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}
```

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

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