

# MathML Browser Test (Presentation Markup)

Safari 6.0.1 (8536.26.14) -- 10/02/2011 -- OSX 10.8.2 w/STIX 1.1 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 \(XHTML 1.1 plus MathML 2.0\)](#).

Formula	Image of TeX rendering (MikTeX 2.9)	Image of MathML rendering (Firefox 4.0 with STIX Fonts)	MathML rendering (by this browser)
<a href="#">Axiom of power set</a>	$\forall A \exists P \forall B [B \in P \iff \forall C (C \in B \Rightarrow C \in A)]$	$\forall A \exists P \forall B [B \in P \iff \forall C (C \in B \Rightarrow C \in A)]$	$\forall A \exists P \forall B [B \in P \iff \forall C (C \in B \Rightarrow C \in A)]$
<a href="#">De Morgan's law</a>	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: $\overline{\bigcup_{i=1}^n A_i} = \bigcap_{i=1}^n \overline{A_i}$
<a href="#">Quadratic Formula</a>	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
<a href="#">Binomial Coefficient</a>	$C(n, k) = C_k^n = {}_n C_k = \binom{n}{k} = \frac{n!}{k!(n-k)!}$	$C(n, k) = C_k^n = {}_n C_k = \binom{n}{k} = \frac{n!}{k!(n-k)!}$	$C(n, k) = C_k^n = {}_n C_k = \binom{n}{k} = \frac{n!}{k!(n-k)!}$
<a href="#">Sophomore's dream</a>	$\int_0^1 x^x dx = \sum_{n=1}^{\infty} (-1)^{n+1} n^{-n}$	$\int_0^1 x^x dx = \sum_{n=1}^{\infty} (-1)^{n+1} n^{-n}$	$\int_0^1 x^x dx = \sum_{n=1}^{\infty} (-1)^{n+1} n^{-n}$
<a href="#">Divergence</a>	$\nabla \cdot \vec{v} = \frac{\partial v_x}{\partial x} + \frac{\partial v_y}{\partial y} + \frac{\partial v_z}{\partial z}$	$\nabla \cdot \vec{v} = \frac{\partial v_x}{\partial x} + \frac{\partial v_y}{\partial y} + \frac{\partial v_z}{\partial z}$	$\nabla \cdot \vec{v} = \frac{\partial v_x}{\partial x} + \frac{\partial v_y}{\partial y} + \frac{\partial v_z}{\partial z}$
<a href="#">Complex number</a>	$c = \underbrace{a}_{\text{real}} + \underbrace{bi}_{\text{imaginary}}$	$c = \underbrace{a}_{\text{real}} + \underbrace{bi}_{\text{imaginary}}$	$c = \underbrace{a}_{\text{real}} + \underbrace{bi}_{\text{imaginary}}$
<a href="#">Moore determinant</a>	$M = \begin{bmatrix} \alpha_1 & \alpha_1^q & \dots & \alpha_1^{q^{n-1}} \\ \alpha_2 & \alpha_2^q & \dots & \alpha_2^{q^{n-1}} \\ \vdots & \vdots & \ddots & \vdots \\ \alpha_m & \alpha_m^q & \dots & \alpha_m^{q^{n-1}} \end{bmatrix}$	$M = \begin{bmatrix} \alpha_1 & \alpha_1^q & \dots & \alpha_1^{q^{n-1}} \\ \alpha_2 & \alpha_2^q & \dots & \alpha_2^{q^{n-1}} \\ \vdots & \vdots & \ddots & \vdots \\ \alpha_m & \alpha_m^q & \dots & \alpha_m^{q^{n-1}} \end{bmatrix}$	$M = \begin{bmatrix} \alpha_1 & \alpha_1^q & \dots & \alpha_1^{q^{n-1}} \\ \alpha_2 & \alpha_2^q & \dots & \alpha_2^{q^{n-1}} \\ \vdots & \vdots & \ddots & \vdots \\ \alpha_m & \alpha_m^q & \dots & \alpha_m^{q^{n-1}} \end{bmatrix}$
