.437***
	(0.239)	(0.144)	(0.265)	(0.161)	(0.152)
Observations	303	289	295	304	1191
$R^2$	0.057	0.008	0.039	0.043	0.024
Treatment × (1 + Female)	-0.221	0.023	0.163	0.004	-0.014
$p_F[Treatment \times (1 + Female) = 0]$	0.327	0.008	0.192	0.000	0.003

Notes: Dependent variable:  $m_{\sim}$ . Robust standard errors (cluster-corrected for column 5) in parentheses. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1. Missing observations (N < 308) due to exclusion of trials in which subjects behaved irrationally (i.e., chose a dominated option). The regressors Final high school grade and Trait self-control are mean-centered.

**Table C.2.** Figure Grouping via siunitx in a Table

(1)	(2)	(3)
-0.100*	-0.10001*	-123 456.444***
(2.871)	(2.87123)	[+50 000.123]

**Table C.3.** Overview of the Choice Lists Presented to Subjects (Adapted from Gerhardt, Schildberg-Hörisch, and Willrodt, 2017)

		Alternative <b>A</b>				Alterr	ative <b>B</b>	
	C <sub>A,1</sub>	<i>p</i> <sub><b>A</b>,1</sub>	C <sub><b>A</b>,2</sub>	P <b>A</b> ,2	C <sub>B,1</sub>	р <sub>в,1</sub>	С <sub><b>В</b>,2</sub>	р <sub>в,2</sub>
Choice List I: $risky/risky$ ( $x = $ €	22.00, r = €7	.50, k =	€11.50; 25	rows)				
Top row	€ 3.00	50%	€22.00	50%	€ 3.00	50%	€ 7.00	50%
Center row	€ 3.00	50%	€22.00	50%	€ 9.00	50%	€13.00	50%
Row with $m = 0$	€ 3.00	50%	€22.00	50%	€10.50	50%	€14.50	50%
Bottom row	€ 3.00	50%	€22.00	50%	€15.00	50%	€19.00	50%
Choice List II: safe/risky ( $x = \epsilon$	£16.00, <i>r</i> = €5	.00, k =	€5.00; 19 r	ows)				
Top row	€11.00	100%			€11.00	50%	€21.00	50%
Center row	€11.00	100%			€ 6.50	50%	€16.50	50%
Row with $m = 0$	€11.00	100%			€ 6.00	50%	€16.00	50%
Bottom row	€11.00	100%			€ 2.00	50%	€12.00	50%
Choice List III: "long shot" (x =	€14.00, r = -	-€36.00,	k = €7.00;	21 rows	)			
Top row	€ 7.00	90%	€50.00	10%	€ 7.00	90%	€10.00	10%
Row with $m = 0$	€ 7.00	90%	€50.00	10%	€11.00	90%	€14.00	10%
Center row	€ 7.00	90%	€50.00	10%	€12.00	90%	€15.00	10%
Bottom row	€ 7.00	90%	€50.00	10%	€17.00	90%	€20.00	10%
Choice List IV: delayed payoffs	(x = €18.00, r	= €6.00	0, <i>k</i> = €8.5	0, paid ir	n one week; 2	20 rows)	)	
Top row	€ 9.50	50%	€12.00	50%	€ 9.50	50%	€24.00	50%
Above-center row	€ 9.50	50%	€12.00	50%	€ 5.00	50%	€19.50	50%
Below-center row	€ 9.50	50%	€12.00	50%	€ 4.50	50%	€19.00	50%
Row with $m = 0$	€ 9.50	50%	€12.00	50%	€ 3.50	50%	€18.00	50%
Bottom row	€ 9.50	50%	€12.00	50%	€ 0.00	50%	€14.50	50%

 Table C.4. A Really Long Table That Spans Multiple Pages

	(1)	(2)	(3)	(4)
Row 1	0.0070	0.1356	0.1560	0.8979
Row 2	0.4223	0.7311	0.4213	0.6900
Row 3	0.0767	0.5110	0.7399	0.9491
Row 4	0.5954	0.1685	0.3778	0.9960
Row 5	0.6465	0.0524	0.8895	0.1544
Row 6	0.3838	0.7069	0.1773	0.5785
Row 7	0.1537	0.5442	0.6361	0.0327
Row 8	0.0879	0.1812	0.3082	0.2942
Row 9	0.2720	0.2565	0.6214	0.8944
Row 10	0.4873	0.3064	0.9913	0.0591
Row 11	0.8387	0.1713	0.6747	0.7455
Row 12	0.0645	0.4891	0.2892	0.1013
Row 13	0.0989	0.3798	0.5795	0.3725
Row 14	0.3256	0.7080	0.0262	0.8709
Row 15	0.7867	0.8768	0.0690	0.6081
Row 16	0.2713	0.4399	0.5838	0.6107
Row 17	0.5236	0.1527	0.4402	0.8002
Row 18	0.4851	0.4619	0.4040	0.2711
Row 19	0.1742	0.8151	0.2757	0.4184
Row 20	0.0495	0.3288	0.2759	0.1452
Row 21	0.1678	0.2403	0.1993	0.3676
Row 22	0.4977	0.9472	0.2810	0.2493
Row 23	0.6777	0.6516	0.3573	0.1413
Row 24	0.3668	0.3075	0.8724	0.3945
Row 25	0.5877	0.5670	0.0417	0.5213
Row 26	0.3599	0.5485	0.2407	0.6362
Row 27	0.1029	0.9796	0.5696	0.8696
Row 28	0.3070	0.8169	0.4015	0.4386
Row 29	0.4453	0.0670	0.3726	0.3257
Row 30	0.2648	0.9977	0.8864	0.0755
Row 31	0.4085	0.2017	0.5406	0.1333
Row 32	0.4861	0.4466	0.3472	0.2486
Row 33	0.5996	0.8639	0.1837	0.7636
Row 34	0.4446	0.3755	0.6901	0.4208
Row 35	0.9616	0.3585	0.0074	0.2867
Row 36	0.5168	0.5752	0.5778	0.0060
Row 37	0.7978	0.0283	0.7998	0.9952
Row 38	0.0561	0.3133	0.1207	0.6922
Row 39	0.5237	0.1488	0.9217	0.2268
Row 40	0.0944	0.7939	0.6252	0.9836
Row 41	0.3179	0.6226	0.4493	0.4277
Row 42	0.7175	0.7267	0.8016	0.6880
Row 43	0.0192	0.4807	0.7610	0.9808
Row 44	0.9923	0.8888	0.4494	0.0645
Row 45	0.3938	0.8529	0.0496	0.0429
Row 46	0.1135	0.6166	0.5899	0.7500

Table C.4—continued

	(1)	(2)	(3)	(4)
Row 47	0.0654	0.1640	0.1952	0.0431
Row 48	0.8895	0.0549	0.1105	0.1284
Row 49	0.6817	0.8942	0.6597	0.3661
Row 50	0.6690	0.8817	0.2343	0.1903
Row 51	0.4091	0.0874	0.4726	0.1381
Row 52	0.9061	0.9039	0.7439	0.2061
Row 53	0.5282	0.2135	0.5223	0.7846
Row 54				
	0.6505	0.7404	0.8748	0.2078
Row 55	0.5824	0.8443	0.3242	0.8253
Row 56	0.0151	0.9929	0.4812	0.5010
Row 57	0.7296	0.8420	0.1535	0.4273
Row 58	0.8102	0.8068	0.1832	0.8830
Row 59	0.1650	0.5545	0.1820	0.0791
Row 60	0.5882	0.5750	0.9195	0.8993
Row 61	0.0638	0.5132	0.5994	0.0877
Row 62	0.9916	0.8032	0.0564	0.3218
Row 63	0.5555	0.4078	0.7056	0.9225
Row 64	0.8680	0.5577	0.2992	0.0941
Row 65	0.2939	0.7801	0.7039	0.7295
Row 66	0.0829	0.6756	0.5386	0.0644
Row 67	0.3868	0.4199	0.0308	0.5947
Row 68	0.0943	0.2663	0.0379	0.0887
Row 69	0.0050	0.1396	0.8348	0.2830
Row 70	0.9585	0.8018	0.4472	0.9477
Row 71	0.8153	0.2659	0.7030	0.4096
Row 72	0.7532	0.4214	0.3914	0.2360
Row 73	0.6419	0.2074	0.7386	0.0653
Row 74	0.4215	0.7004	0.3193	0.9282
Row 75	0.1307	0.8242	0.1305	0.8925
Row 76	0.5812	0.6879	0.4844	0.0464
Row 77	0.1080	0.5293	0.2700	0.4844
Row 78	0.3073	0.7945	0.8300	0.3479
Row 79	0.4777	0.5842	0.2233	0.3206
Row 80	0.7218	0.7687	0.0432	0.7268
Row 81	0.1427	0.8696	0.7573	0.1263
Row 82	0.0244	0.6493	0.6750	0.9651
Row 83	0.1925	0.4131	0.3064	0.0508
Row 84	0.8678	0.3827	0.7732	0.3896
Row 85	0.6830	0.0868	0.0773	0.1712
Row 86	0.2699	0.5507	0.1200	0.4458
Row 87	0.3873	0.8615	0.0624	0.4357
Row 88	0.0610	0.0065	0.1505	0.0287
Row 89	0.3380	0.6846	0.1305	0.8998
Row 90	0.4337	0.2892	0.9326	0.7977
Row 91	0.7618	0.7254	0.6185	0.5718
Row 92	0.2404	0.2312	0.6645	0.7351
	0.2 10 1	JJ_L	5.5015	3331

Table C.4—continued

ow 93 ow 94 ow 95 ow 96 ow 97 ow 98 ow 99	0.8908 0.7596 0.9736 0.2555	0.4011 0.5054	0.6728 0.3343	0.4192
ow 95 ow 96 ow 97 ow 98 ow 99	0.9736		0.3343	
ow 96 ow 97 ow 98 ow 99		0.2007	0.0070	0.1696
ow 97 ow 98 ow 99	0.2555	0.2894	0.8395	0.7554
ow 98 ow 99		0.3570	0.6331	0.3460
ow 98 ow 99	0.5865	0.8620	0.9528	0.8383
ow 99	0.1753	0.9843	0.5822	0.7130
	0.2085	0.7513	0.4976	0.6609
ow 100	0.8550	0.6317	0.2716	0.3482
ow 101	0.0003	0.2699	0.1657	0.9740
ow 102	0.8108	0.7631	0.4779	0.7736
ow 103	0.1700	0.7518	0.6194	0.2642
ow 104	0.9089	0.7737	0.1760	0.1838
ow 105	0.2693	0.6957	0.8645	0.7214
ow 105 ow 106	0.7675	0.7649	0.1831	0.5527
ow 100 ow 107	0.6605	0.6763	0.6069	0.6509
ow 107	0.9355	0.8627	0.0009	0.0309
ow 108	0.2459	0.2674	0.5147	0.1309
ow 110		0.9926		0.3231
	0.1111 0.3883		0.6565	
ow 111		0.7516	0.0597	0.2444
w 112	0.3873	0.8884	0.8992	0.4628
w 113	0.7374	0.3370	0.2922	0.8778
w 114	0.9644	0.3383	0.7343	0.4642
w 115	0.8793	0.1624	0.6602	0.6129
w 116	0.7910	0.7928	0.9132	0.4582
w 117	0.4158	0.6584	0.0655	0.3760
w 118	0.6719	0.8505	0.2902	0.3726
w 119	0.6456	0.6116	0.7580	0.3331
ow 120	0.9372	0.5338	0.9066	0.8391
w 121	0.1427	0.6179	0.7094	0.5079
w 122	0.1748	0.9789	0.1452	0.5829
ow 123	0.7514	0.2678	0.7714	0.1895
w 124	0.4058	0.7714	0.4468	0.5559
ow 125	0.0799	0.6205	0.4477	0.3788
ow 126	0.3297	0.7600	0.5485	0.8005
ow 127	0.8873	0.3812	0.9346	0.4062
w 128	0.5164	0.9326	0.8897	0.6300
ow 129	0.1876	0.8342	0.5704	0.9817
ow 130	0.3990	0.2170	0.8709	0.4717
ow 131	0.4454	0.3671	0.2185	0.9753
ow 132	0.8951	0.9321	0.3854	0.4805
ow 133	0.3442	0.8316	0.8667	0.6898
ow 134	0.0586	0.2090	0.3720	0.1668
ow 135	0.1312	0.5375	0.6314	0.2907
ow 136	0.5138	0.7588	0.2177	0.7461
ow 137	0.4966	0.1501	0.3993	0.0631
	0.7154	0.8785	0.8362	0.5782

Table C.4—continued

	(1)	(2)	(3)	(4)
Row 139	0.6265	0.2019	0.9703	0.2705
Row 140	0.5248	0.5235	0.5018	0.9854
Row 141	0.2711	0.5263	0.8829	0.8525
Row 142	0.1335	0.8354	0.0190	0.3996
Row 143	0.7644	0.3912	0.8849	0.7440
Row 144	0.4358	0.2065	0.4528	0.8955
Row 145	0.9038	0.0718	0.7912	0.5230
Row 146	0.1919	0.7559	0.2908	0.2352
Row 147	0.6801	0.3179	0.8315	0.7988
Row 148	0.7810	0.3397	0.5245	0.8478
Row 149	0.1458	0.1098	0.2659	0.2319
Row 150	0.7207	0.1931	0.2071	0.0241

Notes: At the very end, you can add some notes to the table.

# Appendix D Math Test Serif

#### **D.1** Overview Serif

Default:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta\vartheta P\Pi\Sigma\sigma$ ;  $\sigma_\epsilon, c^\alpha$  mathnormal:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta\vartheta P\Pi\Sigma\sigma$  mathrm:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta\vartheta P\Pi\Sigma\sigma$  mathup:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta\vartheta P\Pi\Sigma\sigma$  mathit:  $a\alpha\alpha b\beta G\Gamma\epsilon\epsilon\theta\vartheta P\Pi\Sigma\sigma$  mathbf:  $a\alpha b\beta G\Gamma\epsilon\epsilon\theta\vartheta P\Pi\Sigma\sigma$  mathbf:  $a\alpha b\beta G\Gamma\epsilon\epsilon\theta\vartheta P\Pi\Sigma\sigma$  mathbfit:  $a\alpha b\beta G\Gamma\epsilon\epsilon\theta\vartheta P\Pi\Sigma\sigma$  mathbfit:  $a\alpha b\beta G\Gamma\epsilon\epsilon\theta\vartheta P\Pi\Sigma\sigma$ 

Default:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$ ;  $\sigma_\epsilon, c^a$  mathnormal:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathrm:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathup:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathit:  $a\alpha\alpha b\beta G^{\circ}\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathbf:  $a\alpha\alpha b\beta G^{\circ}\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathbfit:  $a\alpha\alpha b\beta G^{\circ}\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathbfit:  $a\alpha\alpha b\beta G^{\circ}\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathbfup:  $a\alpha\alpha b\beta G^{\circ}\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$ 

Default:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta\theta P\Pi\Sigma \sigma$ ;  $\sigma_{\epsilon}$ ,  $c^{\alpha}$  mathnormal:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta\theta P\Pi\Sigma \sigma$  mathrm:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \vartheta P\Pi\Sigma \sigma$  mathup:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathit:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathbf:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathbfit:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathbfit:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathbfit:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$ 

Default: αααbβGΓΓεεθθΡΠΣσ;  $σ_ε$ ,  $c^α$  mathnormal: αααbβGΓΓεεθθΡΠΣσ mathrm: αααbβGΓΓεεθθΡΠΣσ mathup: αααbβGΓΓεεθθΡΠΣσ mathit: αααbβGΓΓεεθθΡΠΣσ mathif: αααbβGΓΓεεθθΡΠΣσ mathbf: αααbβGΓΓεεθθΡΠΣσ mathbfit: αααbβGΓΓεεθθΡΠΣσ mathbfit: αααbβGΓΓεεθθΡΠΣσ mathbfit: αααbβGΓΓεεθθΡΠΣσ mathbfit: αααbβGΓΓεεθθΡΠΣσ

#### **D.2** Formulas Serif

 $\alpha, \beta, \gamma, \delta, \epsilon, \epsilon, \zeta, \eta, \theta, \vartheta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \varpi, \rho, \varrho, \sigma, \zeta, \tau, \upsilon, \phi, \varphi, \chi, \psi, \omega, \epsilon, A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, \Upsilon, \Phi, X, \Psi, \Omega, F,$ 

 $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\epsilon$ ,  $\epsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ ,  $\vartheta$ ,  $\iota$ ,  $\kappa$ ,  $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\xi$ , o,  $\pi$ ,  $\boldsymbol{\sigma}$ ,  $\rho$ ,  $\varrho$ ,  $\sigma$ ,  $\varsigma$ ,  $\tau$ ,  $\upsilon$ ,  $\phi$ ,  $\varphi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\varepsilon$ , A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T,  $\Upsilon$ ,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ , F,  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\epsilon$ ,  $\epsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ ,  $\theta$ ,  $\iota$ ,  $\kappa$ ,  $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\xi$ , o,  $\pi$ ,  $\pi$ ,  $\rho$ ,  $\rho$ ,  $\sigma$ ,  $\varsigma$ ,  $\tau$ ,  $\upsilon$ ,  $\phi$ ,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\varepsilon$ , A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T, Y,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ , F,

α, β, γ, δ, ε, ε, ζ, η, θ, ε, ε, λ, μ, ν, ξ, σ, π, ρ, ρ, σ, ς, τ, υ, φ, φ, χ, ψ, ω, ε, Α, Β, Γ, Δ, Ε, Z, H, Θ, Γ, Λ, Μ, Ν, Ξ, Ο, Π, Ρ, Σ, T, Υ, Φ, X, Ψ, Ω, F,

$$\begin{split} &\alpha a > 0, \beta b + (3 \times 27), \Gamma G = 7 < 8, \lambda \\ &\alpha a > 0, \beta b + (3 \times 27), \Gamma G = 7 < 8, \lambda \\ &\lim_{\nu \to \infty} \nu(\nu) = \max_{s \in S} \{ s \pm 3\gamma + y - 1 \} = 4 \times 7 \\ &\hat{\beta} = (X'X)^{-1}X'y \end{split}$$

$$\lim_{N \to \infty} \sum_{i=0}^{N} x^{i} = \min_{x \in \mathbb{R}} S(x)$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Disambiguation: 0 O O, 1 I I | lI/, ij, rnm,  $\theta \Theta$ ,  $\phi \psi$ , --

Latin vs. Greek:  $a \alpha, d \delta, e \epsilon, i \iota, k \kappa, n \eta, o \sigma, p \rho, \beta \beta, u \upsilon, v v, w \omega, x \chi, y \gamma, A \Delta \Lambda, O \Theta \Omega, T \Gamma, Y \Upsilon.$ 

 $\alpha a > 0, \beta b + (3 \times 27), \Gamma G = 7 < 8, \lambda$ 

 $\lim_{\nu \to \infty} \nu(\nu) = \max_{s \in S} \{ s \pm 3\gamma + y - 1 \} = 4 \times 7$   $\hat{\beta} = (X'X)^{-1}X'y$ 

$$\lim_{N\to\infty}\sum_{i=0}^N x^i = \min_{x\in\mathbb{R}} S(x)$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Disambiguation: 0 O O, 1 l I | l I /, i j, rn m,  $\theta$   $\Theta$ ,  $\phi$   $\psi$ , – –

Latin vs. Greek:  $a \alpha, d \delta, e \epsilon, i \iota, k \kappa, n \eta, o \sigma, p \rho, \beta \beta, u \upsilon, v \nu, w \omega, x \chi, y \gamma, A \Delta \Lambda, O \Theta \Omega, T \Gamma, Y \Upsilon.$ 

 $\alpha a > 0$ ,  $\beta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$   $\lim_{v \to \infty} v(v) = \max_{s \in S} \{s \pm 3\gamma + y - 1\} = 4 \times 7$  $\hat{\beta} = (X'X)^{-1}X'y$ 

$$\lim_{N\to\infty}\sum_{i=0}^N x^i = \min_{x\in\mathbb{R}} S(x)$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Disambiguation: 0 O O, 1 I I | I I /, i j, rn m,  $\theta$   $\Theta$ ,  $\phi$   $\psi$ , – –

Latin vs. Greek:  $a \alpha$ ,  $d \delta$ ,  $e \varepsilon$ ,  $i \iota$ ,  $k \kappa$ ,  $n \eta$ ,  $o \sigma$ ,  $p \rho$ ,  $\beta \beta$ ,  $u \upsilon$ , v v,  $w \omega$ ,  $x \chi$ ,  $y \gamma$ ,  $A \Delta \Lambda$ ,  $O \Theta \Omega$ ,  $T \Gamma$ , Y Y.

$$lpha a > 0$$
,  $eta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$   
 $\lim_{v \to \infty} v(v) = \max_{s \in S} \{s \pm 3\gamma + y - 1\} = 4 \times 7$   
 $\hat{\beta} = (X'X)^{-1}X'y$ 

$$\lim_{N\to\infty}\sum_{i=0}^N x^i=\min_{x\in\mathbb{R}} S(x)$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Disambiguation: 0 O O, 1 l l | l l |, i j, rn m,  $\theta$   $\Theta$ ,  $\phi$   $\psi$ , - Latin vs. Greek: a  $\alpha$ , d  $\delta$ , e  $\varepsilon$ , i  $\iota$ , k  $\kappa$ , n  $\eta$ , o  $\sigma$ , p  $\rho$ ,  $\beta$   $\beta$ , u v, v v, w  $\omega$ , x  $\chi$ , y  $\gamma$ , A  $\Delta$   $\Lambda$ , O  $\Theta$   $\Omega$ , T  $\Gamma$ , Y Y.

# D.3 Math Alphabets Serif

Default

0,1,2,3,4,5,6,7,8,9, 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,  $A,B,\Gamma,\Delta,E,Z,H,\Theta,I,K,\Lambda,M,N,\Xi,O,\Pi,P,\Sigma,T,\Upsilon,\Phi,X,\Psi,\Omega,$   $\alpha,\beta,\gamma,\delta,\epsilon,\zeta,\eta,\theta,\iota,\kappa,\lambda,\mu,\nu,\xi,o,\pi,\rho,\sigma,\tau,\upsilon,\phi,\chi,\psi,\omega,\epsilon,\vartheta,\varpi,\varrho,\varsigma,\varphi,$ 

Math Normal (\mathnormal)

$$0,1,2,3,4,5,6,7,8,9,$$

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

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

$$A,B,\Gamma,\Delta,E,Z,H,\Theta,I,K,\Lambda,M,N,\Xi,O,\Pi,P,\Sigma,T,\Upsilon,\Phi,X,\Psi,\Omega,$$

$$\alpha,\beta,\gamma,\delta,\epsilon,\zeta,\eta,\theta,\iota,\kappa,\lambda,\mu,\nu,\xi,o,\pi,\rho,\sigma,\tau,\upsilon,\phi,\chi,\psi,\omega,\epsilon,\vartheta,\varpi,\rho,\varsigma,\varphi,$$

Math Italic (\mathit)

0,1,2,3,4,5,6,7,8,9, 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,  $A,B,`,`,E,Z,H,^,I,K,^,M,N,^,O,^,P,^,T,^,,^,X,^-,^,$   $\alpha,\beta,\gamma,\delta,\epsilon,\zeta,\eta,\theta,\iota,\kappa,\lambda,\mu,\nu,\xi,o,\pi,\rho,\sigma,\tau,\nu,\phi,\chi,\psi,\omega,\epsilon,\vartheta,\varpi,\rho,\varsigma,\varphi,$ 

```
Math Roman (\mathrm)
```

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

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,

 $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, \Upsilon, \Phi, X, \Psi, \Omega,$ 

 $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \nu, \phi, \chi, \psi, \omega, \epsilon, \vartheta, \varpi, \varrho, \varsigma, \varphi,$ 

### Math Bold (\mathbf)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

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,

 $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, \Upsilon, \Phi, X, \Psi, \Omega,$ 

 $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, v, \phi, \chi, \psi, \omega, \epsilon, \vartheta, \varpi, \varrho, \varsigma, \varphi,$ 

#### Caligraphic (\mathcal)

 $\mathscr{A}, \mathscr{B}, \mathscr{C}, \mathfrak{D}, \mathscr{E}, \mathscr{F}, \mathscr{G}, \mathcal{H}, \mathscr{I}, \mathscr{J}, \mathcal{K}, \mathscr{L}, \mathscr{M}, \mathcal{N}, \mathcal{O}, \mathscr{P}, \mathscr{Q}, \mathscr{R}, \mathscr{S}, \mathscr{T}, \mathscr{U}, \mathscr{V}, \mathscr{W}, \mathscr{X}, \mathscr{Y}, \mathscr{Z},$ 

Script (\mathscr)

$$\mathscr{A}, \mathscr{B}, \mathscr{C}, \mathfrak{D}, \mathscr{E}, \mathscr{F}, \mathscr{G}, \mathscr{H}, \mathscr{I}, \mathscr{J}, \mathscr{K}, \mathscr{L}, \mathscr{M}, \mathscr{N}, \mathscr{O}, \mathscr{P}, \mathscr{Q}, \mathscr{R}, \mathscr{S}, \mathscr{T}, \mathscr{U}, \mathscr{V}, \mathscr{W}, \mathscr{X}, \mathscr{Y}, \mathscr{Z},$$

Fraktur (\mathfrak)

$$\mathfrak{A},\mathfrak{B},\mathfrak{C},\mathfrak{D},\mathfrak{E},\mathfrak{F},\mathfrak{G},\mathfrak{H},\mathfrak{I},\mathfrak{J},\mathfrak{K},\mathfrak{L},\mathfrak{M},\mathfrak{N},\mathfrak{O},\mathfrak{P},\mathfrak{Q},\mathfrak{R},\mathfrak{S},\mathfrak{T},\mathfrak{U},\mathfrak{V},\mathfrak{W},\mathfrak{X},\mathfrak{Y},\mathfrak{Z},$$
 
$$\mathfrak{a},\mathfrak{b},\mathfrak{c},\mathfrak{d},\mathfrak{e},\mathfrak{f},\mathfrak{g},\mathfrak{h},\mathfrak{i},\mathfrak{j},\mathfrak{k},\mathfrak{l},\mathfrak{m},\mathfrak{n},\mathfrak{o},\mathfrak{p},\mathfrak{q},\mathfrak{r},\mathfrak{s},\mathfrak{t},\mathfrak{u},\mathfrak{v},\mathfrak{w},\mathfrak{x},\mathfrak{y},\mathfrak{z},$$

Blackboard Bold (\mathbb)

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

#### D.4 Character Sidebearings Serif

#### Default

$$\begin{split} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |T| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |A| + |M| + \\ |N| + |E| + |O| + |\Pi| + |P| + |E| + |T| + |T| + |\Phi| + |X| + |\Psi| + |\Omega| + \\ |\alpha| + |\beta| + |\gamma| + |\delta| + |\epsilon| + |\zeta| + |\eta| + |\theta| + |\iota| + |\kappa| + |\lambda| + |\mu| + \\ |v| + |\xi| + |o| + |\pi| + |\rho| + |\sigma| + |\tau| + |v| + |\phi| + |\chi| + |\psi| + |\omega| + \\ |\varepsilon| + |\vartheta| + |\sigma| + |\rho| + |\zeta| + |\varphi| + \end{split}$$

#### Math Roman (\mathrm)

$$\begin{split} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |I| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |\Gamma| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |\Lambda| + |M| + \\ |N| + |\Xi| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |\Upsilon| + |\Phi| + |X| + |\Psi| + |\Omega| + \\ \end{split}$$

Math Bold (\mathbf)

$$\begin{split} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |T| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |A| + |M| + \\ |N| + |\Xi| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |\Upsilon| + |\Phi| + |X| + |\Psi| + |\Omega| + \\ \end{split}$$

