

MathML Browser Test (Presentation Markup)

Safari 5.1 (7534.48.3) -- 7/22/2011 -- OS X10.7
w/ STIX 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	$\forall A \exists P \forall B [B \in P \iff \forall C (C \in B \Rightarrow C \in A)]$	$\forall A \exists P \forall B [B \in P \iff \forall C (C \in B \Rightarrow C \in A)]$	$\forall A \exists P \forall B [B \in P \forall C (C \in B \Rightarrow C \in A)]$
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: $\neg(p \wedge q) \iff (\neg p) \vee (\neg q)$ Boolean algebra: $\overline{\bigcup_{i=1}^n A_i} = \bigcap_{i=1}^n \overline{A_i}$
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	$C(n, k) = C_k^n = {}_n C_k = \binom{n}{k} = \frac{n!}{k!(n-k)!}$	$C(n, k) = C_k^n = {}_n C_k = \binom{n}{k} = \frac{n!}{k!(n-k)!}$	$C(n, k) = C_k^n = {}_n C_k = \binom{n}{k} = \frac{n!}{k!(n-k)!}$
Sophomore's dream	$\int_0^1 x^x dx = \sum_{n=1}^{\infty} (-1)^{n+1} n^{-n}$	$\int_0^1 x^x dx = \sum_{n=1}^{\infty} (-1)^{n+1} n^{-n}$	$\int_0^1 x^x dx = \sum_{n=1}^{\infty} (-1)^{n+1} n^{-n}$
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	$c = \underbrace{a}_{\text{real}} + \underbrace{bi}_{\text{imaginary}}$	$c = \underbrace{a}_{\text{real}} + \underbrace{bi}_{\text{imaginary}}$	complex number $c = \underbrace{a}_{\text{real}} + \underbrace{bi}_{\text{imaginary}}$
Moore determinant	$M = \begin{bmatrix} \alpha_1 & \alpha_1^q & \dots & \alpha_1^{q^{n-1}} \\ \alpha_2 & \alpha_2^q & \dots & \alpha_2^{q^{n-1}} \\ \vdots & \vdots & \ddots & \vdots \\ \alpha_m & \alpha_m^q & \dots & \alpha_m^{q^{n-1}} \end{bmatrix}$	$M = \begin{bmatrix} \alpha_1 & \alpha_1^q & \dots & \alpha_1^{q^{n-1}} \\ \alpha_2 & \alpha_2^q & \dots & \alpha_2^{q^{n-1}} \\ \vdots & \vdots & \ddots & \vdots \\ \alpha_m & \alpha_m^q & \dots & \alpha_m^{q^{n-1}} \end{bmatrix}$	$M = \begin{bmatrix} \alpha_1 & \alpha_1^q & \dots & \alpha_1^{q^{n-1}} \\ \alpha_2 & \alpha_2^q & \dots & \alpha_2^{q^{n-1}} \\ \vdots & \vdots & \ddots & \vdots \\ \alpha_m & \alpha_m^q & \dots & \alpha_m^{q^{n-1}} \end{bmatrix}$
Sphere volume	Spherical coordinates derivation of the volume of a sphere ($\frac{4}{3}\pi R^3$). The formula S for a sphere of radius R in spherical coordinates is: $S = \{0 \leq \phi \leq 2\pi, 0 \leq \theta \leq \pi, 0 \leq \rho \leq R\}$ $\text{Volume} = \iiint_S \rho^2 \sin \theta \, d\rho \, d\theta \, d\phi$ $= \int_0^{2\pi} d\phi \int_0^\pi \sin \theta \, d\theta \int_0^R \rho^2 \, d\rho$ $= \phi \Big _0^{2\pi} (-\cos \theta) \Big _0^\pi \frac{1}{3} \rho^3 \Big _0^R$ $= 2\pi \times 2 \times \frac{1}{3} R^3$ $= \frac{4}{3} \pi R^3$	Spherical coordinates derivation of the volume of a sphere ($\frac{4}{3}\pi R^3$). The formula S for a sphere of radius R in spherical coordinates is: $S = \{0 \leq \phi \leq 2\pi, 0 \leq \theta \leq \pi, 0 \leq \rho \leq R\}$ $\text{Volume} = \iiint_S \rho^2 \sin \theta \, d\rho \, d\theta \, d\phi$ $= \int_0^{2\pi} d\phi \int_0^\pi \sin \theta \, d\theta \int_0^R \rho^2 \, d\rho$ $= \phi \Big _0^{2\pi} (-\cos \theta) \Big _0^\pi \frac{1}{3} \rho^3 \Big _0^R$ $= 2\pi \times 2 \times \frac{1}{3} R^3$ $= \frac{4}{3} \pi R^3$	Spherical coordinates derivation of the volume of a sphere ($\frac{4}{3}\pi R^3$). The formula S for a sphere of radius R in spherical coordinates is: $S = \{0 \leq \phi \leq 2\pi, 0 \leq \theta \leq \pi, 0 \leq \rho \leq R\}$ $\text{Volume} = \iiint_S \rho^2 \sin \theta \, d\rho \, d\theta \, d\phi$ $= \int_0^{2\pi} d\phi \int_0^\pi \sin \theta \, d\theta \int_0^R \rho^2 \, d\rho$ $= \phi \Big _0^{2\pi} (-\cos \theta) \Big _0^\pi \frac{1}{3} \rho^3 \Big _0^R$ $= 2\pi \times 2 \times \frac{1}{3} R^3$ $= \frac{4}{3} \pi R^3$
Schwinger-Dyson equation	$\langle \psi \mathcal{T} \left\{ \frac{\delta}{\delta \phi} F[\phi] \right\} \psi \rangle = -i \langle \psi \mathcal{T} \left\{ F[\phi] \frac{\delta}{\delta \phi} S[\phi] \right\} \psi \rangle$	$\langle \psi \mathcal{T} \left\{ \frac{\delta}{\delta \phi} F[\phi] \right\} \psi \rangle = -i \langle \psi \mathcal{T} \left\{ F[\phi] \frac{\delta}{\delta \phi} S[\phi] \right\} \psi \rangle$	$\langle \psi \mathcal{T} \left\{ \frac{\delta}{\delta \phi} F[\phi] \right\} \psi \rangle = -i \langle \psi \mathcal{T} \left\{ F[\phi] \frac{\delta}{\delta \phi} S[\phi] \right\} \psi \rangle$
Differentiable Manifold (tangent vector)	$\gamma_1 \equiv \gamma_2 \iff \begin{cases} \gamma_1(0) = \gamma_2(0) = p, \text{ and} \\ \frac{d}{dt} \phi \circ \gamma_1(t) \Big _{t=0} = \frac{d}{dt} \phi \circ \gamma_2(t) \Big _{t=0} \end{cases}$	$\gamma_1 \equiv \gamma_2 \iff \begin{cases} \gamma_1(0) = \gamma_2(0) = p, \text{ and} \\ \left. \frac{d}{dt} \phi \circ \gamma_1(t) \right _{t=0} = \left. \frac{d}{dt} \phi \circ \gamma_2(t) \right _{t=0} \end{cases}$	$\gamma_1 \equiv \gamma_2 \iff \begin{cases} \gamma_1(0) = \gamma_2(0) = p, \text{ and} \\ \left. \left(\frac{d}{dt} \phi \circ \gamma_1(t) \right) \right _{t=0} = \left. \left(\frac{d}{dt} \phi \circ \gamma_2(t) \right) \right _{t=0} \end{cases}$
Cichoń's Diagram	$\begin{array}{ccccccc} \text{cov}(\mathcal{L}) & \rightarrow & \text{non}(\mathcal{K}) & \rightarrow & \text{cof}(\mathcal{K}) & \rightarrow & \text{cof}(\mathcal{L}) \rightarrow 2^{\aleph_1} \\ \uparrow & & \uparrow & & \uparrow & & \uparrow \\ \aleph_1 & \rightarrow & \text{add}(\mathcal{L}) & \rightarrow & \text{add}(\mathcal{K}) & \rightarrow & \text{cov}(\mathcal{K}) \rightarrow \text{non}(\mathcal{L}) \end{array}$	$\begin{array}{ccccccc} \text{cov}(\mathcal{S}) & \rightarrow & \text{non}(\mathcal{B}) & \rightarrow & \text{cof}(\mathcal{B}) & \rightarrow & \text{cof}(\mathcal{S}) \rightarrow 2^{\aleph_0} \\ \uparrow & & \uparrow & & \uparrow & & \uparrow \\ \aleph_1 & \rightarrow & \text{add}(\mathcal{S}) & \rightarrow & \text{add}(\mathcal{B}) & \rightarrow & \text{cov}(\mathcal{B}) \rightarrow \text{non}(\mathcal{S}) \end{array}$	$\begin{array}{ccccccc} \text{cov}(\mathcal{S}) & \rightarrow & \text{non}(\mathcal{B}) & \rightarrow & \text{cof}(\mathcal{B}) & \rightarrow & \text{cof}(\mathcal{S}) \rightarrow 2^{\aleph_0} \\ \uparrow & & \uparrow & & \uparrow & & \uparrow \\ \aleph_1 & \rightarrow & \text{add}(\mathcal{S}) & \rightarrow & \text{add}(\mathcal{B}) & \rightarrow & \text{cov}(\mathcal{B}) \rightarrow \text{non}(\mathcal{S}) \end{array}$
multiscripts & greek alphabet	$\begin{array}{c} \kappa \epsilon^\lambda \\ \zeta \mathfrak{B}^\eta \prod \xi \mathfrak{D}^\sigma \pi \\ \beta \mathfrak{A}^\gamma \prod \sigma \mathfrak{E}^\tau \\ \chi \mathfrak{F}^\psi \\ \phi \mathfrak{G}^\omega \end{array}$	$\begin{array}{c} \kappa \epsilon^\lambda \\ \zeta \mathfrak{B}^\eta \prod \xi \mathfrak{D}^\sigma \pi \\ \beta \mathfrak{A}^\gamma \prod \sigma \mathfrak{E}^\tau \\ \chi \mathfrak{F}^\psi \\ \phi \mathfrak{G}^\omega \end{array}$	$\begin{array}{c} \epsilon \mu \lambda \kappa \\ \zeta \mathfrak{B}^\eta \prod \xi \mathfrak{D}^\sigma \pi \\ \beta \mathfrak{A}^\gamma \prod \sigma \mathfrak{E}^\tau \\ \chi \mathfrak{F}^\psi \\ \phi \mathfrak{G}^\omega \end{array}$
nested roots	$\sqrt{1 + \sqrt[3]{2 + \sqrt[5]{3 + \sqrt[7]{4 + \sqrt[11]{5 + \sqrt[13]{6 + \sqrt[17]{7 + \sqrt[19]{A}}}}}}}} = x^m$	$\sqrt{1 + \sqrt[3]{2 + \sqrt[5]{3 + \sqrt[7]{4 + \sqrt[11]{5 + \sqrt[13]{6 + \sqrt[17]{7 + \sqrt[19]{A}}}}}}}} = x^m$	$\sqrt{1 + \sqrt[3]{2 + \sqrt[5]{3 + \sqrt[7]{4 + \sqrt[11]{5 + \sqrt[13]{6 + \sqrt[17]{7 + \sqrt[19]{A}}}}}}}} = x^m$
nested matrices	$\begin{pmatrix} \begin{pmatrix} a_1 & a_2 & a_3 & a_4 \\ a_5 & a_6 & a_7 & a_8 \end{pmatrix} & \begin{pmatrix} b_1 \\ b_2 \\ b_3 \\ b_4 \end{pmatrix} \\ 0 & \begin{pmatrix} c_1 & c_2 \\ c_3 & c_4 \end{pmatrix} \end{pmatrix}$	$\begin{pmatrix} \begin{pmatrix} a_1 & a_2 & a_3 & a_4 \\ a_5 & a_6 & a_7 & a_8 \end{pmatrix} & \begin{pmatrix} b_1 \\ b_2 \\ b_3 \\ b_4 \end{pmatrix} \\ 0 & \begin{pmatrix} c_1 & c_2 \\ c_3 & c_4 \end{pmatrix} \end{pmatrix}$	$\begin{pmatrix} \begin{pmatrix} a_1 & a_2 & a_3 & a_4 \\ a_5 & a_6 & a_7 & a_8 \end{pmatrix} & \begin{pmatrix} b_1 \\ b_2 \\ b_3 \\ b_4 \end{pmatrix} \\ 0 & \begin{pmatrix} c_1 & c_2 \\ c_3 & c_4 \end{pmatrix} \end{pmatrix}$
font sizes	Huge, Large, normalsize, small	scriptlevel: $-3, -2, -1, 0, 1$	scriptlevel: $(-3, -2, -1, 0, 1)$

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 and WCAG-Priority 1,2,3 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 (`mtcd`) default vertical padding produces excessive spacing. Setting the top and bottom padding to zero "0" fixes this.

When using the `menced` 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](#)