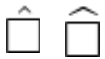


\hat{ x } 

\widehat{ x } 

\check{ x } 

\tilde{ x } 

\widetilde{ x } 

\acute{ x } 

\grave{ x } 

\dot{ x } 

\ddot{ x } 

\breve{ x } 

\bar{ x } $\bar{\square}$

\vec{ x } $\vec{\square}$

\overline{ x } $\overline{\square}$

\overbrace{ x } $\overbrace{\square}$

\overleftarrow{ x } $\overleftarrow{\square}$

\overrightarrow{ x } $\overrightarrow{\square}$

\overleftrightarrow{ x } $\overleftrightarrow{\square}$

\overset{x}{y}{ x } $\overset{x}{yx}$

\underline{ x } $\underline{\square}$

\underbrace{ x } $\underbrace{\square}$

\underleftarrow{ x } 

\underrightarrow{ x } 

\underleftrightarrow{ x } 

\underset{x}{y}{ x } $\underset{x}{yx}$

Normally \prod_{x}^{y}{x}{y} gives $\prod_{x}^{y} xy$

but \textstyle \prod_{x}^{y}{x}{y} will give $\textstyle\prod_{x}^{y} xy$

Writing a matrix:

To write a matrix like $\begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix}$

write

```
\begin{pmatrix}
 a_{11} & a_{12} \\
 a_{21} & a_{22}
 \end{pmatrix}
```

To write

$$\begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix}$$

write

```
\left[ \begin{matrix}
 a_{11} & a_{12} \\
 a_{21} & a_{22}
 \end{matrix} \right]
```

To write $\begin{vmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{vmatrix}$

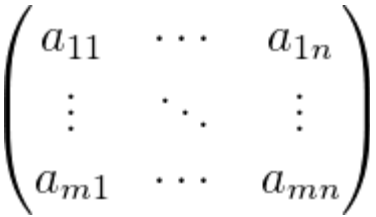
write

```
\left| \begin{matrix}
 a_{11} & a_{12} \\
 a_{21} & a_{22}
 \end{matrix} \right|
```

Higher order matrices can also be writen $\begin{pmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{pmatrix}$

```
\begin{pmatrix}
a_{11} & a_{12} & a_{13}\\
a_{21} & a_{22} & a_{23}\\
a_{31} & a_{32} & a_{33}
\end{pmatrix}
```

$$\begin{pmatrix}
a_{11} & a_{12} & a_{13}\\
a_{21} & a_{22} & a_{23}\\
a_{31} & a_{32} & a_{33}
\end{pmatrix}$$



```
\begin{pmatrix}
    a_{11} & \cdots & a_{1n}\\
    \vdots &  \ddots & \vdots\\
    a_{m1} & \cdots & a_{mn}
\end{pmatrix}
```

$$\begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix}$$

```
\left[ \begin{matrix}
 a & h & g \\
 h & b & f  \\
g & f & c
\end{matrix} \right]
```

$$\begin{bmatrix} x_{11} & x_{12} & x_{13} \\ x_{21} & y_{22} & x_{23} \\ x_{31} & x_{32} & x_{33} \end{bmatrix}$$

```
\left[ \begin{matrix}
    x_{11} & x_{12} & x_{13} \\
    x_{21} & y_{22} & x_{23}  \\
    x_{31} & x_{32} & x_{33}
    \end{matrix} \right]
```

$\square_{\square}$ x_y $\square^{\square}$ x^y

$\overset{\square}{\square}$ \overset{x}{y} $\underset{\square}{\square}$ \underset{x}{y}

$\frac{x}{y}$ \frac{x}{y} $\sqrt[x]{y}$ \sqrt[x]{y} $\begin{matrix}\square\\\square\end{matrix}$ {x \atop y}

$\sqrt{x}$ \sqrt{x}

$\prod_{x}^{y}$ \prod_{x}^{y} $\textstyle\prod_{x}^{y}$ \textstyle \prod_{x}^{y} $\coprod_{x}^{y}$ \coprod_{x}^{y}

$\textstyle\coprod_{x}^{y}$ \textstyle \coprod_{x}^{y} $\sum_{x}^{y}$ \sum_{x}^{y}

$\textstyle\sum_{x}^{y}$ \textstyle \sum_{x}^{y}

Brackets: $()$ \left(\right)

$\left[\right]$ \left[\right] $\left\{ \right\}$ \left\{ \right\} $\left| \right|$ \left| \right|

Some Example:

$\sqrt{a^2 + b^2}$ \sqrt{a^2 + b^2}

$\lim_{x \to \infty }$ \lim_{x \to \infty }

$\sqrt{b^2 - 4ac}$ \sqrt{b^2 - 4ac}

$\frac{-b \pm \sqrt{b^2 -4ac} }{2a}$ \frac{-b \pm \sqrt{b^2 -4ac} }{2a}

$\frac{ n! }{ r! \left(n-r \right)! }$ \frac{ n! }{ r! \left(n-r \right)! }

$$\frac{dy}{dx}$$ \frac{dy}{dx}

$$\frac{\partial y}{\partial x}$$ \frac{\partial y}{\partial x}

$$\frac{d^2y}{dx^2}$$ \frac{d^2 y}{d x^2}

$$\frac{d^2}{dx^2}$$ \frac{d^2 }{d x^2}

$$\frac{d^2}{dxdy}$$ \frac{d^2 }{dx dy}

$$\frac{\Delta y}{\Delta x}$$ \frac{\Delta y}{\Delta x}

$$\sum_{i=1}^{n} X_i$$ \sum_{i=1}^{n} X_i

$$\sum_{i=1}^{n} X_i^2$$ \sum_{i=1}^{n} X_i^2

$$\sum_{i=1}^{n} X_i Y_i$$ \sum_{i=1}^{n} X_i Y_i

$$\sum_{i=1}^{n} (X_i - \overline{X})^2$$ \sum_{i=1}^{n} (X_i - \overline{X})^2

$$X_1, \dots, X_n$$ X_1, \dots, X_n

$$\frac{x - \mu}{\sigma}$$ \frac{x - \mu }{ \sigma}

$$\bigcup_{i=1}^{n} X_i$$ \bigcup_{i=1}^{n}{X_i}

$$\bigcap_{i=1}^{n} X_i$$ \bigcap_{i=1}^{n}{X_i}

$$\cos^{-1}\theta$$ \cos^{-1}\theta

$$\sin^{-1}\theta$$ \sin^{-1}\theta

$$e^{i\theta}$$ e^{i \theta}

$$\left(\frac{\pi}{2}-\theta\right)$$ \left(\frac{\pi}{2}-\theta \right)

$$\overrightarrow{AB}$$ \overrightarrow{AB}

$\overleftrightarrow{AB}$ \overleftrightarrow{AB}

$\widehat{AB}$ \widehat{AB}

ΔABC \Delta A B C

${}_{10}^{5}C^{16}$ _{10}^{5}C^{16}

$2H_2 + O_2 \xrightarrow{n,m} 2H_2O$ 2H_2 + O_2 \xrightarrow{n,m}2H_2O

$A \underset{b}{\overset{a}{\longleftrightarrow}} B$ A\underset{b}{\overset{a}{\longleftrightarrow}}B

$$A \underset{0}{\overset{a}{\rightleftarrows}} B$$

```
A\underset{0}{\overset{a}{\rightleftarrows}}B
```

$$A \underset{0°C}{\overset{100°C}{\rightleftarrows}} B$$

```
A\underset{0^{\circ}C }{\overset{100^{\circ}C}{\rightleftarrows}}B
```

$$\vec{F} = m\vec{a}$$

```
\vec{F}=m\vec{a}
```

$$\oint \vec{F} \cdot d\vec{s} = 0$$

```
\oint \vec{F} \cdot d\vec{s}=0
```

$$\psi(t) = \hat{\psi} e^{i(\omega t \pm \theta)}$$

```
\psi (t)=\hat{\psi}e^{i(\omega t\, \pm\, \theta)}
```

$$\sum_i \hat{\psi}_i cos(\alpha_i \pm \omega t)$$

```
\sum_i \hat{\psi_i} cos(\alpha_i \pm \omega t)
```

$$\lim_{n \to \infty} \sum_{k=1}^{n} \frac{1}{k^2} = \frac{\pi^2}{6}$$

```
\lim_{n \to \infty}
\sum_{k=1}^n \frac{1}{k^2}
= \frac{\pi^2}{6}
```

$$A \quad d_{e_{e_p}} \quad h^{i^{g^h}}$$

```
A \quad d_{e_{e_p}} \quad h^{i^{g^h}}
```

$$\forall x \in \mathbf{R}: \qquad x^2 \geq 0$$

```
\forall x \in \mathbf{R}:
\qquad x^{2} \geq 0
```

$$x^2 \geq 0 \qquad \text{for all } x \in \mathbf{R}$$

```
x^{2} \geq 0\qquad
\text{for all }x\in\mathbf{R}
```

$$x^2 \geq 0 \qquad \text{for all } x \in \mathbb{R}$$

```
x^{2} \geq 0\qquad
\text{for all } x
\in \mathbb{R}
```