Math Calligraphic (\mathcal)

$$\begin{aligned} |\mathcal{A}| + |\mathcal{B}| + |\mathcal{C}| + |\mathcal{D}| + |\mathcal{E}| + |\mathcal{F}| + |\mathcal{G}| + |\mathcal{H}| + |\mathcal{I}| + |\mathcal{I}| + |\mathcal{I}| + |\mathcal{H}| +$$

## **D.5** Superscript Positioning Serif

Default

$$\begin{split} A^2 + B^2 + C^2 + D^2 + E^2 + F^2 + G^2 + H^2 + I^2 + J^2 + K^2 + L^2 + M^2 + \\ N^2 + O^2 + P^2 + Q^2 + R^2 + S^2 + T^2 + U^2 + V^2 + W^2 + X^2 + Y^2 + Z^2 + \\ a^2 + b^2 + c^2 + d^2 + e^2 + f^2 + g^2 + h^2 + i^2 + j^2 + k^2 + l^2 + m^2 + \\ n^2 + o^2 + p^2 + q^2 + r^2 + s^2 + t^2 + u^2 + v^2 + w^2 + x^2 + y^2 + z^2 + \\ A^2 + B^2 + \Gamma^2 + \Delta^2 + E^2 + Z^2 + H^2 + \Theta^2 + I^2 + K^2 + \Lambda^2 + M^2 + \\ N^2 + \Xi^2 + O^2 + \Pi^2 + P^2 + \Sigma^2 + T^2 + \Upsilon^2 + \Phi^2 + X^2 + \Psi^2 + \Omega^2 + \\ \alpha^2 + \beta^2 + \gamma^2 + \delta^2 + \epsilon^2 + \zeta^2 + \eta^2 + \theta^2 + \iota^2 + \kappa^2 + \lambda^2 + \mu^2 + \\ v^2 + \xi^2 + o^2 + \pi^2 + \rho^2 + \sigma^2 + \tau^2 + v^2 + \phi^2 + \chi^2 + \psi^2 + \omega^2 + \\ \varepsilon^2 + \vartheta^2 + \varpi^2 + \varrho^2 + \zeta^2 + \varphi^2 + \end{split}$$

$$\begin{split} &A^2+B^2+C^2+D^2+E^2+F^2+G^2+H^2+I^2+J^2+K^2+L^2+M^2+\\ &N^2+O^2+P^2+Q^2+R^2+S^2+T^2+U^2+V^2+W^2+X^2+Y^2+Z^2+\\ &a^2+b^2+c^2+d^2+e^2+f^2+g^2+h^2+i^2+j^2+k^2+l^2+m^2+\\ &n^2+o^2+p^2+q^2+r^2+s^2+t^2+u^2+v^2+w^2+x^2+y^2+z^2+\\ &A^2+B^2+\Gamma^2+\Delta^2+E^2+Z^2+H^2+\Theta^2+I^2+K^2+\Lambda^2+M^2+\\ &N^2+\Xi^2+O^2+\Pi^2+P^2+\Sigma^2+T^2+\Upsilon^2+\Phi^2+X^2+\Psi^2+\Omega^2+\\ \end{split}$$

Math Bold (\mathbf)

$$A^{2} + B^{2} + C^{2} + D^{2} + E^{2} + F^{2} + G^{2} + H^{2} + I^{2} + J^{2} + K^{2} + L^{2} + M^{2} + N^{2} + O^{2} + P^{2} + Q^{2} + R^{2} + S^{2} + T^{2} + U^{2} + V^{2} + W^{2} + X^{2} + Y^{2} + Z^{2} + A^{2} + b^{2} + c^{2} + d^{2} + e^{2} + f^{2} + g^{2} + h^{2} + i^{2} + j^{2} + k^{2} + l^{2} + m^{2} + N^{2} + O^{2} + p^{2} + q^{2} + r^{2} + s^{2} + t^{2} + u^{2} + v^{2} + w^{2} + x^{2} + y^{2} + z^{2} + A^{2} + B^{2} + \Gamma^{2} + \Delta^{2} + E^{2} + Z^{2} + H^{2} + \Theta^{2} + I^{2} + K^{2} + \Lambda^{2} + M^{2} + N^{2} + \Xi^{2} + O^{2} + \Pi^{2} + P^{2} + \Sigma^{2} + T^{2} + \Upsilon^{2} + \Phi^{2} + X^{2} + \Psi^{2} + \Omega^{2} + \Omega^{2$$

Math Calligraphic (\mathcal)

$$\mathcal{A}^{2} + \mathcal{B}^{2} + \mathcal{C}^{2} + \mathcal{D}^{2} + \mathcal{E}^{2} + \mathcal{F}^{2} + \mathcal{F}^{2} + \mathcal{F}^{2} + \mathcal{F}^{2} + \mathcal{F}^{2} + \mathcal{F}^{2} + \mathcal{L}^{2} + \mathcal{M}^{2} + \mathcal{N}^{2} + \mathcal{O}^{2} + \mathcal{P}^{2} + \mathcal{Q}^{2} + \mathcal{R}^{2} + \mathcal{P}^{2} + \mathcal{P}^{2}$$

# D.6 Subscript Positioning Serif

$$\begin{split} A_i + B_i + C_i + D_i + E_i + F_i + G_i + H_i + I_i + J_i + K_i + L_i + M_i + \\ N_i + O_i + P_i + Q_i + R_i + S_i + T_i + U_i + V_i + W_i + X_i + Y_i + Z_i + \\ a_i + b_i + c_i + d_i + e_i + f_i + g_i + h_i + i_i + j_i + k_i + l_i + m_i + \\ n_i + o_i + p_i + q_i + r_i + s_i + t_i + u_i + v_i + w_i + x_i + y_i + z_i + \\ A_i + B_i + \Gamma_i + \Delta_i + E_i + Z_i + H_i + \Theta_i + I_i + K_i + \Lambda_i + M_i + \\ N_i + \Xi_i + O_i + \Pi_i + P_i + \Sigma_i + T_i + \Upsilon_i + \Phi_i + X_i + \Psi_i + \Omega_i + \\ \alpha_i + \beta_i + \gamma_i + \delta_i + \epsilon_i + \zeta_i + \eta_i + \theta_i + \iota_i + \kappa_i + \lambda_i + \mu_i + \\ v_i + \xi_i + o_i + \pi_i + \rho_i + \sigma_i + \tau_i + v_i + \phi_i + \chi_i + \psi_i + \omega_i + \\ \varepsilon_i + \vartheta_i + \varpi_i + \varrho_i + \varsigma_i + \varphi_i + \end{split}$$

$$\begin{split} &A_i + B_i + C_i + D_i + E_i + F_i + G_i + H_i + I_i + J_i + K_i + L_i + M_i + \\ &N_i + O_i + P_i + Q_i + R_i + S_i + T_i + U_i + V_i + W_i + X_i + Y_i + Z_i + \\ &a_i + b_i + c_i + d_i + e_i + f_i + g_i + h_i + i_i + j_i + k_i + l_i + m_i + \\ &n_i + o_i + p_i + q_i + r_i + s_i + t_i + u_i + v_i + w_i + x_i + y_i + z_i + \\ &A_i + B_i + \Gamma_i + \Delta_i + E_i + Z_i + H_i + \Theta_i + I_i + K_i + \Lambda_i + M_i + \\ &N_i + \Xi_i + O_i + \Pi_i + P_i + \Sigma_i + T_i + \Upsilon_i + \Phi_i + X_i + \Psi_i + \Omega_i + \\ \end{split}$$

Math Bold (\mathbf)

$$\begin{aligned} &A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + \\ &N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + \\ &a_{i} + b_{i} + c_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + \\ &n_{i} + o_{i} + p_{i} + q_{i} + r_{i} + s_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + \\ &A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + \\ &N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + \Upsilon_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + \end{aligned}$$

Math Calligraphic (\mathcal)

$$\begin{split} \mathscr{A}_i + \mathscr{B}_i + \mathscr{C}_i + \mathscr{D}_i + \mathscr{E}_i + \mathscr{F}_i + \mathscr{G}_i + \mathscr{H}_i + \mathscr{I}_i + \mathscr{J}_i + \mathscr{K}_i + \mathscr{L}_i + \mathscr{M}_i + \\ \mathscr{N}_i + \mathscr{O}_i + \mathscr{P}_i + \mathscr{Q}_i + \mathscr{R}_i + \mathscr{F}_i + \mathscr{T}_i + \mathscr{V}_i + \mathscr{V}_i + \mathscr{V}_i + \mathscr{Y}_i + \mathscr{Y}_i + \mathscr{Z}_i + \\ \end{split}$$

# **D.7 Accent Positioning Serif**

### Math Italic (\mathit)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{i} + \hat{j} + \hat{k} + \hat{l} + \hat{m} + \hat{\ell} + \hat{\wp} + \hat{i} + \hat{j} + \hat{i} \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{r} + \hat{r} + \hat{E} + \hat{Z} + \hat{H} + \hat{r} + \hat{I} + \hat{K} + \hat{r} + \hat{M} + \\ \hat{N} + \hat{r} + \hat{O} + \hat{r} + \hat{P} + \hat{r} + \hat{T} + \hat{r} + \hat{r} + \hat{r} + \hat{r} + \hat{r} + \\ \hat{a} + \hat{\beta} + \hat{\gamma} + \hat{\delta} + \hat{\epsilon} + \hat{\zeta} + \hat{\eta} + \hat{\theta} + \hat{t} + \hat{\kappa} + \hat{\lambda} + \hat{\mu} + \\ \hat{v} + \hat{\xi} + \hat{o} + \hat{\pi} + \hat{\rho} + \hat{\sigma} + \hat{\tau} + \hat{v} + \hat{\phi} + \hat{\chi} + \hat{\psi} + \hat{\omega} + \\ \hat{\epsilon} + \hat{\vartheta} + \hat{\varpi} + \hat{\varrho} + \hat{\varsigma} + \hat{\varsigma} + \hat{\varphi} +$$

#### Math Roman (\mathrm)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{i} + \hat{j} + \hat{k} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{\Theta} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{T} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} +$$

### Math Bold (\mathbf)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} +$$

$$\hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} +$$

$$\hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} +$$

$$\hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{i} + \hat{j} + \hat{k} + \hat{I} + \hat{m} +$$

$$\hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} +$$

$$\hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{\Theta} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} +$$

$$\hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{T} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} +$$

## Math Calligraphic (\mathcal)

$$\hat{\mathcal{A}} + \hat{\mathcal{B}} + \hat{\mathcal{C}} + \hat{\mathcal{D}} + \hat{\mathcal{E}} + \hat{\mathcal{F}} + \hat{\mathcal{G}} + \hat{\mathcal{H}} + \hat{\mathcal{J}} + \hat{\mathcal{J}} + \hat{\mathcal{J}} + \hat{\mathcal{L}} + \hat{\mathcal{M}} + \hat{\mathcal{J}} + \hat{\mathcal{D}} + \hat{\mathcal$$

#### **D.8** Differentials Serif

```
\begin{aligned} \mathrm{d}A + \mathrm{d}B + \mathrm{d}C + \mathrm{d}D + \mathrm{d}E + \mathrm{d}F + \mathrm{d}G + \mathrm{d}H + \mathrm{d}I + \mathrm{d}J + \mathrm{d}K + \mathrm{d}L + \mathrm{d}M + \\ \mathrm{d}N + \mathrm{d}O + \mathrm{d}P + \mathrm{d}Q + \mathrm{d}R + \mathrm{d}S + \mathrm{d}T + \mathrm{d}U + \mathrm{d}V + \mathrm{d}W + \mathrm{d}X + \mathrm{d}Y + \mathrm{d}Z + \\ \mathrm{d}a + \mathrm{d}b + \mathrm{d}c + \mathrm{d}d + \mathrm{d}e + \mathrm{d}f + \mathrm{d}g + \mathrm{d}h + \mathrm{d}i + \mathrm{d}j + \mathrm{d}k + \mathrm{d}l + \mathrm{d}m + \\ \mathrm{d}n + \mathrm{d}o + \mathrm{d}p + \mathrm{d}q + \mathrm{d}r + \mathrm{d}s + \mathrm{d}t + \mathrm{d}u + \mathrm{d}v + \mathrm{d}w + \mathrm{d}x + \mathrm{d}y + \mathrm{d}z + \\ \mathrm{d}A + \mathrm{d}B + \mathrm{d}\Gamma + \mathrm{d}\Delta + \mathrm{d}E + \mathrm{d}Z + \mathrm{d}H + \mathrm{d}\Theta + \mathrm{d}I + \mathrm{d}K + \mathrm{d}\Lambda + \mathrm{d}M + \\ \mathrm{d}N + \mathrm{d}\Xi + \mathrm{d}O + \mathrm{d}\Pi + \mathrm{d}P + \mathrm{d}\Sigma + \mathrm{d}T + \mathrm{d}\Upsilon + \mathrm{d}\Phi + \mathrm{d}X + \mathrm{d}\Psi + \mathrm{d}\Omega + \\ \mathrm{d}\alpha + \mathrm{d}\beta + \mathrm{d}\gamma + \mathrm{d}\delta + \mathrm{d}\epsilon + \mathrm{d}\zeta + \mathrm{d}\eta + \mathrm{d}\theta + \mathrm{d}\iota + \mathrm{d}\kappa + \mathrm{d}\lambda + \mathrm{d}\mu + \\ \mathrm{d}v + \mathrm{d}\xi + \mathrm{d}o + \mathrm{d}\pi + \mathrm{d}\rho + \mathrm{d}\sigma + \mathrm{d}\tau + \mathrm{d}v + \mathrm{d}\phi + \mathrm{d}\chi + \mathrm{d}\psi + \mathrm{d}\omega + \\ \mathrm{d}\epsilon + \mathrm{d}\vartheta + \mathrm{d}\sigma + \mathrm{d}\varrho + \mathrm{d}\zeta + \mathrm{d}\varphi + \mathrm{d}\Gamma + \mathrm{d}\Psi + \mathrm{d}\Psi + \mathrm{d}\Lambda + \mathrm{d}M + \\ \mathrm{d}A + \mathrm{d}B + \mathrm{d}\Gamma + \mathrm{d}\Delta + \mathrm{d}E + \mathrm{d}Z + \mathrm{d}H + \mathrm{d}\Theta + \mathrm{d}I + \mathrm{d}K + \mathrm{d}\Lambda + \mathrm{d}M + \\ \mathrm{d}N + \mathrm{d}\Xi + \mathrm{d}O + \mathrm{d}\Pi + \mathrm{d}P + \mathrm{d}\Sigma + \mathrm{d}T + \mathrm{d}\Upsilon + \mathrm{d}\Psi + \mathrm{d}\Lambda + \mathrm{d}M + \\ \mathrm{d}N + \mathrm{d}\Xi + \mathrm{d}O + \mathrm{d}\Pi + \mathrm{d}P + \mathrm{d}\Sigma + \mathrm{d}T + \mathrm{d}\Upsilon + \mathrm{d}\Psi + \mathrm{d}X + \mathrm{d}\Psi + \mathrm{d}\Lambda + \mathrm{d}M + \\ \mathrm{d}N + \mathrm{d}\Xi + \mathrm{d}O + \mathrm{d}\Pi + \mathrm{d}P + \mathrm{d}\Sigma + \mathrm{d}T + \mathrm{d}\Upsilon + \mathrm{d}\Psi + \mathrm{d}X + \mathrm{d}\Psi + \mathrm{d}\Omega + \mathrm{d}\Lambda + \mathrm{
```

$$\begin{split} \partial A + \partial B + \partial C + \partial D + \partial E + \partial F + \partial G + \partial H + \partial I + \partial J + \partial K + \partial L + \partial M + \\ \partial N + \partial O + \partial P + \partial Q + \partial R + \partial S + \partial T + \partial U + \partial V + \partial W + \partial X + \partial Y + \partial Z + \\ \partial a + \partial b + \partial c + \partial d + \partial e + \partial f + \partial g + \partial h + \partial i + \partial j + \partial k + \partial l + \partial m + \\ \partial n + \partial o + \partial p + \partial q + \partial r + \partial s + \partial t + \partial u + \partial v + \partial w + \partial x + \partial y + \partial z + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \\ \partial N + \partial \Xi + \partial O + \partial \Pi + \partial P + \partial \Sigma + \partial T + \partial \Upsilon + \partial \Phi + \partial X + \partial \Psi + \partial \Omega + \\ \partial \alpha + \partial \beta + \partial \gamma + \partial \delta + \partial \epsilon + \partial \zeta + \partial \eta + \partial \theta + \partial \iota + \partial \kappa + \partial \lambda + \partial \mu + \\ \partial \nu + \partial \xi + \partial o + \partial \pi + \partial \rho + \partial \sigma + \partial \tau + \partial v + \partial \phi + \partial \chi + \partial \psi + \partial \omega + \\ \partial \varepsilon + \partial \vartheta + \partial \sigma + \partial \varrho + \partial \zeta + \partial \varphi + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \\ \partial N + \partial \Xi + \partial O + \partial \Pi + \partial P + \partial \Sigma + \partial T + \partial \Upsilon + \partial \Phi + \partial X + \partial \Psi + \partial \Omega + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial C + \partial C + \partial \Gamma + \partial C + \partial C$$

# D.9 Slash Kerning Serif

 $1/A + 1/B + 1/C + 1/D + 1/E + 1/F + 1/G + 1/H + 1/I + 1/J + 1/K + 1/L + 1/M + 1/N + 1/O + 1/P + 1/Q + 1/R + 1/S + 1/T + 1/U + 1/V + 1/W + 1/X + 1/Y + 1/Z + 1/a + 1/b + 1/c + 1/d + 1/e + 1/f + 1/g + 1/h + 1/i + 1/j + 1/k + 1/l + 1/m + 1/n + 1/o + 1/p + 1/q + 1/r + 1/s + 1/t + 1/u + 1/v + 1/w + 1/x + 1/y + 1/z + 1/A + 1/B + 1/\Gamma + 1/\Delta + 1/E + 1/Z + 1/H + 1/\Theta + 1/I + 1/K + 1/\Lambda + 1/M + 1/N + 1/\Xi + 1/O + 1/\Pi + 1/P + 1/\Sigma + 1/T + 1/\Upsilon + 1/\Phi + 1/X + 1/\Psi + 1/\Omega + 1/\alpha + 1/\beta + 1/\gamma + 1/\delta + 1/\epsilon + 1/\zeta + 1/\eta + 1/\theta + 1/\iota + 1/\kappa + 1/\lambda + 1/\mu + 1/\nu + 1/\xi + 1/o + 1/\pi + 1/\rho + 1/\sigma + 1/\tau + 1/\upsilon + 1/\psi + 1/\psi + 1/\psi + 1/\omega + 1/\varepsilon + 1/\vartheta + 1/\Theta + 1/\varrho + 1/\varrho$ 

 $A/2 + B/2 + C/2 + D/2 + E/2 + F/2 + G/2 + H/2 + I/2 + J/2 + K/2 + L/2 + M/2 + N/2 + O/2 + P/2 + Q/2 + R/2 + S/2 + T/2 + U/2 + V/2 + W/2 + X/2 + Y/2 + Z/2 + a/2 + b/2 + c/2 + d/2 + e/2 + f/2 + g/2 + h/2 + i/2 + j/2 + k/2 + l/2 + m/2 + n/2 + o/2 + p/2 + q/2 + r/2 + s/2 + t/2 + u/2 + v/2 + w/2 + x/2 + y/2 + z/2 + A/2 + B/2 + \Gamma/2 + \Delta/2 + E/2 + Z/2 + H/2 + \Theta/2 + I/2 + K/2 + A/2 + M/2 + N/2 + E/2 + O/2 + I/2 + P/2 + E/2 + T/2 + T/2 + \Phi/2 + X/2 + \Psi/2 + \Omega/2 + a/2 + \beta/2 + \gamma/2 + \delta/2 + e/2 + \zeta/2 + \eta/2 + \theta/2 + \iota/2 + \kappa/2 + \lambda/2 + \mu/2 + v/2 + \xi/2 + o/2 + \pi/2 + \rho/2 + \sigma/2 + \tau/2 + v/2 + \phi/2 + \chi/2 + \psi/2 + \omega/2 + \varepsilon/2 + \vartheta/2 + \varpi/2 + \varrho/2 + \varphi/2 + \varphi/2 + \psi/2 + \psi/2 + \omega/2 + \varepsilon/2 + \vartheta/2 + \varpi/2 + \varrho/2 + \varphi/2 + \varphi/2 + \psi/2 + \psi/2$ 

# D.10 (Big) Operators Serif

## **D.11 Radicals Serif**

$$\sqrt{x+y} \qquad \sqrt{x^2+y^2} \qquad \sqrt{x_i^2+y_j^2} \qquad \sqrt{\left(\frac{\cos x}{2}\right)} \qquad \sqrt{\left(\frac{\sin x}{2}\right)}$$

$$\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{x+y}}}}}}$$

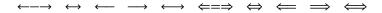
# D.12 Over- and Underbraces Serif

$$\widehat{x}$$
  $\widehat{x+y}$   $\widehat{x^2+y^2}$   $\widehat{x_i^2+y_j^2}$   $\underbrace{x}$   $\underbrace{x+y}$   $\underbrace{x_i+y_j}$   $\underbrace{x_i^2+y_j^2}$ 

#### D.13 Normal and Wide Accents Serif

$$\dot{x}$$
  $\ddot{x}$   $\ddot{x}$   $\bar{x}$   $\bar{x}$ 

# D.14 Long Arrows Serif



## D.15 Left and Right Delimiters Serif

$$-(f) - -[f] - -|f| - -[f] - -\langle f \rangle - -\{f\} -$$

Using \left and \right.

$$-(f)--[f]--|f|--|f|--\langle f\rangle--\{f\}-$$

# D.16 Big-g-g Delimiters Serif

### **D.17 Binary Operators Serif**

$x \pm y$	\pm	$x \cap y$	\cap	$x \diamond y$	\diamond	$x \oplus y$	\oplus
$x \mp y$	\mp	$x \cup y$	\cup	$x \triangle y$	\bigtriangleup	$x \ominus y$	\ominus
$x \times y$	\times	$x \uplus y$	\uplus	$x \nabla y$	\bigtriangledown	$x \otimes y$	\otimes
$x \div y$	\div	$x\sqcap y$	\sqcap	$x \triangleleft y$	\triangleleft	$x \oslash y$	\oslash
x*y	\ast	$x \sqcup y$	\sqcup	$x \triangleright y$	\triangleright	$x \odot y$	\odot
$x \star y$	\star	$x \lor y$	\vee	$x \triangleleft y$	<b>\lhd</b>	$x \bigcirc y$	\bigcirc
$x \circ y$	\circ	$x \wedge y$	\wedge	$x \triangleright y$	\rhd	$x \dagger y$	\dagger
$x \bullet y$	\bullet	$x \setminus y$	\setminus	$x \triangleleft y$	\unlhd	$x \ddagger y$	\ddagger
$x \cdot y$	\cdot	$x \wr y$	\wr	$x \trianglerighteq y$	\unrhd	x§ $y$	<b>\</b> S
x + y	+	x-y	_	$x \coprod y$	\amalg	$x^{\P}y$	\P

#### **D.18 Relations Serif**

```
x \leq y
          \leq
                             x \ge y
                                        \geq
                                                           x \equiv y
                                                                      \equiv
                                                                                   x \models y
                                                                                              \models
          \prec
x \prec y
                             x \succ y
                                        \succ
                                                           x \sim y
                                                                      \sim
                                                                                    x \perp y
                                                                                              \perp
x \leq y
          \preceq
                             x \succeq y
                                        \succeq
                                                           x \simeq y
                                                                      \simeq
                                                                                    x \mid y
                                                                                              \mid
x \ll y
          \11
                                                                      \asymp
                                                                                    x \parallel y
                                                                                              \parallel
                             x \gg y
                                        \gg
                                                           x \simeq y
x \subset y
          \subset
                                        \supset
                                                                      \approx
                                                                                              \bowtie
                             x \supset y
                                                           x \approx y
                                                                                   x \bowtie y
x \subseteq y
          \subseteq
                             x \supseteq y
                                        \supseteq
                                                           x \cong y
                                                                      \cong
                                                                                    x \bowtie y
                                                                                              \Join
x \sqsubset y
          \sqsubset
                             x \supset y
                                        \sqsupset
                                                           x \neq y
                                                                      \neq
                                                                                    x \smile y
                                                                                             \smile
          \sqsubseteq
                                        \sqsupseteq
                                                                                             \frown
x \sqsubseteq y
                             x \supseteq y
                                                           x \doteq y
                                                                      \doteq
                                                                                    x - y
x \in y
          \in
                             x \ni y
                                        \ni
                                                                      \propto
                                                                                   x = y
                                                           x \propto y
                                                                                              =
          \vdash
                             x \dashv y
                                        \dashv
x \vdash y
                                                           x < y
                                                                      <
                                                                                    x > y
                                                                                              >
x:y
```

# **D.19 Punctuation Serif**

```
x,y , x;y ; x:y \colon x.y \ldotp x\cdot y \cdotp
```

#### **D.20 Arrows Serif**

$x \leftarrow y$	\leftarrow	$x \leftarrow y$	\longleftarrow	$x \uparrow y$	\uparrow
$x \leftarrow y$	\Leftarrow	$x \longleftarrow y$	\Longleftarrow	$x \uparrow y$	\Uparrow
$x \rightarrow y$	\rightarrow	$x \longrightarrow y$	\longrightarrow	$x \downarrow y$	\downarrow
$x \Rightarrow y$	\Rightarrow	$x \Longrightarrow y$	\Longrightarrow	$x \downarrow y$	\Downarrow
$x \longleftrightarrow y$	\leftrightarrow	$x \longleftrightarrow y$	\longleftrightarrow	$x \uparrow y$	\updownarrow
$x \Leftrightarrow y$	\Leftrightarrow	$x \Longleftrightarrow y$	\Longleftrightarrow	$x \updownarrow y$	\Updownarrow
$x \mapsto y$	\mapsto	$x \longmapsto y$	\longmapsto	$x \nearrow y$	\nearrow
$x \leftarrow y$	\hookleftarrow	$x \hookrightarrow y$	\hookrightarrow	$x \setminus y$	\searrow
$x \leftarrow y$	\leftharpoonup	$x \rightarrow y$	\rightharpoonup	$x \not y$	\swarrow
$x \leftarrow y$	\leftharpoondown	$x \rightarrow y$	\rightharpoondown	$x \setminus y$	\nwarrow
$x \rightleftharpoons y$	\rightleftharpoons	$x \rightsquigarrow y$	\leadsto		

# D.21 Miscellaneous Symbols Serif

```
\ldots
                                \cdots
                                                 x:y
                                                         \vdots
                                                                            x \cdot y
                                                                                      \ddots
x...y
                      x \cdots y
x \aleph y
          \aleph
                      x/y
                                 \prime
                                                 x \forall y
                                                         \forall
                                                                            x \infty y
                                                                                      \infty
хћу
          \hbar
                      хØу
                                \emptyset
                                                 x\exists y
                                                         \exists
                                                                            x\Box y
                                                                                      \Box
                                \nabla
                                                                                      \Diamond
хıу
          \imath
                      x\nabla y
                                                 x \neg y
                                                         \neg
                                                                            x \Diamond y
          \jmath
                      x\sqrt{y}
                                \surd
                                                 x \flat y
                                                         \flat
                                                                            x \triangle y
                                                                                      \triangle
хју
x\ell y
          \ell
                      xTy
                                \top
                                                 x \nmid y
                                                         \natural
                                                                            x♣y
                                                                                      \clubsuit
                      x \perp y
                                \bot
                                                         \sharp
                                                                                      \diamondsuit
          \wp
                                                 x \sharp y
                                                                            x \diamondsuit y
хюу
x\Re y
          \Re
                      x||y
                                \backslash \mid
                                                 x \setminus y
                                                         \backslash
                                                                            x \nabla y
                                                                                      \heartsuit
                                                         \partial
                                                                                      \spadesuit
x\Im y
          \Im
                      x \angle y
                                 \angle
                                                 x \partial y
                                                                            x \spadesuit y
х℧у
          \mho
                                                 x|y
                                                          x!y
                                                                                      !
                      x.y
```

