Align

math/align-intertext

```
We do this with the double-angle formula
\begin{align*}
    \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta),
\end{align*}
which we can rewrite as
\begin{align*}
    &= \cos^2(\theta) - (1 - \cos^2(\theta))\\
    &= 2\cos^2(\theta)-1.
\end{align*}
```

We do this with the double-angle formula

$$\cos(2\theta) = \cos^2(\theta) - \sin^2(\theta),$$

which we can rewrite as

$$\begin{aligned} &= \cos^2(\theta) - (1 - \cos^2(\theta)) \\ &= 2\cos^2(\theta) - 1. \end{aligned}$$

Align

math/align-intertext

```
We do this with the double-angle formula
\begin{align*}
    \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta),
\intertext{which we can rewrite as}
    &= \cos^2(\theta) - (1 - \cos^2(\theta))\\
    &= 2\cos^2(\theta)-1.
\end{align*}
```

We do this with the double-angle formula

$$\cos(2\theta) = \cos^2(\theta) - \sin^2(\theta),$$

which we can rewrite as

$$\begin{aligned} &= \cos^2(\theta) - (1 - \cos^2(\theta)) \\ &= 2\cos^2(\theta) - 1. \end{aligned}$$

Align

math/align-numbers

```
The double-angle formula can now be rewritten as
\begin{align}
    \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta)\\
    &= 2\cos^2(\theta)-1.
\end{align}
```

The double-angle formula can now be rewritten as

$$\cos(2\theta) = \cos^2(\theta) - \sin^2(\theta) \tag{1}$$
$$= 2\cos^2(\theta) - 1. \tag{2}$$

Align

math/align-numbers

```
The double-angle formula can now be rewritten as
\begin{align}
    \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta)
    \nonumber\\
    &= 2\cos^2(\theta)-1.
\end{align}
```

The double-angle formula can now be rewritten as

$$\begin{aligned} \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta) \\ &= 2\cos^2(\theta) - 1. \end{aligned} \tag{1}$$

Align

math/align-numbers

```
The double-angle formula can now be rewritten as
\begin{align*}
    \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta)\\
    &= 2\cos^2(\theta)-1.
\end{align*}
```

The double-angle formula can now be rewritten as

$$\begin{aligned}\cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta)\\ &= 2\cos^2(\theta) - 1.\end{aligned}$$

Align

math/align-tag

```
The double-angle formula can now be rewritten as
\begin{align*}
    \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta)\\
    &= 2\cos^2(\theta)-1. \tag{$ * $}
\end{align*}
```

The double-angle formula can now be rewritten as

$$\begin{aligned}\cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta)\\ &= 2\cos^2(\theta) - 1. \end{aligned} \tag{$*$}$$

Align

math/align-unaligned

```
The double-angle formula can now be rewritten as
\begin{align}
    \cos(2\theta) = \cos^2(\theta) - \sin^2(\theta)\\
    = 2\cos^2(\theta)-1.
\end{align}
```

The double-angle formula can now be rewritten as

$$\cos(2\theta) = \cos^2(\theta) - \sin^2(\theta) \tag{1}$$
$$= 2\cos^2(\theta) - 1. \tag{2}$$

Also in use

math/also-in-use

```
AA \(\sqrt{2}\)
BB \[\sqrt{3}\]
CC $$ \sqrt{4} $$
```

AA $\sqrt{2}$ BB

$$\sqrt{3}$$

CC

$$\sqrt{4}$$

Formulas: Arrows and operators

math/arrows

```
\DeclareMathOperator{\Image}{Image}

a \iff b, a\implies b, a\mapsto b
\lim_{x\to 0}\frac{\sin(x)}{x} = 1
\Image(f) = \mathbb{R}_{\geq 0}
```

$$a \iff b, a \implies b, a \mapsto b$$

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

$$\operatorname{Image}(f) = \mathbb{R}_{\geq 0}$$

Formulas: The basics

math/basics

Formula	Code	Formula	Code
$\sqrt{2}$	$ $	$\sqrt[3]{8}$	$ $
$\frac{2}{3}$	$ $	x_1	$ $
$6 \geq 3$	$ $	x_1^2	$ $
$a^2 + b^2$	$ $	a^{2+b^2}	$ $

