

Let’s calculate smth with expression given:  $f(x, y) = x \cdot y^{2.000}$   
Firstly, let’s insert all constants and simplify it:  $f(x, y) = x \cdot y^{2.000}$   
BRITISH SCIENTISTS WERE SHOCKED, WHEN THEY COUNT IT!!!  
In the point (x = 3.000, y = 2.000)it’s value = 12.000  
1 step: finding a derivation of function:

$$y$$

here it is:

$$1.000$$

2 step: finding a derivation of function:

$$y^{2.000}$$

here it is:

$$2.000 \cdot y$$

3 step: finding a derivation of function:

$$x$$

here it is:

$$1.000$$

4 step: finding a derivation of function:

$$x \cdot y^{2.000}$$

here it is:

$$y^{2.000} + 2.000 \cdot y \cdot x$$

Congratulations! The first derivation of the expression is:

$$y^{2.000} + 2.000 \cdot y \cdot x$$

In the point (x = 3.000, y = 2.000) it’s value = 16.000  
Let’s calculate the 3 derivation of the expression:  
Calculating the 1 derivation of the expression:  
1 step: finding a derivation of function:

$$y$$

here it is:

$$1.000$$

2 step: finding a derivation of function:

$$y^{2.000}$$

here it is:

$$2.000 \cdot y$$

3 step: finding a derivation of function:

$$x$$

here it is:

$$1.000$$

4 step: finding a derivation of function:

$$x \cdot y^{2.000}$$

here it is:

$$y^{2.000} + 2.000 \cdot y \cdot x$$

Calculating the 2 derivation of the expression:  
1 step: finding a derivation of function:

$$x$$

here it is:

$$1.000$$

2 step: finding a derivation of function:

$$y$$

here it is:

$$1.000$$

3 step: finding a derivation of function:

$$2.000$$

here it is:

$$0.000$$

4 step: finding a derivation of function:

$$2.000 \cdot y$$

here it is:

$$2.000$$

5 step: finding a derivation of function:

$$2.000 \cdot y \cdot x$$

here it is:

$$2.000 \cdot x + 2.000 \cdot y$$

6 step: finding a derivation of function:

$$y$$

here it is:

$$1.000$$

7 step: finding a derivation of function:

$$y^{2.000}$$

here it is:

$$2.000 \cdot y$$

8 step: finding a derivation of function:

$$y^{2.000} + 2.000 \cdot y \cdot x$$

here it is:

$$2.000 \cdot y + 2.000 \cdot x + 2.000 \cdot y$$

Calculating the 3 derivation of the expression:

1 step: finding a derivation of function:

$$y$$

here it is:

$$1.000$$

2 step: finding a derivation of function:

$$2.000$$

here it is:

$$0.000$$

3 step: finding a derivation of function:

$$2.000 \cdot y$$

here it is:

$$2.000$$

4 step: finding a derivation of function:

$$x$$

here it is:

$$1.000$$

5 step: finding a derivation of function:

$$2.000$$

here it is:

$$0.000$$

6 step: finding a derivation of function:

$$2.000 \cdot x$$

here it is:

$$2.000$$

7 step: finding a derivation of function:

$$2.000 \cdot x + 2.000 \cdot y$$

here it is:

$$4.000$$

8 step: finding a derivation of function:

$$y$$

here it is:

$$1.000$$

9 step: finding a derivation of function:

$$2.000$$

here it is:

$$0.000$$

10 step: finding a derivation of function:

$$2.000 \cdot y$$

here it is:

$$2.000$$

11 step: finding a derivation of function:

$$2.000 \cdot y + 2.000 \cdot x + 2.000 \cdot y$$

here it is:

$$6.000$$

Finally... The 3 derivation of the expression:

$$6.000$$

BRITISH SCIENTISTS WERE SHOCKED AGAIN, WHEN THEY COUNT THE 3 DERIVATION OF THIS EXPRESSION!!!

In the point (x = 3.000, y = 2.000)it's value = 6.000

Partial derivation of the expression on the variable 'x':

$$\frac{\partial f}{\partial x} = 4.000$$

In the point (x = 3.000, y = 2.000) it's value = 4.000000 !!!

Partial derivation of the expression on the variable 'y':

$$\frac{\partial f}{\partial y} = 3.000 \cdot 2.000 \cdot y$$

In the point (x = 3.000, y = 2.000) it's value = 12.000000 !!!

Full derivation:

$$\sqrt{16.000 + (3.000 \cdot 2.000 \cdot y)^{2.000}}$$

In the point (x = 3.000, y = 2.000)it's value = 12.649 !!!

Let's consider the expression as a function of x variable: f(x) = 4.000 · x

Maklorens formula for x → 3.000: f(x) = 12.000 + 4.000 · (x – 3.000)+o((x – 3.000)<sup>4.000</sup>)

Graph f(x):

Tangent equation in point -2.000:

$$f(x) = 4.000 \cdot (x - (-2.000)) + (-8.000)$$

Normal equation in point -2.000:  $f(x) = (-0.250) \cdot (x - (-2.000)) + (-8.000)$