## D.22 Variable-Sized Operators Serif

```
x \sum y
         \sum
                      x \cap y
                               \bigcap
                                              x \odot y
                                                        \bigodot
x \prod y
                                                        \bigotimes
         \prod
                               \bigcup
                                              x \otimes y
                     x|y
x \mid y
         \coprod
                               \bigsqcup
                                              x \bigoplus y
                                                        \bigoplus
x \mid y
         \int
                      x \bigvee y
                               \bigvee
                                              x + y
                                                        \biguplus
         \oint
                               \bigwedge
x \phi y
                      x \wedge y
```

# D.23 Log-Like Operators Serif

```
x \cos y
                          x \csc y
                                                  x kery
                                                                x \lim \sup y
                                                                               x \min y
                                                                                           x \sinh y
x \arccos y
                                      x \exp y
x \arcsin y
              x \cosh y
                         x \deg y
                                      x \gcd y
                                                  x \log y
                                                                 x \ln y
                                                                                x Pry
                                                                                           x \sup y
x arctany
                          x \det y
                                      x hom y
                                                  x \lim y
              x \cot y
                                                                 x \log y
                                                                                x \sec y
                                                                                           x tan y
x argy
              x \coth y \quad x \dim y
                                      x \inf y
                                                  x \lim \inf y
                                                                x \max y
                                                                                x \sin y
                                                                                           x tanh y
```

## **D.24 Delimiters Serif**

```
(
x(y)
                     x)y
                                          x \uparrow y
                                                    \uparrow
                                                                         x \uparrow y
                                                                                  \Uparrow
x[y]
      [
                     x]y
                             ]
                                          x \downarrow y
                                                    \downarrow
                                                                         x \downarrow y
                                                                                  \Downarrow
x\{y
      \{
                                          x \updownarrow y
                                                    \updownarrow
                                                                         x \updownarrow y
                                                                                  \Updownarrow
                     x}y
                             \}
x|y
       \lfloor
                     x y
                             \rfloor
                                          x[y]
                                                    \lceil
                                                                         x]y
                                                                                  \rceil
       \langle
                     x\rangle y
                             \rangle
                                                                                  \backslash
x\langle y
                                          x/y
                                                                         x \setminus y
x|y
       x||y
                             1/
```

# D.25 Large Delimiters Serif

## **D.26** Math Mode Accents Serif

```
\hat{a} \hat{a} \acute{a} \acute{a} \bar{a} \bar{a} \acute{a} \dot{a} \breve{a} \breve{a} \check{a} \check{a} \grave{a} \grave{a} \vec{a} \vec{a} \ddot{a} \ddot{a} \tilde{a} \tilde{a}
```

## **D.27 Miscellaneous Constructions Serif**

```
abc
                               abc
       \widetilde{abc}
                                       \widehat{abc}
abc
       \overleftarrow{abc}
                               abc
                                       \overrightarrow{abc}
abc
       \overline{abc}
                               abc
                                       \underline{abc}
abc
       \overbrace{abc}
                                       \underbrace{abc}
                                abc
√abc
       \sqrt{abc}
                                √abc
                                       \sqrt[n]{abc}
                               \frac{abc}{xyz}
f'
       f'
                                       \frac{abc}{xyz}
```

# **D.28 AMS Delimiters Serif**

 $x \vdash y$  \ullcorner  $x \vdash y$  \ullcorner  $x \perp y$  \llcorner  $x \perp y$  \llcorner

# **D.29 AMS Arrows Serif**

$x \longrightarrow y$	\dashrightarrow	<i>x</i> ← <i>y</i>	\dashleftarrow
$x \succeq y$	\leftleftarrows	$x \leftrightarrows y$	\leftrightarrows
$x \in y$	\Lleftarrow	$x \leftarrow y$	\twoheadleftarrow
$x \leftarrow y$	\leftarrowtail	$x \notin y$	\looparrowleft
$x \leftrightharpoons y$	\leftrightharpoons	$x \cap y$	\curvearrowleft
$x \circlearrowleft y$	\circlearrowleft	$x \uparrow y$	\Lsh
$x \uparrow \uparrow y$	\upuparrows	$x \mid y$	\upharpoonleft
$x \downarrow y$	\downharpoonleft	$x \rightarrow y$	\multimap
$x \leftrightarrow y$	\leftrightsquigarrow	$x \rightrightarrows y$	\rightrightarrows
$x \rightleftharpoons y$	\rightleftarrows	$x \rightrightarrows y$	\rightrightarrows
$x \rightleftharpoons y$	\rightleftarrows	$x \rightarrow y$	\twoheadrightarrow
$x \mapsto y$	\rightarrowtail	$x \Rightarrow y$	\looparrowright
$x \rightleftharpoons y$	\rightleftharpoons	$x \cap y$	\curvearrowright
$x \bigcirc y$	\circlearrowright	x  ightharpoonup y	\Rsh
$x \downarrow \downarrow y$	\downdownarrows	$x \upharpoonright y$	\upharpoonright
$x \mid y$	\downharpoonright	$x \leadsto y$	\rightsquigarrow

# **D.30** AMS Negated Arrows Serif

```
x \nleftrightarrow y \nleftarrow x \nleftrightarrow y \nrightarrow x \nleftrightarrow y \nRightarrow x \nleftrightarrow y \nleftrightarrow x \nleftrightarrow y \nleftrightarrow
```

# D.31 AMS Greek Serif

 $x \in \mathcal{Y} \setminus \text{digamma} x \in \mathcal{Y} \setminus \text{varkappa}$ 

## **D.32** AMS Hebrew Serif

#### D.33 AMS Miscellaneous Serif

```
хћу
        \hbar
                              хħу
                                     \hslash
                                     \triangledown
x \triangle y
        \vartriangle
                              x \nabla y
        \square
                              x \Diamond y
                                     \lozenge
x \square y
        \circledS
                                     \angle
x \angle y
        \measuredangle
                              x∄y
x∡y
                                      \nexists
                                     \Finv^u
х℧у
        \mho
                              х∃у
        \backslash \mathsf{Game}^u
                                     \Bbbk^u
хӘу
                              xky
\chi \backslash \gamma
        \backprime
                              хØу
                                     \varnothing
                                     \blacktriangledown
        \blacktriangle
                              x \nabla y
x \blacktriangle y
x \blacksquare y
        \blacksquare
                              x♦y
                                     \blacklozenge
x \bigstar y
        \bigstar
                              x∢y
                                     \sphericalangle
xCy
        \complement
                                      \eth
                              хðу
x/y
        \diagup^u
                              x \setminus y
                                     \diagdown<sup>u</sup>
^{\it u} Not defined in amssymb.sty, define using the \newsymbol command.
```

## **D.34** AMS Binary Operators Serif

```
x + y \setminus dotplus
                                   x \setminus y \smallsetminus
x \cap y
         \Cap
                                   x \cup y
                                             \Cup
x \overline{\wedge} y
         \barwedge
                                   x \vee y
                                             \veebar
x \overline{\wedge} y
         \doublebarwedge x \boxminus y \boxminus
x \boxtimes y
         \boxtimes
                                   x \boxdot y \setminus boxdot
                                   x * y \setminus divideontimes
x \boxplus y
         \boxplus
x \ltimes y
         \ltimes
                                   x \times y \setminus rtimes
x \lambda y
         \leftthreetimes x \wedge y \rightthreetimes
         \curlywedge
                                   x Y y \setminus \text{curlyvee}
x \downarrow y
x \ominus y
         \circleddash
                                   x \otimes y \setminus circledast
         \circledcirc
                                             \centerdot
x \odot y
                                   x \cdot y
x \mathbf{T} y \intercal
```

## **D.35 AMS Relations Serif**

 $x \leq y$ **\leqslant**  $x \lesssim y$  $\label{lessim}$  $x \approx y$ \approxeq  $x \ll y \setminus 1111$  $x \leq y$ \lesseqgtr \doteqdot  $x \doteq y$ \fallingdotseq x = y $x \subseteq y$ \backsimeq  $x \subseteq y$ \Subset \preccurlyeq  $x \leq y$  $x \lesssim y$ \precsim  $x \triangleleft y$ \vartriangleleft  $x \models y$ \vDash \smallsmile  $x \smile y$ x = y\bumpeq  $x \ge y$ \geqq  $x \geqslant y$ \eqslantgtr  $x \gtrsim y$ \gtrapprox  $x \gg y \setminus ggg$  $x \geq y$ \gtreqless x = y\eqcirc  $x \triangleq y$ \triangleq  $x \approx y$ \thickapprox  $x \ni y$ \Supset  $x \succcurlyeq y$ \succcurlyeq  $\slash$ succsim  $x \gtrsim y$ \vartriangleright  $x \triangleright y$  $x \Vdash y$ \Vdash  $x \parallel y$ \shortparallel  $x \pitchfork y$ \pitchfork  $x \triangleleft y$ **\blacktriangleleft** \backepsilon  $x \ni y$ 

**\because** 

x : y

## **D.36** AMS Negated Relations Serif

```
x ≮ y \nless
                                     x ≰ y \nleq
x \not\leq y \setminus \text{nleqslant}
                                     x ≰ y \nleqq
x \leq y \setminus lneq
                                     x \not\subseteq y \setminus lneqq
x \leq y \lvertneqq
                                   x ⋦ y \lnsim
x \lessapprox y
         \lnapprox
                                     x ⊀y \nprec
x \not \leq y \setminus \mathsf{npreceq}
                                     x \not\gtrsim y \setminus \text{precnsim}
x \not \gtrsim y
         \precnapprox
                                    x≁y \nsim
x y
          \nshortmid
                                     x \nmid y
                                               \nmid
x \not\vdash y
         \nvdash
                                    x⊭y \nvDash
x \not \triangle y
         \ntriangleleft x \not\equiv y \ntrianglelefteq
x \not\subseteq y
                                     x \subsetneq y \subsetneq
         \nsubseteq
x \not\subseteq y \setminus \text{varsubsetneq}
                                     x \subsetneq y \subsetneqq
x \not\subseteq y \varsubsetneqq x \not\geqslant y \ngtr
x≱y \ngeq
                                     x≱y \ngeqslant
x ≱ y \ngeqq
                                    x \geqslant y \setminus \mathsf{gneq}
x \not\supseteq y
                                   x≩y \gvertneqq
         \gneqq
x \gtrsim y \setminus gnsim
                                  x≩y \gnapprox
x \not\succ y \setminus \text{nsucc}
                                   x ≱y \nsucceq
                                     x \not\gtrsim y \setminus \text{succnsim}
x ≱y \nsucceqq
x \not\geq y \succnapprox
                                    x \not\cong y \setminus \text{ncong}
          \nshortparallel x \not\parallel y \nparallel
x x y
x \not\models y
          \nvDash
                                     x⊮y \nVDash
x \not \triangleright y \ntriangleright x \not \trianglerighteq y \ntrianglerighteq
x \not\supseteq y \setminus \text{nsupseteq}
                                    x \not\supseteq y \setminus \text{nsupseteqq}
                                     x \supseteq y \setminus \text{varsupsetneq}
x \supsetneq y
         \supsetneq
x \supseteq y
                                     x \not\supseteq y \varsupsetneqq
         \supsetneqq
```

## D.37 Math "Torture" Test Serif

Most of the following examples are taken from *The TeXbook* (Knuth, 1984, see https://ctan.org/pkg/texbook) and were adapted for ETeX from Karl Berry's torture test for plain TeX math fonts.

```
\begin{array}{lll} x+y-z, & x+y*z, & z*y/z, & (x+y)(x-y)=x^2-y^2, \\ x\times y\cdot z=[xyz], & x\circ y\bullet z, & x\cup y\cap z, & x\sqcup y\sqcap z, \\ x\vee y\wedge z, & x\pm y\mp z, & x=y/z, & x:=y, & x\leq y\neq z, & x\sim y\simeq z \ x\equiv y\not\equiv z, & x\subset y\subseteq z \\ \sin 2\theta=2\sin\theta\cos\theta, & \mathrm{O}(n\log n\log n), & \mathrm{Pr}(X>x)=\exp(-x/\mu), \\ \left(x\in A(n)\ \middle|\ x\in B(n)\right), & \bigcup_n X_n\ \middle\|\ \bigcap_n Y_n \\ \mathrm{In\text{-}text\ matrices}\begin{pmatrix} 11\\01\end{pmatrix} \ \mathrm{and} \begin{pmatrix} a&b&c\\0&1&m&n \end{pmatrix}. \end{array}
```

$$a_{0} + \frac{1}{a_{1} + \frac{1}{a_{2} + \frac{1}{a_{4}}}}$$

$$\binom{p}{2}x^{2}y^{p-2} - \frac{1}{1-x}\frac{1}{1-x^{2}} = \frac{a+1}{b} / \frac{c+1}{d}.$$

$$\sqrt{1 + \sqrt{1 + \sqrt{1 + \sqrt{1 + \sqrt{1 + x}}}}}$$

$$\sqrt[p]{1 + \sqrt[k]{1 + \sqrt[k]{1 + \sqrt{1 + x}}}}$$

$$\sqrt[p]{1 + \sqrt[k]{1 + \sqrt[k]{1 + \sqrt{1 + x}}}}$$

$$\left(\frac{\partial^{2}}{\partial x^{2}} + \frac{\partial^{2}}{\partial y^{2}}\right) |\varphi(x + iy)|^{2} = 0$$

$$\pi(n) = \sum_{m=2}^{n} \left[ \left(\sum_{k=1}^{m-1} \lfloor (m/k) / \lceil m/k \rceil \rfloor\right)^{-1} \right].$$

$$\int_{0}^{\infty} \frac{t - ib}{t^{2} + b^{2}} e^{iat} dt = e^{ab} E_{1}(ab), \quad a, b > 0.$$

$$A := \begin{pmatrix} x - \lambda & 1 & 0 \\ 0 & x - \lambda & 1 \\ 0 & 0 & x - \lambda \end{pmatrix}.$$

$$\begin{pmatrix} a & b & c \\ d & e & f \end{pmatrix} \begin{pmatrix} u & x \\ v & y \\ w & z \end{pmatrix}$$

$$A = \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix}$$

$$C & I & C' \\ M = I & C & 1 & 0 & 0 \\ b & 1 - b & 0 \\ 0 & a & 1 - a \end{pmatrix}$$

$$\sum_{n=0}^{\infty} a_{n} z^{n} \quad \text{converges if} \quad |z| < \left( \limsup_{n \to \infty} \sqrt[n]{|a_{n}|} \right)^{-1}.$$

$$\frac{f(x + \Delta x) - f(x)}{\Delta x} \rightarrow f'(x) \quad \text{as } \Delta x \to 0.$$

$$||u_i|| = 1$$
,  $u_i \cdot u_j = 0$  if  $i \neq j$ .

The confluent image of  $\begin{cases} an \ arc \\ a \ circle \\ a \ fan \end{cases}$  is  $\begin{cases} an \ arc \\ an \ arc \ or \ a \ circle \\ a \ fan \ or \ an \ arc \end{cases}$ .

$$T(n) \leq T(2^{\lceil \lg n \rceil}) \leq c(3^{\lceil \lg n \rceil} - 2^{\lceil \lg n \rceil})$$
$$< 3c \cdot 3^{\lg n}$$
$$= 3c n^{\lg 3}.$$

$$(x+y)(x-y) = x^{2} - xy + yx - y^{2}$$
$$= x^{2} - y^{2}$$
$$(x+y)^{2} = x^{2} + 2xy + y^{2}.$$

$$\left(\int_{-\infty}^{\infty} e^{-x^2} dx\right)^2 = \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} e^{-(x^2+y^2)} dx dy$$
$$= \int_{0}^{2\pi} \int_{0}^{\infty} e^{-r^2} dr d\theta$$
$$= \int_{0}^{2\pi} \left( e^{-\frac{r^2}{2}} \Big|_{r=0}^{r=\infty} \right) d\theta$$
$$= \pi.$$

$$\prod_{k\geq 0} \frac{1}{(1-q^k z)} = \sum_{n\geq 0} z^n / \prod_{1\leq k\leq n} (1-q^k).$$

$$\sum_{\substack{0 < i \le m \\ 0 < j \le n}} p(i,j) \neq \sum_{i=1}^{p} \sum_{j=1}^{q} \sum_{k=1}^{r} a_{ij} b_{jk} c_{ki} \neq \sum_{\substack{1 \le i \le p \\ 1 \le j \le q \\ 1 \le k \le r}} a_{ij} b_{jk} c_{ki}$$

$$\max_{1 \le n \le m} \log_2 P_n \quad \text{and} \quad \lim_{x \to 0} \frac{\sin x}{x} = 1$$

Inline math:  $\max_{1 \le n \le m} \log_2 P_n$  and  $\lim_{x \to 0} \frac{\sin x}{x} = 1$ 

$$p_1(n) = \lim_{m \to \infty} \sum_{\nu=0}^{\infty} \left( 1 - \cos^{2m}(\nu!^n \pi/n) \right)$$

In line math:  $p_1(n) = \lim_{m \to \infty} \sum_{\nu=0}^{\infty} \left( 1 - \cos^{2m}(\nu!^n \pi/n) \right)$ 

# Appendix E Math Test Serif Bold

#### E.1 Overview Serif Bold

Default:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$ ;  $\sigma_\epsilon, c^a$  mathnormal:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathrm:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathup:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathit:  $a\alpha\alpha b\beta G\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathbf:  $a\alpha b\beta G\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathbfit:  $a\alpha b\beta G\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathbfit:  $a\alpha b\beta G\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathbfit:  $a\alpha b\beta G\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$ 

Default:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$ ;  $\sigma_\epsilon, c^a$  mathnormal:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathrm:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathup:  $a\alpha\alpha b\beta G\Gamma\Gamma\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathit:  $a\alpha\alpha b\beta G^{\circ}\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathbf:  $a\alpha\alpha b\beta G^{\circ}\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathbfit:  $a\alpha\alpha b\beta G^{\circ}\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathbfit:  $a\alpha\alpha b\beta G^{\circ}\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$  mathbfup:  $a\alpha\alpha b\beta G^{\circ}\epsilon\epsilon\theta \vartheta P\Pi\Sigma\sigma$ 

Default:  $\alpha\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta\theta P\Pi\Sigma \sigma$ ;  $\sigma_{\epsilon}$ ,  $c^{\alpha}$  mathnormal:  $\alpha\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta\theta P\Pi\Sigma \sigma$  mathrm:  $\alpha\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \vartheta P\Pi\Sigma \sigma$  mathup:  $\alpha\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta\theta P\Pi\Sigma \sigma$  mathit:  $\alpha\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta\theta P\Pi\Sigma \sigma$  mathbf:  $\alpha\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta\theta P\Pi\Sigma \sigma$  mathbfit:  $\alpha\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta\theta P\Pi\Sigma \sigma$  mathbfit:  $\alpha\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta\theta P\Pi\Sigma \sigma$  mathbfit:  $\alpha\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta\theta P\Pi\Sigma \sigma$ 

Default: αααbβGΓΓεεθθΡΠΣσ;  $σ_ε$ ,  $c^α$  mathnormal: αααbβGΓΓεεθθΡΠΣσ mathrm: αααbβGΓΓεεθθΡΠΣσ mathup: αααbβGΓΓεεθθΡΠΣσ mathit: αααbβGΓΓεεθθΡΠΣσ mathif: αααbβGΓΓεεθθΡΠΣσ mathbf: αααbβGΓΓεεθθΡΠΣσ mathbfit: αααbβGΓΓεεθθΡΠΣσ mathbfit: αααbβGΓΓεεθθΡΠΣσ mathbfit: αααbβGΓΓεεθθΡΠΣσ mathbfit: αααbβGΓΓεεθθΡΠΣσ

#### **E.2** Formulas Serif Bold

 $\alpha, \beta, \gamma, \delta, \epsilon, \epsilon, \zeta, \eta, \theta, \vartheta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \varpi, \rho, \varrho, \sigma, \zeta, \tau, \upsilon, \phi, \varphi, \chi, \psi, \omega, \varepsilon, A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, A, M, N, \Xi, O, \Pi, P, \Sigma, T, \Upsilon, \Phi, X, \Psi, \Omega, F,$ 

 $\alpha,\,\beta,\,\gamma,\,\delta,\,\epsilon,\,\epsilon,\,\zeta,\,\eta,\,\theta,\,\theta,\,\iota,\,\kappa,\,\lambda,\,\mu,\,\nu,\,\xi,\,o,\,\pi,\,\pi,\,\rho,\,\rho,\,\sigma,\,\varsigma,\,\tau,\,\upsilon,\,\phi,\,\phi,\,\chi,\,\psi,\,\omega,\,\rho,\,A,\,B,\,\Gamma,\,\Delta,\,E,\,Z,\,H,\,\theta,\,I,\,K,\,\Lambda,\,M,\,N,\,\Xi,\,O,\,\Pi,\,P,\,\Sigma,\,T,\,Y,\,\Phi,\,X,\,\Psi,\,\Omega,\,F,$ 

$$\alpha a > 0$$
,  $\beta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$ 

$$\alpha a > 0, \beta b + (3 \times 27), \Gamma G = 7 < 8, \lambda$$

$$\lim_{\nu \to \infty} \nu(\nu) = \max_{s \in S} \{ s \pm 3\gamma + y - 1 \} = 4 \times 7$$

$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\lim_{N\to\infty}\sum_{i=0}^N x^i = \min_{x\in\mathbb{R}} S(x)$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Disambiguation: 0 O O, 1 I I | lI/, ij, rnm,  $\theta \Theta$ ,  $\phi \psi$ , --

Latin vs. Greek:  $a \alpha, d \delta, e \epsilon, i \iota, k \kappa, n \eta, o \sigma, p \rho, \beta \beta, u \upsilon, v \nu, w \omega, x \chi, y \gamma, A \Delta \Lambda, O \Theta \Omega, T \Gamma, Y \Upsilon.$ 

$$\alpha a > 0, \beta b + (3 \times 27), \Gamma G = 7 < 8, \lambda$$

$$\lim_{\nu \to \infty} \nu(\nu) = \max_{s \in S} \{ s \pm 3\gamma + y - 1 \} = 4 \times 7$$

$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\lim_{N\to\infty}\sum_{i=0}^N x^i = \min_{x\in\mathbb{R}} S(x)$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Disambiguation: 0 O O, 1 l I | l I /, i j, rn m,  $\theta$   $\Theta$ ,  $\phi$   $\psi$ , – –

Latin vs. Greek:  $a \alpha, d \delta, e \epsilon, i \iota, k \kappa, n \eta, o \sigma, p \rho, \beta \beta, u \upsilon, v \nu, w \omega, x \chi, y \gamma, A \Delta \Lambda, O \Theta \Omega, T \Gamma, Y \Upsilon.$ 

$$\alpha a > 0$$
,  $\beta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$ 

$$lim_{\nu\to\infty}\,\nu(\nu)=max_{s\in S}\{s\pm 3\gamma+y-1\}=4\times 7$$

 $\hat{\beta} = (X'X)^{-1}X'y$ 

$$\lim_{N\to\infty}\sum_{i=0}^N x^i=\min_{x\in\mathbb{R}}S(x)$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Disambiguation: 0 O O, 1 l I | l I /, i j, rn m,  $\theta$   $\Theta$ ,  $\phi$   $\psi$ , - -

Latin vs. Greek:  $a \alpha$ ,  $d \delta$ ,  $e \varepsilon$ ,  $i \iota$ ,  $k \kappa$ ,  $n \eta$ ,  $o \sigma$ ,  $p \rho$ ,  $\beta \beta$ ,  $u \upsilon$ , v v,  $w \omega$ ,  $x \chi$ ,  $y \gamma$ ,  $A \Delta \Lambda$ ,  $O \Theta \Omega$ ,  $T \Gamma$ , Y Y.

$$\begin{split} &\alpha a>0, \beta b+(3\times 27), \Gamma G=7<8, \lambda\\ &\lim_{v\to\infty} v(v)=\max_{s\in S}\{s\pm 3\gamma+y-1\}=4\times 7\\ &\hat{\beta}=(X'X)^{-1}X'y \end{split}$$

$$\lim_{N\to\infty}\sum_{i=0}^N x^i=\min_{\mathbf{x}\in\mathbb{R}}\mathbf{S}(\mathbf{x})$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Disambiguation: 0 O O, 1 l l | l l |, i j, rn m,  $\theta$   $\Theta$ ,  $\phi$   $\psi$ , - Latin vs. Greek: a  $\alpha$ , d  $\delta$ , e  $\varepsilon$ , i  $\iota$ , k  $\kappa$ , n  $\eta$ , o  $\sigma$ , p  $\rho$ ,  $\beta$   $\beta$ , u v, v v, w  $\omega$ , x  $\chi$ , y  $\gamma$ , A  $\Delta$   $\Lambda$ , O  $\Theta$   $\Omega$ , T  $\Gamma$ , Y Y.