Formulas: The basics

math/basics

Formula	Code	Formula	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ $`
$\frac{2}{3}$	`$ $`	x_1	`$ $`
$6 \geq 3$	`$ $`	x_1^2	`$ $`
$a^2 + b^2$	`$ $`	a^{2+b^2}	`$ $`

Formulas: The basics

math/basics

Formula	Code	Formula	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ $`
$6 \geq 3$	`$ $`	x_1^2	`$ $`
$a^2 + b^2$	`$ $`	a^{2+b^2}	`$ $`

Formulas: The basics

math/basics

Formula	Code	Formula	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ $`
$6 \geq 3$	`$ 6\geq 3 $`	x_1^2	`$ $`
$a^2 + b^2$	`$ $`	a^{2+b^2}	`$ $`

Formulas: The basics

math/basics

Formula	Code	Formula	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ $`
$6 \geq 3$	`$ 6\geq 3 $`	x_1^2	`$ $`
$a^2 + b^2$	`$ a^2 + b^2 $`	a^{2+b^2}	`$ $`

Formulas: The basics

math/basics

Formula	Code	Formula	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ \sqrt[3]{8} $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ x_1 $`
$6 \geq 3$	`$ 6\geq 3 $`	x_1^2	`$ x_1^2 $`
$a^2 + b^2$	`$ a^2 + b^2 $`	a^{2+b^2}	`$ a^{2+b^2} $`

Formulas: The basics

math/basics

Formula	Code	Formula	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ \sqrt[3]{8} $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ x_1 $`
$6 \geq 3$	`$ 6\geq 3 $`	x_1^2	`$ $`
$a^2 + b^2$	`$ a^2 + b^2 $`	a^{2+b^2}	`$ $`

Formulas: The basics

math/basics

Formula	Code	Formula	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ \sqrt[3]{8} $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ x_1 $`
$6 \geq 3$	`$ 6\geq 3 $`	x_1^2	`$ x_1^2 $`
$a^2 + b^2$	`$ a^2 + b^2 $`	a^{2+b^2}	`$ a^{2+b^2} $`

Formulas: The basics

math/basics

Formula	Code	Formula	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ \sqrt[3]{8} $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ x_1 $`
$6 \geq 3$	`$ 6\geq 3 $`	x_1^2	`$ x_1^2 $`
$a^2 + b^2$	`$ a^2 + b^2 $`	a^{2+b^2}	`$ a^{2 + b^2} $`

Formulas: The basics

math/basics

Formula	Code	Formula	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ \sqrt[3]{8} $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ x_1 $`
$6 \geq 3$	`$ 6\geq 3 $`	x_1^2	`$ x_1^2 $`
$a^2 + b^2$	`$ a^2 + b^2 $`	a^{2+b^2}	`$ a^{2 + b^2} $`

`$ x^22 $`: x^22

Formulas: The basics

math/basics

Formula	Code	Formula	Code
$\sqrt{2}$	`$ \sqrt{2} $`	$\sqrt[3]{8}$	`$ \sqrt[3]{8} $`
$\frac{2}{3}$	`$ \frac{2}{3} $`	x_1	`$ x_1 $`
$6 \geq 3$	`$ 6\geq 3 $`	x_1^2	`$ x_1^2 $`
$a^2 + b^2$	`$ a^2 + b^2 $`	a^{2+b^2}	`$ a^{2 + b^2} $`

`$ x^22 $`: x^22 | `$ x^{22}$`: x^{22}

Formulas: Calculus

math/calculus

```
\usepackage{commath}
```

```
\dod{\sin(x)}{x}, \dpd{f(x,y)}{x}, \partial_x f

\int_{0}^{\infty}e^{-x}\dif x = 1
```

$$\frac{\mathrm{d}\sin(x)}{\mathrm{d}x}, \frac{\partial f(x,y)}{\partial x}, \partial_x f$$

$$\int_0^\infty e^{-x}\,\mathrm{d}x = 1$$

Equation

math/equation

```
The trigonometric identity is
$ \sin^2(\theta) + \cos^2(\theta) = 1 $.

The trigonometric identity is
\begin{equation}
    \sin^2(\theta) + \cos^2(\theta) = 1.
\end{equation}
```

De trigonometric identity is $\sin^2(\theta) + \cos^2(\theta) = 1$.

