Mit StarOffice zum Schwarzen Loch

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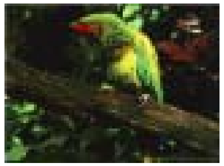


Einführung in StarOffice Math

Komponenten von StarOffice 5.2

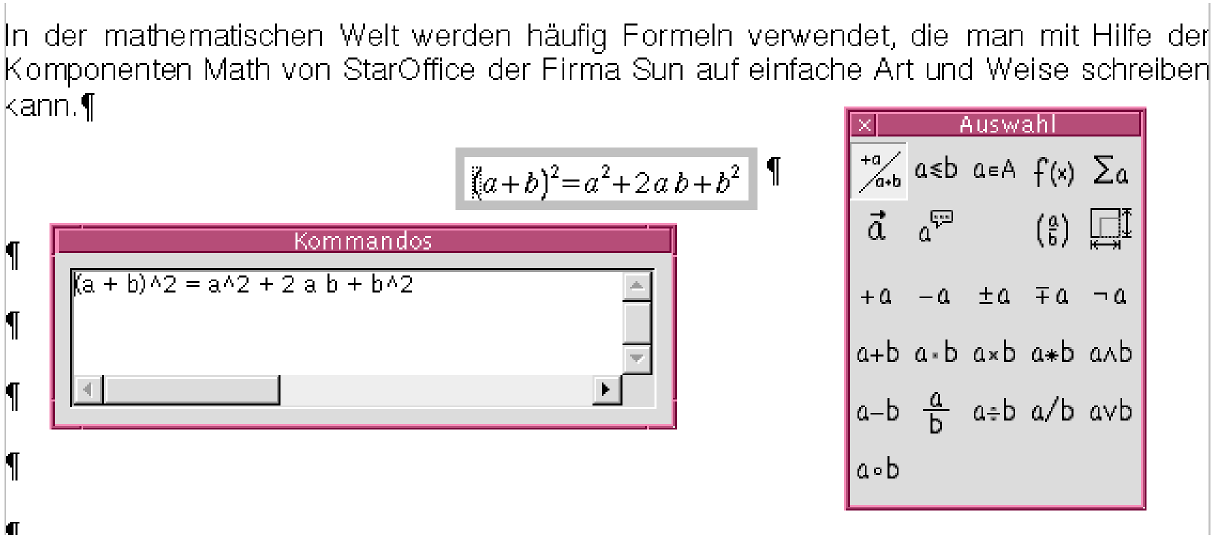
StarOffice Writer, Calc, Impress, Draw, Schedule, Base, Mail, Discussion, Basic, Chart, Image, Math

Einführung in StarOffice Math

Komponenten von StarOffice 6.0

StarOffice Writer, Calc, Impress, Draw, Basic, Math

Eingabefenster



Freier Fall in Luft

$$m\ddot{x} = mg - C\dot{x}^2$$

$$\dot{x}(t) = \sqrt{\frac{mg}{C}}\,\frac{e^{2\sqrt{\frac{C}{mg}}gt} - 1}{e^{2\sqrt{\frac{C}{mg}}gt} + 1} = \sqrt{\frac{mg}{C}}\,\tanh\left(\sqrt{\frac{C}{mg}}\,gt\right)$$

Kommandos

```
m ddot x ~ = ~ m g - C {dot x}^2 newline newline
dot x(t) ~ = ~ sqrt{{m g} over C} ~
{func e^{2 ~ sqrt{C over {m g}} g t} ~ - ~ 1} over {func e^{2 ~ sqrt{C over {m g}} g t} ~ + ~ 1} ~
= ~ sqrt{{m g} over C} ~ func tanh(sqrt{C over {m g} } ~ g t)
```