# E.3 Math Alphabets Serif Bold

#### **Default**

0,1,2,3,4,5,6,7,8,9, 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,  $A,B,\Gamma,\Delta,E,Z,H,\Theta,I,K,\Lambda,M,N,\Xi,O,\Pi,P,\Sigma,T,\Upsilon,\Phi,X,\Psi,\Omega,$   $\alpha,\beta,\gamma,\delta,\epsilon,\zeta,\eta,\theta,\iota,\kappa,\lambda,\mu,\nu,\xi,o,\pi,\rho,\sigma,\tau,\upsilon,\phi,\chi,\psi,\omega,\epsilon,\vartheta,\varpi,\varrho,\varsigma,\varphi,$ 

## Math Normal (\mathnormal)

$$\begin{aligned} &0,1,2,3,4,5,6,7,8,9,\\ &A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z,\\ &a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z,\\ &A,B,\Gamma,\Delta,E,Z,H,\Theta,I,K,\Lambda,M,N,\Xi,O,\Pi,P,\Sigma,T,\Upsilon,\Phi,X,\Psi,\Omega,\\ &\alpha,\beta,\gamma,\delta,\epsilon,\zeta,\eta,\theta,\iota,\kappa,\lambda,\mu,\nu,\xi,o,\pi,\rho,\sigma,\tau,\nu,\phi,\chi,\psi,\omega,\epsilon,\vartheta,\varpi,\varrho,\varsigma,\varphi, \end{aligned}$$

## Math Italic (\mathit)

$$0,1,2,3,4,5,6,7,8,9,$$
 $A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z,$ 
 $a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z,$ 
 $A,B,`,`,E,Z,H,`,I,K,`,M,N,`,O,`,P,`,T,`,`,X,^,,$ 
 $\alpha,\beta,\gamma,\delta,\epsilon,\zeta,\eta,\theta,\iota,\kappa,\lambda,\mu,v,\xi,o,\pi,\rho,\sigma,\tau,v,\phi,\chi,\psi,\omega,\epsilon,\vartheta,\sigma,\rho,\varsigma,\varphi,$ 

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

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,

 $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, \Upsilon, \Phi, X, \Psi, \Omega,$ 

 $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, v, \phi, \chi, \psi, \omega, \epsilon, \vartheta, \varpi, \varrho, \zeta, \varphi,$ 

#### Math Bold (\mathbf)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

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,

 $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, \Upsilon, \Phi, X, \Psi, \Omega,$ 

 $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, v, \phi, \chi, \psi, \omega, \epsilon, \vartheta, \varpi, \varrho, \zeta, \varphi,$ 

#### Caligraphic (\mathcal)

 $\mathscr{A}, \mathscr{B}, \mathscr{C}, \mathfrak{D}, \mathscr{E}, \mathscr{F}, \mathscr{G}, \mathscr{H}, \mathscr{I}, \mathscr{J}, \mathscr{K}, \mathscr{L}, \mathscr{M}, \mathscr{N}, \mathscr{O}, \mathscr{P}, \mathscr{Q}, \mathscr{R}, \mathscr{S}, \mathscr{T}, \mathscr{U}, \mathscr{V}, \mathscr{W}, \mathscr{X}, \mathscr{Y}, \mathscr{Z}, \mathscr{Y}, \mathscr{Y}$ 

## Script (\mathscr)

 $\mathscr{A}, \mathscr{B}, \mathscr{C}, \mathfrak{D}, \mathscr{E}, \mathscr{F}, \mathscr{G}, \mathscr{H}, \mathscr{I}, \mathscr{J}, \mathscr{K}, \mathscr{L}, \mathscr{M}, \mathscr{N}, \mathscr{O}, \mathscr{P}, 2, \mathscr{R}, \mathscr{F}, \mathscr{T}, \mathscr{U}, \mathscr{V}, \mathscr{W}, \mathscr{X}, \mathscr{Y}, \mathscr{Z},$ 

#### Fraktur (\mathfrak)

 $\mathfrak{A},\mathfrak{B},\mathfrak{C},\mathfrak{D},\mathfrak{E},\mathfrak{F},\mathfrak{G},\mathfrak{H},\mathfrak{I},\mathfrak{I},\mathfrak{K},\mathfrak{L},\mathfrak{M},\mathfrak{N},\mathfrak{O},\mathfrak{P},\mathfrak{Q},\mathfrak{R},\mathfrak{G},\mathfrak{T},\mathfrak{U},\mathfrak{V},\mathfrak{W},\mathfrak{X},\mathfrak{Y},\mathfrak{Z},$ 

 $\mathfrak{a},\mathfrak{b},\mathfrak{c},\mathfrak{d},\mathfrak{e},\mathfrak{f},\mathfrak{g},\mathfrak{h},\mathfrak{i},\mathfrak{j},\mathfrak{k},\mathfrak{l},\mathfrak{m},\mathfrak{n},\mathfrak{o},\mathfrak{p},\mathfrak{q},\mathfrak{r},\mathfrak{s},\mathfrak{t},\mathfrak{u},\mathfrak{v},\mathfrak{w},\mathfrak{x},\mathfrak{h},\mathfrak{z},$ 

## Blackboard Bold (\mathbb)

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,

### E.4 Character Sidebearings Serif Bold

#### Default

|A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + |I|

|N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + |W| + |W|

|a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + |a|

|n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + |z|

 $|A| + |B| + |\Gamma| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |\Lambda| + |M| + |B|$ 

 $|N|+|\varXi|+|O|+|\varPi|+|P|+|\varSigma|+|\varUpsilon|+|\varUpsilon|+|\varPhi|+|X|+|\varPsi|+|\varOmega|+$ 

 $|\alpha| + |\beta| + |\gamma| + |\delta| + |\epsilon| + |\zeta| + |\eta| + |\theta| + |\iota| + |\kappa| + |\lambda| + |\mu| + |\alpha| + |\beta| + |\alpha| + |\alpha|$ 

 $|\nu| + |\xi| + |o| + |\pi| + |\rho| + |\sigma| + |\tau| + |\upsilon| + |\phi| + |\chi| + |\psi| + |\omega| +$ 

 $|\varepsilon| + |\vartheta| + |\varpi| + |\varrho| + |\varsigma| + |\varphi| +$ 

$$\begin{aligned} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |\Gamma| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |A| + |M| + \\ |N| + |\Xi| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |\Upsilon| + |\Phi| + |X| + |\Psi| + |\Omega| + \\ \end{aligned}$$

#### Math Bold (\mathbf)

$$\begin{aligned} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |T| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |A| + |M| + \\ |N| + |\Xi| + |O| + |H| + |P| + |\Sigma| + |T| + |\Upsilon| + |\Phi| + |X| + |\Psi| + |\Omega| + \end{aligned}$$

# Math Calligraphic (\mathcal)

$$\begin{aligned} |\mathcal{A}| + |\mathcal{B}| + |\mathcal{C}| + |\mathcal{D}| + |\mathcal{E}| + |\mathcal{F}| + |\mathcal{G}| + |\mathcal{H}| + |\mathcal{I}| + |\mathcal{I}| + |\mathcal{I}| + |\mathcal{H}| +$$

## E.5 Superscript Positioning Serif Bold

$$\begin{split} A^2 + B^2 + C^2 + D^2 + E^2 + F^2 + G^2 + H^2 + I^2 + J^2 + K^2 + L^2 + M^2 + \\ N^2 + O^2 + P^2 + Q^2 + R^2 + S^2 + T^2 + U^2 + V^2 + W^2 + X^2 + Y^2 + Z^2 + \\ a^2 + b^2 + c^2 + d^2 + e^2 + f^2 + g^2 + h^2 + i^2 + j^2 + k^2 + l^2 + m^2 + \\ n^2 + o^2 + p^2 + q^2 + r^2 + s^2 + t^2 + u^2 + v^2 + w^2 + x^2 + y^2 + z^2 + \\ A^2 + B^2 + \Gamma^2 + \Delta^2 + E^2 + Z^2 + H^2 + \Theta^2 + I^2 + K^2 + \Lambda^2 + M^2 + \\ N^2 + \Xi^2 + O^2 + \Pi^2 + P^2 + \Sigma^2 + T^2 + \Upsilon^2 + \Phi^2 + X^2 + \Psi^2 + \Omega^2 + \\ \alpha^2 + \beta^2 + \gamma^2 + \delta^2 + \epsilon^2 + \zeta^2 + \eta^2 + \theta^2 + \iota^2 + \kappa^2 + \lambda^2 + \mu^2 + \\ v^2 + \xi^2 + o^2 + \pi^2 + \rho^2 + \sigma^2 + \tau^2 + v^2 + \phi^2 + \chi^2 + \psi^2 + \omega^2 + \\ \varepsilon^2 + \vartheta^2 + \varpi^2 + \varrho^2 + \zeta^2 + \varphi^2 + \end{split}$$

$$\begin{split} A^2 + B^2 + C^2 + D^2 + E^2 + F^2 + G^2 + H^2 + I^2 + J^2 + K^2 + L^2 + M^2 + \\ N^2 + O^2 + P^2 + Q^2 + R^2 + S^2 + T^2 + U^2 + V^2 + W^2 + X^2 + Y^2 + Z^2 + \\ a^2 + b^2 + c^2 + d^2 + e^2 + f^2 + g^2 + h^2 + i^2 + j^2 + k^2 + I^2 + m^2 + \\ n^2 + o^2 + p^2 + q^2 + r^2 + s^2 + t^2 + u^2 + v^2 + w^2 + x^2 + y^2 + z^2 + \\ A^2 + B^2 + \Gamma^2 + \Delta^2 + E^2 + Z^2 + H^2 + \Theta^2 + I^2 + K^2 + \Lambda^2 + M^2 + \\ N^2 + \Xi^2 + O^2 + \Pi^2 + P^2 + \Sigma^2 + T^2 + \Upsilon^2 + \Phi^2 + X^2 + \Psi^2 + \Omega^2 + \Phi^2 + X^2 + \Psi^2 + \Omega^2 + \Phi^2 + X^2 + \Psi^2 + \Omega^2 + \Phi^2 + \Omega^2 + \Phi^2$$

#### Math Bold (\mathbf)

$$A^{2} + B^{2} + C^{2} + D^{2} + E^{2} + F^{2} + G^{2} + H^{2} + I^{2} + J^{2} + K^{2} + L^{2} + M^{2} + N^{2} + O^{2} + P^{2} + Q^{2} + R^{2} + S^{2} + T^{2} + U^{2} + V^{2} + W^{2} + X^{2} + Y^{2} + Z^{2} + A^{2} + D^{2} + C^{2} + d^{2} + e^{2} + f^{2} + g^{2} + h^{2} + i^{2} + j^{2} + k^{2} + l^{2} + m^{2} + D^{2} + D^{2$$

# Math Calligraphic (\mathcal)

$$\mathcal{A}^{2} + \mathcal{B}^{2} + \mathcal{C}^{2} + \mathcal{D}^{2} + \mathcal{E}^{2} + \mathcal{F}^{2} + \mathcal{G}^{2} + \mathcal{H}^{2} + \mathcal{F}^{2} + \mathcal{F}^{2} + \mathcal{H}^{2} + \mathcal{H}^{2}$$

## E.6 Subscript Positioning Serif Bold

$$\begin{split} A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + \\ N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + \\ a_{i} + b_{i} + c_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + \\ n_{i} + o_{i} + p_{i} + q_{i} + r_{i} + s_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + \\ A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + \\ N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + \Upsilon_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + \\ \alpha_{i} + \beta_{i} + \gamma_{i} + \delta_{i} + \epsilon_{i} + \zeta_{i} + \eta_{i} + \theta_{i} + \iota_{i} + \kappa_{i} + \lambda_{i} + \mu_{i} + \\ v_{i} + \xi_{i} + o_{i} + \pi_{i} + \rho_{i} + \sigma_{i} + \tau_{i} + v_{i} + \phi_{i} + \chi_{i} + \psi_{i} + \omega_{i} + \\ \varepsilon_{i} + \vartheta_{i} + \varpi_{i} + \varrho_{i} + \varsigma_{i} + \varphi_{i} + \end{aligned}$$

$$\begin{split} A_i + B_i + C_i + D_i + E_i + F_i + G_i + H_i + I_i + J_i + K_i + L_i + M_i + \\ N_i + O_i + P_i + Q_i + R_i + S_i + T_i + U_i + V_i + W_i + X_i + Y_i + Z_i + \\ a_i + b_i + c_i + d_i + e_i + f_i + g_i + h_i + i_i + j_i + k_i + l_i + m_i + \\ n_i + o_i + p_i + q_i + r_i + s_i + t_i + u_i + v_i + w_i + x_i + y_i + z_i + \\ A_i + B_i + \Gamma_i + \Delta_i + E_i + Z_i + H_i + \Theta_i + I_i + K_i + \Lambda_i + M_i + \\ N_i + \Xi_i + O_i + \Pi_i + P_i + \Sigma_i + T_i + \Upsilon_i + \Phi_i + X_i + \Psi_i + \Omega_i + \\ \end{split}$$

## Math Bold (\mathbf)

$$\begin{split} A_i + B_i + C_i + D_i + E_i + F_i + G_i + H_i + I_i + J_i + K_i + L_i + M_i + \\ N_i + O_i + P_i + Q_i + R_i + S_i + T_i + U_i + V_i + W_i + X_i + Y_i + Z_i + \\ a_i + b_i + c_i + d_i + e_i + f_i + g_i + h_i + i_i + j_i + k_i + l_i + m_i + \\ n_i + o_i + p_i + q_i + r_i + s_i + t_i + u_i + v_i + w_i + x_i + y_i + z_i + \\ A_i + B_i + \Gamma_i + \Delta_i + E_i + Z_i + H_i + \Theta_i + I_i + K_i + \Lambda_i + M_i + \\ N_i + \Xi_i + O_i + \Pi_i + P_i + \Sigma_i + T_i + \Upsilon_i + \Phi_i + X_i + \Psi_i + \Omega_i + \\ \end{split}$$

## Math Calligraphic (\mathcal)

$$\mathcal{A}_i + \mathcal{B}_i + \mathcal{C}_i + \mathcal{D}_i + \mathcal{E}_i + \mathcal{F}_i + \mathcal{G}_i + \mathcal{H}_i + \mathcal{J}_i + \mathcal{J}_i + \mathcal{J}_i + \mathcal{H}_i + \mathcal$$

# E.7 Accent Positioning Serif Bold

### Math Italic (\mathit)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{1} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{i} + \hat{j} + \hat{k} + \hat{l} + \hat{m} + \hat{\ell} + \hat{\wp} + \hat{i} + \hat{j} + \hat{i} \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{r} + \hat{r} + \hat{E} + \hat{Z} + \hat{H} + \hat{r} + \hat{I} + \hat{K} + \hat{r} + \hat{M} + \\ \hat{N} + \hat{r} + \hat{O} + \hat{r} + \hat{P} + \hat{r} + \\ \hat{a} + \hat{\beta} + \hat{r} + \hat{\delta} + \hat{e} + \hat{c} + \hat{\zeta} + \hat{\eta} + \hat{\theta} + \hat{i} + \hat{\kappa} + \hat{\lambda} + \hat{\mu} + \\ \hat{v} + \hat{\xi} + \hat{o} + \hat{\pi} + \hat{\rho} + \hat{\sigma} + \hat{r} + \hat{v} + \hat{v} + \hat{\phi} + \hat{\chi} + \hat{\psi} + \hat{\omega} + \\ \hat{\varepsilon} + \hat{\vartheta} + \hat{\sigma} + \hat{\rho} + \hat{c} + \hat{c}$$

#### Math Roman (\mathrm)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{I} + \hat{J} + \hat{K} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{\Theta} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{T} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} +$$

# Math Bold (\mathbf)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{i} + \hat{j} + \hat{k} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{\Theta} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{T} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} +$$

# Math Calligraphic (\mathcal)

$$\hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{J} + \hat{J} + \hat{H} +$$

#### E.8 Differentials Serif Bold

$$\begin{split} \partial A + \partial B + \partial C + \partial D + \partial E + \partial F + \partial G + \partial H + \partial I + \partial J + \partial K + \partial L + \partial M + \\ \partial N + \partial O + \partial P + \partial Q + \partial R + \partial S + \partial T + \partial U + \partial V + \partial W + \partial X + \partial Y + \partial Z + \\ \partial \alpha + \partial b + \partial c + \partial d + \partial e + \partial f + \partial g + \partial h + \partial i + \partial j + \partial k + \partial l + \partial m + \\ \partial n + \partial o + \partial p + \partial q + \partial r + \partial s + \partial t + \partial u + \partial v + \partial w + \partial x + \partial y + \partial z + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \\ \partial N + \partial \Xi + \partial O + \partial \Pi + \partial P + \partial \Sigma + \partial T + \partial \Upsilon + \partial \Phi + \partial X + \partial \Psi + \partial \Omega + \\ \partial \alpha + \partial \beta + \partial \gamma + \partial \delta + \partial \epsilon + \partial \zeta + \partial \eta + \partial \theta + \partial \iota + \partial \kappa + \partial \lambda + \partial \mu + \\ \partial \nu + \partial \xi + \partial o + \partial \pi + \partial \rho + \partial \sigma + \partial \tau + \partial v + \partial \phi + \partial \chi + \partial \psi + \partial \omega + \\ \partial \epsilon + \partial \theta + \partial \sigma + \partial \varrho + \partial \zeta + \partial \Psi + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \\ \partial N + \partial \Xi + \partial O + \partial \Pi + \partial P + \partial \Sigma + \partial T + \partial \Upsilon + \partial \Phi + \partial X + \partial \Psi + \partial \Omega + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial C + \partial C$$

## E.9 Slash Kerning Serif Bold

 $1/A + 1/B + 1/C + 1/D + 1/E + 1/F + 1/G + 1/H + 1/I + 1/J + 1/K + 1/L + 1/M + 1/N + 1/O + 1/P + 1/Q + 1/R + 1/S + 1/T + 1/U + 1/V + 1/W + 1/X + 1/Y + 1/Z + 1/a + 1/b + 1/c + 1/d + 1/e + 1/f + 1/g + 1/h + 1/i + 1/j + 1/k + 1/l + 1/m + 1/n + 1/o + 1/p + 1/q + 1/r + 1/s + 1/t + 1/u + 1/v + 1/w + 1/x + 1/y + 1/z + 1/A + 1/B + 1/\Gamma + 1/\Delta + 1/E + 1/Z + 1/H + 1/\Theta + 1/I + 1/K + 1/\Lambda + 1/M + 1/N + 1/\Xi + 1/O + 1/\Pi + 1/P + 1/\Xi + 1/T + 1/\Upsilon + 1/\Phi + 1/X + 1/\Psi + 1/\Omega + 1/\alpha + 1/\beta + 1/\gamma + 1/\delta + 1/\epsilon + 1/\zeta + 1/\eta + 1/\theta + 1/\iota + 1/\kappa + 1/\lambda + 1/\mu + 1/\nu + 1/\xi + 1/o + 1/\pi + 1/\rho + 1/\sigma + 1/\tau + 1/\upsilon + 1/\psi + 1/\psi + 1/\psi + 1/\omega + 1/\varepsilon + 1/\vartheta + 1/\varphi + 1/\varphi$ 

 $A/2 + B/2 + C/2 + D/2 + E/2 + F/2 + G/2 + H/2 + I/2 + J/2 + K/2 + L/2 + M/2 + N/2 + O/2 + P/2 + Q/2 + R/2 + S/2 + T/2 + U/2 + V/2 + W/2 + X/2 + Y/2 + Z/2 + a/2 + b/2 + c/2 + d/2 + e/2 + f/2 + g/2 + h/2 + i/2 + j/2 + k/2 + l/2 + m/2 + n/2 + o/2 + p/2 + q/2 + r/2 + s/2 + t/2 + u/2 + v/2 + w/2 + x/2 + y/2 + z/2 + A/2 + B/2 + \Gamma/2 + \Delta/2 + E/2 + Z/2 + H/2 + \Theta/2 + I/2 + K/2 + A/2 + M/2 + N/2 + E/2 + O/2 + II/2 + P/2 + E/2 + T/2 + T/2 + T/2 + \Phi/2 + X/2 + \Psi/2 + \Omega/2 + a/2 + \beta/2 + \gamma/2 + \delta/2 + e/2 + \zeta/2 + \eta/2 + \theta/2 + i/2 + \kappa/2 + \lambda/2 + \mu/2 + v/2 + \xi/2 + o/2 + \pi/2 + \rho/2 + \sigma/2 + \tau/2 + v/2 + \phi/2 + \chi/2 + \psi/2 + \omega/2 + \varepsilon/2 + \vartheta/2 + \sigma/2 + g/2 + c/2 + \varphi/2 + \psi/2 + \psi/2 + \omega/2 + \varepsilon/2 + \vartheta/2 + \sigma/2 + g/2 + c/2 + \varphi/2 + \psi/2 + \psi/2 + \omega/2 + \omega/2 + \vartheta/2 + \sigma/2 + g/2 + c/2 + \varphi/2 + \psi/2 + \psi/2 + \omega/2 + \omega/2 + \vartheta/2 + \sigma/2 + g/2 + c/2 + \varphi/2 + \psi/2 + \psi/2 + \omega/2 + \omega/2 + \psi/2 + \psi/2$ 

# E.10 (Big) Operators Serif Bold

## E.11 Radicals Serif Bold

$$\sqrt{x+y} \qquad \sqrt{x^2+y^2} \qquad \sqrt{x_i^2+y_j^2} \qquad \sqrt{\left(\frac{\cos x}{2}\right)} \qquad \sqrt{\left(\frac{\sin x}{2}\right)}$$

$$\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{x+y}}}}}}$$

# E.12 Over- and Underbraces Serif Bold

$$\widehat{x}$$
  $\widehat{x+y}$   $\widehat{x^2+y^2}$   $\widehat{x_i^2+y_j^2}$   $\underbrace{x}$   $\underbrace{x+y}$   $\underbrace{x_i+y_j}$   $\underbrace{x_i^2+y_j^2}$ 

## E.13 Normal and Wide Accents Serif Bold

$$\dot{x}$$
  $\ddot{x}$   $\ddot{x}$ 

# E.14 Long Arrows Serif Bold

 $\longleftrightarrow$   $\longleftrightarrow$   $\longleftrightarrow$   $\longleftrightarrow$   $\Longleftrightarrow$ 

## E.15 Left and Right Delimiters Serif Bold

$$-(f) - -[f] - -|f| - -|f| - -\langle f \rangle - -\{f\} -$$

Using \left and \right.

$$-\big(f\big)--[f]--[f]--[f]--\langle f\rangle--\{f\}-$$

$$-f(--f(--f)--f(--f)--f(--f)--f(--f)$$

# E.16 Big-g-g Delimiters Serif Bold

# **E.17 Binary Operators Serif Bold**

$x \pm y$	\pm	$x \cap y$	\cap	$x \diamond y$	\diamond	$x \oplus y$	\oplus
$x \mp y$	\mp	$x \cup y$	\cup	$x \triangle y$	\bigtriangleup	$x \ominus y$	\ominus
$x \times y$	\times	$x \uplus y$	\uplus	$x \nabla y$	\bigtriangledown	$x \otimes y$	\otimes
$x \div y$	\div	$x\sqcap y$	\sqcap	$x \triangleleft y$	\triangleleft	$x \oslash y$	\oslash
x * y	\ast	$x \sqcup y$	\sqcup	$x \triangleright y$	\triangleright	$x \odot y$	\odot
$x \star y$	\star	$x \lor y$	\vee	$x \triangleleft y$	\lhd	$x \bigcirc y$	\bigcirc
$x \circ y$	\circ	$x \wedge y$	\wedge	$x \triangleright y$	\rhd	$x \dagger y$	\dagger
$x \bullet y$	\bullet	$x \setminus y$	\setminus	$x \triangleleft y$	\unlhd	$x \ddagger y$	\ddagger
$x \cdot y$	\cdot	$x \wr y$	\wr	$x \trianglerighteq y$	\unrhd	x§ $y$	<b>\</b> S
x + y	+	x-y	_	$x \coprod y$	\amalg	$x^{\P}v$	\P

### **E.18 Relations Serif Bold**

```
x \leq y
          \leq
                             x \ge y
                                       \geq
                                                           x \equiv y
                                                                      \equiv
                                                                                   x \models y
                                                                                              \models
          \prec
                                                                      \sim
x \prec y
                             x \succ y
                                       \succ
                                                           x \sim y
                                                                                   x \perp y
                                                                                              \perp
x \leq y
          \preceq
                             x \succeq y
                                       \succeq
                                                           x \simeq y
                                                                      \simeq
                                                                                   x \mid y
                                                                                              \mid
                             x \gg y
x \ll y
          \11
                                                                      \asymp
                                                                                   x \parallel y
                                                                                              \parallel
                                       \gg
                                                           x \times y
x \subset y
          \subset
                                                                      \approx
                                                                                              \bowtie
                             x\supset y
                                       \supset
                                                           x \approx y
                                                                                   x \bowtie y
x \subseteq y
          \subseteq
                             x \supseteq y
                                       \supseteq
                                                           x \cong y
                                                                      \cong
                                                                                   x \bowtie y
                                                                                              \Join
x \sqsubset y
          \sqsubset
                             x \supset y
                                       \sqsupset
                                                           x \neq y
                                                                      \neq
                                                                                   x - y
                                                                                              \smile
x \sqsubseteq y
          \sqsubseteq
                                       \sqsupseteq
                                                           x \doteq y
                                                                      \doteq
                                                                                              \frown
                             x \supseteq y
                                                                                   x - y
x \in y
          \in
                             x \ni y
                                       \ni
                                                           x \propto y
                                                                      \propto
                                                                                   x = y
                                                                                              =
          \vdash
                             x \dashv y
                                        \dashv
                                                           x < y
x \vdash y
                                                                      <
                                                                                   x > y
                                                                                              >
x:y
```

## E.19 Punctuation Serif Bold

x,y , x;y ; x:y \colon x.y \ldotp  $x\cdot y$  \cdotp

#### **E.20 Arrows Serif Bold**

$x \leftarrow y$	\leftarrow	$x \leftarrow y$	\longleftarrow	$x \uparrow y$	\uparrow
$x \leftarrow y$	\Leftarrow	$x \longleftarrow y$	\Longleftarrow	$x \uparrow y$	\Uparrow
$x \rightarrow y$	\rightarrow	$x \longrightarrow y$	\longrightarrow	$x \downarrow y$	\downarrow
$x \Rightarrow y$	\Rightarrow	$x \Longrightarrow y$	\Longrightarrow	$x \downarrow y$	\Downarrow
$x \longleftrightarrow y$	\leftrightarrow	$x \longleftrightarrow y$	\longleftrightarrow	$x \uparrow y$	\updownarrow
$x \Leftrightarrow y$	\Leftrightarrow	$x \Longleftrightarrow y$	\Longleftrightarrow	$x \updownarrow y$	\Updownarrow
$x \mapsto y$	\mapsto	$x \longmapsto y$	\longmapsto	$x \nearrow y$	\nearrow
$x \leftarrow y$	\hookleftarrow	$x \hookrightarrow y$	\hookrightarrow	$x \setminus y$	\searrow
$x \leftarrow y$	\leftharpoonup	$x \rightarrow y$	\rightharpoonup	$x \not y$	\swarrow
$x \leftarrow y$	\leftharpoondown	$x \rightarrow y$	\rightharpoondown	$x \setminus y$	\nwarrow
$x \rightleftharpoons y$	\rightleftharpoons	<i>x</i> ⊶ <i>y</i>	\leadsto		

# E.21 Miscellaneous Symbols Serif Bold

```
\ldots
                                \cdots
                                                 x:y
                                                          \vdots
                                                                            x \cdot y
                                                                                       \dots
x...y
                      x \cdots y
x \times y
          \aleph
                      x/y
                                 \prime
                                                 x \forall y
                                                          \forall
                                                                            x \infty y
                                                                                       \infty
хћу
          \hbar
                      x \emptyset y
                                 \emptyset
                                                 x\exists y
                                                          \exists
                                                                            x\Box y
                                                                                       \Box
                                 \nabla
хıу
          \imath
                      x\nabla y
                                                 x \neg y
                                                          \neg
                                                                            x \Diamond y
                                                                                       \Diamond
          \jmath
                      x\sqrt{y}
                                 \surd
                                                 xby
                                                          \flat
                                                                            x \triangle y
                                                                                       \triangle
хју
x\ell y
          \ell
                      x\mathsf{T}y
                                 \top
                                                  x \nmid y
                                                          \natural
                                                                            x♣y
                                                                                       \clubsuit
          \wp
                      x \perp y
                                 \bot
                                                 x | y
                                                          \sharp
                                                                            x \diamondsuit y
                                                                                       \diamondsuit
хру
x\Re y
          \Re
                      x||y
                                 \backslash |
                                                 x \setminus y
                                                          \backslash
                                                                            x \nabla y
                                                                                       \heartsuit
          \Im
                                                  x \partial y
                                                          \partial
                                                                                       \spadesuit
x\Im y
                      x \angle y
                                 \angle
                                                                            x \spadesuit y
х
          \mho
                                                 x|y
                                                          x!y
                                                                                       !
                      x.y
```

## E.22 Variable-Sized Operators Serif Bold

```
x \sum y
         \sum
                      x \cap y
                               \bigcap
                                              x \odot y
                                                        \bigodot
x \prod y
         \prod
                      x[]y
                               \bigcup
                                              x \otimes y
                                                        \bigotimes
x \coprod y
         \coprod
                      x | y
                               \bigsqcup
                                              x \oplus y
                                                        \bigoplus
                      x \bigvee y
x \mid y
         \int
                               \bigvee
                                              x + y
                                                        \biguplus
x \phi y
         \oint
                      x \wedge y
                               \bigwedge
```

# E.23 Log-Like Operators Serif Bold

```
x \arccos y
              x \cos y
                          x \csc y
                                     x \exp y
                                                 x ker y
                                                               x \lim \sup y
                                                                              x min y
                                                                                         x sinh y
                                                                              x Pry
x \arcsin y
                                     x \gcd y
                                                 x \log y
                                                               x \ln y
              x \cosh y
                          x \deg y
                                                                                         x \sup y
x arctany
                          x \det y
                                     x hom y
                                                 x \lim y
                                                               x \log y
              x \cot y
                                                                              x \sec y
                                                                                         x tan y
x argy
              x \coth y
                          x \dim y
                                    x inf y
                                                 x \lim \inf y
                                                               x \max y
                                                                              x \sin y
                                                                                         x tanh y
```