$$p^3_{ij} \qquad m_{\text{Knuth}} \qquad \sum_{k=1}^{3} k \qquad a^x + y \neq a^{x+y} \qquad e^{x^2} \neq e^{x2}$$

```
p^3_{ij} \qquad
m_\text{Knuth}\qquad
\sum_{k=1}^3 k \\[5pt]
a^x+y \neq a^{x+y}\qquad
e^{x^2} \neq {e^x}^2
```

$$\sqrt{x} \Leftrightarrow x^{1/2} \quad \sqrt[3]{2} \quad \sqrt{x^2 + \sqrt{y}} \quad \sqrt{[x^2 + y^2]}$$

```
\sqrt{x} \Leftrightarrow x^{1/2}
\quad \sqrt[3]{2}
\quad \sqrt{x^{2} + \sqrt{y}}
\quad \surd[x^2 + y^2]
```

$$\Psi = v_1 \cdot v_2 \cdot \ldots \qquad n! = 1 \cdot 2 \cdots (n-1) \cdot n$$

```
\Psi = v_1 \cdot v_2
\cdot \ldots \qquad
n! = 1 \cdot 2
\cdots (n-1) \cdot n
```

$$0.\overline{3} = \underline{\underline{1/3}}$$

```
0.\overline{3} =
\underline{\underline{1/3}}
```

$$\underbrace{\overbrace{a+b+c}^{6} \cdot \overbrace{d+e+f}^{9}}_{\text{meaning of life}} = 42$$

```
\underbrace{\overbrace{a+b+c}^6
\cdot \overbrace{d+e+f}^9}
_\text{meaning of life} = 42
```

$$f(x) = x^2 \qquad f(x) = 2x \qquad f(x) = 2 \qquad \hat{XY} \quad \widehat{XY} \quad \bar{x}_0 \quad \bar{x}_0$$

```
f(x) = x^2 \qquad f'(x)
= 2x \qquad f''(x) = 2\\[5pt]
\hat{XY} \quad \widehat{XY}
\quad \bar{x_0} \quad \bar{x}_0
```

$$\lim_{x \to 0} \frac{\sin x}{x} = 1$$

```
\lim_{x \rightarrow 0}
\frac{\sin x}{x}=1
```

$$3\,\operatorname{argh} = 2\operatorname*{Nut}_{x=1}$$

```
3\argh = 2\nut_{x=1}
```

$$a \bmod b$$

$$x \equiv a \pmod{b}$$

```
a\bmod b \\
x\equiv a \pmod{b}
```

$$3/8 \qquad \frac{3}{8} \qquad \tfrac{3}{8}$$

```
3/8 \qquad \frac{3}{8}
\qquad \tfrac{3}{8}
```

$$1\frac{1}{2} \qquad hours$$

```
1\frac{1}{2} \qquad ~hours
```

$$\sqrt{\frac{x^2}{k+1}} \qquad x^{\frac{2}{k+1}} \qquad \frac{\partial^2 f}{\partial x^2}$$

```
\sqrt{\frac{x^2}{k+1}}\qquad
x^\frac{2}{k+1}\qquad
\frac{\partial^2f}
{\partial x^2}
```

$$\binom{n}{k} = \binom{n-1}{k} + \binom{n-1}{k-1}$$

```
\binom{n}{k} =\binom{n-1}{k}
+ \binom{n-1}{k-1}
```

$$f_n(x) \stackrel{*}{\approx} 1$$

```
f_n(x) \stackrel{*}{\approx} 1
```

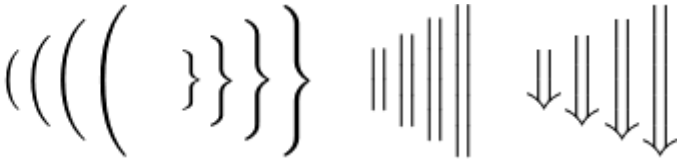
$$\sum_{i=1}^{n} \quad \int_{0}^{\frac{\pi}{2}} \quad \prod_{\epsilon}$$

```
\sum_{i=1}^n \qquad
\int_0^{\frac{\pi}{2}} \qquad
\prod_\epsilon
```

$$\sum_{\substack{0<i<n \\ j\subseteq i}}^{n} P(i,j) = Q(i,j)$$

```
\sum^n_{\substack{0<i<n \\
j\subseteq i}}
P(i,j) = Q(i,j)
```

