OpenType math font Fira

Herbert Voß

April 3, 2019

Contents

1 Usage **1**

2 The default regular weight **2**
2.1 Version normal 2
2.2 Version bold 2

3 Examples **2**
3.1 Digits 2
3.2 Alphabets 3
3.3 Equations test 4

Abstract

The math font FIRA is derived from the Fira Sans and Fira Go sans serif. There are several math versions available (`https://github.com/Stone-Zeng/FiraMath/`) but only the regular version has from todays update all symbols.

1 Usage

`\usepackage[<options>]{firamath-otf}`

Optional arguments are

`fakebold` Use faked bold symbols

`usefilenames` Use filenames for the fonts instead of the symbolic font names

The package itself loads by default

```
\RequirePackage{ifxetex,ifluatex,xkeyval,textcomp}
\RequirePackage{unicode-math}
```

2 The default regular weight

2.1 Version normal

$$\frac{\partial \varrho}{\partial t} + \operatorname{div}(\varrho \vec{v}) = 0$$

$$\varrho \frac{\partial \vec{v}}{\partial t} + (\varrho \vec{v} \cdot \nabla)\vec{v} = \vec{f}_0 + \operatorname{div} \mathsf{T} = \vec{f}_0 - \operatorname{grad} p + \operatorname{div} \mathsf{T}' \tag{1}$$

$$\varrho T \frac{\mathrm{d}s}{\mathrm{d}t} = \varrho \frac{\mathrm{d}e}{\mathrm{d}t} - \frac{p}{\varrho} \frac{\mathrm{d}\varrho}{\mathrm{d}t} = -\operatorname{div} \vec{q} + \mathsf{T}' : \mathsf{D}$$

$$\frac{\partial}{\partial t} \iiint \varrho \, \mathrm{d}^3V + \oiint \varrho (\vec{v} \cdot \vec{v}\vec{n}) \, \mathrm{d}^2A = 0 \tag{2}$$

$$\frac{\partial}{\partial t} \iiint \varrho \vec{v} \, \mathrm{d}^3V + \oiint \varrho \vec{v} (\vec{v} \cdot \vec{n}\,) \, \mathrm{d}^2A = \iiint f_0 \, \mathrm{d}^3V + \oiint \vec{n} \cdot \mathsf{T} \, \mathrm{d}^2A \tag{3}$$

$$\frac{\partial}{\partial t} \iiint \left(\frac{1}{2}v^2 + e\right) \varrho \, \mathrm{d}^3V + \oiint \left(\frac{1}{2}v^2 + e\right) \varrho \left(\vec{v} \cdot \vec{n}\,\right) \mathrm{d}^2A = \tag{4}$$

$$- \oiint \left(\vec{q} \cdot \vec{v}ecn\right) \mathrm{d}^2A + \iiint \left(\vec{v} \cdot \vec{f}_0\right) \mathrm{d}^3V + \oiint \left(\vec{v} \cdot \vec{n}\, \mathsf{T}\right) \mathrm{d}^2A.$$

2.2 Version bold

The bold characters are created with the optional argument `fakebold` which loads the package `xfakebold` which writes some information into the created PDF to get bold characters. For more informations see the documentation of `xfakebold`.

$$\frac{\partial}{\partial t} \iiint \varrho \, \mathrm{d}^3V + \oiint \varrho (\vec{v} \cdot \vec{v}\vec{n}) \, \mathrm{d}^2A = 0 \tag{5}$$

$$\frac{\partial}{\partial t} \iiint \varrho \vec{v} \, \mathrm{d}^3V + \oiint \varrho \vec{v} (\vec{v} \cdot \vec{n}\,) \, \mathrm{d}^2A = \iiint f_0 \, \mathrm{d}^3V + \oiint \vec{n} \cdot \mathsf{T} \, \mathrm{d}^2A \tag{6}$$

$$\frac{\partial}{\partial t} \iiint \left(\frac{1}{2}v^2 + e\right) \varrho \, \mathrm{d}^3V + \oiint \left(\frac{1}{2}v^2 + e\right) \varrho \left(\vec{v} \cdot \vec{n}\,\right) \mathrm{d}^2A = \tag{7}$$

$$- \oiint \left(\vec{q} \cdot \vec{v}\vec{n}\right) \mathrm{d}^2A + \iiint \left(\vec{v} \cdot \vec{f}_0\right) \mathrm{d}^3V + \oiint \left(\vec{v} \cdot \vec{n}\, \mathsf{T}\right) \mathrm{d}^2A.$$