De trigonometric identity is

$$\sin^2(\theta) + \cos^2(\theta) = 1. \tag{1}$$

Formulas

math/inline

The trigonometric identity is $\sin^2(\theta) + \cos^2(\theta) = 1$.

Formulas

math/inline

The trigonometric identity is $\sin^2(\theta) + \cos^2(\theta) = 1$.

```
The trigonometric identity
is $ \sin^2(\theta) + \cos^2(\theta) = 1 $.
```

Formulas

math/inline

The trigonometric identity is $\sin^2(\theta) + \cos^2(\theta) = 1$.

```
The trigonometric identity
is $ \sin^2(\theta) + \cos^2(\theta) = 1 $.
```

```
\usepackage{amsmath,amssymb}
\usepackage{commath,mathtools}
```

Delimiter point

math/left-right-delimeter-point

```
\begin{align*}
    \left.\left[x^2\right]\right|_{x=0}^{x=2} = 4
\end{align*}
```

$$\left.\left[x^2\right]\right|_{x=0}^{x=2} = 4,$$

Left-right

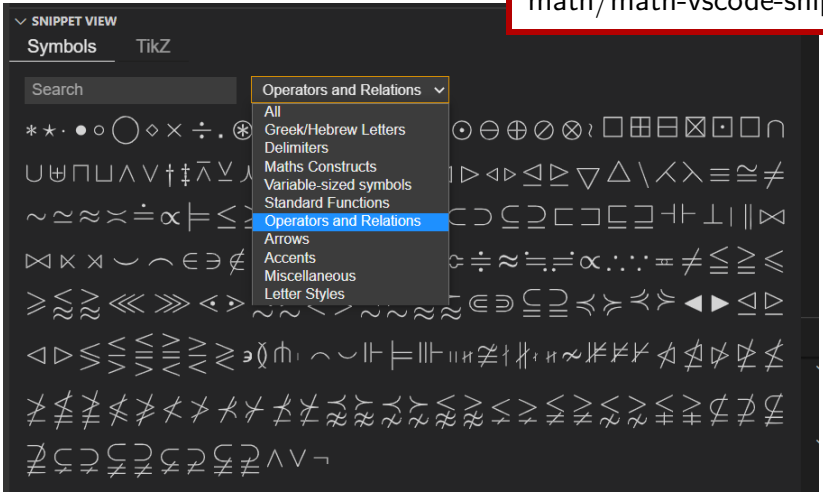
math/left-right

```
\begin{align*}
    &f(\sum_{i=1}^{n}x_i)\\
    &f\left(\sum_{i=1}^{n}x_i\right)
\end{align*}
```

$$f(\sum_{i=1}^{n} x_i)$$

$$f\left(\sum_{i=1}^{n} x_i\right)$$

math/math-vscode-snippet-view



Chemical formulas `\usepackage{mhchem}`

math/mhchem

```
\ce{CO2 + C -> 2 CO}\\
$\ce{CO2 + C -> 2 CO}$\\
\ce{CH4 + 2 $\left(\ce{O2 + 79/21 N2}\right)$}
%$\ce{CH4 + 2 \left(\ce{O2 + 79/21 N2}\right)}$ % Error
```

$\mathrm{CO_2 + C \longrightarrow 2\,CO}$
$\mathrm{CO_2 + C \longrightarrow 2\,CO}$
$\mathrm{CH_4 + 2\left(O_2 + \frac{79}{21}\,N_2\right)}$