GWDG

Göttinger FunkLAN

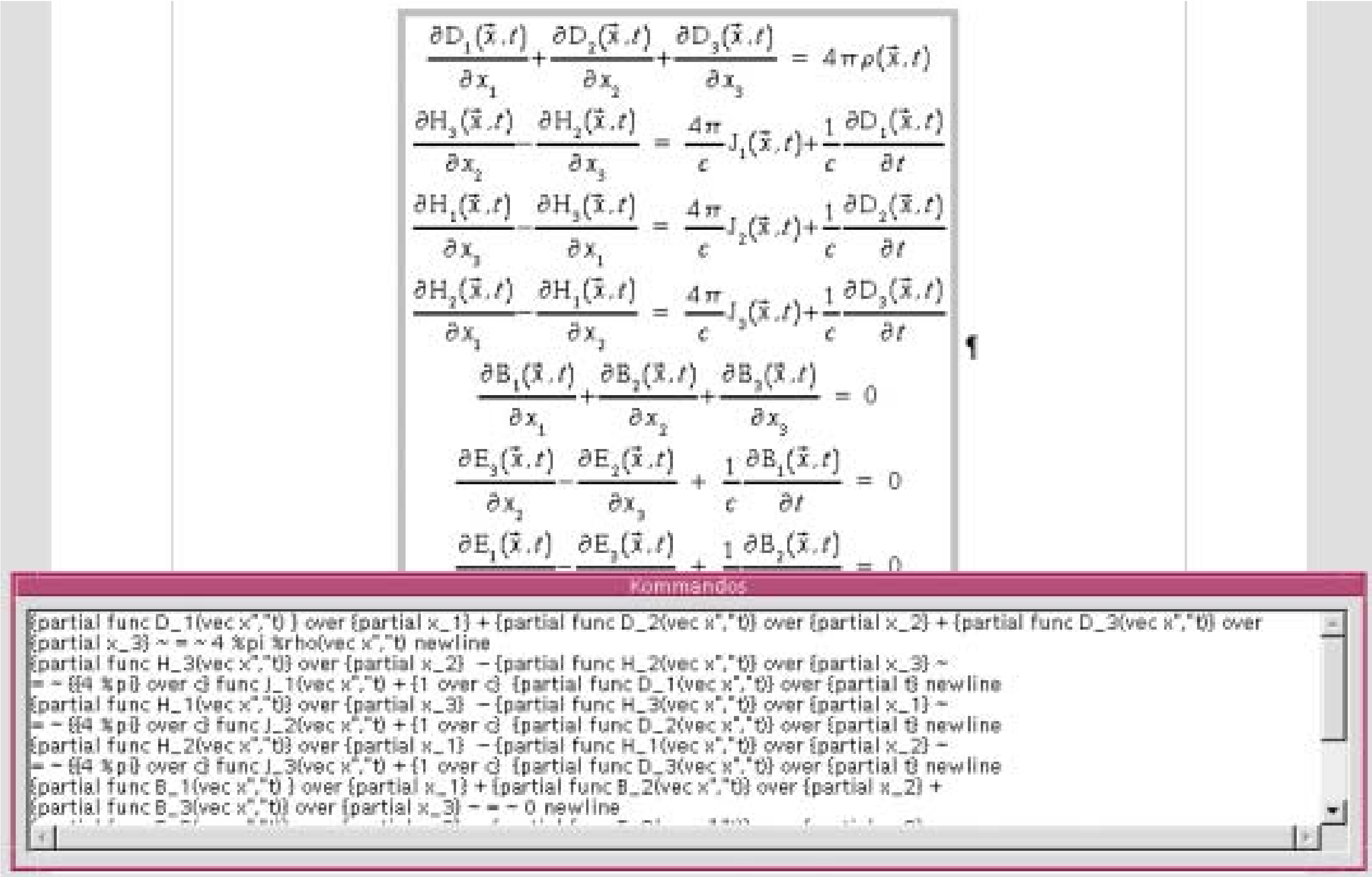
$$\vec{\nabla}\cdot\vec{D} = 4\pi\rho$$
$$\vec{\nabla}\times\vec{H} = \frac{4\pi}{c}\vec{J} + \frac{1}{c}\frac{\partial\vec{D}}{\partial t}$$
$$\vec{\nabla}\cdot\vec{B} = 0$$
$$\vec{\nabla}\times\vec{E} + \frac{1}{c}\frac{\partial\vec{B}}{\partial t} = \vec{0}$$
$$\vec{F} = q\left(\vec{E} + \frac{1}{c}\vec{v}\times\vec{B}\right)$$

¶

Kommandos

```
widevec nabla cdot widevec func D ~ = ~ 4 %pi %rho newline

widevec nabla times widevec func H ~ = ~ {{4 %pi} over c} ~ vec func J ~ +
~ {1 over c} {partial widevec func D } over {partial t}  newline

widevec nabla cdot widevec func B ~ = ~ 0 newline

widevec nabla times vec func E ~ + ~ {1 over c}  {partial widevec func B} over {partial t} ~ = ~ widevec 0 newline

widevec func F ~ = ~ q (widevec func E ~ + ~ {1 over c} {widevec v times widevec func B})
```

