1 List of commands

1.1 Automatic bracing

$$(X) \quad (X^Y) \quad \left(\frac{X}{Y}\right) \quad [X] \quad |X| \quad \{X\} \quad \{x\} \quad \left\{x\right\} \quad \left\{x\right\} \quad \left\{x\right\}$$

$$\left(a^2(b)c_2\right)$$

$$(x) \quad [x] \quad |x| \quad \{x\}$$

$$|a| \quad \left|a\right| \quad |\frac{X}{Y}| \quad \|a\| \quad \left\|a\right\| \quad \|\frac{X}{Y}\|$$

$$x\Big|_0^\infty \quad \left(x\right|_0^\infty \quad \left[x\right|_0^\infty \quad \left[\sum_{X=0}^{N}\right|_0^\infty \quad \left[\sum_{X=0}^{N}\right|_0^\infty$$

$$\mathcal{O}(x^2) \quad \mathcal{O}\left(x^2\right) \quad \mathcal{O}(\frac{X}{Y}) \quad [A,B] \quad \left[A,B\right] \quad [A,\frac{X}{Y}] \quad \{A,B\} \quad \{A,B\}$$

1.2 Vector notation

$$\mathbf{a} \quad \boldsymbol{a} \quad \vec{\mathbf{a}} \quad \vec{\boldsymbol{a}} \quad \hat{\mathbf{a}} \quad \hat{\boldsymbol{a}}$$

$$\cdot \quad \times \quad \times$$

$$\boldsymbol{\nabla} \quad \boldsymbol{\nabla}\Psi \quad \boldsymbol{\nabla}\left(\Psi + X^Y\right) \quad \boldsymbol{\nabla}\left[\Psi + X^Y\right]$$

$$\boldsymbol{\nabla}\cdot \quad \boldsymbol{\nabla}\cdot\mathbf{a} \quad \boldsymbol{\nabla}\cdot\left(\mathbf{a} + X^Y\right) \quad \boldsymbol{\nabla}\cdot\left[\mathbf{a} + X^Y\right]$$

$$\boldsymbol{\nabla}\times \quad \boldsymbol{\nabla}\times\mathbf{a} \quad \boldsymbol{\nabla}\times\left(\mathbf{a} + X^Y\right) \quad \boldsymbol{\nabla}\times\left[\mathbf{a} + X^Y\right]$$

$$\nabla^2 \quad \nabla^2\Psi \quad \nabla^2\left(\Psi + X^Y\right) \quad \nabla^2\left[\Psi + X^Y\right]$$

1.3 Operators

$$\sin\left(\frac{X}{Y}\right) \quad \sin^2(x) \quad \sin x$$

But

$$\sin[\frac{X}{Y}] \quad \sin[x][\frac{X}{Y}] \quad \sin[x]\frac{X}{Y} \quad \sin\{\frac{X}{Y}\} \quad \sin[x]\{\frac{X}{Y}\}$$

$\sin(x)$ $\sinh(x)$ $\arcsin(x)$ $\operatorname{asin}(x)$
$\cos(x)$ $\cosh(x)$ $\arccos(x)$ $\operatorname{acos}(x)$
$\tan(x)$ $\tanh(x)$ $\arctan(x)$ $\operatorname{atan}(x)$
$\csc(x)$ $\operatorname{csch}(x)$ $\operatorname{arccsc}(x)$ $\operatorname{acsc}(x)$
$\sec(x)$ $\operatorname{sech}(x)$ $\operatorname{arcsec}(x)$ $\operatorname{asec}(x)$
$\cot(x)$ $\coth(x)$ $\operatorname{arccot}(x)$ $\operatorname{acot}(x)$

$$\exp\left(X^Y\right) \qquad \log\left(X^Y\right) \qquad \ln\left(X^Y\right) \qquad \det\left(X^Y\right) \qquad \Pr\left(X^Y\right)$$

$$\operatorname{tr}\rho \qquad \operatorname{tr}\left(X^Y\right) \qquad \operatorname{Tr}\rho \qquad \operatorname{rank} M \qquad \operatorname{erf}(x) \qquad \operatorname{Res}[f(z)]$$

$$\mathcal{P}\int f(z)\,\mathrm{d}z \qquad \text{P.V.}\int f(z)\,\mathrm{d}z \qquad \operatorname{Re}\{z\} \qquad \Re \qquad \operatorname{Im}\{z\} \qquad \Im$$

