# Template functions

Function $f$ in `d(f,x)` does not have to be defined, it can be a template function with just a name and an argument list. The argument list determines the result. For example, `d(f(x),x)` evaluates to itself because $f$ depends on $x$. However, `d(f(x),y)` evaluates to zero because $f$ does not depend on $y$.

Example 1. $f(x)$ depends on $x$.

```
d(f(x),x)
```

$\mathrm{d}(f(x),x)$

Example 2. $f(x)$ does not depend on $y$.

```
d(f(x),y)
```

0

Example 3. $f(x,y)$ depends on both $x$ and $y$.

```
d(f(x,y),y)
```

$\mathrm{d}(f(x,y),y)$

Example 4. $f()$ is a wildcard that matches any symbol.

```
d(f(),t)
```

$\mathrm{d}(f(),t)$

Template functions are useful for working with differential forms. For example, show that

$$\nabla \cdot (\nabla \times \mathbf{F}) = 0$$

```
F = (Fx(),Fy(),Fz())
div(curl(F))
```

0