Differenziell



Integralform

$$\oint_S \vec{\mathrm{D}}(\vec{x},t)\cdot\vec{\mathrm{n}}(\vec{x})\,df = 4\pi\int_V \rho(\vec{x},t)\,d^3x$$

$$\oint_S \vec{\mathrm{B}}(\vec{x},t)\cdot\vec{\mathrm{n}}(\vec{x})\,df = 0$$

$$\oint_C \vec{\mathrm{H}}(\vec{x},t)\cdot d\vec{l} = \int_S\left[\frac{4\pi}{c}\vec{\mathrm{J}}(\vec{x},t)+\frac{1}{c}\frac{\partial\vec{\mathrm{D}}(\vec{x},t)}{\partial t}\right]\cdot\vec{n}(\vec{x})\,df$$

$$\oint_C \vec{\mathrm{E}}(\vec{x},t)\cdot d\vec{l} = -\frac{1}{c}\int_S\frac{\partial\vec{\mathrm{B}}(\vec{x},t)}{\partial t}\cdot\vec{n}(\vec{x})\,df$$

¶

Kommandos

```
lint csub S widevec func D(vec x","t) cdot widevec func n(vec x) df ~ = ~ 4 %pi int csub V %rho(vec x","t) d^{3}x newline
lint csub S widevec func B(vec x","t) cdot widevec func n(vec x) df ~ = ~ 0 newline
lint csub C widevec func H(vec x","t) cdot d vec l ~ = ~
int csub S left[ {{4 %pi} over c} widevec func J(vec x","t) + {1 over c} {partial widevec func D(vec x","t)} over {partial t} right] cdot
widevec n(vec x) df newline
lint csub C widevec func E(vec x","t) cdot d vec l ~ = ~ - {1 over c} int csub S {{partial widevec func B(vec x","t)} over {partial t}} cdot
widevec n(vec x) df
```

PAULI-Matrizen

$$\sigma_x = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}, \quad \sigma_y = \begin{pmatrix} 0 & -i \\ i & 0 \end{pmatrix}, \quad \sigma_z = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$$ ¶

$$\vec{S} \stackrel{\text{def}}{=} \frac{\hbar}{2} \vec{\sigma}$$

Kommandos

```
%sigma_x = left (matrix{0 # 1 ## 1 # 0} right ) , ~~
%sigma_y = left (matrix{0 # -i ## i # 0} right ) , ~~
%sigma_z = left (matrix{1 # 0 ## 0 # -1} right ) newline

widevec S ~def~ {hbar over 2}` widevec %sigma
```

HEISENBERGS Antiferromagnet

$$\Omega_N = \sum_{n_1,\ldots,n_N \in Z_N^\nu} a_{n_1 \cdots n_N} S_{+n_1} \cdots S_{+n_N} \Omega_f$$

$$\forall\, l \in \mathbb{Z}^\nu:\quad \gamma_N(l) \stackrel{\text{def}}{=} \frac{1}{\|\Omega_N\|^2}\left(\Omega_N \middle| S_{z0} S_{zl} \Omega_N\right) \qquad \Rightarrow$$

$$\gamma_N(l) = -\frac{1}{4} + \frac{1}{2}(N-1)\frac{\sum\limits_{\substack{n_1,\ldots,n_{N-2} \in Z_N^\nu \\ \neq 0, l}} \left|a_{n_1 \cdots n_{N-2} 0 l}\right|^2}{\sum\limits_{\substack{m_1,\ldots,m_{N-1} \in Z_N^\nu \\ \neq 0}} \left|a_{m_1 \cdots m_{N-1} 0}\right|^2} \qquad \forall\, l \in \mathbb{Z}^\nu \setminus \{0\}$$ ¶

$$\gamma_N(0) = \frac{1}{4}$$

Kommandos

```
%OMEGA_N ~~=~ sum from{n_1, dotslow , n_N  in Z_N^%ny} a_{n_1 dotsaxis n_N}
S_{+n_1} dotsaxis S_{+n_N} %OMEGA_f newline

forall l in setZ^%ny ":" ~~%gamma_N(l) def 1 over {ldline %OMEGA_N rdline^2}
left ( %OMEGA_N mline S_{z 0} S_{z l} %OMEGA_N right ) ~~~~~~ drarrow newline

%gamma_N(l) = -{1 over 4} + {1 over 2} (N - 1) {sum from {{n_1, dotslow , n_{N-2} in Z_N^%ny} csub {{}<>{}, {}<> 0, l}}
{abs{a_{n_1 dotsaxis n_{N-2}0 l}}}^2} over {sum from {{m_1, dotslow , m_{N-1} in Z_N^%ny}csub { {}<>{}, {}<> 0}}
{abs{a_{m_1 dotsaxis m_{N-1}0}}}^2}~~~~~~~ forall l in setZ^%ny setminus lbrace 0 rbrace newline

%gamma_N(0) = 1 over 4
```

