MathML Browser Test (Presentation Markup)

Safari -- 11/21/2011 -- iOS 5.01 w/native fonts

This is an HTML5 using MathML document.
Click on a formula/equation to see the source code that generated it.
If you are having problems viewing this document, try viewing this older version.

Formula	Image of TeX rendering (MiKTeX 2.9)	Image of MathML rendering (Firefox 4.0 with STIX Fonts)	MathML rendering (by this browser)
Axiom of power set	$\forall A\, \exists P\, \forall B\, [B \in P \iff \forall C\, (C \in B \Rightarrow C \in A)]$	$\forall A\, \exists P\, \forall B\, [B \in P \iff \forall C\, (C \in B \Rightarrow C \in A)]$	$\forall A \exists P \forall B \left[B \in P \square \forall C \left(C \in B \Rightarrow C\right.\right.$
De Morgan's law	**Logic:** $\neg(p \wedge q) \iff (\neg p) \vee (\neg q)$ **Boolean algebra:** $\overline{\bigcup_{i=1}^{n} A_i} = \bigcap_{i=1}^{n} \overline{A_i}$	Logic: $\neg(p \wedge q) \iff (\neg p) \vee (\neg q)$ Boolean algebra: $\overline{\bigcup_{i=1}^{n} A_i} = \bigcap_{i=1}^{n} \overline{A_i}$	Logic: $\neg\left(p \wedge q\right) \square \left(\neg p\right) \vee \left(\neg\right.$ Boolean algebra: $\bigcup_{i=1}^{n} A_i = \bigcap_{i=1}^{n} A$
Quadratic Formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Binomial Coefficient	$\mathbf{C}(n, k) = \mathbf{C}_k^n = {}_n\mathbf{C}_k = \binom{n}{k} = \frac{n!}{k!\,(n-k)!}$	$C(n, k) = C_k^n = {}_nC_k = \binom{n}{k} = \frac{n!}{k!\,(n-k)!}$	$C\left(n, k\right) = C_k^n = C\ k\ n = \square \begin{matrix} n \\ k \end{matrix} \square = \frac{}{k!\,(}$
Sophomore's dream	$\int_0^1 x^x\, \mathrm{d}x = \sum_{n=1}^{\infty} (-1)^{n+1}\, n^{-n}$	$\int_0^1 x^x\, dx = \sum_{n=1}^{\infty} (-1)^{n+1} n^{-n}$	$\int_0^1 x^x dx = \sum_{n=1}^{\infty} \left(-1\right)^{n+1} n^{-n}$
Divergence	$\nabla \cdot \vec{v} = \frac{\partial v_x}{\partial x} + \frac{\partial v_y}{\partial y} + \frac{\partial v_z}{\partial z}$	$\nabla \cdot \vec{v} = \frac{\partial v_x}{\partial x} + \frac{\partial v_y}{\partial y} + \frac{\partial v_z}{\partial z}$	$\nabla \cdot \vec{v} = \frac{\partial v_x}{\partial x} + \frac{\partial v_y}{\partial y} + \frac{\partial v_z}{\partial z}$
Complex number	$c = \overbrace{\underbrace{a}_{\text{real}} + \underbrace{bi}_{\text{imaginary}}}^{\text{complex number}}$	$c = \overbrace{\underbrace{a}_{\text{real}} + \underbrace{b\,i}_{\text{imaginary}}}^{\text{complex number}}$	$c = \overset{\text{complex number}}{\underset{\text{real}}{a} + \underset{\text{imaginary}}{b\,i}}$
