```
with(plots):
f:= (x, y) → cos^2(sqrt(x^2 + y^2))/sqrt(x^2 + y^2 + 1);
```

$$(x, y) \to \frac{\cos\left(\sqrt{x^2+y^2}\right)^2}{\sqrt{x^2+y^2+1}} \tag{1}$$

x- and y-derivatives of f are denoted by g and h here:

```
g := unapply(diff(f(x, y), x), [x, y]);
```

$$(x, y) \to -\frac{2\cos\left(\sqrt{x^2+y^2}\right)\sin\left(\sqrt{x^2+y^2}\right)x}{\sqrt{x^2+y^2+1}\,\sqrt{x^2+y^2}} - \frac{\cos\left(\sqrt{x^2+y^2}\right)^2 x}{\left(x^2+y^2+1\right)^{(3/2)}} \tag{2}$$

```
h := unapply(diff(f(x, y), y), [x, y]);
```

$$(x, y) \to -\frac{2\cos\left(\sqrt{x^2+y^2}\right)\sin\left(\sqrt{x^2+y^2}\right)y}{\sqrt{x^2+y^2+1}\,\sqrt{x^2+y^2}} - \frac{\cos\left(\sqrt{x^2+y^2}\right)^2 y}{\left(x^2+y^2+1\right)^{(3/2)}} \tag{3}$$

Linearization of f at (a,b):

```
a := 1/10; b := 0;
L := (x, y) → f(a, b) + g(a, b)·(x − a) + h(a, b)·(y − b);
```

$$(x, y) \to f(a, b) + g(a, b)\,(x-a) + h(a, b)\,(y-b) \tag{4}$$

```
plot3d({f(x, y), L(x, y)}, x = −2..2, y = −2..2, transparency = 3/10);
```