<a href="#">Sphere volume</a>	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: $S = \{0 \leq \phi \leq 2\pi, 0 \leq \theta \leq \pi, 0 \leq \rho \leq R\}$ 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: $S = \{0 \leq \phi \leq 2\pi, 0 \leq \theta \leq \pi, 0 \leq \rho \leq R\}$ 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: $S = \{0 \leq \phi \leq 2\pi, 0 \leq \theta \leq \pi, 0 \leq \rho \leq R\}$ Volume = $\iiint_S \rho^2 \sin \theta d\rho d\theta d\phi$ $= \int_0^{2\pi} d\phi \int_0^\pi \sin \theta d\theta \int_0^R \rho^2 d\rho$ $= \phi \Big _0^{2\pi} (-\cos \theta) \Big _0^\pi \frac{1}{3} \rho^3 \Big _0^R$ $= 2\pi \times 2 \times \frac{1}{3} R^3$ $= \frac{4}{3} \pi R^3$
<a href="#">Schwinger-Dyson equation</a>	$\langle \psi   \mathcal{T} \left\{ \frac{\delta}{\delta \phi} F[\phi] \right\}   \psi \rangle = -i \langle \psi   \mathcal{T} \left\{ F[\phi] \frac{\delta}{\delta \phi} S[\phi] \right\}   \psi \rangle$	$\langle \psi   \mathcal{T} \left\{ \frac{\delta}{\delta \phi} F[\phi] \right\}   \psi \rangle = -i \langle \psi   \mathcal{T} \left\{ F[\phi] \frac{\delta}{\delta \phi} S[\phi] \right\}   \psi \rangle$	$\langle \psi   \mathcal{T} \left\{ \frac{\delta}{\delta \phi} F[\phi] \right\}   \psi \rangle = -i \langle \psi   \mathcal{T} \left\{ F[\phi] \frac{\delta}{\delta \phi} S[\phi] \right\}   \psi \rangle$
<a href="#">Differentiable Manifold (tangent vector)</a>	$\gamma_1 \equiv \gamma_2 \iff \begin{cases} \gamma_1(0) = \gamma_2(0) = p, \text{ and} \\ \frac{d}{dt} \phi \circ \gamma_1(t) \Big _{t=0} = \frac{d}{dt} \phi \circ \gamma_2(t) \Big _{t=0} \end{cases}$	$\gamma_1 \equiv \gamma_2 \iff \begin{cases} \gamma_1(0) = \gamma_2(0) = p, \text{ and} \\ \frac{d}{dt} \phi \circ \gamma_1(t) \Big _{t=0} = \frac{d}{dt} \phi \circ \gamma_2(t) \Big _{t=0} \end{cases}$	$\gamma_1 \equiv \gamma_2 \iff \begin{cases} \gamma_1(0) = \gamma_2(0) = p, \text{ and} \\ \frac{d}{dt} \phi \circ \gamma_1(t) \Big _{t=0} = \frac{d}{dt} \phi \circ \gamma_2(t) \Big _{t=0} \end{cases}$
<a href="#">Cichoń's Diagram</a>	$\begin{array}{ccccccc} \text{cov}(L) & \rightarrow & \text{non}(K) & \rightarrow & \text{cof}(K) & \rightarrow & \text{cof}(L) & \rightarrow & 2^a \\ \uparrow & & \uparrow & & \uparrow & & \uparrow & & \\ N_1 & \rightarrow & \text{add}(L) & \rightarrow & \text{add}(K) & \rightarrow & \text{cov}(K) & \rightarrow & \text{non}(L) \end{array}$	$\begin{array}{ccccccc} \text{cov}(S) & \rightarrow & \text{non}(S) & \rightarrow & \text{cof}(S) & \rightarrow & \text{cof}(S) & \rightarrow & 2^{N_0} \\ \uparrow & & \uparrow & & \uparrow & & \uparrow & & \\ N_1 & \rightarrow & \text{add}(S) & \rightarrow & \text{add}(S) & \rightarrow & \text{cov}(S) & \rightarrow & \text{non}(S) \end{array}$	$\begin{array}{ccccccc} \text{cov}(S) & \rightarrow & \text{non}(S) & \rightarrow & \text{cof}(S) & \rightarrow & \text{cof}(S) & \rightarrow & 2^{N_0} \\ \uparrow & & \uparrow & & \uparrow & & \uparrow & & \\ N_1 & \rightarrow & \text{add}(S) & \rightarrow & \text{add}(S) & \rightarrow & \text{cov}(S) & \rightarrow & \text{non}(S) \end{array}$
<a href="#">multiscripts &amp; greek alphabet</a>	$\zeta \epsilon \theta \eta \prod \xi \nu \rho \sigma \tau \pi \alpha \beta \gamma \delta \chi \phi \psi \omega$	$\zeta \epsilon \theta \eta \prod \xi \nu \rho \sigma \tau \pi \alpha \beta \gamma \delta \chi \phi \psi \omega$	$\Pi \text{ } \epsilon \nu \tau \rho \sigma \text{ } \mathcal{D} \text{ } \pi \text{ } \nu \text{ } \xi \text{ } \mathcal{A} \text{ } \delta \text{ } \gamma \text{ } \alpha \text{ } \beta \text{ } \mathcal{B} \text{ } \theta \text{ } \eta \text{ } \epsilon \text{ } \zeta \text{ } \mathcal{F} \text{ } \omega \text{ } \psi \text{ } \phi \text{ } \chi$
<a href="#">nested roots</a>	$\sqrt{1 + \sqrt[3]{2 + \sqrt[4]{3 + \sqrt[5]{4 + \sqrt[6]{5 + \sqrt[7]{6 + \sqrt[8]{7 + \sqrt[9]{8}}}}}}}} = x^n$	$\sqrt{1 + \sqrt[3]{2 + \sqrt[4]{3 + \sqrt[5]{4 + \sqrt[6]{5 + \sqrt[7]{6 + \sqrt[8]{7 + \sqrt[9]{8}}}}}}}} = x^n$	$\sqrt{1 + \sqrt[3]{2 + \sqrt[4]{3 + \sqrt[5]{4 + \sqrt[6]{5 + \sqrt[7]{6 + \sqrt[8]{7 + \sqrt[9]{8}}}}}}}} = x^n$
<a href="#">nested matrices</a>	$\left( \begin{pmatrix} a_1 & a_2 & a_3 & a_4 \\ a_5 & a_6 & a_7 & a_8 \\ 0 & c_1 & c_2 & c_3 \\ c_3 & c_4 & & \end{pmatrix} \begin{pmatrix} b_1 \\ b_2 \\ b_3 \\ b_4 \end{pmatrix} \right)$	$\left( \begin{pmatrix} a_1 & a_2 & a_3 & a_4 \\ a_5 & a_6 & a_7 & a_8 \\ 0 & c_1 & c_2 & c_3 \\ c_3 & c_4 & & \end{pmatrix} \begin{pmatrix} b_1 \\ b_2 \\ b_3 \\ b_4 \end{pmatrix} \right)$	$\left( \begin{pmatrix} a_1 & a_2 & a_3 & a_4 \\ a_5 & a_6 & a_7 & a_8 \\ 0 & c_1 & c_2 & c_3 \\ c_3 & c_4 & & \end{pmatrix} \begin{pmatrix} b_1 \\ b_2 \\ b_3 \\ b_4 \end{pmatrix} \right)$
<a href="#">font sizes</a>	Huge, Large, normalsize, small	scriptlevel : <b>-3</b> , -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 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 `mfenced` tag, the "fences" have no spacing around them.

When using the vertical bar "`|`" (`&vert;`) 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 667567 - MathML is not displayed correctly inside link and underline tags](#)

## 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](#)