But

$$\operatorname{Re}(\frac{X}{Y}) \qquad \operatorname{Re}[\frac{X}{Y}] \qquad \operatorname{Im}(\frac{X}{Y}) \qquad \operatorname{Im}[\frac{X}{Y}]$$

1.4 Quick quad text

$$[\quad \text{word or phrase} \quad][\text{word or phrase} \quad]$$

$$[, \quad], [\quad \text{c.c.} \quad], [\quad \text{if} \quad], [\quad \text{then} \quad], [\quad \text{else} \quad], [\quad \text{otherwise} \quad], [\quad \text{unless} \quad], [\quad \text{given} \quad]$$

$$[\quad \text{using} \quad], [\quad \text{assume} \quad], [\quad \text{since} \quad], [\quad \text{let} \quad], [\quad \text{for} \quad], [\quad \text{all} \quad], [\quad \text{even} \quad], [\quad \text{odd} \quad],$$
$$[\quad \text{integer} \quad], [\quad \text{and} \quad], [\quad \text{or} \quad], [\quad \text{as} \quad], [\quad \text{in} \quad]$$

1.5 Derivatives

$$\mathrm{d} \qquad \mathrm{d}x \qquad \mathrm{d}x \qquad \mathrm{d}^3x \qquad \mathrm{d}(\cos\theta)$$

$$\frac{\mathrm{d}}{\mathrm{d}x} \qquad \frac{\mathrm{d}}{\mathrm{d}x}f \qquad \frac{\mathrm{d}f}{\mathrm{d}x} \qquad \frac{\mathrm{d}^n f}{\mathrm{d}x^n} \qquad \frac{\mathrm{d}}{\mathrm{d}x}\left(\frac{X}{Y}\right) \qquad \mathrm{d}f/\mathrm{d}x$$

$$\frac{\partial}{\partial x} \qquad \frac{\partial}{\partial x}f \qquad \frac{\partial}{\partial x} \qquad \frac{\partial f}{\partial x} \qquad \frac{\partial^n f}{\partial x^n} \qquad \frac{\partial}{\partial x}\left(\frac{X}{Y}\right) \qquad \partial f/\partial x$$

$$\delta F[g(x)] \qquad \delta(E-TS) \qquad \frac{\delta}{\delta g} \qquad \frac{\delta F}{\delta g} \qquad \frac{\delta}{\delta V}(E-TS) \qquad \delta F/\delta x$$

But

$$\mathrm{d}^2[\frac{X}{Y}]$$

And multiple derivatives, sorta; But only for partial:

$$\frac{\partial^2 f}{\partial x \partial y} \qquad \frac{\partial^2 f}{\partial x \partial y} z \qquad \frac{\partial^2 f}{\partial x \partial y} z \qquad \frac{\partial x}{\partial y}$$

$$\frac{\mathrm{d}f}{\mathrm{d}x} y \qquad \frac{\delta F}{\delta f} g$$

1.6 Dirac bra-ket notation

$$\langle\phi|\psi\rangle \quad \text{as opposed to} \quad \langle\phi|\psi\rangle$$
$$\langle\phi|\,|\psi\rangle\langle\xi|\,. \quad \text{as opposed to} \quad \langle\phi|\psi\rangle\,\langle\xi|$$

$$\left|X^Y\right\rangle \qquad |X^Y\rangle \qquad \left\langle X^Y\right| \qquad \langle X^Y|$$

$$\langle\phi|\psi\rangle \qquad \left\langle\phi\middle|X^Y\right\rangle \qquad \langle\phi|X^Y\rangle \qquad \langle\phi|X^Y\rangle \qquad \langle\phi|X^Y\rangle$$