3 Examples

3.1 Digits

- Digits: 0123456789

- Proportional digits: 0123456789
- Bold digits (\symbf): **0123456789**
- Bold proportional digits (\symbf): **0123456789**

3.2 Alphabets

- Latin letters (mathnormal):
  ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
- Latin upright letters (\symup):
  ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
- Latin typewriter letters (\symtt):
  ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
- Latin bold letters (\symbf):
  ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
- Latin bold upright letters (\symbfup):
  ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
- Latin blackboard letters (\symbb):
  𝔸𝔹ℂ𝔻𝔼𝔽𝔾ℍ𝕀𝕁𝕂𝕃𝕄ℕ𝕆ℙℚℝ𝕊𝕋𝕌𝕍𝕎𝕏𝕐ℤ𝕒𝕓𝕔𝕕𝕖𝕗𝕘𝕙𝕚𝕛𝕜𝕝𝕞𝕟𝕠𝕡𝕢𝕣𝕤𝕥𝕦𝕧𝕨𝕩𝕪𝕫
- Greek letters:
  ΑΒΓΔΕΖΗΘΘΙΚΛΜΝΞΟΠΡΣΤΥΦΧΨΩαβγδεεζηθϑικιλμνξοπρϱσςτυφφχψω
- Greek upright letters (\symup):
  ΑΒΓΔΕΖΗΘΘΙΚΛΜΝΞΟΠΡΣΤΥΦΧΨΩαβγδεεζηθϑικιλμνξοπρϱσςτυφφχψω
- Greek bold letters (\symbf):
  ΑΒΓΔΕΖΗΘΘΙΚΛΜΝΞΟΠΡΣΤΥΦΧΨΩαβγδεεζηθϑικιλμνξοπρϱσςτυφφχψω
- Greek bold upright letters (\symbfup):
  ΑΒΓΔΕΖΗΘΘΙΚΛΜΝΞΟΠΡΣΤΥΦΧΨΩαβγδεεζηθϑικιλμνξοπρϱσςτυφφχψω
- Dotless letters:
  ı + *ȷ* + ı + ȷ
- Hebrew א + ב + ג + ד
- Ligature (text):
  ff fi fl ffi ffl
- Non-ligature (math):
  ff fi fl ffi ffl + *ff fi fl ffi ffl* + ff fi fl ffi ffl
- Miscellaneous:
  ħ + ħ + Å
  $\forall x > x_0, \exists \delta, \delta \in \varnothing$