Moore determinant	$M = \begin{bmatrix} \alpha_1 & \alpha_1^q & \cdots & \alpha_1^{q^{n-1}} \\ \alpha_2 & \alpha_2^q & \cdots & \alpha_2^{q^{n-1}} \\ \vdots & \vdots & \ddots & \vdots \\ \alpha_m & \alpha_m^q & \cdots & \alpha_m^{q^{n-1}} \end{bmatrix}$	$M = \begin{bmatrix} \alpha_1 & \alpha_1^q & \dots & \alpha_1^{q^{n-1}} \\ \alpha_2 & \alpha_2^q & \dots & \alpha_2^{q^{n-1}} \\ \vdots & \vdots & \ddots & \vdots \\ \alpha_m & \alpha_m^q & \dots & \alpha_m^{q^{n-1}} \end{bmatrix}$	$M = \begin{matrix} \alpha_1 & \alpha_1^q & \dots & \alpha_1^{q^{n-1}} \\ \alpha_2 & \alpha_2^q & \dots & \alpha_2^{q^{n-1}} \\ \vdots & \vdots & \ddots & \vdots \\ \alpha_m & \alpha_m^q & \dots & \alpha_m^{q^{n-1}} \end{matrix}$
Sphere volume	Spherical coordinates derivation of the volume of a sphere $\left(\frac{4}{3}\pi R^3\right)$. The formula S for a sphere of radius R in spherical coordinates is: $S = \{0 \le \phi \le 2\pi,\ 0 \le \theta \le \pi,\ 0 \le \rho \le R\}$ $\text{Volume} = \iiint_S \rho^2 \sin\theta\, \mathrm{d}\rho\, \mathrm{d}\theta\, \mathrm{d}\phi$ $= \int_0^{2\pi} \mathrm{d}\phi \int_0^{\pi} \sin\theta\, \mathrm{d}\theta \int_0^R \rho^2 \mathrm{d}\rho$ $= \phi\Big\vert_0^{2\pi}\ (-\cos\theta)\Big\vert_0^{\pi}\ \tfrac{1}{3}\rho^3\Big\vert_0^R$ $= 2\pi \times 2 \times \tfrac{1}{3}R^3$ $= \tfrac{4}{3}\pi R^3$	Spherical coordinates derivation of the volume of a sphere $\left(\frac{4}{3}\pi R^3\right)$. The formula S for a sphere of radius R in spherical coordinates is: $S = \{0 \le \phi \le 2\pi,\ 0 \le \theta \le \pi,\ 0 \le \rho \le R\}$ $\text{Volume} = \iiint_S \rho^2 \sin\theta\, d\rho\, d\theta\, d\phi$ $= \int_0^{2\pi} d\phi \int_0^{\pi} \sin\theta\, d\theta \int_0^R \rho^2\, d\rho$ $= \phi\Big\vert_0^{2\pi} (-\cos\theta)\Big\vert_0^{\pi} \frac{1}{3}\rho^3\Big\vert_0^R$ $= 2\pi \times 2 \times \frac{1}{3}R^3$ $= \frac{4}{3}\pi R^3$	Spherical coordinates derivation of the volume of a sph The formula S for a sphere of radius R in spherical coord $S = \{0 \le \phi \le 2\pi, 0 \le \theta \le \pi\}$ $\text{Volume} = \iiint_S \rho^2 \sin\theta\, d\rho\, d\theta\, d\phi$ $= \int_0^{2\pi} d\phi \int_0^{\pi} \sin\theta\, d\theta \int_0^R \rho^2 d\rho$ $= \phi \square_0^{2\pi} \left(-\cos\theta\right) \square_0^{\pi} \frac{1}{3}\rho^3 \square$ $= 2\pi \times 2 \times \frac{1}{3}R^3$ $= \frac{4}{3}\pi R^3$
Schwinger-Dyson equation	$\left\langle \psi \middle\vert \mathcal{T}\left\{\frac{\delta}{\delta\phi}F[\phi]\right\} \middle\vert \psi \right\rangle = -i \left\langle \psi \middle\vert \mathcal{T}\left\{F[\phi]\frac{\delta}{\delta\phi}S[\phi]\right\} \middle\vert \psi \right\rangle$	$\left\langle \psi \middle\vert \mathcal{T}\left\{\frac{\delta}{\delta\phi}F[\phi]\right\} \middle\vert \psi \right\rangle = -i \left\langle \psi \middle\vert \mathcal{T}\left\{F[\phi]\frac{\delta}{\delta\phi}S[\phi]\right\} \middle\vert \psi \right\rangle$	$\square \psi \square \square \square \frac{\delta}{\delta\phi} F[\phi] \square \square \psi \square = -i \square \psi \square \square \square F[\phi]$