### **E.24** Delimiters Serif Bold

```
x(y)
       (
                                                                          x \uparrow y
                                                                                    \Uparrow
                     x)y
                                           x \uparrow y
                                                     \uparrow
x[y]
       [
                             ]
                     x]y
                                           x \downarrow y
                                                     \downarrow
                                                                          x \downarrow y
                                                                                    \Downarrow
x{y}
       \{
                     x}y
                             \}
                                           x \uparrow y
                                                     \updownarrow
                                                                          x \updownarrow y
                                                                                    \Updownarrow
                                                                                    \rceil
x \mid y
       \lfloor
                             \rfloor
                                                     \lceil
                                                                          x]y
                     x y
                                           x[y]
x\langle y
       \langle
                     x\rangle y
                             \rangle
                                           x/y
                                                                          x \setminus y
                                                                                    \backslash
x|y
                     x||y
```

# **E.25** Large Delimiters Serif Bold

## E.26 Math Mode Accents Serif Bold

```
\hat{a} \hat{a} \acute{a} \acute{a} \bar{a} \bar{a} \acute{a} \dot{a} \breve{a} \breve{a} \check{a} \check{a} \grave{a} \grave{a} \vec{a} \vec{a} \ddot{a} \dot{a} \tilde{a} \tilde{a}
```

## E.27 Miscellaneous Constructions Serif Bold

```
abc
       \widetilde{abc}
                               abc
                                       \widehat{abc}
abc
       \overleftarrow{abc}
                               abċ
                                       \overrightarrow{abc}
abc
       \overline{abc}
                               abc
                                       \underline{abc}
abc
       \overbrace{abc}
                                abc
                                       \underbrace{abc}
                                ∛abc
√abc
       \sqrt{abc}
                                       \sqrt[n]{abc}
                               abc
f'
       f'
                                       \frac{abc}{xyz}
                               \overline{xyz}
```

# **E.28** AMS Delimiters Serif Bold

 $x \vdash y$  \ullcorner  $x \vdash y$  \ullcorner  $x \perp y$  \llcorner

# **E.29 AMS Arrows Serif Bold**

$x \dashrightarrow y$	\dashrightarrow	<i>x</i> ← <i>y</i>	\dashleftarrow
x = y	\leftleftarrows	$x \leftrightarrows y$	\leftrightarrows
$x \in y$	\Lleftarrow	$x \leftarrow y$	\twoheadleftarrow
$x \leftarrow y$	\leftarrowtail	$x \notin y$	\looparrowleft
$x \leftrightharpoons y$	\leftrightharpoons	$x \cap y$	\curvearrowleft
$x \circlearrowleft y$	\circlearrowleft	$x \uparrow y$	\Lsh
$x \uparrow \uparrow y$	\upuparrows	$x \mid y$	\upharpoonleft
$x \downarrow y$	\downharpoonleft	$x \rightarrow y$	\multimap
$x \leftrightarrow y$	\leftrightsquigarrow	$x \rightrightarrows y$	\rightrightarrows
$x \rightleftarrows y$	\rightleftarrows	$x \rightrightarrows y$	\rightrightarrows
$x \rightleftarrows y$	\rightleftarrows	$x \rightarrow y$	\twoheadrightarrow
$x \mapsto y$	\rightarrowtail	$x \rightarrow y$	\looparrowright
$x \rightleftharpoons y$	\rightleftharpoons	$x \cap y$	\curvearrowright
$x \circlearrowleft y$	\circlearrowright	x  ightharpoonup y	\Rsh
$x \downarrow \downarrow y$	\downdownarrows	$x \mid y$	\upharpoonright
$x \mid y$	\downharpoonright	$x \leadsto y$	\rightsquigarrow

# E.30 AMS Negated Arrows Serif Bold

```
x \leftrightarrow y \nleftarrow x \nrightarrow y \nrightarrow x \nleftrightarrow y \nRightarrow x \nleftrightarrow y \nleftrightarrow x \nleftrightarrow y \nleftrightarrow
```

# E.31 AMS Greek Serif Bold

 $x \not = y$  \digamma  $x \not = y$  \varkappa

## **E.32** AMS Hebrew Serif Bold

 $x \exists y$  \beth  $x \exists y$  \daleth  $x \exists y$  \gimel

## E.33 AMS Miscellaneous Serif Bold

```
хћу
        \hbar
                              хћу
                                      \hslash
x \triangle y
        \vartriangle
                              x \nabla y
                                     \triangledown
        \square
                              x \Diamond y
                                     \lozenge
x\Box y
                              x∠y
x sy
        \circledS
                                     \angle
        \measuredangle x \not\equiv y
                                      \nexists
x∡y
х℧у
        \mbox{\mbox{\mbox{$\mbox{$}}}
                              x \exists y
                                      \mathsf{\Gammainv}^u
хӘу
        \backslash \mathsf{Game}^u
                              xky
                                      \Bbbk^u
        \backprime
                              x \otimes y \varnothing
x\y
        \blacktriangle x \nabla y \blacktriangledown
x \blacktriangle y
        \blacksquare
                              x \blacklozenge y \blacklozenge
x■y
x \star y
        \bigstar
                              x∢y
                                      \sphericalangle
хСу
        \complement
                              хðу
                                      \eth
x/y
        \diagup^u
                              x \setminus y \setminus diagdown^u
^u Not defined in amssymb.sty, define using the \newsymbol command.
```

# E.34 AMS Binary Operators Serif Bold

x + y	\dotplus	$x \setminus y$	\smallsetminus
$x \cap y$	\Cap	$x \uplus y$	\Cup
$x \overline{\wedge} y$	\barwedge	$x \vee y$	\veebar
$x  \overline{\wedge}  y$	\doublebarwedge	$x \boxminus y$	\boxminus
$x \boxtimes y$	\boxtimes	$x \square y$	\boxdot
$x \boxplus y$	\boxplus	x * y	\divideontimes
$x \ltimes y$	\ltimes	$x \rtimes y$	\rtimes
$x \lambda y$	\leftthreetimes	$x \land y$	\rightthreetimes
$x \curlywedge y$	\curlywedge	$x \land y$	\curlyvee
$x \ominus y$	\circleddash	$x \otimes y$	\circledast
$x \odot y$	\circledcirc	$x \cdot y$	\centerdot
$x \intercal y$	\intercal		

<sup>----</sup>**-----** -----, ------, ------

## **E.35** AMS Relations Serif Bold

 $x \leq y$ **\leqslant**  $x \lesssim y$ \lesssim  $x \cong y$ \approxeq  $x \ll y \setminus 1111$  $x \leq y$ \lesseqgtr  $x \doteq y$ \doteqdot \fallingdotseq x = yx = y\backsimeq  $x \subseteq y$ \Subset  $x \preccurlyeq y$ \preccurlyeq  $x \not \subset y$ \precsim \vartriangleleft  $x \triangleleft y$  $x \models y$ \vDash \smallsmile  $x \smile y$ x = y\bumpeq  $x \ge y$ \geqq  $x \geqslant y$ \eqslantgtr  $x \gtrsim y$ \gtrapprox  $x \gg y$ \ggg  $x \geq y$ \gtreqless x = y\eqcirc  $x \triangleq y$ \triangleq  $x \approx y$ \thickapprox  $x \ni y$ \Supset  $x \succcurlyeq y$ \succcurlyeq  $x \gtrsim y$ \succsim \vartriangleright  $x \triangleright y$  $x \Vdash y$ \Vdash  $x \parallel y$ \shortparallel  $x \pitchfork y$ \pitchfork  $x \triangleleft y$ **\blacktriangleleft**  $x \ni y$ \backepsilon

x : y

\because

## **E.36** AMS Negated Relations Serif Bold

```
x \not \leq y
x ≮ y \nless
                                              \nleq
x \not\leq y \setminus \text{nleqslant}
                                    x \not \leq y
                                             \nleqq
x \le y \setminus lneq
                                    x \not\subseteq y \setminus lneqq
x \leq y
         \lvertneqq
                                   x ≨ y \lnsim
x \lessapprox y
         \lnapprox
                                    x \not\prec y
                                              \nprec
x \not \leq y
         \npreceq
                                    x \not\supset y
                                              \precnsim
x \not \geq y
         \precnapprox
                                   x \not\sim y
                                              \nsim
x i y
          \nshortmid
                                   x \nmid y
                                              \nmid
x \not\vdash y
         \nvdash
                                   x \not\vdash y
                                             \nvDash
x \not = y
         \ntriangleleft x \not\equiv y \ntrianglelefteq
x \not\subseteq y
                                    x \subsetneq y
         \nsubseteq
                                              \subsetneq
x \not\subseteq y
         \varsubsetneq
                                    x \not\subseteq y
                                              \subsetneqq
x \not\subseteq y \varsubsetneqq x \not\geqslant y
                                             \ngtr
x≱y \ngeq
                                    x \not \geq y
                                             \ngeqslant
x \not \geq y
         \ngeqq
                                   x \geqslant y
                                              \gneq
x \not\supseteq y
                                  x \geqq y
         \gneqq
                                              \gvertneqq
x \gtrsim y
         \gnsim
                                 x \ngeq y
                                              \gnapprox
x \not\succ y
         \nsucc
                                  x \not\succeq y
                                              \nsucceq
                                    x \not\gtrsim y
x \not \equiv y \setminus \text{nsucceqq}
                                              \succnsim
x \geq y \succnapprox
                                    x \not\cong y \setminus \text{ncong}
          \nshortparallel x \not\parallel y
                                              \nparallel
x x y
x \nvDash y
         \nvDash
                                    x \not\Vdash y
                                              \nVDash
x \not\triangleright y \ntriangleright x \not\trianglerighteq y \ntrianglerighteq
x \not\supseteq y \nsupseteq
                           x \not\supseteq y
                                              \nsupseteqq
                                    x \supseteq y \varsupsetneq
x \supsetneq y
         \supsetneq
x \supseteq y \supsetneqq
                                    x \not\supseteq y \varsupsetneqq
```

# E.37 Math "Torture" Test Serif Bold

Most of the following examples are taken from *The TeXbook* (Knuth, 1984, see <a href="https://ctan.org/pkg/texbook">https://ctan.org/pkg/texbook</a>) and were adapted for ETeX from Karl Berry's torture test for plain TeX math fonts.

```
\begin{array}{lll} x+y-z, & x+y*z, & z*y/z, & (x+y)(x-y)=x^2-y^2, \\ x\times y\cdot z=[xyz], & x\circ y\bullet z, & x\cup y\cap z, & x\sqcup y\sqcap z, \\ x\vee y\wedge z, & x\pm y\mp z, & x=y/z, & x:=y, & x\leq y\neq z, & x\sim y\simeq z \ x\equiv y\not\equiv z, & x\in y\subseteq z \\ \sin 2\theta=2\sin\theta\cos\theta, & O(n\log n\log n), & \Pr(X>x)=\exp(-x/\mu), \\ \left(x\in A(n)\ \middle|\ x\in B(n)\right), & \bigcup_n X_n\ \middle\|\bigcap_n Y_n \\ & \text{In-text matrices} \begin{pmatrix} 11\\01 \end{pmatrix} \text{ and } \begin{pmatrix} a&b&c\\1&m&n \end{pmatrix}. \end{array}
```

$$a_{0} + \frac{1}{a_{1} + \frac{1}{a_{2} + \frac{1}{a_{3} + \frac{1}{a_{4}}}}}$$

$$\binom{p}{2}x^{2}y^{p-2} - \frac{1}{1-x}\frac{1}{1-x^{2}} = \frac{a+1}{b} / \frac{c+1}{d}.$$

$$\sqrt{1 + \sqrt{1 + \sqrt{1 + \sqrt{1 + \sqrt{1 + x}}}}}$$

$$\sqrt{1 + \sqrt{1 + \sqrt{1 + \sqrt{1 + x^{3} + \frac{1}{x^{3}}}}}$$

$$\left(\frac{\partial^{2}}{\partial x^{2}} + \frac{\partial^{2}}{\partial y^{2}}\right) |\varphi(x+iy)|^{2} = 0$$

$$\pi(n) = \sum_{m=2}^{n} \left[ \left(\sum_{k=1}^{m-1} [(m/k)/[m/k]]\right)^{-1} \right].$$

$$\int_{0}^{\infty} \frac{t-ib}{t^{2} + b^{2}} e^{iat} dt = e^{ab} E_{1}(ab), \quad a, b > 0.$$

$$A := \begin{pmatrix} x - \lambda & 1 & 0 \\ 0 & x - \lambda & 1 \\ 0 & 0 & x - \lambda \end{pmatrix}.$$

$$\begin{pmatrix} a & b & c \\ d & e & f \end{pmatrix} \begin{pmatrix} u & x \\ v & y \\ w & z \end{pmatrix}$$

$$A = \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix}$$

$$C & I & C' \\ M = I & \begin{pmatrix} 1 & 0 & 0 \\ b & 1 - b & 0 \\ 0 & a & 1 - a \end{pmatrix}$$

$$\sum_{n=0}^{\infty} a_{n}z^{n} \quad \text{converges if} \quad |z| < \left(\limsup_{n \to \infty} \sqrt[n]{|a_{n}|}\right)^{-1}.$$

$$\frac{f(x + \Delta x) - f(x)}{\Delta x} \to f'(x) \quad \text{as } \Delta x \to 0.$$

$$||u_i|| = 1,$$
  $u_i \cdot u_j = 0$  if  $i \neq j$ .

The confluent image of  $\left\{ \begin{array}{l} an\ arc \\ a\ circle \\ a\ fan \end{array} \right\} \quad is \quad \left\{ \begin{array}{l} an\ arc \\ an\ arc\ or\ a\ circle \\ a\ fan\ or\ an\ arc \end{array} \right\}.$ 

$$T(n) \le T(2^{\lceil \lg n \rceil}) \le c(3^{\lceil \lg n \rceil} - 2^{\lceil \lg n \rceil})$$
  
 $< 3c \cdot 3^{\lg n}$   
 $= 3c n^{\lg 3}.$ 

$$(x+y)(x-y) = x^{2} - xy + yx - y^{2}$$
$$= x^{2} - y^{2}$$
$$(x+y)^{2} = x^{2} + 2xy + y^{2}.$$

$$\left(\int_{-\infty}^{\infty} e^{-x^2} dx\right)^2 = \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} e^{-(x^2+y^2)} dx dy$$
$$= \int_{0}^{2\pi} \int_{0}^{\infty} e^{-r^2} dr d\theta$$
$$= \int_{0}^{2\pi} \left( e^{-\frac{r^2}{2}} \Big|_{r=0}^{r=\infty} \right) d\theta$$
$$= \pi.$$

$$\prod_{k\geq 0} \frac{1}{(1-q^k z)} = \sum_{n\geq 0} z^n / \prod_{1\leq k\leq n} (1-q^k).$$

$$\sum_{\substack{0 < i \leq m \\ 0 < j \leq n}} p(i,j) \neq \sum_{i=1}^p \sum_{j=1}^q \sum_{k=1}^r a_{ij} b_{jk} c_{ki} \neq \sum_{\substack{1 \leq i \leq p \\ 1 \leq j \leq q \\ 1 \leq k \leq r}} a_{ij} b_{jk} c_{ki}$$

$$\max_{1 \le n \le m} \log_2 P_n \quad \text{and} \quad \lim_{x \to 0} \frac{\sin x}{x} = 1$$

Inline math:  $\max_{1 \le n \le m} \log_2 P_n$  and  $\lim_{x \to 0} \frac{\sin x}{x} = 1$ 

$$p_1(n) = \lim_{m \to \infty} \sum_{\nu=0}^{\infty} \left( 1 - \cos^{2m} (\nu!^n \pi/n) \right)$$

Inline math:  $p_1(n) = \lim_{m \to \infty} \sum_{\nu=0}^{\infty} \left( 1 - \cos^{2m}(\nu!^n \pi/n) \right)$ 

# Appendix F Math Test Sans Serif

#### F.1 Overview Sans Serif

Default:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta\theta P\Pi\Sigma \sigma$ ;  $\sigma_{\epsilon}$ ,  $c^{\alpha}$  mathnormal:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta\theta P\Pi\Sigma \sigma$  mathrm:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \vartheta P\Pi\Sigma \sigma$  mathup:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathit:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathbf:  $a\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathbfit:  $a\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathbfit:  $a\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathbfup:  $a\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$ 

Default: αααββGΓΓεεθθΡΠΣσ;  $σ_ε$ ,  $c^α$  mathnormal: αααββGΓΓεεθθΡΠΣσ mathrm: αααββGΓΓεεθθΡΠΣσ mathup: αααββGΓΓεεθθΡΠΣσ mathit: αααββGΓΓεεθθΡΠΣσ mathbf: αααββGΓΓεεθθΡΠΣσ mathbf: αααββGΓΓεεθθΡΠΣσ mathbfit: αααββGΓΓεεθθΡΠΣσ mathbfit: αααββGΓΓεεθθΡΠΣσ mathbfit: αααββGΓΓεεθθΡΠΣσ mathbfup: αααββGΓΓεεθθΡΠΣσ

Default:  $\alpha\alpha\alpha b\beta G\Gamma \Gamma \epsilon\epsilon\theta\theta P\Pi \Sigma \sigma$ ;  $\sigma_{\epsilon}$ ,  $c^{\alpha}$  mathnormal:  $\alpha\alpha\alpha b\beta G\Gamma \Gamma \epsilon\epsilon\theta\theta P\Pi \Sigma \sigma$  mathrm:  $\alpha\alpha\alpha b\beta G\Gamma \Gamma \epsilon\epsilon\theta\theta P\Pi \Sigma \sigma$  mathup:  $\alpha\alpha\alpha b\beta G\Gamma \Gamma \epsilon\epsilon\theta\theta P\Pi \Sigma \sigma$  mathit:  $\alpha\alpha\alpha b\beta G\Gamma \Gamma \epsilon\epsilon\theta\theta P\Pi \Sigma \sigma$  mathbf:  $\alpha\alpha\alpha b\beta G\Gamma \Gamma \epsilon\epsilon\theta\theta P\Pi \Sigma \sigma$  mathbfit:  $\alpha\alpha\alpha b\beta G\Gamma \Gamma \epsilon\epsilon\theta\theta P\Pi \Sigma \sigma$  mathbfit:  $\alpha\alpha\alpha b\beta G\Gamma \Gamma \epsilon\epsilon\theta\theta P\Pi \Sigma \sigma$  mathbfup:  $\alpha\alpha\alpha b\beta G\Gamma \Gamma \epsilon\epsilon\theta\theta P\Pi \Sigma \sigma$ 

Default: αααbβGΓΓεεθθΡΠΣσ;  $σ_ε$ ,  $c^α$  mathnormal: αααbβGΓΓεεθθΡΠΣσ mathrm: αααbβGΓΓεεθθΡΠΣσ mathup: αααbβGΓΓεεθθΡΠΣσ mathit: αααbβGΓΓεεθθΡΠΣσ mathif: αααbβGΓΓεεθθΡΠΣσ mathbf: αααbβGΓΓεεθθΡΠΣσ mathbfit: αααbβGΓΓεεθθΡΠΣσ mathbfit: αααbβGΓΓεεθθΡΠΣσ mathbfit: αααbβGΓΓεεθθΡΠΣσ

#### F.2 Formulas Sans Serif

α, β, γ, δ, ε, ε, ζ, η, θ, ι, κ, λ, μ, ν, ξ, ο, π, π, ρ, ρ, σ, ς, τ, υ, φ, φ, χ, ψ, ω, ρ, Α, Β, Γ, Δ, Ε, Z, H, Θ, I, K, Λ, M, N, Ξ, O, Π, P, Σ, T, Y, Φ, X, Ψ, Ω, F,

 $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\varepsilon$ ,  $\varepsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ ,  $\theta$ ,  $\iota$ ,  $\kappa$ ,  $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\xi$ , o,  $\pi$ ,  $\pi$ ,  $\rho$ ,  $\rho$ ,  $\sigma$ ,  $\zeta$ ,  $\tau$ ,  $\upsilon$ ,  $\phi$ ,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\varepsilon$ , A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T, Y,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ , F,

 $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\epsilon$ ,  $\epsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ ,  $\theta$ ,  $\iota$ ,  $\kappa$ ,  $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\xi$ , o,  $\pi$ ,  $\pi$ ,  $\rho$ ,  $\rho$ ,  $\sigma$ ,  $\varsigma$ ,  $\tau$ ,  $\upsilon$ ,  $\phi$ ,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\epsilon$ , A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T, Y,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ , F,

$$\alpha a > 0$$
,  $\beta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$   
 $\alpha a > 0$ ,  $\beta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$   
 $\lim_{v \to \infty} v(v) = \max_{s \in S} \{s \pm 3\gamma + y - 1\} = 4 \times 7$   
 $\hat{\beta} = (X'X)^{-1}X'y$ 

$$\lim_{N\to\infty}\sum_{i=0}^N x^i = \min_{x\in\mathbb{R}} S(x)$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Disambiguation: 0 O O, 1 l l | l I /, i j, rn m,  $\theta$  O,  $\phi$   $\psi$ , – –

Latin vs. Greek:  $a \alpha$ ,  $d \delta$ ,  $e \varepsilon$ ,  $i \iota$ ,  $k \kappa$ ,  $n \eta$ ,  $o \sigma$ ,  $p \rho$ ,  $\beta \beta$ ,  $u \upsilon$ , v v,  $w \omega$ ,  $x \chi$ ,  $y \gamma$ ,  $A \Delta \Lambda$ ,  $O \Theta \Omega$ ,  $T \Gamma$ , Y Y.

$$lpha a > 0$$
,  $eta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$   
 $\lim_{\nu \to \infty} \nu(\nu) = \max_{s \in S} \{ s \pm 3\gamma + y - 1 \} = 4 \times 7$   
 $\hat{\beta} = (X'X)^{-1}X'y$ 

$$\lim_{N\to\infty}\sum_{i=0}^N x^i=\min_{x\in\mathbb{R}} S(x)$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Disambiguation: 0 O O, 1 l I | l I /, i j, rn m,  $\theta$  O,  $\phi$   $\psi$ , - -

Latin vs. Greek:  $a \alpha, d \delta, e \varepsilon, i \iota, k \kappa, n \eta, o \sigma, p \rho, \beta \beta, u \upsilon, v v, w \omega, x \chi, y \gamma, A \Delta \Lambda, O \Theta \Omega, T \Gamma, Y Y.$ 

$$\alpha a > 0$$
,  $\beta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$   
 $\lim_{v \to \infty} v(v) = \max_{s \in S} \{s \pm 3\gamma + y - 1\} = 4 \times 7$   
 $\hat{\beta} = (X'X)^{-1}X'y$ 

$$\lim_{N\to\infty}\sum_{i=0}^N x^i = \min_{x\in\mathbb{R}} S(x)$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Latin vs. Greek:  $a \alpha$ ,  $d \delta$ ,  $e \varepsilon$ ,  $i \iota$ ,  $k \kappa$ ,  $n \eta$ ,  $o \sigma$ ,  $p \rho$ ,  $\beta \beta$ ,  $u \upsilon$ , v v,  $w \omega$ ,  $x \chi$ ,  $y \gamma$ ,  $A \Delta \Lambda$ ,  $O \Theta \Omega$ ,  $T \Gamma$ , Y Y.

$$lpha a > 0$$
,  $eta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$   
 $\lim_{v \to \infty} v(v) = \max_{s \in S} \{s \pm 3\gamma + y - 1\} = 4 \times 7$   
 $\hat{\beta} = (X'X)^{-1}X'y$ 

$$\lim_{N\to\infty}\sum_{i=0}^N x^i=\min_{\mathbf{x}\in\mathbb{R}}\mathbf{S}(\mathbf{x})$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Disambiguation: 0 O O, 1 l l | l l /, i j, rn m,  $\theta$   $\Theta$ ,  $\phi$   $\psi$ , - Latin vs. Greek: a  $\alpha$ , d  $\delta$ , e  $\epsilon$ , i  $\iota$ , k  $\kappa$ , n  $\eta$ , o  $\sigma$ , p  $\rho$ ,  $\beta$   $\beta$ , u v, v w  $\omega$ , x  $\chi$ , y  $\gamma$ , A  $\Delta$   $\Lambda$ , O  $\Theta$   $\Omega$ , T  $\Gamma$ , Y Y.