3.3 Equations test

- Basic:
  $1 + 2 - 3 \times 4 \div 5 \pm 6 \mp 7 \dotplus 8 = -a \oplus b \otimes c$
- Binary relations $x + - \oplus \otimes \ominus \odot \oslash \cdot \cdot \times \div y$
- Set theory $A \cap B \cup C \sqcap D \sqcup R \uplus k \uplus l \uplus m$
  $A \subset B \supset C \subseteq D \supseteq E \ \ F \ \ G + A \sqsubset B \sqsupset C \sqsubseteq D \sqsupseteq E$
  $\complement_U A \cup \complement_C C \subset \complement_U A \cup \complement_C C \in R \in Q \ni Z \ni N$
- Superscript and subscript:
  $2^2 + 2^{2^2} + 2^{2^{2^2}} + 2^{2^2} + x_a + x_{a_i} + x_{a_{i_1}}$
- Arrows:
  $x \leftarrow y \rightarrow z \leftrightarrow w \nleftarrow y \nrightarrow z \nleftrightarrow w \Leftarrow a \Rightarrow b \Leftrightarrow c \ \ a = b \ \ c$
  $x \uparrow y \downarrow z \updownarrow w \Uparrow a \Downarrow b \Updownarrow c$
  $p \nwarrow p \nearrow p \searrow p \swarrow p \nwarrow p \nearrow p \searrow p \swarrow p$
  $x \leftharpoonup x \leftharpoondown x \upharpoonright x \upharpoonleft x \rightharpoonup x \rightharpoondown x \downharpoonright x \downharpoonleft x$
  $A \longleftarrow B \longrightarrow C \longleftrightarrow D \Longleftarrow E \Longrightarrow F \Longleftrightarrow G$
  $X \mapsfrom Y \mapsto Z \updownarrow W \downarrow P \leftrightarrows S \rightleftarrows R$
  $M \longmapsfrom N \longmapsto O \Longmapsfrom K \Longmapsto L$
  $f \rightleftarrows f \upuparrows f \leftrightarrows f \downdownarrows g \rightrightarrows g \uparrow\uparrow g \leftleftarrows g \downdownarrows h \rightrightarrows h \leftleftarrows p \rightleftharpoons p \leftrightharpoons p \upharpoonleft\downharpoonright p \downharpoonleft\upharpoonright p$
- Math accents:

$$\acute{x}\ \grave{x}\ \check{x}\ \hat{x}\ \bar{x}\ \breve{x}\ \mathring{x}\ \dot{x}\ \ddot{x}\ \dddot{x}\ \ddddot{x}\ \tilde{x}\ \vec{x}\ \vec{\vec{x}}\ \tilde{x}\ \vec{x}\ \tilde{x}\ \vec{x}\ \not{x}\ \not{\not{x}}\ \overline{x}\ \hat{x}\ \tilde{x}\ \vec{x}\ \underline{x}\ \underline{\underline{x}}\ \underline{\underline{x}}\ \underline{x}\ \underline{x}\ \underline{x}\ \underline{x}$$

- Integral:

$$\int_0^\pi \sin x \, \mathrm{d}x = \int_0^\pi \sin x \, \mathrm{d}x = \cos 0 - \cos \pi = 2$$

$$\int_{-\infty}^{+\infty} \mathrm{d}z \iint_{-\infty}^{+\infty} \mathrm{d}^2 y \iiint_{-\infty}^{+\infty} \mathrm{d}^3 x \iiiint_{-\infty}^{+\infty} \mathrm{d}^4 p$$

$$\oint \mathrm{d}r \oiint \mathrm{d}\theta \oiiint \mathrm{d}\varphi$$

$$\int_0^\pi \sin x \, \mathrm{d}x = \int_0^\pi \sin x \, \mathrm{d}x = \cos 0 - \cos \pi + C$$

$$\int_{-\infty}^{+\infty} \mathrm{d}z \iint_{-\infty}^{+\infty} \mathrm{d}^2 y \iiint_{-\infty}^{+\infty} \mathrm{d}^3 x \iiiint_{-\infty}^{+\infty} \mathrm{d}^4 p$$

$$\oint \mathrm{d}r \oiint \mathrm{d}\theta \oiiint \mathrm{d}\varphi$$

- Huge operators:

$$\int_0^\infty \int_0^\infty \sum_{i=1}^\infty \prod_{j=i}^\infty \coprod_{k=i}^\infty$$

$$\sum_{i=1}^\infty \frac{1}{x^i} = \frac{1}{1-x} \quad \prod_{i=1}^\infty \frac{1}{x^i} = x^{-n(n+1)/2} \quad \coprod_{i=i}^\infty \frac{1}{x^i} = ?$$

- Huge operators (inline):

$$\int_0^\infty \int_0^\infty \iint dx \iiint dy \iiiint dp \oint dr \oiint d\theta \oiiint d\varphi \sum_{i=1}^\infty \prod_{j=i}^\infty \coprod_{i=i}^\infty$$