Some examples are taken from the `mhchem` package documentation (see below)

More example can be found in the documentation of `mhchem`, see
https://ctan.org/pkg/mhchem

Formulas: Mathematical relations

math/relations

Formula	Code	Formula	Code
$a \leq b$	`$ a \leq b $`	$a \geq b$	`$ a \geq b $`
$a < b$	`$ a < b $`	$a > b$	`$ a > b $`
$a \ll b$	`$ a \ll b $`	$a \gg b$	`$ a \gg b $`
$a = b$	`$ a = b $`	$a \simeq b$	`$ a \simeq b $`
$a \neq b$	`$ a \neq b $`	$a \approx b$	`$ a \approx b $`
$a \sim b$	`$ a \sim b $`	$a \stackrel{*}{=} b$	`$ a \stackrel{*}{=} b $`

math/structures

```
\begin{align*}
    R(\theta) = \begin{pmatrix}
        \cos(\theta) & -\sin(\theta)\\
        \sin(\theta) & \cos(\theta)
    \end{pmatrix},\quad
    \abs{x} = \begin{cases}
        x & \text{if $ x \geq 0$}\\
        -x & \text{if $ x < 0$}
    \end{cases}
\end{align*}
```

$$R(\theta) = \begin{pmatrix} \cos(\theta) & -\sin(\theta) \\ \sin(\theta) & \cos(\theta) \end{pmatrix}, \quad |x| = \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0 \end{cases}$$