## F.3 Math Alphabets Sans Serif

Default

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 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, A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T, Y,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ ,  $\alpha$ ,  $\beta$ , Y,  $\delta$ ,  $\varepsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ ,  $\iota$ ,  $\kappa$ ,  $\lambda$ ,  $\mu$ , v,  $\xi$ , o,  $\pi$ ,  $\rho$ ,  $\sigma$ ,  $\tau$ , v,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\varepsilon$ ,  $\theta$ ,  $\pi$ ,  $\rho$ ,  $\varsigma$ ,  $\phi$ ,

Math Normal (\mathnormal)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 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,  $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, Y, \Phi, X, \Psi, \Omega,$  $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, v, \xi, o, \pi, \rho, \sigma, \tau, \upsilon, \phi, \chi, \psi, \omega, \epsilon, \theta, \pi, \rho, \varsigma, \phi,$ 

Math Italic (\mathit)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 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, A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N, E, O,  $\Pi$ , P,  $\Sigma$ , T, Y,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ ,  $\alpha$ ,  $\beta$ , Y,  $\delta$ ,  $\varepsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ ,  $\iota$ , K,  $\lambda$ ,  $\mu$ , v,  $\xi$ ,  $\rho$ ,  $\pi$ ,  $\rho$ ,  $\sigma$ ,  $\tau$ , v,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\varepsilon$ ,  $\theta$ ,  $\pi$ ,  $\rho$ ,  $\varsigma$ ,  $\phi$ ,

```
Math Roman (\mathrm)
```

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

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,

A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T,  $\Upsilon$ ,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ ,

 $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \nu, \phi, \chi, \psi, \omega, \epsilon, \vartheta, \varpi, \varrho, \varsigma, \varphi,$ 

#### Math Bold (\mathbf)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

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,

 $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, Y, \Phi, X, \Psi, \Omega$ 

 $\alpha,\beta,\gamma,\delta,\epsilon,\zeta,\eta,\theta,\iota,\kappa,\lambda,\mu,\nu,\xi,o,\pi,\rho,\sigma,\tau,\upsilon,\phi,\chi,\psi,\omega,\epsilon,\theta,\pi,\rho,\varsigma,\phi,$ 

#### Caligraphic (\mathcal)

 $\mathcal{A}$  ,  $\mathcal{B}$  ,  $\mathcal{C}$  ,  $\mathcal{D}$  ,  $\mathcal{E}$  ,  $\mathcal{F}$  ,  $\mathcal{G}$  ,  $\mathcal{H}$  ,  $\mathcal{I}$  ,  $\mathcal{I}$  ,  $\mathcal{H}$  ,  $\mathcal{M}$  ,  $\mathcal{N}$  ,  $\mathcal{O}$  ,  $\mathcal{P}$  ,  $\mathcal{Q}$  ,  $\mathcal{R}$  ,  $\mathcal{F}$  ,  $\mathcal{T}$  ,  $\mathcal{U}$  ,  $\mathcal{V}$  ,  $\mathcal{W}$  ,  $\mathcal{X}$  ,  $\mathcal{Y}$  ,  $\mathcal{Z}$  ,

Script(\mathscr)

$$\mathscr{A}, \mathscr{B}, \mathscr{C}, \mathfrak{D}, \mathscr{E}, \mathscr{F}, \mathscr{G}, \mathscr{H}, \mathscr{I}, \mathscr{J}, \mathscr{K}, \mathscr{L}, \mathscr{M}, \mathscr{N}, \mathscr{O}, \mathscr{P}, \mathscr{Q}, \mathscr{R}, \mathscr{F}, \mathscr{T}, \mathscr{U}, \mathscr{V}, \mathscr{W}, \mathscr{X}, \mathscr{Y}, \mathscr{Z},$$

Fraktur (\mathfrak)

 $\mathfrak{A},\mathfrak{B},\mathfrak{C},\mathfrak{D},\mathfrak{E},\mathfrak{F},\mathfrak{G},\mathfrak{H},\mathfrak{I},\mathfrak{I},\mathfrak{K},\mathfrak{L},\mathfrak{M},\mathfrak{N},\mathfrak{O},\mathfrak{P},\mathfrak{Q},\mathfrak{R},\mathfrak{G},\mathfrak{T},\mathfrak{U},\mathfrak{V},\mathfrak{W},\mathfrak{X},\mathfrak{Y},\mathfrak{Z},$ 

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

Blackboard Bold (\mathbb)

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

#### F.4 Character Sidebearings Sans Serif

Default

$$|A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| +$$

$$|N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + |W| + |W|$$

$$|a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + |m|$$

$$|n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + |z|$$

$$|A| + |B| + |\Gamma| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |\Lambda| + |M| +$$

$$|N| + |\Xi| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |Y| + |\Phi| + |X| + |\Psi| + |\Omega| + |\Phi| + |X| + |\Psi| + |\Omega| + |\Psi| + |\Psi|$$

$$|\alpha| + |\beta| + |\gamma| + |\delta| + |\epsilon| + |\zeta| + |\eta| + |\theta| + |\iota| + |\kappa| + |\lambda| + |\mu| + |\alpha| + |\beta| + |\alpha| + |\alpha|$$

$$|v| + |\xi| + |o| + |\pi| + |\rho| + |\sigma| + |\tau| + |v| + |\phi| + |\chi| + |\psi| + |\omega| + |\psi| + |\alpha|$$

 $|\varepsilon| + |\theta| + |\pi| + |\rho| + |\varsigma| + |\phi| +$ 

$$\begin{aligned} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |I| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |\Gamma| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |\Lambda| + |M| + \\ |N| + |\Xi| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |\Upsilon| + |\Phi| + |X| + |\Psi| + |\Omega| + \end{aligned}$$

Math Bold (\mathbf)

$$\begin{aligned} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |T| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |A| + |M| + \\ |N| + |E| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |Y| + |\Phi| + |X| + |\Psi| + |\Omega| + \end{aligned}$$

Math Calligraphic (\mathcal)

$$\begin{aligned} |\mathcal{A}| + |\mathcal{B}| + |\mathcal{C}| + |\mathcal{D}| + |\mathcal{E}| + |\mathcal{F}| + |\mathcal{G}| + |\mathcal{H}| + |\mathcal{I}| + |\mathcal{I}| + |\mathcal{I}| + |\mathcal{H}| +$$

## F.5 Superscript Positioning Sans Serif

$$A^{2} + B^{2} + C^{2} + D^{2} + E^{2} + F^{2} + G^{2} + H^{2} + I^{2} + J^{2} + K^{2} + L^{2} + M^{2} + N^{2} + O^{2} + P^{2} + Q^{2} + R^{2} + S^{2} + T^{2} + U^{2} + V^{2} + W^{2} + X^{2} + Y^{2} + Z^{2} + Q^{2} + D^{2} + C^{2} + D^{2} + C^{2} + D^{2} + D^{2$$

$$\begin{split} A^2 + B^2 + C^2 + D^2 + E^2 + F^2 + G^2 + H^2 + I^2 + J^2 + K^2 + L^2 + M^2 + \\ N^2 + O^2 + P^2 + Q^2 + R^2 + S^2 + T^2 + U^2 + V^2 + W^2 + X^2 + Y^2 + Z^2 + \\ a^2 + b^2 + c^2 + d^2 + e^2 + f^2 + g^2 + h^2 + i^2 + j^2 + k^2 + I^2 + m^2 + \\ n^2 + o^2 + p^2 + q^2 + r^2 + s^2 + t^2 + u^2 + v^2 + w^2 + x^2 + y^2 + z^2 + \\ A^2 + B^2 + \Gamma^2 + \Delta^2 + E^2 + Z^2 + H^2 + \Theta^2 + I^2 + K^2 + \Lambda^2 + M^2 + \\ N^2 + \Xi^2 + O^2 + \Pi^2 + P^2 + \Sigma^2 + T^2 + \Upsilon^2 + \Phi^2 + X^2 + \Psi^2 + \Omega^2 + \\ \end{split}$$

Math Bold (\mathbf)

$$A^{2} + B^{2} + C^{2} + D^{2} + E^{2} + F^{2} + G^{2} + H^{2} + I^{2} + J^{2} + K^{2} + L^{2} + M^{2} + N^{2} + O^{2} + P^{2} + Q^{2} + R^{2} + S^{2} + T^{2} + U^{2} + V^{2} + W^{2} + X^{2} + Y^{2} + Z^{2} + G^{2} + D^{2} + C^{2} + D^{2} + C^{2} + D^{2} + D^{2$$

Math Calligraphic (\mathcal)

$$\mathcal{A}^{2} + \mathcal{B}^{2} + \mathcal{C}^{2} + \mathcal{D}^{2} + \mathcal{E}^{2} + \mathcal{F}^{2} + \mathcal{H}^{2} + \mathcal{H}^{2}$$

### F.6 Subscript Positioning Sans Serif

$$A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + A_{i} + D_{i} + C_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + N_{i} + O_{i} + P_{i} + q_{i} + r_{i} + S_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + Y_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + A_{i} + B_{i} + Y_{i} + \delta_{i} + \varepsilon_{i} + \zeta_{i} + \eta_{i} + \theta_{i} + t_{i} + K_{i} + \lambda_{i} + \mu_{i} + V_{i} + \xi_{i} + O_{i} + \pi_{i} + \rho_{i} + \sigma_{i} + \tau_{i} + U_{i} + \Phi_{i} + \chi_{i} + \Psi_{i} + \omega_{i} + \varepsilon_{i} + \theta_{i} + \pi_{i} + \rho_{i} + \zeta_{i} + \Phi_{i} + \varepsilon_{i} + \varphi_{i} + \varepsilon_{i} + \varphi_{i} + \varepsilon_{i} + \varphi_{i} + \varepsilon_{i} + \varphi_{i} + \varphi_{i} + \varepsilon_{i} + \varphi_{i} + \varepsilon_{i} + \varphi_{i} + \varphi_{i$$

$$\begin{aligned} &A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + \\ &N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + \\ &a_{i} + b_{i} + c_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + \\ &n_{i} + o_{i} + p_{i} + q_{i} + r_{i} + s_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + \\ &A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + \\ &N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + \Upsilon_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + \end{aligned}$$

Math Bold (\mathbf)

$$\begin{aligned} &A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + \\ &N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + \\ &a_{i} + b_{i} + c_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + \\ &n_{i} + o_{i} + p_{i} + q_{i} + r_{i} + s_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + \\ &A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + \\ &N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + Y_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + \end{aligned}$$

Math Calligraphic (\mathcal)

$$\mathcal{A}_i + \mathcal{B}_i + \mathcal{C}_i + \mathcal{D}_i + \mathcal{E}_i + \mathcal{F}_i + \mathcal{G}_i + \mathcal{H}_i + \mathcal{J}_i + \mathcal{J}_i + \mathcal{H}_i + \mathcal{L}_i + \mathcal{M}_i + \mathcal{N}_i + \mathcal{O}_i + \mathcal{P}_i + \mathcal{Q}_i + \mathcal{R}_i + \mathcal{F}_i + \mathcal{F}_i + \mathcal{U}_i + \mathcal{V}_i + \mathcal{W}_i + \mathcal{X}_i + \mathcal{Y}_i + \mathcal{Z}_i + \mathcal$$

## F.7 Accent Positioning Sans Serif

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} +$$

$$\hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} +$$

$$\hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} +$$

$$\hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{I} + \hat{J} + \hat{k} + \hat{I} + \hat{m} +$$

$$\hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} +$$

$$\hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{\Theta} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} +$$

$$\hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{Z} + \hat{T} + \hat{Y} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} +$$

$$\hat{a} + \hat{\beta} + \hat{y} + \hat{\delta} + \hat{\epsilon} + \hat{\zeta} + \hat{\eta} + \hat{\theta} + \hat{I} + \hat{K} + \hat{\lambda} + \hat{\mu} +$$

$$\hat{v} + \hat{\xi} + \hat{O} + \hat{\pi} + \hat{P} + \hat{O} + \hat{T} + \hat{U} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\omega} +$$

$$\hat{\epsilon} + \hat{\theta} + \hat{\pi} + \hat{P} + \hat{C} + \hat{\Phi} +$$

#### Math Italic (\mathit)

#### Math Roman (\mathrm)

$$\begin{split} \hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{i} + \hat{j} + \hat{k} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{\Theta} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{T} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} + \end{split}$$

#### Math Bold (\mathbf)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{I} + \hat{J} + \hat{k} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{O} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{Y} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} +$$

## Math Calligraphic (\mathcal)

$$\hat{\mathcal{A}} + \hat{\mathcal{B}} + \hat{\mathcal{C}} + \hat{\mathcal{D}} + \hat{\mathcal{E}} + \hat{\mathcal{F}} + \hat{\mathcal{G}} + \hat{\mathcal{H}} + \hat{\mathcal{J}} + \hat{\mathcal{J}} + \hat{\mathcal{J}} + \hat{\mathcal{L}} + \hat{\mathcal{M}} + \hat{\mathcal{J}} + \hat{\mathcal{D}} + \hat{\mathcal{$$

#### F.8 Differentials Sans Serif

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

#### F.9 Slash Kerning Sans Serif

```
 1/A + 1/B + 1/C + 1/D + 1/E + 1/F + 1/G + 1/H + 1/I + 1/J + 1/K + 1/L + 1/M + 1/N + 1/O + 1/P + 1/Q + 1/R + 1/S + 1/T + 1/U + 1/V + 1/W + 1/X + 1/Y + 1/Z + 1/a + 1/b + 1/c + 1/d + 1/e + 1/f + 1/g + 1/h + 1/i + 1/j + 1/k + 1/l + 1/m + 1/n + 1/o + 1/p + 1/q + 1/r + 1/s + 1/t + 1/u + 1/v + 1/w + 1/x + 1/y + 1/z + 1/A + 1/B + 1/\Gamma + 1/\Delta + 1/E + 1/Z + 1/H + 1/\Theta + 1/I + 1/K + 1/\Lambda + 1/M + 1/N + 1/E + 1/O + 1/\Pi + 1/P + 1/E + 1/T + 1/Y + 1/\Phi + 1/X + 1/\Psi + 1/\Omega + 1/A + 1/B + 1/Y + 1/B + 1/F + 1/F
```

```
A/2 + B/2 + C/2 + D/2 + E/2 + F/2 + G/2 + H/2 + I/2 + J/2 + K/2 + L/2 + M/2 + N/2 + O/2 + P/2 + Q/2 + R/2 + S/2 + T/2 + U/2 + V/2 + W/2 + X/2 + Y/2 + Z/2 + a/2 + b/2 + c/2 + d/2 + e/2 + f/2 + g/2 + h/2 + i/2 + j/2 + k/2 + l/2 + m/2 + n/2 + o/2 + p/2 + q/2 + r/2 + s/2 + t/2 + u/2 + v/2 + w/2 + x/2 + y/2 + z/2 + A/2 + B/2 + \Gamma/2 + \Delta/2 + E/2 + Z/2 + H/2 + O/2 + I/2 + K/2 + A/2 + M/2 + A/2 + B/2 + C/2 + D/2 + D/2 + T/2 + T/2 + Y/2 + D/2 + X/2 + W/2 + A/2 + D/2 + D/2
```

## F.10 (Big) Operators Sans Serif

$$\sum_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n} \coprod_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n} \int_{i=1}^{n} x^{n} \oint_{i=1}^{n} x^{n} dx^{n} dx^{$$

### F.11 Radicals Sans Serif

$$\sqrt{x+y} \qquad \sqrt{x^2+y^2} \qquad \sqrt{x_i^2+y_j^2} \qquad \sqrt{\left(\frac{\cos x}{2}\right)} \qquad \sqrt{\left(\frac{\sin x}{2}\right)}$$

$$\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{x+y}}}}}}}$$

## F.12 Over- and Underbraces Sans Serif

$$\widehat{x}$$
  $\widehat{x+y}$   $\widehat{x^2+y^2}$   $\widehat{x_i^2+y_j^2}$   $\underbrace{x}$   $\underbrace{x+y}$   $\underbrace{x_i+y_j}$   $\underbrace{x_i^2+y_j^2}$ 

#### F.13 Normal and Wide Accents Sans Serif

$$\dot{x} \ \ddot{x} \ \ddot{x} \ \bar{x} \$$

# F.14 Long Arrows Sans Serif

 $\longleftrightarrow \longleftrightarrow \longleftrightarrow \longleftrightarrow \Longleftrightarrow \Longleftrightarrow \Longleftrightarrow$ 

## F.15 Left and Right Delimiters Sans Serif

$$-(f) - -[f] - -|f| - -|f| - -\langle f \rangle - -\{f\} -$$

Using \left and \right.

$$-(f)$$
  $--[f]$   $--[f]$   $--\langle f \rangle$   $--\{f\}$   $-$ 

$$-)f(--)f(--)f(--/f/--)f(--/f/--)f$$

# F.16 Big-g-g Delimiters Sans Serif

#### F.17 Binary Operators Sans Serif

$x \pm y$	\pm	$x \cap y$	\cap	$x \diamond y$	\diamond	$x \oplus y$	\oplus
$x \mp y$	\mp	$x \cup y$	\cup	$x \triangle y$	\bigtriangleup	$x \ominus y$	\ominus
$x \times y$	\times	$x \uplus y$	\uplus	$x \nabla y$	\bigtriangledown	$x \otimes y$	\otimes
$x \div y$	\div	$x \sqcap y$	\sqcap	$x \triangleleft y$	\triangleleft	$x \oslash y$	\oslash
<i>x</i> * <i>y</i>	\ast	$x \sqcup y$	\sqcup	$x \triangleright y$	\triangleright	$x \odot y$	\odot
x⋆y	\star	$x \lor y$	\vee	$x \triangleleft y$	\lhd	$x \bigcirc y$	\bigcirc
$x \circ y$	\circ	$x \wedge y$	\wedge	$x \triangleright y$	\rhd	x † y	\dagger
$x \bullet y$	\bullet	$x \setminus y$	\setminus	$x \triangleleft y$	\unlhd	x ‡ y	\ddagger
$x \cdot y$	\cdot	<i>x</i> ≀ <i>y</i>	\wr	$x \trianglerighteq y$	\unrhd	x§y	<b>\</b> S
x + y	+	x - y	_	$x \coprod y$	\amalg	$x \P y$	\P

#### F.18 Relations Sans Serif

```
x \le y
          \leq
                             x \ge y
                                       \geq
                                                           x \equiv y
                                                                    \equiv
                                                                                  x \models y
                                                                                            \models
          \prec
                                                                    \sim
x < y
                             x > y
                                       \succ
                                                           x \sim y
                                                                                  x \perp y
                                                                                            \perp
x \leq y
          \preceq
                             x \geq y
                                       \succeq
                                                           x \simeq y
                                                                    \simeq
                                                                                  x \mid y
                                                                                            \mid
x \ll y
          \11
                                                                    \asymp
                                                                                  x \parallel y
                                                                                            \parallel
                             x \gg y
                                       \gg
                                                           x \times y
x \subset y
          \subset
                                                                    \approx
                                                                                            \bowtie
                             x\supset y
                                       \supset
                                                           x \approx y
                                                                                  x \bowtie y
                                                                                  x \bowtie y
x \subseteq y
          \subseteq
                             x \supseteq y
                                       \supseteq
                                                           x \cong y
                                                                    \cong
                                                                                            \Join
                                                           x \neq y
x \sqsubset y
          \sqsubset
                             x \supset y
                                       \sqsupset
                                                                    \neq
                                                                                  x \smile y
                                                                                           \smile
          \sqsubseteq
                                                                                  x \frown y \setminus frown
x \sqsubseteq y
                             x \supseteq y
                                       \sqsupseteq
                                                           x \doteq y
                                                                    \doteq
x \in y
          \in
                             x \ni y
                                       \ni
                                                                    \propto
                                                                                  x = y
                                                           x \propto y
          \vdash
                                       \dashv
x \vdash y
                             x \dashv y
                                                           x < y
                                                                    <
                                                                                  x > y
                                                                                            >
x:y
```

# F.19 Punctuation Sans Serif

```
x,y , x;y \colon x.y \ldotp x\cdot y \cdotp
```

#### F.20 Arrows Sans Serif

$x \leftarrow y$	\leftarrow	$x \leftarrow\!$	\longleftarrow	$x \uparrow y$	\uparrow
$x \leftarrow y$	\Leftarrow	$x \longleftarrow y$	\Longleftarrow	$x \uparrow y$	\Uparrow
$x \rightarrow y$	\rightarrow	$x \longrightarrow y$	\longrightarrow	$x \downarrow y$	\downarrow
$x \Rightarrow y$	\Rightarrow	$x \Longrightarrow y$	\Longrightarrow	$x \downarrow y$	\Downarrow
$x \leftrightarrow y$	\leftrightarrow	$x \longleftrightarrow y$	\longleftrightarrow	x	\updownarrow
$x \Leftrightarrow y$	\Leftrightarrow	$x \Longleftrightarrow y$	\Longleftrightarrow	<i>x</i>	\Updownarrow
$x \mapsto y$	\mapsto	$x \longmapsto y$	\longmapsto	x ∕ y	\nearrow
$x \leftarrow y$	\hookleftarrow	$x \hookrightarrow y$	\hookrightarrow	$x \searrow y$	\searrow
$x \leftarrow y$	\leftharpoonup	$x \rightharpoonup y$	\rightharpoonup	x	\swarrow
$x \leftarrow y$	\leftharpoondown	$x \rightarrow y$	\rightharpoondown	x <sup>►</sup> y	\nwarrow
$x \rightleftharpoons y$	\rightleftharpoons	x ⊶ y	\leadsto		

# F.21 Miscellaneous Symbols Sans Serif

```
\cdots
                                        x:y
                                               \vdots
                                                              x \cdot y
                                                                      \ddots
x . . . y
x \aleph y
        \aleph
                  x/y
                           \prime
                                        x∀y
                                               \forall
                                                                      \infty
                                                              x∞y
хћу
        \hbar
                  хØу
                           \emptyset
                                        х∃у
                                               \exists
                                                              x\Box y
                                                                      \Box
                                        x \neg y
                                                                      \Diamond
хıу
        \imath
                  x\nabla y
                          \nabla
                                               \neg
                                                              x \Diamond y
        \jmath
                  x√y
                          \surd
                                        xby
                                               \flat
                                                              X\triangle V
                                                                      \triangle
хју
xℓy
        \ell
                  x \top y
                           \top
                                        хЦу
                                               \natural
                                                                      \clubsuit
                                                              х♣у
        \wp
                           \bot
                                        x‡y
                                               \sharp
                                                                      \diamondsuit
                  x \perp y
                                                              x≎y
х℘у
xRey
        \Re
                  x||y
                           \backslash \bot
                                        x \setminus y
                                               \backslash
                                                              х♡у
                                                                      \heartsuit
        \Im
                                               \partial
                                                                      \spadesuit
xImy
                  x∠y
                           \angle
                                        хду
                                                              хфу
х℧у
        \mho
                                        x|y
                                               x!y
                  x.y
```

## F.22 Variable-Sized Operators Sans Serif

```
x \sum y
         \sum
                      x \cap y
                               \bigcap
                                               x \odot y
                                                        \bigodot
x \prod y
                               \bigcup
                                                        \bigotimes
         \prod
                                               x \otimes y
                      x \mid y
x\coprod y
         \coprod
                               \bigsqcup
                                               x \bigoplus y
                                                         \bigoplus
x∫y
         \int
                      x \setminus / y
                               \bigvee
                                               x (+) y
                                                         \biguplus
         \oint
                               \bigwedge
x \phi y
```

## F.23 Log-Like Operators Sans Serif

```
x arccos y
             x cos y
                         x csc y
                                    x exp y
                                                x ker y
                                                              x lim sup y
                                                                            x min y
                                                                                       x sinh y
x arcsin y
             x cosh y
                         x deg y
                                    x gcd y
                                                x lg y
                                                              x \ln y
                                                                            x Pr y
                                                                                       x sup y
x arctan y
             x cot y
                         x det y
                                    x hom y
                                                x lim y
                                                              x \log y
                                                                            x sec y
                                                                                       x tan y
             x \coth y \quad x \dim y \quad x \inf y
                                                x \lim \inf y = x \max y
x arg y
                                                                            x sin y
                                                                                       x tanh y
```

#### **F.24** Delimiters Sans Serif

```
x(y
       (
                     x)y
                                                                                  \Uparrow
                                          x \uparrow y
                                                   \uparrow
                                                                         x \uparrow y
χ[v
       Γ
                     xlv
                                          x \downarrow y
                                                   \downarrow
                                                                         x \downarrow y
                                                                                  \Downarrow
x{y
                            \}
                                          x \uparrow y
                                                   \updownarrow
                                                                        \Updownarrow
       \{
                     x}y
      \lfloor
                                                   \lceil
                                                                                  \rceil
x \mid y
                     x \rfloor y
                            \rfloor
                                          x[y
                                                                         x \rceil y
       \langle
                            \rangle
                                                                                  \backslash
x\langle y
                     x\rangle y
                                         x/y
                                                                         x \setminus y
x|y
                     x||y
                            1
```

## F.25 Large Delimiters Sans Serif

#### F.26 Math Mode Accents Sans Serif

```
\hat{a} \hat{a} \hat{a} \acute{a} \bar{a} \bar{a} \hat{a} \dot{a} \check{a} \breve{a} \check{a} \check{a} \hat{a} \grave{a} \vec{a} \vec{a} \hat{a} \dot{a} \hat{a} \tilde{a}
```

#### F.27 Miscellaneous Constructions Sans Serif

```
abc
       \widetilde{abc}
                              abc
                                     \widehat{abc}
abc
       \overleftarrow{abc}
                              abć
                                     \overrightarrow{abc}
abc
       \overline{abc}
                              abc
                                     \underline{abc}
abc
       \overbrace{abc}
                                     \underbrace{abc}
                               abc
√abc
                               ∜abc
                                     \sqrt[n]{abc}
       \sqrt{abc}
                              <u>abc</u>
f
       f'
                                     \frac{abc}{xyz}
```

#### F.28 AMS Delimiters Sans Serif

 $x^{\Gamma}y$  \ulcorner  $x^{\Gamma}y$  \urcorner  $x_{\perp}y$  \llcorner  $x_{\perp}y$  \llcorner

#### F.29 AMS Arrows Sans Serif

```
x \longrightarrow y \setminus dashrightarrow
                                          x ←-- y \dashleftarrow
x \not\sqsubseteq y
           \leftleftarrows
                                          x \leftrightarrows y
                                                     \leftrightarrows
x \Leftarrow y
           \Lleftarrow
                                          \twoheadleftarrow
x \leftarrow y
          \leftarrowtail
                                          x \notin y
                                                     \looparrowleft
          \leftrightharpoons
                                                     \curvearrowleft
x \leftrightharpoons y
                                          x \cap y
хОу
          \circlearrowleft
                                          x \uparrow y
                                                     \Lsh
          \upuparrows
                                                     \upharpoonleft
x \uparrow \uparrow y
                                          x 1 y
x \downarrow y
           \downharpoonleft
                                          x \rightarrow y
                                                     \multimap
x ↔ y
          \leftrightsquigarrow x \rightrightarrows y
                                                     \rightrightarrows
x \rightleftharpoons y
          \rightleftarrows
                                          x \rightrightarrows y
                                                     \rightrightarrows
           \rightleftarrows
                                                     \twoheadrightarrow
x \rightleftarrows y
                                          x \rightarrow y
x \mapsto y
          \rightarrowtail
                                          x \rightarrow y
                                                     \looparrowright
          \rightleftharpoons
                                                     \curvearrowright
x \rightleftharpoons y
                                          x \cap y
хОу
           \circlearrowright
                                          x 
ightharpoonup y
                                                     \Rsh
x \downarrow \downarrow y
           \downdownarrows
                                          x \mid y
                                                     \upharpoonright
x \mid y
           \downharpoonright
                                          x \rightsquigarrow y
                                                     \rightsquigarrow
```

### F.30 AMS Negated Arrows Sans Serif

```
x \leftrightarrow y \nleftarrow x \nrightarrow y \nrightarrow x \nleftrightarrow y \nRightarrow x \nleftrightarrow y \nleftrightarrow x \nleftrightarrow y \nleftrightarrow
```

### F.31 AMS Greek Sans Serif

x<sub>F</sub>y \digamma x<sub>X</sub>y \varkappa

#### F.32 AMS Hebrew Sans Serif

### F.33 AMS Miscellaneous Sans Serif

```
хћу
       \hbar
                           хћу
                                  \hslash
       \vartriangle
                           x\nabla y
                                 \triangledown
x \triangle y
       \square
                           x \Diamond y
                                 \lozenge
x\Box y
                           x∠y
х®у
       \circledS
                                 \angle
       \measuredangle x∄y
                                  \nexists
x∡y
х℧у
       \mbox{\mbox{\mbox{$\mbox{$}}}
                                 \Finv^u
                           х∃у
       \backslash \mathsf{Game}^u
                           x k y
                                 \Bbbk^u
хӘу
       \backprime
                           хØу
                                 \varnothing
x\y
       \blacktriangle xv
                                 \blacktriangledown
x▲y
x■y
       \blacksquare
                           x∳y
                                 \blacklozenge
                                 \sphericalangle
x★y
       \bigstar
                           x∢y
хСу
       \complement
                           хðу
                                  \eth
x/y
       \diagup^u
                           x \setminus y \setminus diagdown^u
<sup>u</sup> Not defined in amssymb.sty, define using the \newsymbol command.
```

# F.34 AMS Binary Operators Sans Serif

$x \dotplus y$	\dotplus	$x \setminus y$	\smallsetminus
$x \cap y$	\Cap	$x \cup y$	\Cup
$x \overline{\wedge} y$	\barwedge	$x \vee y$	\veebar
$x \stackrel{\equiv}{\wedge} y$	\doublebarwedge	$x \boxminus y$	\boxminus
$x \boxtimes y$	\boxtimes	$x \odot y$	\boxdot
$x \boxplus y$	\boxplus	<i>x</i> <b>∗</b> <i>y</i>	\divideontimes
$x \ltimes y$	\ltimes	$x \rtimes y$	\rtimes
$x \geq y$	\leftthreetimes	$x \rightthreetimes y$	\rightthreetimes
$x \downarrow y$	\curlywedge	$x \Upsilon y$	\curlyvee
$x \ominus y$	\circleddash	$x \otimes y$	\circledast
$x \odot y$	\circledcirc	<i>x</i> <b>•</b> <i>y</i>	\centerdot
х <b>т</b> у	\intercal		

### F.35 AMS Relations Sans Serif

 $x \leq y$ **\leqslant**  $x \lesssim y$ \lesssim  $x \approx y$ \approxeq  $x \ll y \setminus 1111$  $x \leq y$ **\lesseqgtr** \doteqdot  $x \doteq y$ x = y\fallingdotseq  $x \hookrightarrow y$ \backsimeq  $x \subseteq y$ \Subset  $x \leq y$ \preccurlyeq  $x \lesssim y$ \precsim  $x \triangleleft y$ \vartriangleleft  $x \models y$ \vDash \smallsmile  $x \smile y$ x = y\bumpeq  $x \ge y$ \geqq  $x \geqslant y$ \eqslantgtr  $x \gtrsim y$ \gtrapprox  $x \gg y \setminus ggg$  $x \geq y$ \gtreqless x = y\eqcirc  $x \triangleq y$ \triangleq  $x \approx y$ \thickapprox  $x \ni y$ \Supset  $x \succcurlyeq y$ \succcurlyeq  $x \gtrsim y$ \succsim \vartriangleright  $x \triangleright y$ \Vdash  $x \parallel y$ \shortparallel  $x \pitchfork y$ \pitchfork *x* **⋖** *y* **\blacktriangleleft** 

