mathtools 꾸러미

amsmath 꾸러미의 확장판

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2015 한국텍학회 학술대회 및 정기총회

국가수리과학연구소

차례

수식 조판

The TEXbook

GENTLE READER: This is a handbook about TEX, a new typesetting system intended for the creation of beautiful books—and especially for books that contain a lot of mathematics.

The TEXbook

16, 17, 18, 19, 26, G

장(chapter) 수

$$\frac{6}{37} = 0.\dot{1}6\dot{2}$$

쪽(page) 수

$$\frac{120}{483} = 0.\overbrace{\dot{2}4844\ldots22360\dot{}}^{66}$$

꾸러미 소개

mathtools가 다루는 사항

1. `amsmath` 꾸러미의 버그 수정
   - `http://www.latex-project.org/cgi-bin/ltxbugs2html?category=AMS+LaTeX`
   - 3591, 3614
2. 수식 조판용 유용한 툴 제공
   - 간단한 매크로
   - 새로운 수식 환경

수식 조판 도구

1. Fine–tuning mathematical layout
2. Controlling tags
3. Extensible symbols
4. New mathematical building blocks
5. Intertext and short intertext
6. Paired delimiters

```
> texdoc mathtools
```

Mathtools — for beautiful math

꾸러미 로딩

```
\usepackage[fleqn,tbtags]{amsmath}
```

꾸러미 로딩

```
\usepackage[fleqn,tbtags]{mathtools}
```

수식 미세 조정

\mathllap, \mathclap, \mathrlap,

\clap, \mathmbox, \mathmakebox,

\cramped, \crampedllap,

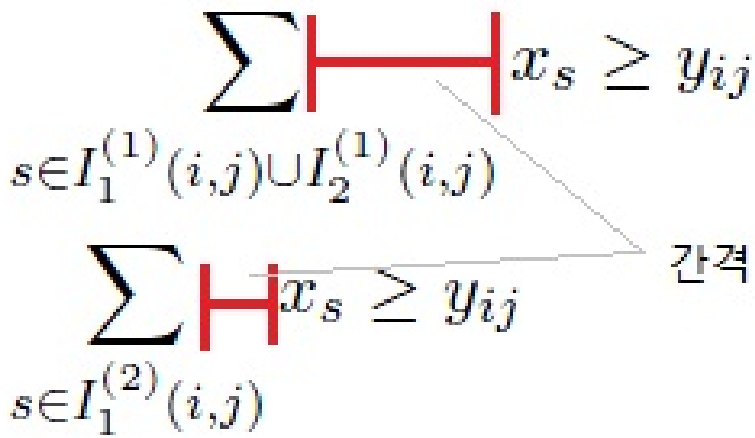
\crampedclap, \crampedrlap,

\smashoperator, \adjustlimits

KTUG QnA 마당

http://www.ktug.org/xe/index.php?document_srl=158017

"정렬시 summation과 수식간의 간격 조절에 대해 궁금합니다."



\mathclap

```
V = \sum_{s\in I_1^{(1)}(i,j)\cup I_2^{(1)}(i,j)}x_s\ge
y_{ij}
```

$$V = \sum_{s\in I_1^{(1)}(i,j)\cup I_2^{(1)}(i,j)} x_s \ge y_{ij}$$

```
V =
\sum_{\mathclap{s\in I_1^{(1)}(i,j)\cup I_2^{(1)}(i,j)}}x_s\ge
y_{ij}
```

$$V = \sum_{\mathclap{s\in I_1^{(1)}(i,j)\cup I_2^{(1)}(i,j)}} x_s \ge y_{ij}$$

\smashoperator

$$\prod_{j\geq 0}\left(\sum_{k\geq 0} a_{jk}z^k\right) = \sum_{n\geq 0} z^n \left(\sum_{\substack{k_0,k_1,\ldots\geq 0\\ k_0+k_1+\cdots=n}} a_{0k_0}a_{1k_1}\cdots\right).$$

