0.1 Derivative notations

```
\usepackage{derivative}
```

0.1.1 Ordinary derivative

```
\begin{align}
  & \frac{df}{dx} \\
  & \odv{f}{x} \\
  & \odv*{f}{x}
\end{align}
```

$$\frac{df}{dx} \tag{1}$$

$$\frac{\mathrm{d}f}{\mathrm{d}x} \tag{2}$$

$$\frac{\mathrm{d}}{\mathrm{d}x} f \tag{3}$$

0.1.2 Partial derivative

```
\begin{align}
  & \frac{\partial f}{\partial x} \\
  & \pdv{f}{x} \\
  & \pdv*{f}{x} \\
  & \pdv{f}!{x} \\
  & \pdv{f}{x,y}
  & \pdv[order={2,3}]{f}{x,y,z} \\
\end{align}
```

$$\frac{\partial f}{\partial x} \tag{4}$$

$$\frac{\partial f}{\partial x} \tag{5}$$

$$\frac{\partial}{\partial x} f \tag{6}$$

$$\partial_x f \tag{7}$$

$$\frac{\partial^2 f}{\partial x \, \partial y} \tag{8}$$

$$\frac{\partial^6 f}{\partial x^2 \, \partial y^3 \, \partial z} \tag{9}$$

0.1.3 Material derivative

```
\begin{align}
  & \frac{Df}{Dx} \\
  & \mdv{f}{x} \\
  & \mdv*{f}{x}
\end{align}
```

$$\frac{Df}{Dx} \tag{10}$$

$$\frac{\mathrm{D}f}{\mathrm{D}x} \tag{11}$$

$$\frac{\mathrm{D}}{\mathrm{D}x} f \tag{12}$$

0.1.4 Functional derivative

```
\begin{align}
  & \frac{\delta f}{\delta x} \\
  & \fdv{f}{x} \\
  & \fdv*{f}{x}
\end{align}
```

$$\frac{\delta f}{\delta x} \tag{13}$$

$$\frac{\delta f}{\delta x} \tag{14}$$

$$\frac{\delta}{\delta x} f \tag{15}$$

0.1.5 Average rate of change

```
\begin{align}
  & \frac{\Delta f}{\Delta x}
    ↪  \\
  & \adv{f}{x}
\end{align}
```

$$\frac{\Delta f}{\Delta x} \tag{16}$$

$$\frac{\Delta f}{\Delta x} \tag{17}$$

0.1.6 Jacobian

```
\begin{align}
  & \frac{
    \partial (f, g, h)
  }{
    \partial (x, y, z)
  } \\
  & \jdv{f, g, h}{x, y, z}
\end{align}
```

$$\frac{\partial(f, g, h)}{\partial(x, y, z)} \tag{18}$$

$$\frac{\partial\left(f, g, h\right)}{\partial\left(x, y, z\right)} \tag{19}$$