```
> w := (x, y, z) → ln(x² + y² + z²) :
> x := (r, s) → r·exp(s)·sin(r) :
> y := (r, s) → r·exp(s)·cos(r) :
> z := (r, s) → r·exp(s) :
> diff(w(x(r, s), y(r, s), z(r, s)), r);
```

$$\frac{2\,r\,(e^s)^2\,\sin(r)^2 + 2\,r\,(e^s)^2\,\cos(r)^2 + 2\,r\,(e^s)^2}{r^2\,(e^s)^2\,\sin(r)^2 + r^2\,(e^s)^2\,\cos(r)^2 + r^2\,(e^s)^2} \tag{1}$$

```
> simplify(%);
```

$$\frac{2}{r} \tag{2}$$

```
> D[1](w)(x, y, z)·D[1](x)(r, s) + D[2](w)(x, y, z)·D[1](y)(r, s) + D[3](w)(x, y, z)
       ·D[1](z)(r, s);
```

$$\frac{2\,x\,(e^s\,\sin(r) + r\,e^s\,\cos(r))}{x^2 + y^2 + z^2} + \frac{2\,y\,(e^s\,\cos(r) - r\,e^s\,\sin(r))}{x^2 + y^2 + z^2} + \frac{2\,z\,e^s}{x^2 + y^2 + z^2} \tag{3}$$

```
> eval(%, [x = x(r, s), y = y(r, s), z = z(r, s)]);
```

$$\frac{2\,r\,e^s\,\sin(r)\,(e^s\,\sin(r) + r\,e^s\,\cos(r))}{r^2\,(e^s)^2\,\sin(r)^2 + r^2\,(e^s)^2\,\cos(r)^2 + r^2\,(e^s)^2} + \frac{2\,r\,e^s\,\cos(r)\,(e^s\,\cos(r) - r\,e^s\,\sin(r))}{r^2\,(e^s)^2\,\sin(r)^2 + r^2\,(e^s)^2\,\cos(r)^2 + r^2\,(e^s)^2}$$

$$+ \frac{2\,r\,(e^s)^2}{r^2\,(e^s)^2\,\sin(r)^2 + r^2\,(e^s)^2\,\cos(r)^2 + r^2\,(e^s)^2} \tag{4}$$

```
> simplify(%);
```

$$\frac{2}{r} \tag{5}$$

```
>
```