Subscript/superscript: Inzichtsvragen

math/subscript-superscript-inzicht

Foutief `\vec{F}_{tot}`

Correct

Foutief

Hint

Correct

Code A

Code B

Subscript/superscript: Inzichtsvragen

math/subscript-superscript-inzicht

Foutief `\vec{F}_{tot}` $\vec{F}_{tot}$

Correct

Foutief

Hint

Correct

Code A

Code B

Subscript/superscript: Inzichtsvragen

math/subscript-superscript-inzicht

Foutief `\vec{F}_{tot}` $\vec{F}_{tot}$

Correct `\vec{F}_{\text{tot}}` $\vec{F}_{\text{tot}}$

Foutief

Hint

Correct

Code A

Code B

Subscript/superscript: Inzichtsvragen

math/subscript-superscript-inzicht

Foutief `\vec{F}_{tot}` $\vec{F}_{tot}$

Correct `\vec{F}_{\text{tot}}` $\vec{F}_{\text{tot}}$

Foutief `\vec{F_{\text{tot}}}`

Hint

Correct

Code A

Code B

Subscript/superscript: Inzichtsvragen

math/subscript-superscript-inzicht

Foutief `\vec{F}_{tot}` $\vec{F}_{tot}$

Correct `\vec{F}_{\text{tot}}` $\vec{F}_{\text{tot}}$

Foutief `\vec{F_{\text{tot}}}`

Hint `\vec{abc}` $a\vec{b}c$ $\vec{abc}$

Correct

Code A

Code B

Subscript/superscript: Inzichtsvragen

math/subscript-superscript-inzicht

Foutief `\vec{F}_{tot}` $\vec{F}_{tot}$

Correct `\vec{F}_{\text{tot}}` $\vec{F}_{\text{tot}}$

Foutief `\vec{F_{\text{tot}}}` $\vec{F_{\text{tot}}}$ $\vec{F_{\text{tot}}}$

Hint `\vec{abc}` $\vec{abc}$ $\vec{abc}$

Correct

Code A

Code B

Subscript/superscript: Inzichtsvragen

math/subscript-superscript-inzicht

Foutief `\vec{F}_{tot}` $\vec{F}_{tot}$

Correct `\vec{F}_{\text{tot}}` $\vec{F}_{\text{tot}}$

Foutief `\vec{F_{\text{tot}}}` $F_{\vec{\text{tot}}}$ $\vec{F_{\text{tot}}}$

Hint `\vec{abc}` $a\vec{b}c$ $\vec{abc}$

Correct `\vec{F}_{\text{tot}}` $\vec{F}_{\text{tot}}$ $\vec{F}_{\text{tot}}$

Code A

Code B

Subscript/superscript: Inzichtsvragen

math/subscript-superscript-inzicht

Foutief	`\vec{F}_{tot}`	$\vec{F}_{tot}$
Correct	`\vec{F}_{\text{tot}}`	$\vec{F}_{\text{tot}}$
Foutief	`\vec{F_{\text{tot}}}`	$F_{\vec{\text{tot}}}$ $\vec{F_{\text{tot}}}$
Hint	`\vec{abc}`	$a\vec{b}c$ $\vec{abc}$
Correct	`\vec{F}_{\text{tot}}`	$\vec{F}_{\text{tot}}$ $\vec{F}_{\text{tot}}$
Code A	`x_0^2`	
Code B	`{x_0}^2`	

Subscript/superscript: Inzichtsvragen

math/subscript-superscript-inzicht

Foutief	`\vec{F}_{tot}`	$\vec{F}_{tot}$
Correct	`\vec{F}_{\text{tot}}`	$\vec{F}_{\text{tot}}$
Foutief	`\vec{F_{\text{tot}}}`	$F_{\vec{\text{tot}}}$ $\vec{F_{\text{tot}}}$
Hint	`\vec{abc}`	$a\vec{b}c$ $\vec{abc}$
Correct	`\vec{F}_{\text{tot}}`	$\vec{F}_{\text{tot}}$ $\vec{F}_{\text{tot}}$
Code A	`x_0^2`	x_0^2
Code B	`{x_0}^2`	

Subscript/superscript: Inzichtsvragen

math/subscript-superscript-inzicht

Foutief	`\vec{F}_{tot}`	$\vec{F}_{tot}$
Correct	`\vec{F}_{\text{tot}}`	$\vec{F}_{\text{tot}}$
Foutief	`\vec{F_{\text{tot}}}`	$\vec{F_{\text{tot}}}$ $\boxed{\vec{F_{\text{tot}}}}$
Hint	`\vec{abc}`	$\vec{abc}$ $\boxed{\vec{abc}}$
Correct	`\vec{F}_{\text{tot}}`	$\vec{F}_{\text{tot}}$ $\boxed{\vec{F}_{\text{tot}}}$
Code A	`x_0^2`	x_0^2
Code B	`{x_0}^2`	${x_0}^2$

So many! And there are lots more :-)

CTAN symbol list:
`http://mirrors.ctan.org/info/symbols/comprehensive/symbols-a4.pdf`

Detexify:
`http://detexify.kirelabs.org/classify.html`

Formulas: Symbols

math/symbols

Formula	Code	Formula	Code
$x_1, \ldots, x_n$	`$ $`	$5 \cdot 6$	`$ $`
α, β, γ	`$ $`	A, B, Γ	`$ $`
ϵ, ε	`$ $`	$\mathcal{P}$	`$ $`
ϕ, φ	`$ $`	$\mathbb{P}$	`$ $`

Formulas: Symbols

math/symbols

Formula	Code	Formula	Code
$x_1, \dots, x_n$	`$ x_1,\dots,x_n $`	$5 \cdot 6$	`$ $`
α, β, γ	`$ $`	A, B, Γ	`$ $`
ϵ, ε	`$ $`	$\mathcal{P}$	`$ $`
ϕ, φ	`$ $`	$\mathbb{P}$	`$ $`

Formulas: Symbols

math/symbols

Formula	Code	Formula	Code
$x_1, \ldots, x_n$	`$ x_1,\dots,x_n $`	$5 \cdot 6$	`$ $`
α, β, γ	`$ \alpha,\beta,\gamma $`	A, B, Γ	`$ $`
ϵ, ε	`$ $`	$\mathcal{P}$	`$ $`
ϕ, φ	`$ $`	$\mathbb{P}$	`$ $`