[Differentiable Manifold (tangent vector)]	$\gamma_1 \equiv \gamma_2 \iff \begin{cases} \gamma_1(0)=\gamma_2(0)=p, \text{ and} \\ \frac{d}{dt}\phi\circ\gamma_1(t)\big\vert_{t=0} = \frac{d}{dt}\phi\circ\gamma_2(t)\big\vert_{t=0} \end{cases}$	$\gamma_1 \equiv \gamma_2 \iff \begin{cases} \gamma_1(0)=\gamma_2(0)=p, \text{ and} \\ \frac{d}{dt}\phi\circ\gamma_1(t)\big\vert_{t=0} = \frac{d}{dt}\phi\circ\gamma_2(t)\big\vert_{t=0} \end{cases}$	$\gamma_1 \equiv \gamma_2 \square \square\ \gamma_1\ (0) = \gamma_2\ (0) = p$, and $\square\ \frac{d}{dt}\phi\circ\gamma_1\ (t)\ \square_{t=0} = \square\ \frac{d}{dt}\phi\circ\gamma_2$ (
[Cichoń's Diagram]	$\begin{array}{ccccccccc} & & \mathrm{cov}(\mathcal{L}) & \longrightarrow & \mathrm{non}(\mathcal{K}) & \longrightarrow & \mathrm{cof}(\mathcal{K}) & \longrightarrow & \mathrm{cof}(\mathcal{L}) & \longrightarrow & 2^{\aleph_0} \\ & & \uparrow & & \uparrow & & \uparrow & & \uparrow & & \\ & & & & \mathfrak{b} & \longrightarrow & \mathfrak{d} & & & & \\ & & & & \uparrow & & \uparrow & & & & \\ \aleph_1 & \longrightarrow & \mathrm{add}(\mathcal{L}) & \longrightarrow & \mathrm{add}(\mathcal{K}) & \longrightarrow & \mathrm{cov}(\mathcal{K}) & \longrightarrow & \mathrm{non}(\mathcal{L}) & & \end{array}$	$\begin{array}{ccccccccc} & & \mathrm{cov}(\mathcal{L}) & \longrightarrow & \mathrm{non}(\mathcal{K}) & \longrightarrow & \mathrm{cof}(\mathcal{K}) & \longrightarrow & \mathrm{cof}(\mathcal{L}) & \longrightarrow & 2^{\aleph_0} \\ & & \uparrow & & \uparrow & & \uparrow & & \uparrow & & \\ & & & & \mathfrak{b} & \longrightarrow & \mathfrak{d} & & & & \\ & & & & \uparrow & & \uparrow & & & & \\ \aleph_1 & \longrightarrow & \mathrm{add}(\mathcal{L}) & \longrightarrow & \mathrm{add}(\mathcal{K}) & \longrightarrow & \mathrm{cov}(\mathcal{K}) & \longrightarrow & \mathrm{non}(\mathcal{L}) & & \end{array}$	$\begin{array}{ccccccc} & \mathrm{cov}\ (\mathcal{L}) & \square & \mathrm{non}\ (\square) & \square & \mathrm{cof}\ (\square) & \square\ \mathrm{co} \\ & \uparrow & & \uparrow & & \uparrow & \\ & \square & \square & \square & & & \\ & \uparrow & & \uparrow & & & \\ \aleph_1 & \square & \mathrm{add}\ (\mathcal{L}) & \square & \mathrm{add}\ (\square) & \square & \mathrm{cov}\ (\square) \end{array}$
multiscripts & greek alphabet		$\overset{{}^{\kappa}_{\iota}\mathfrak{C}^{\lambda}_{\mu}}{\underset{{}^{\chi}_{\phi}\mathfrak{F}^{\psi}_{\omega}}{{}^{\zeta}_{\varepsilon}\mathfrak{B}^{\eta}_{\theta}\,{}^{\beta}_{\alpha}\mathfrak{A}^{\gamma}_{\delta}\prod{}^{\xi}_{\nu}\mathfrak{D}^{o}_{\pi}\,{}^{\sigma}_{\rho}\mathfrak{E}^{\tau}_{\upsilon}}}$	$\overset{\mathfrak{C}\,\mu\,\lambda\,\iota\,\kappa}{\underset{\square\,\omega\,\psi\,\phi\,\chi}{\prod \square\,\upsilon\,\tau\,\rho\,\sigma\,\square\,\pi\,o\,\nu\,\xi\,\square\,\delta}}$
nested roots	$\frac{\sqrt{1+\sqrt[3]{2+\sqrt[5]{3+\sqrt[7]{4+\sqrt[11]{5+\sqrt[13]{6+\sqrt[17]{7+\sqrt[19]{A}}}}}}}}}{e^{\pi}} = x'''$	$\frac{\sqrt{1+\sqrt[3]{2+\sqrt[5]{3+\sqrt[7]{4+\sqrt[11]{5+\sqrt[13]{6+\sqrt[17]{7+\sqrt[19]{A}}}}}}}}}{e^{\pi}} = x'''$	$\frac{\sqrt{1+\sqrt[3]{2+\sqrt[5]{3+\sqrt[7]{4+\sqrt[11]{5+\sqrt[13]{6+\sqrt[17]{7+\sqrt[19]{\ }}}}}}}}}{e^{\pi}}$
nested matrices	$\left(\begin{array}{cc} \begin{pmatrix} a_1 & a_2 & a_3 & a_4 \\ a_5 & a_6 & a_7 & a_8 \end{pmatrix} & \multirow{2}{*}{$\begin{pmatrix} b_1 \\ b_2 \\ b_3 \\ b_4 \end{pmatrix}$} \\ 0 \quad \begin{pmatrix} c_1 & c_2 \\ c_3 & c_4 \end{pmatrix} & \end{array}\right)$	$\left(\begin{array}{cc} \left(\begin{array}{c} \begin{pmatrix} a_1 & a_2 & a_3 & a_4 \\ a_5 & a_6 & a_7 & a_8 \end{pmatrix} \\ 0 \quad \begin{pmatrix} c_1 & c_2 \\ c_3 & c_4 \end{pmatrix} \end{array}\right. & \begin{pmatrix} b_1 \\ b_2 \\ b_3 \\ b_4 \end{pmatrix} \end{array}\right)$	$\square\ \square\ a_1\ a_2\ a_3\ a_4\ \square\ \ a_5\ a_6\ a_7\ a_8\ \square\ \ \square\ b_1\ b_2\ b_3\ b_4\ \ 0\ \square\ c_1\ c_2\ c_3\ c_4\ \square$
font sizes	Huge, Large, normalsize, small	scriptlevel : -3, -2, -1, 0, 1	scriptlevel : $(-3, -2, -1, 0$

