表 1 微小量 d マクロの仕様確認。数式モード中かどうかで挙動を変える

No	command	expected	result
1	\$\d x\$	$\mathrm{d}x$	$\mathrm{d}x$
2	\d x		X

ソースコード 1 derivative パッケージの setup 例 1

```
\derivativesetup{
    d = roman,
}
```

表 2 常微分マクロの仕様確認。コード1による設定を適用した場合の挙動

No	command	expected	result
1	$\order{x}{f}$	$\frac{\mathrm{d}f}{\mathrm{d}x}$	$\frac{\mathrm{d}f}{\mathrm{d}x}$
2	\odr{x}[2]{f}	$\frac{\mathrm{d}^2 f}{\mathrm{d}x^2}$	$\frac{\mathrm{d}^2 f}{\mathrm{d}x^2}$
3	\odr{x}[n]{f}	$\frac{\mathrm{d}^n f}{\mathrm{d}x^n}$	$\frac{\mathrm{d}^n f}{\mathrm{d} x^n}$
4	$\order{x_1}{f}$	$\frac{\mathrm{d}f}{\mathrm{d}x_1}$	$\frac{\mathrm{d}f}{\mathrm{d}x_1}$
5	\odr{x_1}{y_2}	$\frac{\mathrm{d}y_2}{\mathrm{d}x_1}$	$\frac{\mathrm{d}y_2}{\mathrm{d}x_1}$
6	$\label{local_def} $$ \operatorname{dr}\{t\}_{\infty}^u\}$$	$\frac{\mathrm{d} oldsymbol{u}}{\mathrm{d} t}$	$\frac{\mathrm{d} \boldsymbol{u}}{\mathrm{d} t}$
7	$\order{\bm{x}}{f}$	$\frac{\mathrm{d}f}{\mathrm{d}oldsymbol{x}}$	$\frac{\mathrm{d}f}{\mathrm{d}\boldsymbol{x}}$

ソースコード 2 derivative パッケージの setup 例 2

```
\derivativesetup{
    d = italic,
}
```

表 3 常微分マクロの仕様確認。コード 2 による設定を適用した場合の挙動

No	command	expected	result
1	$\order{x}{f}$	$\frac{df}{dx}$	$\frac{df}{dx}$
2	\odr{x}[2]{f}	$\frac{d^2f}{dx^2}$	$\frac{d^2f}{dx^2}$
3	\odr{x}[n]{f}	$\frac{d^n f}{dx^n}$	$\frac{d^n f}{dx^n}$
4	$\ordr{x_1}{f}$	$\frac{df}{dx_1}$	$\frac{df}{dx_1}$
5	\odr{x_1}{y_2}	$\frac{dy_2}{dx_1}$	$\frac{dy_2}{dx_1}$
6	$\label{local_def} $$ \operatorname{dor}\{t\}_{\mathbb{Q}}$ $$$	$rac{doldsymbol{u}}{dt}$	$\frac{doldsymbol{u}}{dt}$
7	$\operatorname{\operatorname{dr}}\{\operatorname{m}\{x\}\}\{f\}$	$rac{df}{doldsymbol{x}}$	$rac{df}{dm{x}}$