- Huge operators (inline):

$$\int_0^\infty \int_0^\infty \iint dx \iiint dy \iiiint dp \oint dr \oiint d\theta \oiiint d\varphi \sum_{i=1}^\infty \prod_{j=i}^\infty \coprod_{i=i}^\infty$$

- Fraction:

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

- Fraction (inline):

$$\frac{1}{2} + \frac{1g}{2} + \frac{1}{\frac{2}{3}+4} + \frac{\frac{1}{2}+3}{4}$$

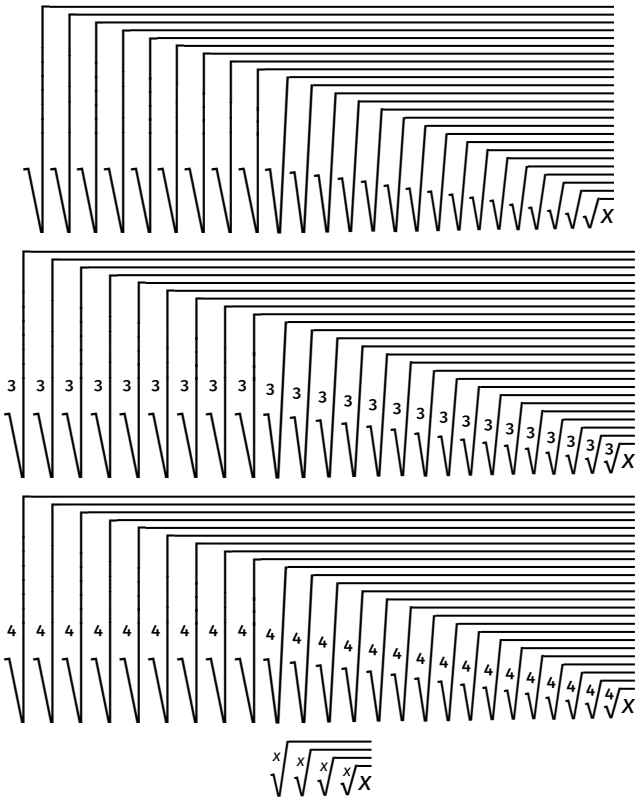
- Radical:

$$\sqrt{2} + \sqrt{2^2} + \sqrt{1+\sqrt{2}} + \sqrt{1+\sqrt{1+\sqrt{3}}} + \sqrt{\sqrt{\sqrt{\sqrt{2}}}} + \sqrt{\frac{1}{2}}$$

$$\sqrt[3]{2} + \sqrt[3]{2^2} + \sqrt[3]{1+\sqrt[3]{2}} + \sqrt[3]{1+\sqrt[3]{1+\sqrt[3]{3}}} + \sqrt[3]{\sqrt[3]{\sqrt[3]{\sqrt[3]{2}}}} + \sqrt[3]{\frac{1}{2}}$$

$$\sqrt[4]{2} + \sqrt[4]{2^2} + \sqrt[4]{1+\sqrt[4]{2}} + \sqrt[4]{1+\sqrt[4]{1+\sqrt[4]{3}}} + \sqrt[4]{\sqrt[4]{\sqrt[4]{\sqrt[4]{2}}}} + \sqrt[4]{\frac{1}{2}}$$

$$\sqrt[x]{y} + \sqrt[x]{\sqrt[x]{y}} + \sqrt[x]{\sqrt[x]{\sqrt[x]{y}}} + \sqrt[x]{\frac{1}{2}} + \sqrt{\begin{matrix} x \\ y \\ z \\ w \end{matrix}} + \sqrt[3]{\begin{matrix} x \\ y \\ z \\ w \end{matrix}} + \sqrt[4]{\begin{matrix} x \\ y \\ z \\ w \end{matrix}} + \sqrt[x]{\begin{matrix} x \\ y \\ z \\ w \end{matrix}} + \sqrt{\begin{matrix} x \\ y \\ z \\ w \\ p \end{matrix}} + \sqrt[3]{\begin{matrix} x \\ y \\ z \\ w \\ p \end{matrix}} + \sqrt[4]{\begin{matrix} x \\ y \\ z \\ w \\ p \end{matrix}} + \sqrt[x]{\begin{matrix} x \\ y \\ z \\ w \\ p \end{matrix}}$$