$$\langle a|b\rangle \qquad \langle a|a\rangle \qquad \left\langle a\middle|X^Y\right\rangle \qquad \langle a|X^Y\rangle$$

$$\langle a|b\rangle \qquad |a\rangle\langle b| \qquad |a\rangle\langle a| \qquad \left|a\right\rangle\left\langle X^Y\right| \qquad |a\rangle\langle X^Y| \qquad |a\rangle\langle b|$$

$$|a\rangle\langle b| \qquad \langle A\rangle \qquad \langle\Psi|A|\Psi\rangle \qquad \langle\Psi|A|\Psi\rangle \qquad \langle\Psi|\frac{X}{Y}|\Psi\rangle \qquad \langle X^Y|\frac{X}{Y}|X^Y\rangle \qquad \left\langle\Psi\middle|\frac{X}{Y}\middle|\Psi\right\rangle$$

$$\langle n|A|m\rangle \qquad \langle n|A|m\rangle \qquad \langle n|\frac{X}{Y}|m\rangle \qquad \langle n|\frac{X}{Y}|X^Y\rangle \qquad \left\langle n\middle|\frac{X}{Y}\middle|m\right\rangle$$

1.7 Matrix macros

$$\begin{pmatrix} 1 & 0 \\ 0 & 1 \\ a & b \end{pmatrix}$$

$$\begin{pmatrix} 1 & 0 & a \\ 0 & 1 & b \\ c & d & e \end{pmatrix}$$

$$\begin{pmatrix} 1 & 0 & a \\ 0 & 1 & b \\ c & d & e \end{pmatrix}$$

But, alignment is illusion

$$\begin{pmatrix} 1 & 0 & \frac{x}{y} \\ 0 & 1 & b \\ u+v+w+x+y+z & d & e \end{pmatrix}$$

$$\begin{matrix} a & b \\ c & d \end{matrix} \quad \begin{pmatrix} a & b \\ c & d \end{pmatrix} \quad \begin{Bmatrix} a & b \\ c & d \end{Bmatrix} \quad \begin{bmatrix} a & b \\ c & d \end{bmatrix} \quad \begin{vmatrix} a & b \\ c & d \end{vmatrix} \quad \left|\begin{smallmatrix} a & b \\ c & d \end{smallmatrix}\right| \quad \begin{Vmatrix} a & b \\ c & d \end{Vmatrix} \quad \left\|\begin{smallmatrix} a & b \\ c & d \end{smallmatrix}\right\|$$

$$\left(\begin{smallmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{smallmatrix}\right) \quad \left(\begin{smallmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \end{smallmatrix}\right) \quad \left(\begin{smallmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{smallmatrix}\right) \quad \left(\begin{smallmatrix} a_1 \\ a_2 \\ a_3 \end{smallmatrix}\right) \quad \left(\begin{smallmatrix} a_1 & a_2 & a_3 \end{smallmatrix}\right) \quad \left(\begin{smallmatrix} 0 & 0 \\ 0 & 0 \end{smallmatrix}\right)$$

$$\left(\begin{smallmatrix} 1 & 0 \\ 0 & 1 \end{smallmatrix}\right) \quad \left(\begin{smallmatrix} 0 & 1 \\ 1 & 0 \end{smallmatrix}\right) \quad \left(\begin{smallmatrix} 0 & -i \\ i & 0 \end{smallmatrix}\right) \quad \left(\begin{smallmatrix} 1 & 0 \\ 0 & -1 \end{smallmatrix}\right)$$

$$\begin{pmatrix} 1 & & \\ & 2 & \\ & & 3 \end{pmatrix} \quad \begin{pmatrix} 1 & 0 \\ 0 & 2 \end{pmatrix} \quad \begin{pmatrix} 1 & & \\ & 2 & 3 \\ & 4 & 5 \end{pmatrix} \quad \begin{pmatrix} & & 1 \\ & 2 & \\ 3 & & \end{pmatrix}$$