表 4 偏微分マクロの仕様確認

No	$\operatorname{command}$	expected	result
1	\pdr{{x}{f}}	$\frac{\partial f}{\partial x}$	$\frac{\partial f}{\partial x}$
2	\pdr{{x}[2]{f}}	$\frac{\partial^2 f}{\partial x^2}$	$\frac{\partial^2 f}{\partial x^2}$
3	\pdr{{x}{y}{f}}	$\frac{\partial^2 f}{\partial x \partial y}$	$\frac{\partial^2 f}{\partial x \partial y}$
4	\pdr{{x}[2]{y}{f}}	$\frac{\partial^3 f}{\partial x^2 \partial y}$	$\frac{\partial^3 f}{\partial x^2 \partial y}$
5	\pdr{{x}[2]{y}[3]{f}}	$\frac{\partial^5 f}{\partial x^2 \partial y^3}$	$\frac{\partial^5 f}{\partial x^2 \partial y^3}$
6	\pdr{{x_1}{y}}	$\frac{\partial y}{\partial x_1}$	$\frac{\partial y}{\partial x_1}$
7	\pdr{{x}{f_2}}	$\frac{\partial f_2}{\partial x}$	$\frac{\partial f_2}{\partial x}$
8	$\pdr{{x_1}{f}}$	$\frac{\partial^2 f}{\partial x_1 \partial t}$	$\frac{\partial^2 f}{\partial x_1 \partial t}$
9	\pdr{{x_1}{x_2}{f}}	$\frac{\partial^2 f}{\partial x_1 \partial x_2}$	$\frac{\partial^2 f}{\partial x_1 \partial x_2}$
10	\pdr{{\bm{x}}{f}}	$rac{\partial f}{\partial oldsymbol{x}}$	$rac{\partial f}{\partial oldsymbol{x}}$
11	\pdr{{\bm{x}}{\bm{y}}{f}}	$rac{\partial^2 f}{\partial m{x} \partial m{y}}$	$rac{\partial^2 f}{\partial m{x} \partial m{y}}$
12	\pdr{{\bm{x}_1}{\bm{y}_2}{f}}	$rac{\partial^2 f}{\partial m{x}_1 \partial m{y}_2}$	$rac{\partial^2 f}{\partial oldsymbol{x}_1 \partial oldsymbol{y}_2}$
13	\pdr{{x}[2]{\bm{u}}}	$\frac{\partial^2 \boldsymbol{u}}{\partial x^2}$	$\frac{\partial^2 \boldsymbol{u}}{\partial x^2}$
14	lem:lem:lem:lem:lem:lem:lem:lem:lem:lem:	$\frac{\partial \boldsymbol{u}}{\partial x} + \frac{\partial \boldsymbol{u}}{\partial y}$	$\frac{\partial \boldsymbol{u}}{\partial x} + \frac{\partial \boldsymbol{u}}{\partial y}$
15	\pdr{{x}{}}	$\frac{\partial}{\partial x}$	$\frac{\partial}{\partial x}$
16	\pdr{{x_1}{}}	$\frac{\partial}{\partial x_1}$	$\frac{\partial}{\partial x_1}$
17	\pdr{{\bm{x}}{}}	$rac{\partial}{\partial m{x}}$	$rac{\partial}{\partial m{x}}$

表 5 偏微分マクロの仕様確認。階数の自動計算抑制

No	command	expected	result
1	\pdr*{{x}[n]{f}[n]}	$\frac{\partial^n f}{\partial x^n}$	$\frac{\partial^n f}{\partial x^n}$
2	\pdr*{{x}[n]{}[n]}	$\frac{\partial^n}{\partial x^n}$	$\frac{\partial^n f}{\partial x^n}$
3	\pdr*{{x}[n]{y}[m]{f}[n+m]}	$\frac{\partial^{n+m} f}{\partial x^n \partial y^m}$	$\frac{\partial^{n+m} f}{\partial x^n \partial y^m}$
4	\pdr*{{x}[1]{y}[1]{f}[1+1]}	$\frac{\partial^{1+1} f}{\partial x^1 \partial y^1}$	$\frac{\partial^{1+1} f}{\partial x^1 \partial y^1}$
5	\pdr*{{x}{y}[n]{f}[n+1]}	$\frac{\partial^{n+1} f}{\partial x \partial y^n}$	$\frac{\partial^{n+1} f}{\partial x \partial y^n}$