- Brackets:

$$(a)(A)(O)(Y)(y)(f)(Q)(T)(Y)(j)(q)$$

$$\left(\left(\left(\left((x)\right)\right)\right)\right) \quad \left(\left(\left(\left((x)\right)\right)\right)\right) \quad \left[\left[\left[\left[[x]\right]\right]\right]\right] \quad \left\{\left\{\left\{\left\{\{x\}\right\}\right\}\right\}\right\}$$

$$(x) + \left(x^2\right) + \left(\frac{1}{2}\right) + \left(\frac{2^2}{3}\right) + \left(\frac{\frac{1}{2}}{\frac{3}{4}}\right)$$

$$(|)[\|]\{\|\|\} \quad (|)[\|]\{\|\|\} \quad (|)[\|]\{\|\|\} \quad \left(|\right)[\|]\{\|\|\} \quad \left(|\right)[\|]\{\|\|\} \quad \left(\left|\right)\left[\|\right]\left\{\|\|\right\} \quad \left(\left|\right)\left[\|\right]\left\{\|\|\right\}$$

- More brackets:

$$\lceil ceiling \rceil \quad \lfloor floor \rfloor \quad (group)$$

- Bra-kets:

$$\langle x| + |x\rangle + \langle\alpha|\beta\rangle + |\alpha^2\rangle\langle\beta^2| + \left\langle\frac{1}{2}\right| + \left|\frac{1}{2}\right\rangle + \left\langle\frac{1}{2}\middle|\frac{1}{2}\right\rangle + \left|\frac{1}{2}\right\rangle\left\langle\frac{1}{2}\right| + \left\langle\frac{a^2}{b^2}\right| + \left|\frac{e^{x^2}}{e^{y^2}}\right\rangle$$

$$\langle|\rangle \quad \langle|\rangle \quad \left\langle|\right\rangle \quad \left\langle\middle|\right\rangle \quad \left\langle\middle|\middle|\right\rangle \qquad \langle\!|\rangle \quad \langle\!|\!\rangle \quad \langle\!|\!\rangle \quad \langle\!\langle|\!\rangle\!\rangle \quad \langle\!\langle|\!|\!\rangle\!\rangle$$

- Matrices:

$$\begin{pmatrix} a & b \\ c & d \end{pmatrix} + \begin{pmatrix} a & b \\ c & d \end{pmatrix}$$

$$\begin{pmatrix} a & b & c & d \\ x & y & z & w \end{pmatrix} \quad \begin{bmatrix} a & b & c & d \\ x & y & z & w \end{bmatrix} \quad \begin{Bmatrix} a & b & c & d \\ x & y & z & w \end{Bmatrix} \quad \begin{vmatrix} a & b & c & d \\ x & y & z & w \end{vmatrix} \quad \begin{Vmatrix} a & b & c & d \\ x & y & z & w \end{Vmatrix}$$

$$\begin{pmatrix} a & b & c & d \\ k & l & m & n \\ x & y & z & w \end{pmatrix} \quad \begin{bmatrix} a & b & c & d \\ k & l & m & n \\ x & y & z & w \end{bmatrix} \quad \begin{Bmatrix} a & b & c & d \\ k & l & m & n \\ x & y & z & w \end{Bmatrix} \quad \begin{vmatrix} a & b & c & d \\ k & l & m & n \\ x & y & z & w \end{vmatrix} \quad \begin{Vmatrix} a & b & c & d \\ k & l & m & n \\ x & y & z & w \end{Vmatrix}$$

$$\begin{pmatrix} a & b & c & d \\ k & l & m & n \\ p & q & s & t \\ x & y & z & w \end{pmatrix} \quad \begin{bmatrix} a & b & c & d \\ k & l & m & n \\ p & q & s & t \\ x & y & z & w \end{bmatrix} \quad \begin{Bmatrix} a & b & c & d \\ k & l & m & n \\ p & q & s & t \\ x & y & z & w \end{Bmatrix} \quad \begin{vmatrix} a & b & c & d \\ k & l & m & n \\ p & q & s & t \\ x & y & z & w \end{vmatrix} \quad \begin{Vmatrix} a & b & c & d \\ k & l & m & n \\ p & q & s & t \\ x & y & z & w \end{Vmatrix}$$