\smashoperator

```
\prod_{j\ge0}\left(\sum_{k\ge0}a_{jk}z^k\right)
  =\sum_{n\ge0}z^n\left(\sum_
      {k_0,k_1,\ldots\ge0\atop k_0+k_1+\cdots=n}
   a_{0k_0}a_{1k_1}\ldots\,\right).
```

$$\prod_{j\ge0}\left(\sum_{k\ge0}a_{jk}z^k\right)=\sum_{n\ge0}z^n\left(\sum_{\substack{k_0,k_1,\ldots\ge0\\k_0+k_1+\cdots=n}}a_{0k_0}a_{1k_1}\ldots\right).$$

\smashoperator

```
\prod_{j\ge0}\biggl(\sum_{k\ge0}a_{jk}z^k\biggr)
  =\sum_{n\ge0}z^n\,\Biggl(\sum_
     {\substack{k_0,k_1,\ldots\ge0\\ k_0+k_1+\cdots=n}}
    a_{0k_0}a_{1k_1}\ldots\,\Biggr).
```

$$\prod_{j\ge0}\biggl(\sum_{k\ge0}a_{jk}z^k\biggr)
  =\sum_{n\ge0}z^n\,\Biggl(\sum_{\substack{k_0,k_1,\ldots\ge0\\ k_0+k_1+\cdots=n}}
    a_{0k_0}a_{1k_1}\ldots\Biggr).$$

\smashoperator

```
\prod_{j\ge0}\biggl(\sum_{k\ge0}a_{jk}z^k\biggr)
  =\sum_{n\ge0}z^n\,\Biggl(\sum_{\mathclap
     {\substack{k_0,k_1,\ldots\ge0\\ k_0+k_1+\cdots=n}}}
    a_{0k_0}a_{1k_1}\ldots\,\Biggr).
```

$$\prod_{j\ge0}\biggl(\sum_{k\ge0}a_{jk}z^k\biggr) =\sum_{n\ge0}z^n\,\Biggl(\sum_{\substack{k_0,k_1,\ldots\ge0\\ k_0+k_1+\cdots=n}} a_{0k_0}a_{1k_1}\ldots\Biggr).$$

\smashoperator

```
V = \smashoperator{\sum_{1\le i\le j\le n}}V_{ij}
```

$$V = \sum_{1\le i\le j\le n} V_{ij}$$

```
V = \smashoperator[l]{\sum_{1\le i\le j\le n}}V_{ij}
```

$$V = \sum_{1\le i\le j\le n} V_{ij}$$

```
V = \smashoperator[r]{\sum_{1\le i\le j\le n}}V_{ij}
```

$$V = \sum_{1\le i\le j\le n} V_{ij}$$

\smashoperator

```
\prod_{j\ge0}\biggl(\sum_{k\ge0}a_{jk}z^k\biggr)
  =\sum_{n\ge0}z^n\,\Biggl(\smashoperator[r]{\sum_
     {\substack{k_0,k_1,\ldots\ge0\\ k_0+k_1+\cdots=n}}}
   a_{0k_0}a_{1k_1}\ldots\,\Biggr).
```

$$\prod_{j\ge0}\biggl(\sum_{k\ge0}a_{jk}z^k\biggr)=\sum_{n\ge0}z^n\,\Biggl(\smashoperator[r]{\sum_{\substack{k_0,k_1,\ldots\ge0\\ k_0+k_1+\cdots=n}}}a_{0k_0}a_{1k_1}\ldots\Biggr).$$

\adjustlimits

$$\lim_{n\to\infty}\max_{p\geq n} \qquad \lim_{n\to\infty}\max_{p^2\geq n} \qquad \lim_{n\to\infty}\sup_{p^2\geq nK} \qquad \lim_{n\to\infty}\sup\max_{p\geq n}$$

\adjustlimits

```
\lim_{n\to\infty}\max_{p\ge n}
\lim_{n\to\infty}\max_{p^2\ge n}
\lim_{n\to\infty}\sup_{p^2\ge nK}
\limsup_{n\to\infty}\max_{p\ge n}
```

$$\lim_{n\to\infty}\max_{p\ge n} \qquad \lim_{n\to\infty}\max_{p^2\ge n} \qquad \lim_{n\to\infty}\sup_{p^2\ge nK} \qquad \limsup_{n\to\infty}\max_{p\ge n}$$