\backepsilon

\because

х э *у* х ∵ у

## F.36 AMS Negated Relations Sans Serif

```
x ≮ y \nless
                                                                x ≰ y
                                                                                  \nleq
                                                                x ≰ y
x≰y \nleqslant
                                                                                  \nleqq
                                                               x ≨ y \lneqq
x ≤ y \lneq
                \lvertneqq
                                                           x≲y \lnsim
x \leq y
                                                           x ⊀ y \nprec
x ≨ y
                 \lnapprox
x ≰ y \npreceq
                                                          x ⋨ y \precnsim
x \underset{\approx}{\not\approx} y \quad \text{\prechapprox} \qquad x \nsim y \quad \text{\nsim}
                                                           x ∤ y
x x y
                  \nshortmid
                                                                                  \nmid
x ⊬ y \nvdash
                                                           x⊭y \nvDash
x \not = y \ntriangleleft x \not = y \ntrianglelefteq
x \not\subseteq y \nsubseteq x \subsetneq y \subsetneq
x \subsetneq y \varsubsetneq x \subsetneq y \subsetneqq
x \subsetneq y \varsubsetneqq x \not\geq y \ngtr
x≱y \ngeq
                                                           x≱y \ngeqslant
x ≱y \ngeqq
                                                           x \geqslant y \setminus gneq
x \not \supseteq y
                 \gneqq
                                                            x≩y \gvertneqq
x≳y \gnsim
                                                           x≩y \gnapprox
x ⊁ y \nsucc
                                                           x ≱ y \nsucceq
x \not \equiv y \nsucceqq x \not \succsim y \succnsim x \not \succsim y \succnsim x \not \succcurlyeq y \ncong
                 \nshortparallel x \not\parallel y \nparallel
хиу
x ⊭ y
                 \ny \ny
x \not \triangleright y \ntriangleright x \not \trianglerighteq y \ntrianglerighteq
x \not\supseteq y \nsupseteq x \not\supseteq y \nsupseteqq
x ⊋ y \supsetneq
                                                               x ⊋ y \varsupsetneq
x \supseteq y \setminus \text{supsetneqq}
                                                                x ⊋ y \varsupsetneqq
```

## F.37 Math "Torture" Test Sans Serif

Most of the following examples are taken from *The TeXbook* (Knuth, 1984, see https://ctan.org/pkg/texbook) and were adapted for MeX from Karl Berry's torture test for plain TeX math fonts.

```
x+y-z, x+y*z, z*y/z, (x+y)(x-y)=x^2-y^2, x\times y\cdot z=[xyz], x\circ y\bullet z, x\cup y\cap z, x\sqcup y\sqcap z, x\vee y\wedge z, x\pm y\mp z, x=y/z, x:=y, x\leq y\neq z, x\sim y\simeq z x\equiv y\not\equiv z, x\subset y\subseteq z \sin 2\theta=2\sin \theta\cos \theta, O(n\log n\log n), Pr(X>x)=\exp(-x/\mu), (x\in A(n)\mid x\in B(n)), \bigcup_n X_n\mid \bigcap_n Y_n In-text matrices \binom{11}{01} and \binom{a\ b\ c}{1\ m\ n}.
```

$$a_0 + \cfrac{1}{a_1 + \cfrac{1}{a_2 + \cfrac{1}{a_3 + \cfrac{1}{a_4}}}}$$

$$\begin{pmatrix} p \\ 2 \end{pmatrix} x^2 y^{p-2} - \frac{1}{1-x} \frac{1}{1-x^2} = \frac{a+1}{b} \bigg/ \frac{c+1}{d}.$$

$$\sqrt{1+\sqrt{1+\sqrt{1+\sqrt{1+\sqrt{1+x}}}}}$$

$$\sqrt[n]{1+\sqrt[h]{1+\sqrt[h]{1+\sqrt[h]{1+x}}}}$$

$$\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right) |\phi(x+iy)|^2 = 0$$

$$\pi(n) = \sum_{m=2}^n \left[ \left(\sum_{k=1}^{m-1} \lfloor (m/k) / \lceil m/k \rceil \rfloor \right)^{-1} \right].$$

$$\int_0^\infty \frac{t-ib}{t^2+b^2} e^{iat} dt = e^{ab} E_1(ab), \quad a,b > 0.$$

$$\mathbf{A} := \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\begin{pmatrix} a & b & c \\ d & e & f \end{pmatrix} \begin{pmatrix} u & x \\ v & y \\ w & z \end{pmatrix}$$

$$\mathbf{A} = \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{pmatrix}$$

$$C & I & C' \\ \mathbf{M} = I & 0 & 0 \\ b & 1-b & 0 \\ 0 & a & 1-a \end{pmatrix}$$

$$\sum_{n=0}^\infty a_n z^n \quad \text{converges if} \quad |z| < \left( \limsup_{n \to \infty} \sqrt[n]{|a_n|} \right)^{-1}.$$

$$\frac{f(x+\Delta x) - f(x)}{\Delta x} \to f'(x) \quad \text{as } \Delta x \to 0.$$

 $||u_i|| = 1$ ,  $u_i \cdot u_i = 0$  if  $i \neq j$ .

The confluent image of 
$$\left\{ \begin{array}{l} \text{an arc} \\ \text{a circle} \\ \text{a fan} \end{array} \right\} \quad \text{is} \quad \left\{ \begin{array}{l} \text{an arc} \\ \text{an arc or a circle} \\ \text{a fan or an arc} \end{array} \right\}.$$

$$T(n) \leq T(2^{\lceil \lg n \rceil}) \leq c(3^{\lceil \lg n \rceil} - 2^{\lceil \lg n \rceil})$$
$$< 3c \cdot 3^{\lg n}$$
$$= 3c n^{\lg 3}.$$

$$(x + y)(x - y) = x^{2} - xy + yx - y^{2}$$
$$= x^{2} - y^{2}$$
$$(x + y)^{2} = x^{2} + 2xy + y^{2}.$$

$$\left(\int_{-\infty}^{\infty} e^{-x^2} dx\right)^2 = \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} e^{-(x^2 + y^2)} dx dy$$

$$= \int_{0}^{2\pi} \int_{0}^{\infty} e^{-r^2} dr d\theta$$

$$= \int_{0}^{2\pi} \left(e^{-\frac{r^2}{2}}\Big|_{r=0}^{r=\infty}\right) d\theta$$

$$= \pi.$$

$$\prod_{k\geq 0} \frac{1}{(1-q^k z)} = \sum_{n\geq 0} z^n / \prod_{1\leq k\leq n} (1-q^k).$$

$$\sum_{\substack{0 < i \le m \\ 0 < j \le n}} p(i,j) \neq \sum_{i=1}^{p} \sum_{j=1}^{q} \sum_{k=1}^{r} a_{ij} b_{jk} c_{ki} \neq \sum_{\substack{1 \le i \le p \\ 1 \le j \le q \\ 1 < b \le r}} a_{ij} b_{jk} c_{ki}$$

$$\max_{1 \le n \le m} \log_2 P_n \quad \text{and} \quad \lim_{x \to 0} \frac{\sin x}{x} = 1$$

Inline math:  $\max_{1 \le n \le m} \log_2 P_n$  and  $\lim_{x \to 0} \frac{\sin x}{x} = 1$ 

$$p_1(n) = \lim_{m \to \infty} \sum_{v=0}^{\infty} \left( 1 - \cos^{2m} (v!^n \pi/n) \right)$$

Inline math:  $p_1(n) = \lim_{m \to \infty} \sum_{v=0}^{\infty} \left(1 - \cos^{2m}(v!^n \pi/n)\right)$ 

## Appendix G Math Test Sans Serif Bold

#### **G.1** Overview Sans Serif Bold

Default: αααbβGΓΓεεθθΡΠΣσ;  $σ_ε$ ,  $c^α$  mathnormal: αααbβGΓΓεεθθΡΠΣσ mathrm: αααbβGΓΓεεθθΡΠΣσ mathup: αααbβGΓΓεεθθΡΠΣσ mathit: αααbβGΓΓεεθθΡΠΣσ mathbf: ααbβGΓΓεεθθΡΠΣσ mathbf: ααbβGΓΓεεθθΡΠΣσ mathbfit: ααbβGΓΓεεθθΡΠΣσ mathbfit: ααbβGΓΓεεθθΡΠΣσ mathbfit: ααbβGΓΓεεθθΡΠΣσ mathbfup: ααbβGΓΓεεθθΡΠΣσ

Default:  $\alpha\alpha\alpha b\beta G \Gamma \Gamma \epsilon \epsilon \theta \theta P \Pi \Sigma \sigma$ ;  $\sigma_{\epsilon}$ ,  $c^{\alpha}$  mathnormal:  $\alpha\alpha\alpha b\beta G \Gamma \Gamma \epsilon \epsilon \theta \theta P \Pi \Sigma \sigma$  mathrm:  $\alpha\alpha\alpha b\beta G \Gamma \Gamma \epsilon \epsilon \theta \theta P \Pi \Sigma \sigma$  mathup:  $\alpha\alpha\alpha b\beta G \Gamma \Gamma \epsilon \epsilon \theta \theta P \Pi \Sigma \sigma$  mathit:  $\alpha\alpha\alpha b\beta G \Gamma \Gamma \epsilon \epsilon \theta \theta P \Pi \Sigma \sigma$  mathbf:  $\alpha\alpha\alpha b\beta G \Gamma \Gamma \epsilon \epsilon \theta \theta P \Pi \Sigma \sigma$  mathbfit:  $\alpha\alpha\alpha b\beta G \Gamma \Gamma \epsilon \epsilon \theta \theta P \Pi \Sigma \sigma$  mathbfit:  $\alpha\alpha\alpha b\beta G \Gamma \Gamma \epsilon \epsilon \theta \theta P \Pi \Sigma \sigma$  mathbfup:  $\alpha\alpha\alpha b\beta G \Gamma \Gamma \epsilon \epsilon \theta \theta P \Pi \Sigma \sigma$ 

Default:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta\theta P\Pi\Sigma \sigma$ ;  $\sigma_{\epsilon}$ ,  $c^{\alpha}$  mathnormal:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta\theta P\Pi\Sigma \sigma$  mathrm:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \vartheta P\Pi\Sigma \sigma$  mathup:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathit:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathbf:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathbfit:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathbfit:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$  mathbfit:  $a\alpha\alpha b\beta G\Gamma\Gamma \epsilon\epsilon\theta \theta P\Pi\Sigma \sigma$ 

Default: αααββGΓΓεεθθΡΠΣσ;  $σ_ε$ ,  $c^α$  mathnormal: αααββGΓΓεεθθΡΠΣσ mathrm: αααββGΓΓεεθθΡΠΣσ mathup: αααββGΓΓεεθθΡΠΣσ mathit: αααββGΓΓεεθθΡΠΣσ mathbf: αααββGΓΓεεθθΡΠΣσ mathbf: αααββGΓΓεεθθΡΠΣσ mathbfit: αααββGΓΓεεθθΡΠΣσ mathbfit: αααββGΓΓεεθθΡΠΣσ mathbfup: αααββGΓΓεεθθΡΠΣσ

### **G.2** Formulas Sans Serif Bold

 $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\varepsilon$ ,  $\varepsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ ,  $\theta$ ,  $\iota$ ,  $\kappa$ ,  $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\xi$ , o,  $\pi$ ,  $\pi$ ,  $\rho$ ,  $\rho$ ,  $\sigma$ ,  $\varsigma$ ,  $\tau$ ,  $\upsilon$ ,  $\phi$ ,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\varepsilon$ , A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T, Y,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ , F,

 $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\varepsilon$ ,  $\varepsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ ,  $\theta$ ,  $\iota$ ,  $\kappa$ ,  $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\xi$ ,  $\sigma$ ,  $\pi$ ,  $\pi$ ,  $\rho$ ,  $\rho$ ,  $\sigma$ ,  $\varsigma$ ,  $\tau$ ,  $\upsilon$ ,  $\phi$ ,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\varphi$ , A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T, Y,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ , F,

 $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\epsilon$ ,  $\epsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ ,  $\theta$ ,  $\iota$ ,  $\kappa$ ,  $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\xi$ , o,  $\pi$ ,  $\pi$ ,  $\rho$ ,  $\rho$ ,  $\sigma$ ,  $\varsigma$ ,  $\tau$ ,  $\upsilon$ ,  $\phi$ ,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\epsilon$ , A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T, Y,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ , F,

 $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\epsilon$ ,  $\epsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ ,  $\theta$ ,  $\iota$ ,  $\kappa$ ,  $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\xi$ , o,  $\pi$ ,  $\pi$ ,  $\rho$ ,  $\rho$ ,  $\sigma$ ,  $\varsigma$ ,  $\tau$ ,  $\upsilon$ ,  $\phi$ ,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\epsilon$ , A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T, Y,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ , F,

$$\alpha a > 0$$
,  $\beta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$ 

$$\alpha a > 0$$
,  $\beta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$ 

$$\lim_{\nu\to\infty}\nu(\nu)=\max_{s\in S}\{s\pm 3\gamma+y-1\}=4\times 7$$
 
$$\hat{\beta}=(X'X)^{-1}X'y$$

$$\lim_{N\to\infty}\sum_{i=0}^N x^i=\min_{\mathbf{x}\in\mathbb{R}}\mathbf{S}(\mathbf{x})$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Latin vs. Greek:  $a \alpha$ ,  $d \delta$ ,  $e \varepsilon$ ,  $i \iota$ ,  $k \kappa$ ,  $n \eta$ ,  $o \sigma$ ,  $p \rho$ ,  $\beta \beta$ ,  $u \upsilon$ , v v,  $w \omega$ ,  $x \chi$ ,  $y \gamma$ ,  $A \Delta \Lambda$ ,  $O \Theta \Omega$ ,  $T \Gamma$ , Y Y.

$$\alpha a > 0$$
,  $\beta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$ 

$$\lim\nolimits_{\nu\to\infty}\nu(\nu)=\max\nolimits_{s\in S}\{s\pm3\gamma+y-1\}=4\times7$$

$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\lim_{N\to\infty}\sum_{i=0}^N x^i=\min_{x\in\mathbb{R}}S(x)$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Disambiguation: 0 O O, 1 l I | l I /, i j, rn m,  $\theta$  O,  $\phi$   $\psi$ , - -

Latin vs. Greek:  $a \alpha, d \delta, e \varepsilon, i \iota, k \kappa, n \eta, o \sigma, p \rho, \beta \beta, u \upsilon, v v, w \omega, x \chi, y \gamma, A \Delta \Lambda, O \Theta \Omega, T \Gamma, y \gamma$ .

$$\alpha a > 0$$
,  $\beta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$ 

$$\lim_{\nu\to\infty}\nu(\nu)=\max_{s\in S}\{s\pm 3\gamma+y-1\}=4\times 7$$

$$\hat{\boldsymbol{\beta}} = (X'X)^{-1}X'y$$

$$\lim_{N\to\infty}\sum_{i=0}^N x^i=\min_{x\in\mathbb{R}}S(x)$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Disambiguation: 0 O O, 1 l I | l I /, i j, rn m,  $\theta$   $\Theta$ ,  $\phi$   $\psi$ , - -

Latin vs. Greek:  $a \alpha$ ,  $d \delta$ ,  $e \varepsilon$ ,  $i \iota$ ,  $k \kappa$ ,  $n \eta$ ,  $o \sigma$ ,  $p \rho$ ,  $\beta \beta$ ,  $u \upsilon$ , v v,  $w \omega$ ,  $x \chi$ ,  $y \gamma$ ,  $A \Delta \Lambda$ ,  $O \Theta \Omega$ ,  $T \Gamma$ , Y Y.

$$\begin{split} &\alpha a>0, \beta b+(3\times 27), \Gamma G=7<8, \lambda\\ &\lim_{v\to\infty} v(v)=\max_{s\in S}\{s\pm 3\gamma+y-1\}=4\times 7\\ &\hat{\beta}=(X'X)^{-1}X'y \end{split}$$

$$\lim_{N\to\infty}\sum_{i=0}^N x^i=\min_{\mathbf{x}\in\mathbb{R}}\mathbf{S}(\mathbf{x})$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

Disambiguation: 0 O O, 1 l l | l l /, i j, rn m,  $\theta$   $\Theta$ ,  $\phi$   $\psi$ , - Latin vs. Greek: a  $\alpha$ , d  $\delta$ , e  $\epsilon$ , i  $\iota$ , k  $\kappa$ , n  $\eta$ , o  $\sigma$ , p  $\rho$ ,  $\beta$   $\beta$ , u v, v w  $\omega$ , x  $\chi$ , y  $\gamma$ , A  $\Delta$   $\Lambda$ , O  $\Theta$   $\Omega$ , T  $\Gamma$ , Y Y.

## G.3 Math Alphabets Sans Serif Bold

#### Default

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 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, A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T, Y,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ ,  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\varepsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ , ι, κ,  $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\xi$ ,  $\rho$ ,  $\pi$ ,  $\rho$ ,  $\sigma$ ,  $\tau$ ,  $\upsilon$ ,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\varepsilon$ ,  $\theta$ ,  $\pi$ ,  $\rho$ ,  $\varsigma$ ,  $\phi$ ,

## Math Normal (\mathnormal)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 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, A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T, Y,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ ,  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\varepsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ , I, K,  $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\xi$ ,  $\delta$ ,  $\pi$ ,  $\rho$ ,  $\sigma$ ,  $\tau$ ,  $\upsilon$ ,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\varepsilon$ ,  $\theta$ ,  $\pi$ ,  $\rho$ ,  $\varsigma$ ,  $\phi$ ,

### Math Italic (\mathit)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 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, A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T, Y,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ ,  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\varepsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ ,  $\iota$ ,  $\kappa$ ,  $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\xi$ ,  $\delta$ ,  $\pi$ ,  $\rho$ ,  $\sigma$ ,  $\tau$ ,  $\upsilon$ ,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\varepsilon$ ,  $\theta$ ,  $\pi$ ,  $\rho$ ,  $\varsigma$ ,  $\phi$ ,

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

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,

A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T,  $\Upsilon$ ,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ ,

 $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \nu, \phi, \chi, \psi, \omega, \epsilon, \vartheta, \varpi, \varrho, \zeta, \varphi,$ 

### Math Bold (\mathbf)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

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,

 $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, Y, \Phi, X, \Psi, \Omega,$ 

 $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \upsilon, \phi, \chi, \psi, \omega, \epsilon, \theta, \pi, \rho, \varsigma, \phi,$ 

## Caligraphic (\mathcal)

 $\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}, \mathcal{E}, \mathcal{F}, \mathcal{G}, \mathcal{H}, \mathcal{I}, \mathcal{J}, \mathcal{K}, \mathcal{L}, \mathcal{M}, \mathcal{N}, \mathcal{O}, \mathcal{P}, \mathcal{Q}, \mathcal{R}, \mathcal{F}, \mathcal{T}, \mathcal{U}, \mathcal{V}, \mathcal{W}, \mathcal{X}, \mathcal{Y}, \mathcal{Z}, \mathcal{Z}$ 

### Script (\mathscr)

 $\mathscr{A}, \mathscr{B}, \mathscr{C}, \mathfrak{D}, \mathscr{E}, \mathscr{F}, \mathscr{G}, \mathscr{H}, \mathscr{I}, \mathscr{J}, \mathscr{K}, \mathscr{L}, \mathscr{M}, \mathscr{N}, \mathscr{O}, \mathscr{P}, \mathscr{Q}, \mathscr{R}, \mathscr{S}, \mathscr{T}, \mathscr{U}, \mathscr{V}, \mathscr{W}, \mathscr{X}, \mathscr{Y}, \mathscr{Z},$ 

#### Fraktur (\mathfrak)

 $\mathfrak{A}, \mathfrak{B}, \mathfrak{C}, \mathfrak{D}, \mathfrak{E}, \mathfrak{F}, \mathfrak{G}, \mathfrak{H}, \mathfrak{I}, \mathfrak{I}, \mathfrak{K}, \mathfrak{L}, \mathfrak{M}, \mathfrak{N}, \mathfrak{D}, \mathfrak{P}, \mathfrak{Q}, \mathfrak{R}, \mathfrak{S}, \mathfrak{T}, \mathfrak{U}, \mathfrak{V}, \mathfrak{W}, \mathfrak{X}, \mathfrak{Y}, \mathfrak{Z}, \mathfrak{A}, \mathfrak{b}, \mathfrak{c}, \mathfrak{d}, \mathfrak{e}, \mathfrak{f}, \mathfrak{g}, \mathfrak{h}, \mathfrak{i}, \mathfrak{j}, \mathfrak{t}, \mathfrak{l}, \mathfrak{m}, \mathfrak{n}, \mathfrak{o}, \mathfrak{p}, \mathfrak{q}, \mathfrak{r}, \mathfrak{s}, \mathfrak{t}, \mathfrak{u}, \mathfrak{v}, \mathfrak{w}, \mathfrak{x}, \mathfrak{y}, \mathfrak{z}, \mathfrak{g}$ 

### Blackboard Bold (\mathbb)

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,

#### **G.4** Character Sidebearings Sans Serif Bold

#### Default

|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| + |W| + |W|

|a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + |a|

|n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + |z|

 $|A| + |B| + |\Gamma| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |\Lambda| + |M| +$ 

 $|N| + |\Xi| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |Y| + |\Phi| + |X| + |\Psi| + |\Omega| + |\Phi| + |X| + |X| + |\Phi| + |X| + |X|$ 

 $|\alpha| + |\beta| + |\gamma| + |\delta| + |\epsilon| + |\zeta| + |\eta| + |\theta| + |\iota| + |\kappa| + |\lambda| + |\mu| + |\alpha|$ 

 $|v| + |\xi| + |o| + |\pi| + |\rho| + |\sigma| + |\tau| + |v| + |\phi| + |\chi| + |\psi| + |\omega| +$ 

 $|\varepsilon| + |\theta| + |\pi| + |\rho| + |\varsigma| + |\phi| +$ 

$$\begin{aligned} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |I| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |\Gamma| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |A| + |M| + \\ |N| + |\Xi| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |\Upsilon| + |\Phi| + |X| + |\Psi| + |\Omega| + \end{aligned}$$

#### Math Bold (\mathbf)

$$\begin{aligned} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |T| + |\Delta| + |E| + |Z| + |H| + |O| + |I| + |K| + |A| + |M| + \\ |N| + |E| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |Y| + |\Phi| + |X| + |\Psi| + |\Omega| + \end{aligned}$$

### Math Calligraphic (\mathcal)

$$\begin{aligned} |\mathcal{A}| + |\mathcal{B}| + |\mathcal{C}| + |\mathcal{D}| + |\mathcal{E}| + |\mathcal{F}| + |\mathcal{G}| + |\mathcal{H}| + |\mathcal{I}| + |\mathcal{I}| + |\mathcal{I}| + |\mathcal{L}| + |\mathcal{L}| + |\mathcal{M}| + |\mathcal{I}| + |\mathcal{D}| + |\mathcal{D}| + |\mathcal{D}| + |\mathcal{D}| + |\mathcal{D}| + |\mathcal{I}| +$$

### **G.5** Superscript Positioning Sans Serif Bold

$$A^{2} + B^{2} + C^{2} + D^{2} + E^{2} + F^{2} + G^{2} + H^{2} + I^{2} + J^{2} + K^{2} + L^{2} + M^{2} + N^{2} + O^{2} + P^{2} + Q^{2} + R^{2} + S^{2} + T^{2} + U^{2} + V^{2} + W^{2} + X^{2} + Y^{2} + Z^{2} + G^{2} + D^{2} + C^{2} + D^{2} + C^{2} + D^{2} + D^{2$$

$$\begin{split} A^2 + B^2 + C^2 + D^2 + E^2 + F^2 + G^2 + H^2 + I^2 + J^2 + K^2 + L^2 + M^2 + \\ N^2 + O^2 + P^2 + Q^2 + R^2 + S^2 + T^2 + U^2 + V^2 + W^2 + X^2 + Y^2 + Z^2 + \\ a^2 + b^2 + c^2 + d^2 + e^2 + f^2 + g^2 + h^2 + i^2 + j^2 + k^2 + I^2 + m^2 + \\ n^2 + o^2 + p^2 + q^2 + r^2 + s^2 + t^2 + u^2 + v^2 + w^2 + x^2 + y^2 + z^2 + \\ A^2 + B^2 + \Gamma^2 + \Delta^2 + E^2 + Z^2 + H^2 + \Theta^2 + I^2 + K^2 + \Lambda^2 + M^2 + \\ N^2 + \Xi^2 + O^2 + \Pi^2 + P^2 + \Sigma^2 + T^2 + \Upsilon^2 + \Phi^2 + X^2 + \Psi^2 + \Omega^2 + \Omega^2$$

#### Math Bold (\mathbf)

$$A^{2} + B^{2} + C^{2} + D^{2} + E^{2} + F^{2} + G^{2} + H^{2} + I^{2} + J^{2} + K^{2} + L^{2} + M^{2} + N^{2} + O^{2} + P^{2} + Q^{2} + R^{2} + S^{2} + T^{2} + U^{2} + V^{2} + W^{2} + X^{2} + Y^{2} + Z^{2} + Q^{2} + D^{2} + C^{2} + D^{2} + C^{2} + D^{2} + D^{2$$

## Math Calligraphic (\mathcal)

$$\mathcal{A}^{2} + \mathcal{B}^{2} + \mathcal{C}^{2} + \mathcal{D}^{2} + \mathcal{E}^{2} + \mathcal{F}^{2} + \mathcal{L}^{2} + \mathcal{M}^{2} + \mathcal{N}^{2} + \mathcal{D}^{2} + \mathcal{D}^{2}$$

### **G.6 Subscript Positioning Sans Serif Bold**

$$\begin{aligned} A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + \\ N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + \\ a_{i} + b_{i} + c_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + \\ n_{i} + o_{i} + p_{i} + q_{i} + r_{i} + s_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + \\ A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + \\ N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + Y_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + \\ \alpha_{i} + \beta_{i} + \gamma_{i} + \delta_{i} + \varepsilon_{i} + \zeta_{i} + \eta_{i} + \theta_{i} + \iota_{i} + \kappa_{i} + \lambda_{i} + \mu_{i} + \\ v_{i} + \xi_{i} + o_{i} + \pi_{i} + \rho_{i} + \sigma_{i} + \tau_{i} + v_{i} + \Phi_{i} + \chi_{i} + \psi_{i} + \omega_{i} + \\ \varepsilon_{i} + \theta_{i} + \pi_{i} + \rho_{i} + \zeta_{i} + \Phi_{i} + \end{aligned}$$

$$\begin{aligned} &A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + \\ &N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + \\ &a_{i} + b_{i} + c_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + \\ &n_{i} + o_{i} + p_{i} + q_{i} + r_{i} + s_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + \\ &A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + \\ &N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + \Upsilon_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + \end{aligned}$$

### Math Bold (\mathbf)

$$\begin{aligned} A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + \\ N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + \\ a_{i} + b_{i} + c_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + \\ n_{i} + o_{i} + p_{i} + q_{i} + r_{i} + s_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + \\ A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + \\ N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + Y_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + \end{aligned}$$

### Math Calligraphic (\mathcal)

$$\mathcal{A}_i + \mathcal{B}_i + \mathcal{C}_i + \mathcal{D}_i + \mathcal{E}_i + \mathcal{F}_i + \mathcal{G}_i + \mathcal{H}_i + \mathcal{I}_i + \mathcal{I}_i + \mathcal{H}_i + \mathcal{L}_i + \mathcal{M}_i + \mathcal{N}_i + \mathcal{O}_i + \mathcal{P}_i + \mathcal{Q}_i + \mathcal{R}_i + \mathcal{F}_i + \mathcal{T}_i + \mathcal{V}_i + \mathcal{V}_i + \mathcal{V}_i + \mathcal{X}_i + \mathcal{Y}_i + \mathcal{Z}_i + \mathcal{D}_i + \mathcal$$

