

▷ Size-adaptive math

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|------------------------------|---------------------|------------------------|
| <code>\bb{...}</code> | (x) | parantheses |
| <code>\bc{...}</code> | $[x]$ | brackets |
| <code>\absv{...}</code> | $ x $ | absolute value |
| <code>\absvsq{...}</code> | $ x ^2$ | absolute value squared |
| <code>\comm{...}{...}</code> | $[x, y]$ | commutator |
| <code>\meanv{...}</code> | $\langle x \rangle$ | mean value |

▷ Braket notation

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|--|------------------------|----------------------|
| <code>\bra{...}</code> | $\langle x $ | bra |
| <code>\ket{...}</code> | $ x\rangle$ | ket |
| <code>\braket{...}{...}</code> | $\langle x y\rangle$ | scalar product |
| <code>\ketbra{...}{...}</code> | $ x\rangle\langle y $ | ket-bra operator |
| <code>\braketop{...}{...}{...}</code> | $\langle x y z\rangle$ | matrix element |
| <code>\smallbraketop{...}{...}{...}</code> | $\langle x y z\rangle$ | small matrix element |

▷ Special functions

| | | |
|---------------------------|------------------------|-------------------------------|
| <code>\deltaf{...}</code> | $\delta(x)$ | delta function |
| <code>\thetaf{...}</code> | $\theta(x)$ | theta function |
| <code>\expf{...}</code> | $\exp(x)$ | exponential function |
| <code>\ef{...}</code> | e^x | exponential function |
| <code>\Ref{...}</code> | $\operatorname{Re}(x)$ | real part, function form |
| <code>\Imf{...}</code> | $\operatorname{Im}(x)$ | imaginary part, function form |
| <code>\Re</code> | Re | real part |
| <code>\Im</code> | Im | imaginary part |

▷ Named states

| | |
|----------------------|----------------|
| <code>\ketPsi</code> | $ \Psi\rangle$ |
|----------------------|----------------|

| | | |
|-----------------------|----------------------|---------------|
| <code>\ketpsi</code> | $ \psi\rangle$ | |
| <code>\ketphi</code> | $ \varphi\rangle$ | |
| <code>\ketup</code> | $ \uparrow\rangle$ | spin up |
| <code>\ketdn</code> | $ \downarrow\rangle$ | spin down |
| <code>\ketzero</code> | $ 0\rangle$ | |
| <code>\ketone</code> | $ 1\rangle$ | |
| <code>\ketg</code> | $ g\rangle$ | ground state |
| <code>\kete</code> | $ e\rangle$ | excited state |
| <code>\vac</code> | $ \text{vac}\rangle$ | vacuum |

▷ Pauli matrices

| | |
|----------------------|------------|
| <code>\sx</code> | σ^x |
| <code>\sy</code> | σ^y |
| <code>\sz</code> | σ^z |
| <code>\splus</code> | σ^+ |
| <code>\sminus</code> | σ^- |

▷ Vectors

| | |
|-----------------------|----------------|
| <code>\vecr</code> | \mathbf{r} |
| <code>\vecrone</code> | \mathbf{r}_1 |
| <code>\vecrtwo</code> | \mathbf{r}_2 |
| <code>\vecrn</code> | \mathbf{r}_N |
| <code>\vecr{i}</code> | \mathbf{r}_i |
| <code>\vecr{j}</code> | \mathbf{r}_j |
| <code>\vecR</code> | \mathbf{R} |
| <code>\vecx</code> | \mathbf{x} |
| <code>\vecy</code> | \mathbf{y} |
| <code>\vecz</code> | \mathbf{z} |

| | |
|------------------------|-----------------------|
| <code>\vecxi</code> | \mathbf{x}_i |
| <code>\vecxj</code> | \mathbf{x}_j |
| <code>\veck</code> | \mathbf{k} |
| <code>\vecq</code> | \mathbf{q} |
| <code>\vecp</code> | \mathbf{p} |
| <code>\vecd</code> | \mathbf{d} |
| <code>\vecmu</code> | $\boldsymbol{\mu}$ |
| <code>\vecsigma</code> | $\boldsymbol{\sigma}$ |

▷ Differentiation

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|----------------------------|-------------------------------|-------------------------|
| <code>\partial{...}</code> | $\frac{\partial}{\partial x}$ | partial differentiation |
| <code>\laplace</code> | ∇^2 | laplace operator |

▷ Integration

| | | |
|--|-------------------------------|-----------------------------------|
| <code>\integral{...}</code> | $\int dx$ | integral |
| <code>\integralb{...}{...}{...}</code> | $\int_x^y dz$ | integral with boundaries |
| <code>\integralf{...}{...}</code> | $\int \frac{dx}{y}$ | integral with fraction |
| <code>\intvol</code> | $\int d^3r$ | integral over r space |
| <code>\intvolp</code> | $\int d^3r'$ | integral over r' space |
| <code>\intvold</code> | $\int d^3r \int d^3r'$ | double integral over space |
| <code>\intk</code> | $\int d^3k$ | integral over k space |
| <code>\intkp</code> | $\int d^3k'$ | integral over k' space |
| <code>\intkn</code> | $\int \frac{d^3k}{(2\pi)^3}$ | normalized integral over k space |
| <code>\intkpn</code> | $\int \frac{d^3k'}{(2\pi)^3}$ | normalized integral over k' space |

▷ Special symbols

| | | |
|---------------------|-----------|---------------------|
| <code>\hc</code> | h.c. | hermitian conjugate |
| <code>\hamil</code> | \hat{H} | Hamilton operator |

| | | |
|-----------------------|-------------------|-------------------------------|
| <code>\hastobe</code> | $\stackrel{!}{=}$ | has to be |
| <code>\eqhat</code> | $\hat{=}$ | corresponds to, is equivalent |
| <code>\id</code> | $\mathbb{1}$ | identity matrix |
| <code>\const</code> | const. | hermitian conjugate |

▷ Second quantization

| | | |
|-----------------------|----------------------|-----------------------|
| <code>\aop</code> | a | annihilation operator |
| <code>\aopd</code> | a^\dagger | creation operator |
| <code>\bop</code> | b | annihilation operator |
| <code>\bopd</code> | b^\dagger | creation operator |
| <code>\cop</code> | c | annihilation operator |
| <code>\copd</code> | c^\dagger | creation operator |
| <code>\nop</code> | n | number operator |
| <code>\psiop</code> | $\hat{\psi}$ | field operator |
| <code>\psiopd</code> | $\hat{\psi}^\dagger$ | |
| <code>\Psiiop</code> | $\hat{\Psi}$ | |
| <code>\Psiiopd</code> | $\hat{\Psi}^\dagger$ | |

▷ Differences

| | |
|------------------|------------|
| <code>\Dx</code> | Δx |
| <code>\Dy</code> | Δy |
| <code>\Dt</code> | Δt |

▷ Trigonometry

| | |
|--------------------|------|
| <code>\asin</code> | asin |
| <code>\acos</code> | acos |
| <code>\atan</code> | atan |

▷ Figures

| | |
|--|---|
| <code>\igopt</code> (2 arguments) | options, filename |
| <code>\ig</code> (2 arguments) | width in units of textwidth, filename |
| <code>\figopt</code> (4 arguments) | width, filename, caption, placement (h, t, ht) |
| <code>\fig</code> (3 arguments) | width, filename, caption |
| <code>\doublefigopt</code> (8 arguments) | w1, f1, c1, w2, f2, c2, main caption, placement |
| <code>\doublefig</code> (7 arguments) | w1, f1, c1, w2, f2, c2, main caption |