\adjustlimits

```
\adjustlimits\lim_{n\to\infty}\max_{p\ge n}
\adjustlimits\lim_{n\to\infty}\max_{p^2\ge n}
\adjustlimits\lim_{n\to\infty}\sup_{p^2\ge nK}
\adjustlimits\limsup_{n\to\infty}\max_{p\ge n}
```

$$\lim_{n\to\infty}\max_{p\ge n} \qquad \lim_{n\to\infty}\max_{p^2\ge n} \qquad \lim_{n\to\infty}\sup_{p^2\ge nK} \qquad \limsup_{n\to\infty}\max_{p\ge n}$$

새로운 수식 환경

행렬

\matrix*, \pmatrix*, \bmatrix*, \Bmatrix*, \vmatrix*, \Vmatrix*,

\begin{matrix*}[<col>] <contents> \end{matrix*}

옵션인자 col: c, l, r

$$\begin{pmatrix} -1 & 3 \\ 2 & -4 \end{pmatrix} \quad \begin{pmatrix} -1 & 3 \\ 2 & -4 \end{pmatrix} \quad \begin{pmatrix} -1 & 3 \\ 2 & -4 \end{pmatrix}$$

disallowspaces, allowspaces

```
\begin{pmatrix*}␣[r]
-1&3\\
2&-4
\end{pmatrix*}
```

$$\begin{pmatrix} [r]-1 & 3 \\ 2 & -4 \end{pmatrix}$$

disallowspaces, allowspaces

```
\usepackage[allowspaces]{mathtools}
```

```
\begin{pmatrix*}
[r]&[s]\\
[t]&[u]
\end{pmatrix*}
```

$$\begin{pmatrix} & [s] \\ [t] & [u] \end{pmatrix}$$

case류 환경

```
a= \begin{cases}
      E = mc^2      & Nothing to see here \\
      \int x-3\, dx & Integral is display style
   \end{cases}
```

$$a = \begin{cases} E = mc^2 & Nothingtoseehere \\ \int x - 3\, dx & Integralisdisplaystyle \end{cases}$$

case류 환경

```
a= \begin{cases*}
      E = mc^2      & Nothing to see here \\
      \int x-3\, dx & Integral is display style
   \end{cases*}
```

$$a = \begin{cases} E = mc^2 & \text{Nothing to see here} \\ \int x - 3\, dx & \text{Integral is display style} \end{cases}$$

case류 환경

```
a= \begin{dcases*}
      E = mc^2      & Nothing to see here \\
      \int x-3\, dx & Integral is display style
   \end{dcases*}
```

$$a = \begin{cases} E = mc^2 & \text{Nothing to see here} \\ \int x - 3\, dx & \text{Integral is display style} \end{cases}$$

case류 환경

\dcases, \dcases*, \rcases, \rcases*,
\drcases, \drcases*, \cases*

Paired delimiters

```
\DeclarePairedDelimiter\abs{\lvert}{\rvert}

\abs{\frac ab}
\abs*{\frac ab}
\abs[\Bigg]{\frac ab}
```

$$\left|\frac{a}{b}\right| \quad \left|\frac{a}{b}\right| \quad \left|\frac{a}{b}\right|$$

왼쪽 윗/아랫첨자

```
{}^{4}_{12}\mathbf{C}^{5+}_{2}
\prescript{14}{2}{\mathbf{C}}^{5+}_{2}
\prescript{4}{12}{\mathbf{C}}^{5+}_{2}
\prescript{14}{}{\mathbf{C}}^{5+}_{2}
\prescript{}{2}{\mathbf{C}}^{5+}_{2}
```

$$ {}^{4}_{12}\mathbf{C}^{5+}_{2} \quad {}^{14}_{2}\mathbf{C}^{5+}_{2} \quad {}^{4}_{12}\mathbf{C}^{5+}_{2} \quad {}^{14}\mathbf{C}^{5+}_{2} \quad {}_{2}\mathbf{C}^{5+}_{2} $$

Split fractions

```
z=\frac{ab+cd+ef+gh+ij+kl+mn+op+qr}{y}
```

$$z = \frac{ab + cd + ef + gh + ij + kl + mn + op + qr}{y}$$

```
z=\frac{\splitfrac{ab+cd+ef+gh+ij}{+kl+mn+op+qr}}{y}
```

$$z = \frac{\begin{aligned} ab + cd + ef + gh + ij \\ + kl + mn + op + qr \end{aligned}}{y}$$

감사합니다.