Schwarzes Loch

$$\Box_g g_{\beta\gamma} \stackrel{\text{def}}{=} g^{\kappa\lambda} g_{\beta\gamma,\kappa,\lambda}$$

$$R_{\beta\gamma} \stackrel{\text{def}}{=} \frac{1}{2}\Box_g g_{\beta\gamma} + \frac{1}{2} g^{\kappa\lambda}\left[g_{\kappa\lambda,\beta,\gamma} - g_{\kappa\beta,\lambda,\gamma} - g_{\kappa\gamma,\lambda,\beta}\right]$$

$$R^{\alpha\beta} - \frac{1}{2} R^{\sigma}{}_{\sigma} g^{\alpha\beta} + \Lambda g^{\alpha\beta} = \kappa T^{\alpha\beta}$$ ¶

$$g_2{}^0 = c^2 dt^2 \left(1-\frac{2m}{r}\right) - \frac{dr^2}{1-\frac{2m}{r}} - r^2 d\omega^2$$

Kommandos

```
%dalembert_g g_{%beta%gamma} ~def~ g^{%kappa%lambda} g_{%beta%gamma","%kappa","%lambda} newline

R_{%beta%gamma} ~def~ 1 over 2 %dalembert_g g_{%beta%gamma} +
1 over 2 g^{%kappa%lambda} left [g_{%kappa%lambda","%beta","%gamma} -
g_{%kappa%beta","%lambda","%gamma} - g_{%kappa%gamma","%lambda","%beta}right ] newline

R^{%alpha%beta} - 1 over 2 {R^%sigma}_%sigma g^{%alpha%beta} + %LAMBDA g^{%alpha%beta} ~=~
%kappa T^{%alpha%beta} newline newline

{g_2}^0 ~=~ c^2 dt^2 left (1- {2 m} over r right ) ~-~ dr^2 over {1 - {2 m} over r}~ -~ r^2 d%omega^2
```

GRIEGERsches Theorem

Behauptung: → $\cos(x) = 1 \quad \forall\, x \in \mathbb{R}$ ¶

Beweis: ¶

$$\forall\, x \in \mathbb{R}:$$

$$\begin{aligned}
\cos(x) + i\sin(x) &= e^{i\,x} && \text{Eulersche Formel} \\
&= e^{\frac{x}{2\pi} 2\pi i} \\
&= \left(e^{2\pi i}\right)^{\frac{x}{2\pi}} \\
&= (1)^{\frac{x}{2\pi}} = 1 \qquad \Rightarrow
\end{aligned}$$

$$1 = \Re\, 1 = \Re\left(\cos(x) + i\sin(x)\right) = \cos(x)$$

q. e. d.

Kommandos

```
alignl forall x in setR ":" newline
alignl cos(x) + i sin(x) ~=~ func e^{i x} ~~~~~~~~~~~~~~~~~~~~"Eulersche Formel" newline
alignl phantom {cos(x) + i sin(x)}~=~ func e^{ alignc {x over {2 %pi}} 2 %pi i} newline
alignl phantom {cos(x) + i sin(x)}~=~ left (func e^{2 %pi i}right )^{ alignc{x over {2 %pi}}} newline
alignl phantom {cos(x) + i sin(x)}~=~ left (1 right )^{ alignc{x over {2 %pi}}} ~=~ 1~~~~~~~~ drarrow newline newline
alignl 1 ~=~ Re 1 ~=~ Re (cos(x) + i sin(x)) ~=~ cos(x) newline
alignr "q. e. d."
```

Ausrichtung von Formeln

Formel ohne Ausrichtung:

$$a + b = c$$
$$b = c + d + e$$

Formel mit phantom-Ausrichtung:

$$\begin{aligned} &a + b = c \\ &\phantom{a+{}} b = c + d + e \end{aligned}$$

Formel mit matrix-Ausrichtung:

$$\begin{matrix} a + b & = & c \\ b & = & c + d + e \end{matrix}$$

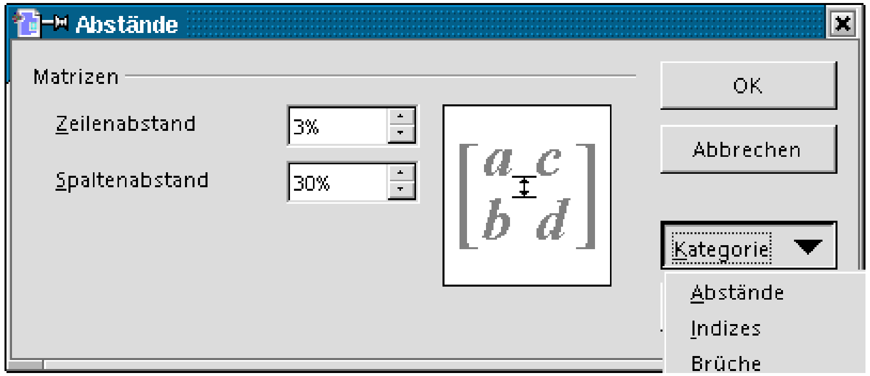
Kommandos

```
"Formel ohne Ausrichtung:" newline
a + b = c newline
b = c + d + e newline newline

"Formel mit phantom-Ausrichtung:" newline
alignl a + {} b = c newline
alignl phantom {a + {}} b = c + d + e newline newline

"Formel mit matrix-Ausrichtung:" newline
matrix {alignr a + b # {}={} # alignl c ##
alignr b # {}={} # alignl c + d + e}
```

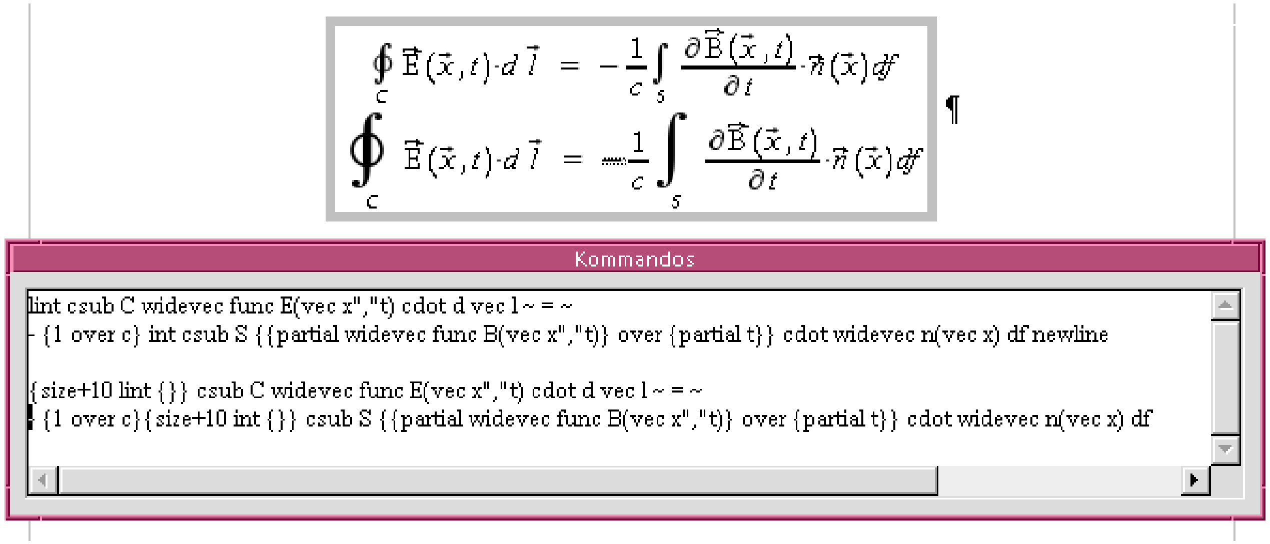
Änderungen von Größen, Abständen, Schriften