Formulas: Symbols

math/symbols

Formula	Code	Formula	Code
$x_1, \dots, x_n$	`$ x_1,\dots,x_n $`	$5 \cdot 6$	`$ $`
α, β, γ	`$ \alpha,\beta,\gamma $`	A, B, Γ	`$ $`
ϵ, ε	`$ \epsilon,\varepsilon $`	$\mathcal{P}$	`$ $`
ϕ, φ	`$ $`	$\mathbb{P}$	`$ $`

Formulas: Symbols

math/symbols

Formula	Code	Formula	Code
$x_1, \dots, x_n$	`$ x_1,\dots,x_n $`	$5 \cdot 6$	`$ $`
α, β, γ	`$ \alpha,\beta,\gamma $`	A, B, Γ	`$ $`
ϵ, ε	`$ \epsilon,\varepsilon $`	$\mathcal{P}$	`$ $`
ϕ, φ	`$ \phi,\varphi $`	$\mathbb{P}$	`$ $`

Formulas: Symbols

math/symbols

Formula	Code	Formula	Code
$x_1, \dots, x_n$	`$ x_1,\dots,x_n $`	$5 \cdot 6$	`$ 5\cdot 6 $`
α, β, γ	`$ \alpha,\beta,\gamma $`	A, B, Γ	`$ $`
ϵ, ε	`$ \epsilon,\varepsilon $`	$\mathcal{P}$	`$ $`
ϕ, φ	`$ \phi,\varphi $`	$\mathbb{P}$	`$ $`

Formulas: Symbols

math/symbols

Formula	Code	Formula	Code
$x_1, \dots, x_n$	`$ x_1,\dots,x_n $`	$5 \cdot 6$	`$ 5\cdot 6 $`
α, β, γ	`$ \alpha,\beta,\gamma $`	A, B, Γ	`$ A,B,\Gamma $`
ϵ, ε	`$ \epsilon,\varepsilon $`	$\mathcal{P}$	`$ $`
ϕ, φ	`$ \phi,\varphi $`	$\mathbb{P}$	`$ $`

Formulas: Symbols

math/symbols

Formula	Code	Formula	Code
$x_1, \dots, x_n$	`$ x_1,\dots,x_n $`	$5 \cdot 6$	`$ 5\cdot 6 $`
α, β, γ	`$ \alpha,\beta,\gamma $`	A, B, Γ	`$ A,B,\Gamma $`
ϵ, ε	`$ \epsilon,\varepsilon $`	$\mathcal{P}$	`$ \mathcal{P} $`
ϕ, φ	`$ \phi,\varphi $`	$\mathbb{P}$	`$ $`

Formulas: Symbols

math/symbols

Formula	Code	Formula	Code
$x_1, \ldots, x_n$	`$ x_1,\dots,x_n $`	$5 \cdot 6$	`$ 5\cdot 6 $`
α, β, γ	`$ \alpha,\beta,\gamma $`	A, B, Γ	`$ A,B,\Gamma $`
ϵ, ε	`$ \epsilon,\varepsilon $`	$\mathcal{P}$	`$ \mathcal{P} $`
ϕ, φ	`$ \phi,\varphi $`	$\mathbb{P}$	`$ \mathbb{P} $`

math/text

$sin(x)$

$\vec{F}_{tot}$

```
$ sin(x) $
$ \vec{F}_{tot}$
```

$\sin(x)$

$\vec{F}_{\text{tot}}$

```
$ \sin(x) $
$ \vec{F}_{\text{tot}}$
```

Formulas: Vectors

math/vectors

Formula	Code	Formula	Code
$\vec{x}$	`$ \vec{x} $`	$\vec{F}_{\text{tot}}$	`$ \vec{F}_{\text{tot}} $`
$\mathbf{x}$	`$ \mathbf{x} $`	$\hat{\imath} + 6\,\hat{k}$	`$ \hat{\imath} + 6\,\hat{k} $`
$\|\vec{x}\|$	`$ \norm{\vec{x}} $`	$\nabla \times \mathbf{A}$	`$ \nabla\times\mathbf{A} $`

$$\vec{F}_{tot},\ \vec{F}_{\text{tot}}$$