

# Derivatives using the `quickderivs` package

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This package contains commands to typeset mathematical derivatives more efficiently.

## 1 Options

- `upright`: enables support for upright derivative symbols, such as  $\partial$ , as compared to  $\partial$ . These can be toggled using the `\dvsetupright` and `\dvsetnormal` commands. If `upright` is passed, then the style is set to upright by default.
- `partial`: the `\dv` and `\df` commands now default partial derivative symbols. The last star argument now switches to normal derivative symbols.

## 2 Commands

- `\dv[*] [upper value] [upper power] {lower variable(s)} [differential symbol] [*]`  
This is the main command of the package. It typesets derivatives in general. The only mandatory parameter is the lower variables. With a single variable, it typesets a normal derivative: `\dv{x}` becomes

$$\frac{d}{dx}$$

The differential symbol parameter changes the differential symbol, with the following supported parameters: `d D e E p`. They produce the following outputs.

	<code>d</code>	<code>D</code>	<code>e</code>	<code>E</code>	<code>p</code>
upright	$\frac{d}{dx}$	$\frac{D}{Dx}$	$\frac{\delta}{\delta x}$	$\frac{\Delta}{\Delta x}$	$\frac{\partial}{\partial x}$
normal	$\frac{d}{dx}$	$\frac{D}{Dx}$	$\frac{\delta}{\delta x}$	$\frac{\Delta}{\Delta x}$	$\frac{\partial}{\partial x}$

Additional symbol can be added by defining the command `\quickderivs@chrs@new char` to the desired symbol and `\quickderivs@chrsspac@new char` to the spacing this character should have between it and a superscript.

The last star parameter toggles between regular and partial derivatives. It takes priority over the differential symbol parameter. Setting the `partial` parameter of

the package makes derivatives default to partial derivatives, and switch to regular derivatives with the star.

The lower variable(s) parameter can take many variables in a row, delimited by commas: `\dv{x,y}*` becomes

$$\frac{\partial^2}{\partial x \partial y}.$$

Simply specifying a number will make that the power of the preceding variable: `\dv{x2}` becomes

$$\frac{d^2}{dx^2}.$$

Numbers can be used as separators between multiple variables as well: `\dv{x2y3}*` becomes

$$\frac{\partial^5}{\partial x^2 \partial y^3}.$$

To instead have the number as a part of the derivative, or any other complex command, enclose it in square brackets: `\dv{{(2x)},{\bar{y}}}*` becomes

$$\frac{\partial^2}{\partial(2x)\partial\bar{y}}.$$

To specify a nonstandard superscript, use a semicolon: `\dv{x;r,y;s}*` becomes

$$\frac{\partial}{\partial x^r \partial y^s}.$$

The upper value is self-explanatory: `\dv[f]{x}` becomes

$$\frac{df}{dx}.$$

The upper power is also simple. Expanding on an earlier example, `\dv[r+s]{x;r,y;s}*` becomes

$$\frac{\partial^{r+s}}{\partial x^r \partial y^s}.$$

Finally, the first star writes the fractions inline: `\dv*[f]{x}` becomes  $df/dx$ .

- `\df[*]{<lower variable(s)>[<differential symbol>][*]`

The latter three parameters are identical to those in the `\dv` command. The first star controls the spacing between the differentials:

with star	without star
$dx dy dz$	$dx dy dz$

- `\dvsetupright` and `\dvsetnormal`

These commands switch between upright and normal characters for the package. `\dvsetupright` is only defined if the `upright` parameter is supplied to the package.