Format

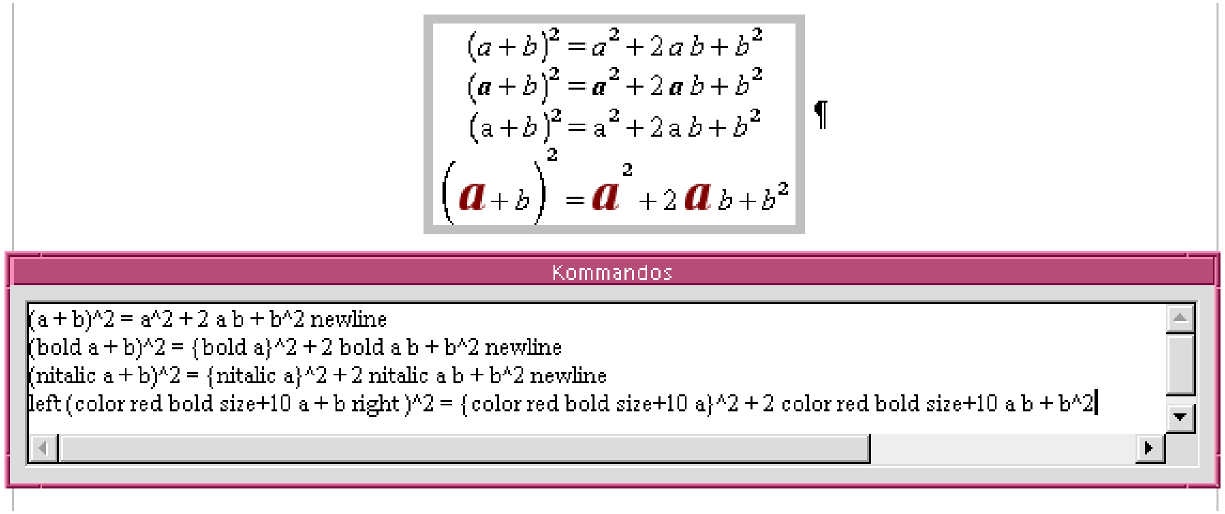
- → Schriftarten
- → Schriftgrößen
- → Abstände →
- → Ausrichtung



Größenänderungen



Schriftauszeichnungen



Verwendung von Schriften

$(a+b)^2 = a^2 + 2\,a\,b + b^2$ a Standard

$(a+b)^2 = a^2 + 2\,a\,b + b^2$ a sans

$(a+b)^2 = a^2 + 2\,a\,b + b^2$ a serif

$(a+b)^2 = a^2 + 2\,a\,b + b^2$ a fixed

¶

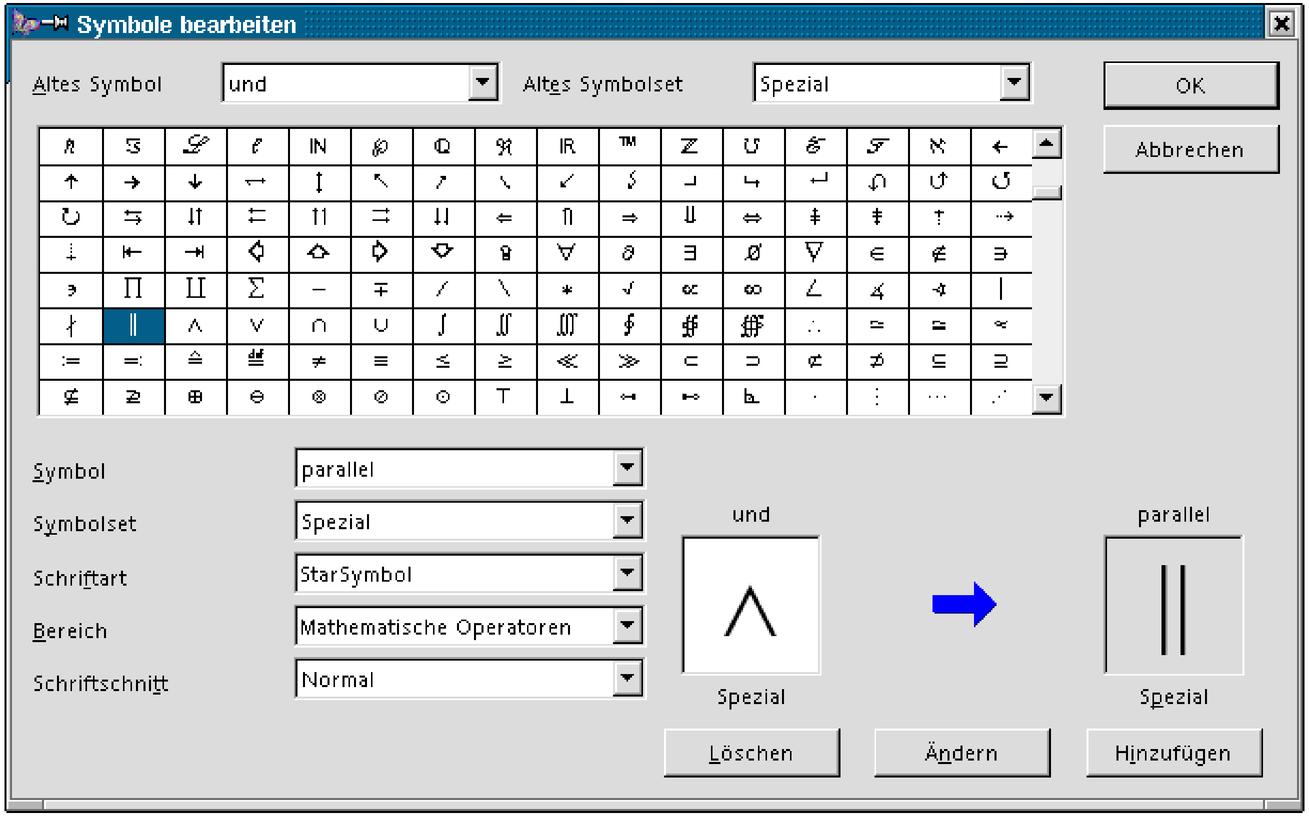
Kommandos

```
(a + b)^2 = a^2 + 2 a b + b^2 ~~~~~~ "a Standard" newline newline

(font sans a + b)^2 = {font sans a}^2 + 2 {font sans a} b + b^2 ~~~~~~ "a " font sans "sans" newline newline

(font serif a + b)^2 = {font serif a}^2 + 2 {font serif a} b + b^2 ~~~~~~ "a " font serif "serif" newline newline

(font fixed a + b)^2 = {font fixed a}^2 + 2 {font fixed a} b + b^2 ~~~~~~ "a " font fixed "fixed"
```