表 6 偏微分マクロ (リーマン幾何学の記法) の仕様確認

No	command	expected	result
1	\pdrr{{x}{f}}	$\partial_x f$	$\partial_x f$
2	\pdrr{{i}{j}{f}}	$\partial_i\partial_j f$	$\partial_i \partial_j f$
3	\pdrr{{i}*{j}{f}}	$\partial_i \partial^j f$	$\partial_i \partial^j f$
4	\pdrr{*{i}{j}{f}}	$\partial^i \partial_j f$	$\partial^i \partial_j f$

表 7 ベクトル演算子マクロの仕様確認 1。基本的なマクロ利用例。

No	command	expected	result
1	\grad{f}	∇f	∇f
2	\div\bm{v}	$ abla \cdot oldsymbol{v}$	$ abla \cdot oldsymbol{v}$
3	$\rot\bm{v}$	$ abla imes oldsymbol{v}$	$ abla imes oldsymbol{v}$
4	\curl\bm{v}	$ abla imes oldsymbol{v}$	$ abla imes oldsymbol{v}$
5	\laplace{f}	$\nabla^2 f$	$\nabla^2 f$
6	$\displaystyle \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	Δf	Δf
7	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	$\nabla^2 f$	$\nabla^2 f$
8	\hesse{f}	$\nabla \otimes \nabla f$	$\nabla \otimes \nabla f$
9	\gradr{f}	$\operatorname{grad} f$	$\operatorname{grad} f$
10	\divr{\bm{v}}	$\operatorname{div} \boldsymbol{v}$	$\operatorname{div} \boldsymbol{v}$
11	\rotr{\bm{v}}	$\mathrm{rot} \boldsymbol{v}$	$\mathrm{rot} \boldsymbol{v}$
12	\curlr{\bm{v}}	$\operatorname{curl} oldsymbol{v}$	$\operatorname{curl} oldsymbol{v}$

ソースコード 3 derivative パッケージの setup 例 3

```
\derivativesetup{
    nabla-deco-1 = ',
    nabla-deco-2 = '',
    nabla-deco-3 = _{\bm{r}'''},
    laplace = delta,
}
```

表 8 ベクトル演算子マクロの仕様確認 2。コード 3 による設定を適用した場合の挙動

No	command	expected	result
1	\grad'{f}	$\nabla' f$	$\nabla' f$
2	\grad''!{f}	$\nabla''\{f\}$	$\nabla''\left\{f\right\}$
3	\grad'''(\frac{f}{g})	$ abla_{m{r}^{\prime\prime\prime}}\left(rac{f}{g} ight)$	$ abla_{m{r}^{\prime\prime\prime}}\left(rac{f}{g} ight)$
4	\grad <i>[f]</i>	$\nabla_i[f]$	$\nabla_i \left[f \right]$
5	\grad <i>'{f}</i>	$\nabla_i' f$	$\nabla_i' f$
6	\grad''\bigg(f)	$\nabla''\bigg(f\bigg)$	$\nabla''\bigg(f\bigg)$
7	\laplacen''{f}	$\nabla''^2 f$	$\nabla''^2 f$
8	\laplace''{f}	$\Delta''f$	$\Delta^{\prime\prime} f$
9	$\hesse<\bm{r}_1>\{f\}$	$ abla_{m{r}_1}\otimes abla_{m{r}_1}f$	$ abla_{m{r}_1}\otimes abla_{m{r}_1}f$

表 9 汎関数微分マクロの仕様確認

No	command	expected	result
1	\fdr{{f}{F}}	$\frac{\delta F}{\delta f}$	$\frac{\delta F}{\delta f_1}$
2	\fdr{{f_1}{f_2}{F}}	$\frac{\delta^2 F}{\delta f_1 \delta f_2}$	$\frac{\delta^2 F}{\delta f_1 \delta f_2}$
3	\fdr{{f_1(x)}{f_2(x')}{F}}	$\frac{\delta^2 F}{\delta f_1(x)\delta f_2(x')}$	$\frac{\delta^2 F}{\delta f_1(x)\delta f_2(x')}$