NOTES:

I hope this site can be used as a learning aid (tutorial by example) for mathematics in TeX/LaTeX and in coding MathML.
A small sample of many different types of mathematical expressions and equations is shown.
All the examples are complete with the source code available. (Just click on the equation/formula.)

This web page was validated as:

- `HTML5` at The W3C Markup Validation Service
- `CSS level 3` at The W3C CSS Validation Service
- `Section 508` accessibility requirements/guidelines at The HiSoftware Cynthia Says Portal

Lessons Learned Working on MathML with STIX Fonts on Firefox:

When using an `mtable`, the table cell (`mtd`) default vertical padding produces excessive spacing. Setting the top and bottom padding to zero "`0`" fixes this.

When using the `mfenced` tag, the "fences" have no spacing around them.
When using the vertical bar "|" (`|`) as a fence, adding a little spacing around it improves the readability of the result.

Firebug is an add-on to the Firefox browser. It is a great development tool that works well with MathML.

Bugs / Enhancements:

- Firefox: Bug 236963 - (stretchy-in-cells) Stretchy characters don't stretch in mtable cells
- Firefox: Bug 403958 - mroot and msqrt overlines not consistent with right hooks in radical glyphs
- Firefox: Bug 491384 - MathML does not honor columnalign attribute of mtable element
- Firefox: Bug 491668 - MathML elements rendered x & y position available but width and height undefined
- Firefox: Bug 504324 - Hyper-linked MathML formulas should have default text-decoration property set to none
- Firebug: Issue 3159 - Show numeric character reference of MathML

Useful Links:

- W3C Math Home
- Latest MathML Recommendation
- W3C MathML Test Suite
- HTML5 (Working Draft)
- HTML5 (Working Draft) Named Character References
- XML Entity definitions for Characters
- MathML Characters
- Mozilla Firefox Browser
- MathML in Mozilla
- Fonts for MathML-enabled Mozilla
- MathML Torture Test
- MathPlayer: MathML for Internet Explorer
- Short Math Guide for LaTeX (PDF)
- TeX: Help displaying a formula
- LaTeX - Wikibooks, collection of open-content textbooks
- MiKTex: TeX for Windows
- TeXShop: TeX for Mac OS X

Comments / Suggestions / Corrections to : (*joe.java* AT *eyeasme* DOT *com*)

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