$$\Big((x+1)(x-1)\Big)^{2}$$



```
\Big((x+1)(x-1)\Big)^{2} \\
\big( \Big( \bigg( \Bigg( \quad
\big\} \Big\} \bigg\} \Bigg\} \quad
\big\| \Big\| \bigg\| \Bigg\| \quad
\big\Downarrow \Big\Downarrow
\bigg\Downarrow \Bigg\Downarrow
```

$$\mathbf{X} = \left(\begin{array}{ccc} x_1 & x_2 & \ldots \\ x_3 & x_4 & \ldots \\ \vdots & \vdots & \ddots \end{array} \right)$$

```
\mathbf{X} = \left(
\begin{array}{ccc}
x_1 & x_2 & \ldots \\
x_3 & x_4 & \ldots \\
\vdots & \vdots & \ddots
\end{array} \right)
```

$$|x| = \begin{cases} -x & \text{if } x < 0, \\ 0 & \text{if } x = 0, \\ x & \text{if } x > 0. \end{cases}$$

```
|x| = \left\{
\begin{array}{rl}
-x & \text{if } x < 0,\\
0 & \text{if } x = 0,\\
x & \text{if } x > 0.
\end{array} \right.
```

$$|x| = \begin{cases} -x & \text{if } x < 0, \\ 0 & \text{if } x = 0, \\ x & \text{if } x > 0. \end{cases}$$

```
|x| =
\begin{cases}
-x & \text{if } x < 0,\\
0 & \text{if } x = 0,\\
x & \text{if } x > 0.
\end{cases}
```

$$P = \frac{\displaystyle\sum_{i=1}^{n}(x_i - x)(y_i - y)}{\displaystyle\left[\sum_{i=1}^{n}(x_i - x)^2 \sum_{i=1}^{n}(y_i - y)^2\right]^{1/2}}$$

```
P = \frac{\displaystyle{
\sum_{i=1}^n (x_i- x)
(y_i- y)}}
{\displaystyle{\left[
\sum_{i=1}^n(x_i-x)^2
\sum_{i=1}^n(y_i- y)^2
\right]^{1/2}}}
```

$$\int \int f(x)g(y)\,\mathrm{d}x\,\mathrm{d}y \qquad \iint f(x)g(y)\,\mathrm{d}x\,\mathrm{d}y \qquad \iint f(x)g(y)\,\mathrm{d}x\,\mathrm{d}y$$

```
\newcommand{\ud}{\,\mathrm{d}}

\int\int f(x)g(y)

\ud x \ud y \\

\int\!\!\!\int

f(x)g(y) \ud x \ud y \\

\iint f(x)g(y) \ud x \ud y
```

$$\int_0^{\frac{\pi}{3}} \frac{i(x^2+3xi)}{yi+4x}xdx \qquad \{\text{where} \quad i, \ \ y \quad \text{are constants.}\}$$

```
\int_{0}^{\frac{\pi}{3}} \frac {i(x^2+3xi)} {yi+4x}  {xdx} \qquad

_{\text \{ \text {where} \quad

{i}, \text { } \text { } {y} \quad

\text {are constants.} \} }
```

Setting the Environment:

“miktex_path.bat”

@echo off

path=C:\Program Files\MiKTeX 2.9\miktex\bin\x64;C:\Program Files (x86)\gs\gs9.05\bin;%path%;

cmd

@echo on

Converting equation to SVG:

latex Sample.tex

dvisvgm --no-fonts Sample.dvi Sample.svg

Document Creation: example.tex

```
\documentclass{article}
\usepackage[utf8]{inputenc}
\usepackage{amsmath}
\usepackage{amsfonts}
```

```
\usepackage{amssymb}

\usepackage[spanish]{babel}

\usepackage{color}

\usepackage[T1]{fontenc}

\DeclareMathOperator{\argh}{argh}

\DeclareMathOperator*{\nut}{Nut}

\pagestyle{empty}

\begin{document}

\begin{huge}

\[\int_{0}^{\infty} x^2 x dx\]

\end{huge}

\end{document}
```

Useful Programs:

basic-miktex-2.9.5105-x64.exe http://miktex.org

dvisvgm-1.5.3-win64.zip http://dvisvgm.sourceforge.net

texmakerwin32_install.exe http://www.xm1math.net/texmaker/

texmaths-0-39.oxt http://roland65.free.fr/texmaths/index.html

http://extensions.libreoffice.org/extension-center/texmaths-1

latexee101.zip (Windows only) http://sourceforge.net/projects/latexee/

latexeqedit-0.4.zip (Windows only) http://latexeqedit.sourceforge.net/index.php

Installer-Equalx-0.7.0_64.exe (Windows, Linux) http://equalx.sourceforge.net/index.html

THRYSOEE.DK http://www.thrysoee.dk/laeqed/