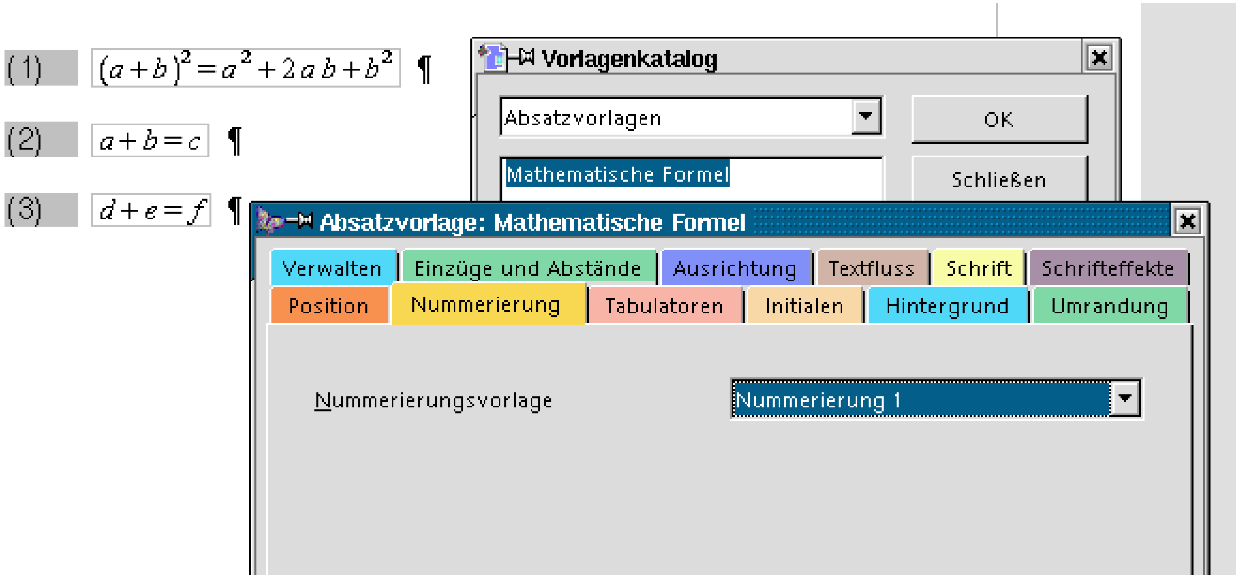
Hinzufügen von Zeichen

Extras

→ ∑ Katalog Bearbeiten ...