## **G.7 Accent Positioning Sans Serif Bold**

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{I} + \hat{J} + \hat{k} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{O} + \hat{P} + \hat{q} + \hat{r} + \hat{S} + \hat{t} + \hat{u} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{A} + \hat{E} + \hat{Z} + \hat{H} + \hat{O} + \hat{I} + \hat{K} + \hat{A} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{Z} + \hat{T} + \hat{Y} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} + \\ \hat{\alpha} + \hat{\beta} + \hat{Y} + \hat{\delta} + \hat{E} + \hat{Z} + \hat{\eta} + \hat{\theta} + \hat{I} + \hat{K} + \hat{A} + \hat{\mu} + \\ \hat{V} + \hat{\xi} + \hat{O} + \hat{m} + \hat{P} + \hat{O} + \hat{T} + \hat{U} + \hat{\Psi} + \hat{X} + \hat{\Psi} + \hat{\omega} + \\ \hat{E} + \hat{\theta} + \hat{\pi} + \hat{P} + \hat{C} + \hat{$$

#### Math Italic (\mathit)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} +$$

$$\hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} +$$

$$\hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} +$$

$$\hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{I} + \hat{J} + \hat{k} + \hat{I} + \hat{m} + \hat{\ell} + \hat{\wp} + \hat{I} + \hat{J} + \hat{I} +$$

$$\hat{n} + \hat{O} + \hat{P} + \hat{Q} + \hat{I} + \hat{S} + \hat{I} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} +$$

$$\hat{A} + \hat{B} + \hat{\Gamma} + \hat{A} + \hat{E} + \hat{Z} + \hat{H} + \hat{O} + \hat{I} + \hat{K} + \hat{A} + \hat{M} +$$

$$\hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{Z} + \hat{T} + \hat{Y} + \hat{O} + \hat{X} + \hat{W} + \hat{O} +$$

$$\hat{\alpha} + \hat{\beta} + \hat{Y} + \hat{S} + \hat{E} + \hat{\zeta} + \hat{\eta} + \hat{\theta} + \hat{I} + \hat{K} + \hat{A} + \hat{\mu} +$$

$$\hat{V} + \hat{\xi} + \hat{O} + \hat{m} + \hat{P} + \hat{O} + \hat{T} + \hat{U} + \hat{P} + \hat{X} + \hat{W} + \hat{O} +$$

$$\hat{E} + \hat{O} + \hat{m} + \hat{P} + \hat{C} + \hat{C} + \hat{C} +$$

$$\hat{E} + \hat{O} + \hat{m} + \hat{P} + \hat{C} + \hat{C} + \hat{C} + \hat{C} + \hat{C} +$$

$$\hat{C} + \hat{C} +$$

$$\hat{C} + \hat{C} +$$

#### Math Roman (\mathrm)

$$\begin{split} \hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{K} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{i} + \hat{j} + \hat{k} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{\Theta} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{T} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} + \end{split}$$

#### Math Bold (\mathbf)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{I} + \hat{J} + \hat{K} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{Z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{O} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{Y} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} +$$

# Math Calligraphic (\mathcal)

$$\hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{J} + \hat{J} + \hat{H} + \hat{L} + \hat{M} + \hat{M} + \hat{D} +$$

#### **G.8** Differentials Sans Serif Bold

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

### G.9 Slash Kerning Sans Serif Bold

```
 1/A + 1/B + 1/C + 1/D + 1/E + 1/F + 1/G + 1/H + 1/I + 1/I + 1/K + 1/L + 1/M + 1/N + 1/O + 1/P + 1/Q + 1/R + 1/S + 1/T + 1/U + 1/V + 1/W + 1/X + 1/Y + 1/Z + 1/a + 1/b + 1/c + 1/d + 1/e + 1/f + 1/g + 1/h + 1/i + 1/j + 1/k + 1/l + 1/m + 1/n + 1/o + 1/p + 1/q + 1/r + 1/s + 1/t + 1/u + 1/v + 1/w + 1/x + 1/y + 1/z + 1/A + 1/B + 1/\Gamma + 1/\Delta + 1/E + 1/Z + 1/H + 1/O + 1/I + 1/K + 1/\Lambda + 1/M + 1/N + 1/E + 1/O + 1/\Pi + 1/P + 1/E + 1/T + 1/Y + 1/D + 1/X + 1/\Psi + 1/\Omega + 1/A + 1/B + 1/Y + 1/A + 1/E + 1/Z + 1/H + 1/O + 1/I + 1/K + 1/A + 1/\Psi + 1/D + 1/A + 1/B + 1/Y + 1/A + 1/F + 1/I + 1/I
```

```
A/2 + B/2 + C/2 + D/2 + E/2 + F/2 + G/2 + H/2 + I/2 + J/2 + K/2 + L/2 + M/2 + N/2 + O/2 + P/2 + Q/2 + R/2 + S/2 + T/2 + U/2 + V/2 + W/2 + X/2 + Y/2 + Z/2 + a/2 + b/2 + c/2 + d/2 + e/2 + f/2 + g/2 + h/2 + i/2 + j/2 + k/2 + l/2 + m/2 + n/2 + o/2 + p/2 + q/2 + r/2 + s/2 + t/2 + u/2 + v/2 + w/2 + x/2 + y/2 + z/2 + A/2 + B/2 + \Gamma/2 + \Delta/2 + E/2 + Z/2 + H/2 + O/2 + I/2 + K/2 + \Lambda/2 + M/2 + N/2 + E/2 + O/2 + I/2 + P/2 + Z/2 + T/2 + Y/2 + O/2 + X/2 + W/2 + A/2 + D/2 + A/2 + B/2 + Y/2 + S/2 + Z/2 + J/2 + J/2
```

## G.10 (Big) Operators Sans Serif Bold

$$\sum_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n} \int_{i=1}^{n} x^{n} \oint_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n} \int_{i=1}^{n} x^{n} \int_{i=1}^{n$$

#### **G.11 Radicals Sans Serif Bold**

$$\sqrt{x+y} \qquad \sqrt{x^2+y^2} \qquad \sqrt{x_i^2+y_j^2} \qquad \sqrt{\left(\frac{\cos x}{2}\right)} \qquad \sqrt{\left(\frac{\sin x}{2}\right)}$$

$$\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{x+y}}}}}}$$

## **G.12** Over- and Underbraces Sans Serif Bold

$$\widehat{x}$$
  $\widehat{x+y}$   $\widehat{x^2+y^2}$   $\widehat{x_i^2+y_j^2}$   $\underbrace{x}$   $\underbrace{x+y}$   $\underbrace{x_i+y_j}$   $\underbrace{x_i^2+y_j^2}$ 

### G.13 Normal and Wide Accents Sans Serif Bold

 $\dot{x}$   $\ddot{x}$   $\ddot{x}$ 

## **G.14** Long Arrows Sans Serif Bold

## G.15 Left and Right Delimiters Sans Serif Bold

$$-(f) - -[f] - -|f| - -(f) - -(f) - -(f)$$

Using \left and \right.

$$-(f) - -[f] - -|f| - -|f| - -\langle f \rangle - -\{f\} -$$

$$-)f(--)f[--/f/--\backslash f\backslash --/f\backslash --\backslash f/-$$

# G.16 Big-g-g Delimiters Sans Serif Bold

# **G.17 Binary Operators Sans Serif Bold**

$x \pm y$	\pm	$x \cap y$	\cap	x	\diamond	$x \oplus y$	\oplus
$x \mp y$	\mp	$x \cup y$	\cup	$x \triangle y$	\bigtriangleup	$x \ominus y$	\ominus
$\mathbf{x} \times \mathbf{y}$	\times	<b>x</b> ⊎ <b>y</b>	\uplus	$x \nabla y$	\bigtriangledown	$x \otimes y$	\otimes
х÷у	\div	$x \sqcap y$	\sqcap	$x \triangleleft y$	\triangleleft	$x \oslash y$	\oslash
<i>x</i> * <i>y</i>	\ast	$x \sqcup y$	\sqcup	$x \triangleright y$	\triangleright	$x \odot y$	\odot
x⋆y	\star	$x \vee y$	\vee	$x \triangleleft y$	<b>\lhd</b>	$x \bigcirc y$	\bigcirc
х о у	\circ	$x \wedge y$	\wedge	$x \triangleright y$	\rhd	x † y	\dagger
<b>x</b> • <b>y</b>	\bullet	$x \setminus y$	\setminus	$x \triangleleft y$	\unlhd	x ‡ y	\ddagger
х • у	\cdot	x≀y	\wr	$x \trianglerighteq y$	\unrhd	х§у	<b>\</b> S
x + y	+	x – y	_	x∐y	\amalg	v₽x	\P

#### **G.18** Relations Sans Serif Bold

```
x \leq y
          \leq
                             x \ge y
                                        \geq
                                                           x \equiv y
                                                                   \equiv
                                                                                  x \models y
                                                                                             \models
x < y
          \prec
                             x > y
                                        \succ
                                                           x \sim y
                                                                     \sim
                                                                                  x \perp y
                                                                                             \perp
                                                           x \simeq y
x \leq y
          \preceq
                             x \geq y
                                        \succeq
                                                                     \simeq
                                                                                  x \mid y
                                                                                             \mid
x \ll y
          \11
                                                                     \asymp
                                                                                  x \parallel y
                                                                                             \parallel
                             x \gg y
                                        \gg
                                                           x \times y
x \subset y
          \subset
                                                                     \approx
                                                                                             \bowtie
                             x\supset y
                                        \supset
                                                           x \approx y
                                                                                  x ⋈ y
x \subseteq y
          \subseteq
                             x \supseteq y
                                        \supseteq
                                                           x \cong y
                                                                     \cong
                                                                                  x \bowtie y
                                                                                             \Join
x \sqsubset y
          \sqsubset
                             x \supset y
                                        \sqsupset
                                                           x \neq y
                                                                     \neq
                                                                                  x \frown y
                                                                                             \smile
          \sqsubseteq
                                                           x \doteq y
                                                                     \doteq
                                                                                             \frown
x \sqsubseteq y
                             x \supseteq y
                                        \sqsupseteq
                                                                                  x \smile y
x \in y
          \in
                                        \ni
                                                                     \propto x = y
                             x \ni y
                                                           \mathbf{x} \propto \mathbf{y}
          \vdash
                                        \dashv
x \vdash y
                             x \dashv y
                                                           x < y
                                                                     <
                                                                                  x > y
                                                                                             >
x : y
```

## **G.19 Punctuation Sans Serif Bold**

x,y , x;y ; x:y \colon x.y \ldotp  $x\cdot y$  \cdotp

#### **G.20** Arrows Sans Serif Bold

$x \leftarrow y$	\leftarrow	$x \leftarrow y$	\longleftarrow	x ↑ y	\uparrow
$x \leftarrow y$	\Leftarrow	$x \Leftarrow y$	\Longleftarrow	<b>x</b> ↑ <b>y</b>	\Uparrow
$x \rightarrow y$	\rightarrow	$x \longrightarrow y$	\longrightarrow	$x \downarrow y$	\downarrow
$x \Rightarrow y$	\Rightarrow	$x \Longrightarrow y$	\Longrightarrow	$x \downarrow y$	\Downarrow
$x \leftrightarrow y$	\leftrightarrow	$x \longleftrightarrow y$	\longleftrightarrow	x	\updownarrow
$x \Leftrightarrow y$	\Leftrightarrow	$x \Longleftrightarrow y$	\Longleftrightarrow	x	\Updownarrow
$x \mapsto y$	\mapsto	$x \mapsto y$	\longmapsto	х∕у	\nearrow
$x \leftarrow y$	\hookleftarrow	$x \hookrightarrow y$	\hookrightarrow	x <b>∖</b> y	\searrow
x	\leftharpoonup	$x \rightharpoonup y$	\rightharpoonup	x ∠ y	\swarrow
$x \leftarrow y$	\leftharpoondown	$x \rightarrow y$	\rightharpoondown	х 🥄 у	\nwarrow
$\mathbf{x} \rightleftharpoons \mathbf{v}$	\rightleftharpoons	x ⊶ v	\leadsto		

## G.21 Miscellaneous Symbols Sans Serif Bold

```
\ldots x...y
                       \cdots
                                    x:y
                                          \vdots
                                                       x \cdot y
                                                              \ddots
x . . . y
x≅y
       \aleph
                x/y
                        \prime
                                    х∀у
                                          \forall
                                                              \infty
                                                       x∞y
хћу
       \hbar
                хØу
                        \emptyset
                                    уΕх
                                          \exists
                                                       х□у
                                                               \Box
хıу
       \imath
                х∇у
                        \nabla
                                    х¬у
                                         \neg
                                                       х◊у
                                                              \Diamond
       \jmath
                х√у
                        \surd
                                    xby
                                          \flat
                                                              \triangle
хју
                                                       x∆y
xℓy
       \ell
                        \top
                                    хфу
                                          \natural
                                                       х♣у
                                                              \clubsuit
                х⊤у
                        \bot
                                    x#y
                                          \sharp
                                                              \diamondsuit
       \wp
                х⊥у
                                                       х◊у
хюу
xRev
       \Re
                x||y
                        \backslash |
                                    x\y
                                          \backslash
                                                       х♡у
                                                              \heartsuit
xImy
                                    х∂у
                                                              \spadesuit
       \Im
                x∠y
                        \angle
                                          \partial
                                                       хфу
х℧у
       \mho
                                    x|y
                                          x!y
                                                              !
                x.y
```

## **G.22 Variable-Sized Operators Sans Serif Bold**

```
x \sum y
        \sum
                   х∩у
                           \bigcap
                                         х⊙у
                                                 \bigodot
х∏у
                                                 \bigotimes
        \prod
                   x \bigcup y
                           \bigcup
                                         x \otimes y
                   x \mid y
х∐у
        \coprod
                           \bigsqcup
                                         x \oplus y
                                                 \bigoplus
х∫у
        \int
                   x \/ y
                           \bigvee
                                         x (+) y
                                                 \biguplus
        \oint
                           \bigwedge
x \phi y
                   x∧y
```

## **G.23** Log-Like Operators Sans Serif Bold

```
x csc y
                                   x exp y
                                              x ker y
                                                           x lim sup y
                                                                         x min y
                                                                                    x sinh y
x arccos y
             x cos y
x arcsin y
             x cosh y
                       x deg y
                                   x gcd y
                                              x lg y
                                                           x ln y
                                                                         x Pr y
                                                                                    x sup y
x arctan y
             x cot y
                        x det y
                                   x hom y
                                              x lim y
                                                           x log y
                                                                                    x tan y
                                                                         x sec y
x arg y
             x \coth y \quad x \dim y
                                   x inf y
                                              x lim inf y
                                                           x max y
                                                                         x sin y
                                                                                    x tanh y
```

#### **G.24** Delimiters Sans Serif Bold

```
(
x(y
                  x)y
                                     x \uparrow y
                                             \uparrow
                                                                x \uparrow y
                                                                         \Uparrow
      [
                         ]
x[y
                  x]y
                                     x \downarrow y
                                             \downarrow
                                                                x \downarrow y
                                                                         \Downarrow
x{y
      \{
                                     \updownarrow
                                                                x $ y
                                                                         \Updownarrow
                  x}y
                         \}
x|y
      \lfloor
                  x]y
                         \rfloor
                                     хΓу
                                             \lceil
                                                                х∖у
                                                                         \rceil
      \langle
                         \rangle
                                                                         \backslash
x⟨y
                  x)y
                                     x/y
                                                                x∖y
x|y
      x||y
                         \backslash \mid
```

## **G.25** Large Delimiters Sans Serif Bold

```
\rmoustache \int \lmoustache \rmoustache \rmousta
```

#### **G.26** Math Mode Accents Sans Serif Bold

```
\hat{a} \hat{a} \acute{a} \acute{a} \bar{a} \bar{a} \acute{a} \dot{a} \breve{a} \breve{a} \check{a} \check{a} \grave{a} \grave{a} \vec{a} \vec{a} \ddot{a} \ddot{a} \tilde{a} \tilde{a}
```

### **G.27** Miscellaneous Constructions Sans Serif Bold

```
abc
       \widetilde{abc}
                               abc
                                      \widehat{abc}
àbc
       \overleftarrow{abc}
                               abć
                                      \overrightarrow{abc}
abc
       \overline{abc}
                               abc
                                      \underline{abc}
abc
       \overbrace{abc}
                                      \underbrace{abc}
                               abc
√abc
       \sqrt{abc}
                               ∜abc
                                      \sqrt[n]{abc}
                               <u>abc</u>
xyz
f′
       f'
                                      \frac{abc}{xyz}
```

# **G.28** AMS Delimiters Sans Serif Bold

 $x \vdash y$  \ullcorner  $x \vdash y$  \ullcorner  $x \perp y$  \llcorner

## **G.29 AMS Arrows Sans Serif Bold**

<b>x</b> → <b>y</b>	\dashrightarrow	x ← y	\dashleftarrow
$x \sqsubseteq y$	\leftleftarrows	$x \leftrightarrows y$	\leftrightarrows
$x \in y$	\Lleftarrow	$x \leftarrow y$	\twoheadleftarrow
$x \leftarrow y$	\leftarrowtail	<b>x</b>	\looparrowleft
$x \leftrightharpoons y$	\leftrightharpoons	$x \cap y$	\curvearrowleft
х 🖰 у	\circlearrowleft	x <sup>←</sup> y	\Lsh
x ↑↑ y	\upuparrows	<b>x</b> 1 <b>y</b>	\upharpoonleft
$x \downarrow y$	\downharpoonleft	$x \rightarrow y$	\multimap
<i>x ↔ y</i>	\leftrightsquigarrow	$x \rightrightarrows y$	\rightrightarrows
$x \rightleftharpoons y$	\rightleftarrows	$x \rightrightarrows y$	\rightrightarrows
$x \rightleftharpoons y$	\rightleftarrows	$x \rightarrow y$	\twoheadrightarrow
$x \rightarrow y$	\rightarrowtail	$x \Rightarrow y$	\looparrowright
$x \rightleftharpoons y$	\rightleftharpoons	$x \cap y$	\curvearrowright
хоу	\circlearrowright	x  ightharpoonup y	\Rsh
$x \downarrow \downarrow y$	\downdownarrows	x	\upharpoonright
$x \mid y$	\downharpoonright	x ⊶ y	\rightsquigarrow

# **G.30** AMS Negated Arrows Sans Serif Bold

```
x \leftrightarrow y \nleftarrow x \nrightarrow y \nrightarrow x \nleftrightarrow y \nRightarrow x \nleftrightarrow y \nleftrightarrow x \nleftrightarrow y \nLeftrightarrow
```

## G.31 AMS Greek Sans Serif Bold

**xfy** \digamma **x**x**y** \varkappa

## **G.32** AMS Hebrew Sans Serif Bold

 $x \exists y$  \beth  $x \exists y$  \daleth  $x \exists y$  \gimel

# **G.33** AMS Miscellaneous Sans Serif Bold

хћу	\hbar	хћу	\hslash	
$x \triangle y$	\vartriangle	$x \nabla y$	\triangledown	
x□y	\square	х◊у	\lozenge	
х®у	\circledS	x∠y	\angle	
x∡y	\measuredangle	х∄у	\nexists	
х℧у	\mho	x∃y	\Finv <sup>u</sup>	
x∂y	\Game <sup>u</sup>	x k y	\Bbbk <sup>u</sup>	
<i>x\y</i>	\backprime	x∅y	\varnothing	
x▲y	\blacktriangle	х▼у	\blacktriangledown	
x <b>≡</b> y	\blacksquare	x∳y	\blacklozenge	
x★y	\bigstar	х∢у	\sphericalangle	
хСу	\complement	хðу	\eth	
x/y	$\diagup^u$	$x \setminus y$	\diagdown <sup>u</sup>	
<sup>u</sup> Not defined in amssymb.sty, define using the \newsymbol command.				

# **G.34** AMS Binary Operators Sans Serif Bold

x + y	\dotplus	$x \setminus y$	\smallsetminus
$x \cap y$	\Cap	$x \cup y$	\Cup
x <u>⊼</u> y	\barwedge	$x \stackrel{\vee}{=} y$	\veebar
x	\doublebarwedge	$x \boxminus y$	\boxminus
$x \boxtimes y$	\boxtimes	x ⊡ y	\boxdot
$x \boxplus y$	\boxplus	<i>x</i>	\divideontimes
$x \ltimes y$	\ltimes	$x \times y$	\rtimes
$x \setminus y$	\leftthreetimes	x	\rightthreetimes
<b>x</b> 人 <b>y</b>	\curlywedge	x  ightharpoonup y	\curlyvee
$x \ominus y$	\circleddash	<b>x</b> ⊗ <b>y</b>	\circledast
<b>x</b> ⊚ <b>y</b>	\circledcirc	<i>x</i> . <i>y</i>	\centerdot
хŢУ	\intercal		

### **G.35** AMS Relations Sans Serif Bold

 $x \lesssim y$ \lesssim  $x \approx y$ \approxeq  $x \ll y \setminus 1111$ \lesseqgtr \doteqdot \fallingdotseq x = y $x \sim y$ \backsimeq \Subset  $x \leq y$ \preccurlyeq  $x \lesssim y$ \precsim  $x \triangleleft y$ \vartriangleleft  $x \models y$ \vDash \smallsmile  $\mathbf{x} \smile \mathbf{y}$ x = y\bumpeq  $x \ge y$ \geqq  $x \geqslant y$ \eqslantgtr **x** ≳ **y** \gtrapprox  $x \gg y \setminus ggg$  $x \geq y$ \gtreqless x = y\eqcirc  $x \triangleq y$ \triangleq  $x \approx y$ \thickapprox x∋y \Supset **x** ≽ **y** \succcurlyeq  $x \gtrsim y$ \succsim \vartriangleright  $x \triangleright y$ \Vdash  $x \parallel y$ \shortparallel  $\protect\$  $x \pitchfork y$ **x ⋖ y \blacktriangleleft** 

\backepsilon

\because

x ∋ y x ∵ y \leqslant

**x** ≤ **y** 

## **G.36** AMS Negated Relations Sans Serif Bold

```
x ≰ y \nleq
x ≮ y \nless
x ≰ y \nleqslant
                            x ⊈ y \nleqq
x \leq y \setminus lneq
                           x ≨ y \lneqq
x \leq y \lvertneqq
                           x ⋦ y \lnsim
x≨y
       \lnapprox
                            x ⊀ y \nprec
x ≠ y \npreceq
                          x ⋨y
                                    \precnsim
x ≨ y \precnapprox
                           x ≁ y \nsim
хху
        \nshortmid
                           x∤y
                                     \mbox{nmid}
x⊬y
       \nvdash
                          x ⊭ y \nvDash
x \not = y \ntriangleleft x \not = y \ntrianglelefteq
x \not\subseteq y \nsubseteq x \subsetneq y \subsetneq
x \subsetneq y \varsubsetneq x \subsetneq y \subsetneqq
x \subsetneq y \varsubsetneqq x \not> y \ngtr
x≱y \ngeq
                          x ≱ y \ngeqslant
x ≩ y \ngeqq
                          x \ge y \setminus gneq
x \ngeq y
                           x ≩ y
       \gneqq
                                    \gvertneqq
x ⋧ y \gnsim
                          x ≈ y \gnapprox
x \gtrsim y \succeque x \gtrsim y \successim x \not \gtrsim y \succeque x \not \approx y \ncore x \not \approx y \ncore
x \not\succ y \setminus \text{nsucc}
                          x ≱ y \nsucceq
        \nshortparallel x∦y
                                     \nparallel
хиу
x⊭y
       \nvDash
                           x ⊭ y \nVDash
x \not\triangleright y \ntriangleright x \not\trianglerighteq y \ntrianglerighteq
x \not\supseteq y \nsupseteq x \not\supseteq y \nsupseteqq
x \supseteq y \supsetneq
                            x \supseteq y \varsupsetneq
x \supseteq y \supsetneqq
                           x ⊋ y \varsupsetneqq
```

## G.37 Math "Torture" Test Sans Serif Bold

Most of the following examples are taken from *The TeXbook* (Knuth, 1984, see https://ctan.org/pkg/texbook) and were adapted for ETeX from Karl Berry's torture test for plain TeX math fonts.

$$a_{0} + \frac{1}{a_{1} + \frac{1}{a_{2} + \frac{1}{a_{3} + \frac{1}{a_{4}}}}}$$

$$\binom{p}{2}x^{2}y^{p-2} - \frac{1}{1-x}\frac{1}{1-x^{2}} = \frac{a+1}{b} / \frac{c+1}{d}.$$

$$\sqrt{1+\sqrt{1+\sqrt{1+\sqrt{1+\sqrt{1+x}}}}}$$

$$\sqrt{1+\sqrt{1+\sqrt{1+\sqrt{1+\sqrt{1+x}}}}}$$

$$\binom{\partial^{2}}{\partial x^{2}} + \frac{\partial^{2}}{\partial y^{2}} \Big) |\phi(x+iy)|^{2} = 0$$

$$\pi(n) = \sum_{m=2}^{n} \left[ \left( \sum_{k=1}^{m-1} \lfloor (m/k) / \lceil m/k \rceil \rfloor \right)^{-1} \right].$$

$$\int_{0}^{\infty} \frac{t-ib}{t^{2}+b^{2}} e^{iat} dt = e^{ab} E_{1}(ab), \quad a,b > 0.$$

$$A := \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 & 0 \\ 0 & x-\lambda & 1 \\ 0 & 0 & x-\lambda \end{pmatrix}.$$

$$\binom{a}{d} e f \begin{pmatrix} x-\lambda & 1 & 0 & 0 \\$$

$$||u_i||=1, \qquad u_i\cdot u_j=0 \quad \text{if } i\neq j.$$

$$T(n) \leq T(2^{\lceil \lg n \rceil}) \leq c(3^{\lceil \lg n \rceil} - 2^{\lceil \lg n \rceil})$$

$$< 3c \cdot 3^{\lg n}$$

$$= 3c n^{\lg 3}.$$

$$(x + y)(x - y) = x^2 - xy + yx - y^2$$
  
=  $x^2 - y^2$   
 $(x + y)^2 = x^2 + 2xy + y^2$ .

$$\left(\int_{-\infty}^{\infty} e^{-x^2} dx\right)^2 = \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} e^{-(x^2+y^2)} dx dy$$

$$= \int_{0}^{2\pi} \int_{0}^{\infty} e^{-r^2} dr d\theta$$

$$= \int_{0}^{2\pi} \left( e^{-\frac{r^2}{2}} \Big|_{r=0}^{r=\infty} \right) d\theta$$

$$= \pi.$$

$$\prod_{k\geq 0} \frac{1}{(1-q^k z)} = \sum_{n\geq 0} z^n / \prod_{1\leq k\leq n} (1-q^k).$$

$$\sum_{\substack{0 < i \leq m \\ 0 < j \leq n}} p(i,j) \neq \sum_{i=1}^p \sum_{j=1}^q \sum_{k=1}^r a_{ij} b_{jk} c_{ki} \neq \sum_{\substack{1 \leq i \leq p \\ 1 \leq j \leq q \\ 1 \leq k \leq r}} a_{ij} b_{jk} c_{ki}$$

$$\max_{1 \le n \le m} \log_2 P_n \quad \text{and} \quad \lim_{x \to 0} \frac{\sin x}{x} = 1$$

Inline math:  $\max_{1 \le n \le m} \log_2 P_n$  and  $\lim_{x \to 0} \frac{\sin x}{x} = 1$ 

$$p_1(n) = \lim_{m \to \infty} \sum_{v=0}^{\infty} \left( 1 - \cos^{2m} (v!^n \pi/n) \right)$$

Inline math:  $p_1(n) = \lim_{m \to \infty} \sum_{\nu=0}^{\infty} (1 - \cos^{2m}(\nu!^n \pi/n))$ 

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