- Nablas:

$$\nabla x + \nabla f + \nabla \cdot \boldsymbol{u} + \nabla \times \boldsymbol{v}$$

$$\nabla \quad \boldsymbol{\nabla} \quad \nabla \quad \boldsymbol{\nabla}; \quad \tilde{\nabla} \quad \tilde{\boldsymbol{\nabla}} \quad \tilde{\nabla} \quad \tilde{\boldsymbol{\nabla}}$$

- Over-/underline and over-/underbraces

$$\overline{b} \quad \overline{ab} \quad \overline{abc} \quad \overline{abcd} \quad \overline{abcde} \quad \overline{a+b+c} \quad \overline{x_1, x_2, \dots, x_n}$$

$$\overset{\frown}{} \quad \widehat{b} \quad \widehat{ab} \quad \widehat{abc} \quad \widehat{abcd} \quad \widehat{abcde} \quad \widehat{a+b+c} \quad \overbrace{x_1, x_2, \dots, x_n}^{n}$$

$$\overset{\sqcap}{} \quad \overline{b} \quad \overline{ab} \quad \overline{abc} \quad \overline{abcd} \quad \overline{abcde} \quad \overline{a+b+c} \quad \overbrace{x_1, x_2, \dots, x_n}^{n}$$

$$\overset{\overbrace{\ }}{} \quad \overbrace{b} \quad \overbrace{ab} \quad \overbrace{abc} \quad \overbrace{abcd} \quad \overbrace{abcde} \quad \overbrace{a+b+c} \quad \overbrace{x_1, x_2, \dots, x_n}^{n}$$

$$\underline{b} \quad \underline{ab} \quad \underline{abc} \quad \underline{abcd} \quad \underline{abcde} \quad \underline{a+b+c} \quad \underline{x_1, x_2, \dots, x_n}$$

$$\underset{\smile}{} \quad \underset{\smile}{b} \quad \underset{\smile}{ab} \quad \underset{\smile}{abc} \quad \underset{\smile}{abcd} \quad \underset{\smile}{abcde} \quad \underset{\smile}{a+b+c} \quad \underbrace{x_1, x_2, \dots, x_n}_{n}$$

$$\underset{\sqcup}{} \quad \underset{\sqcup}{b} \quad \underset{\sqcup}{ab} \quad \underset{\sqcup}{abc} \quad \underset{\sqcup}{abcd} \quad \underset{\sqcup}{abcde} \quad \underset{\sqcup}{a+b+c} \quad \underbrace{x_1, x_2, \dots, x_n}_{n}$$

$$\underset{\underbrace{\ }}{} \quad \underbrace{b} \quad \underbrace{ab} \quad \underbrace{abc} \quad \underbrace{abcd} \quad \underbrace{abcde} \quad \underbrace{a+b+c} \quad \underbrace{x_1, x_2, \dots, x_n}_{n}$$

- Primes

$$x'x''x'''x''''x^{x'}x^{x''}x^{x'''}x^{x''''}x^{x}$$

$$x'x''x'''x$$

$$x'x''x'''x$$

```
\lim\limits_{x\to\infty} \frac{1}{x^2} = 0
```

$$\lim_{x\to\infty} \frac{1}{x^2} = 0$$

```
\frac{\partial y(x)}{\partial x} = \frac{\symup{d}y(x)}{\symup{d}x} = y'(x)
```

$$\frac{\partial y(x)}{\partial x} = \frac{\mathrm{d}y(x)}{\mathrm{d}x} = y'(x)$$