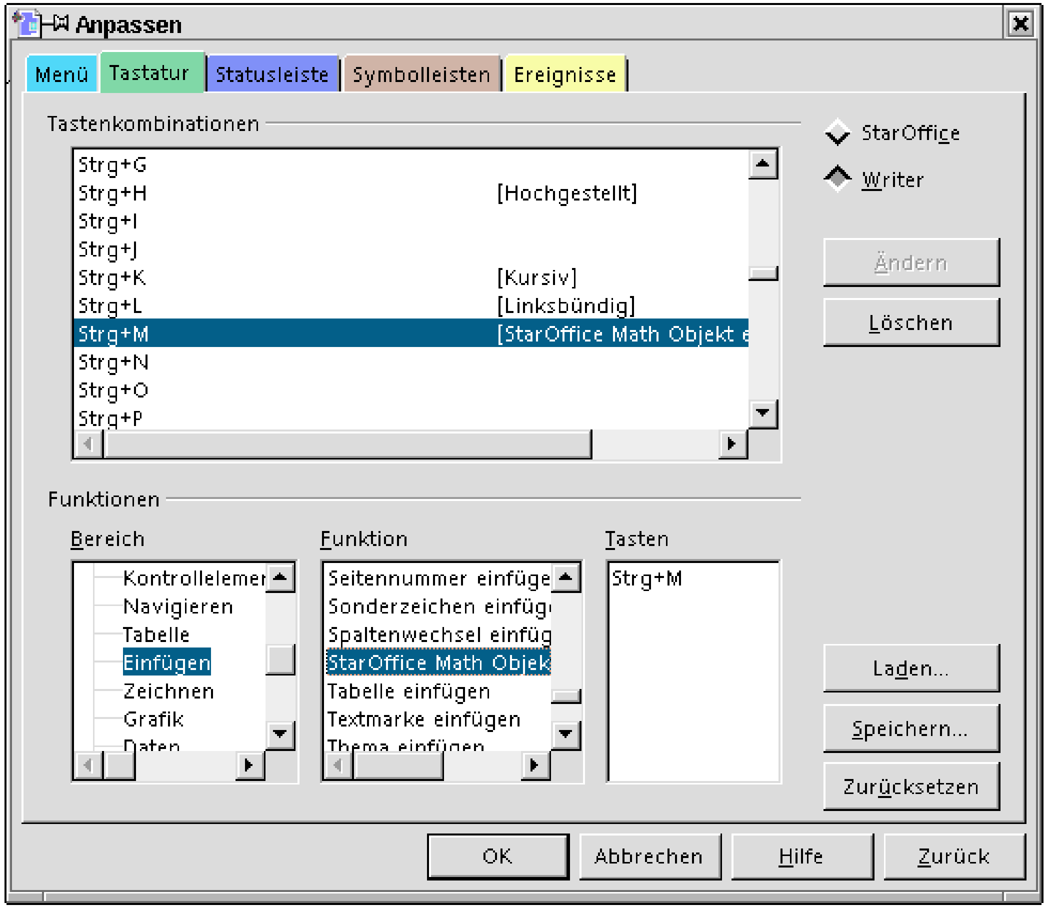
Automatische Nummerierung



Tastaturbelegung

Extras

→ Anpassen



GWDG

StarOffice und XML

```
wgriege@PCGrieger.gwdg.de
wgriege@PCGrieger:~/Kurse/StarOffice/XML > ls -l
insgesamt 8
-rw-------    1 wgriege  GWDG         7228 Mär 31 19:11 ein_beispiel.sxw
wgriege@PCGrieger:~/Kurse/StarOffice/XML > unzip ein_beispiel.sxw
Archive:  ein_beispiel.sxw
  inflating: content.xml
  inflating: ObjBFFFDFE1/content.xml
  inflating: ObjBFFFDFE1/settings.xml
  inflating: styles.xml
 extracting: meta.xml
  inflating: settings.xml
  inflating: META-INF/manifest.xml
wgriege@PCGrieger:~/Kurse/StarOffice/XML > more ObjBFFFDFE1/content.xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE math:math PUBLIC "-//OpenOffice.org//DTD Modified W3C MathML 1.01//EN"
 "math.dtd"><math:math xmlns:math="http://www.w3.org/1998/Math/MathML"><math:sem
antics><math:mrow><math:mrow><math:msup><math:mrow><math:mo math:stretchy="false
">î
th:mo><math:mi>b</math:mi></math:mrow><math:mo math:stretchy="false">î
</math:mrow><math:mn>2</math:mn></math:msup><math:mo math:stretchy="false">=</ma
th:mo><math:mrow><math:msup><math:mi>a</math:mi><math:mn>2</math:mn></math:msup>
<math:mo math:stretchy="false">î  </math:mo><math:mn>2</math:mn></math:mrow></mh
:mrow><math:mi>a</math:mi><math:mrow><math:mi>b</math:mi><math:mo math:stretchy=
"false">î  </math:mo><math:msup><math:mi>b</math:mi><math:mn>2</math:mn></math:u
p></math:mrow></math:mrow><math:annotation math:encoding="StarMath 5.0">(a + b)^
2 = a^2 + 2 a b + b^2</math:annotation></math:semantics></math:math>
wgriege@PCGrieger:~/Kurse/StarOffice/XML >
```