

Let's calculate smth with a given function: $f(x, y) = \sin x \cdot y^{2.000}$
Firstly, let's insert all constants and simplify this expression: $f(x, y) = \sin x \cdot y^{2.000}$
BRITISH SCIENTISTS WERE SHOCKED, WHEN THEY COUNT IT!!!
In the point (x = 3.000, y = 2.000) it's value = 0.564
Personally, I've always thought about first derivation of something like that function... Haven't you?
But now, by using informatics and math skills I feel that I'm prepared enough to calculate it!
1 step. finding a derivation of:
 y
While preparing for exams, I learned a lot of new things, for example:
 $(y)' =$
=1.000
2 step. finding a derivation of:
 $y^{2.000}$
It's really easy to find:
 $(y^{2.000})' =$
=2.000 $\cdot y$
3 step. finding a derivation of:
 x
My roommate mumbled it in his sleep all night:
 $(x)' =$
=1.000
4 step. finding a derivation of:
 $\sin x$
Sounds logical that it is the same as:
 $(\sin x)' =$
=cos x
5 step. finding a derivation of:
 $\sin x \cdot y^{2.000}$
For centuries, people have hunted for the secret knowledge that:
 $(\sin x \cdot y^{2.000})' =$
=cos $x \cdot y^{2.000} + 2.000 \cdot y \cdot \sin x$
Congratulations! The first derivation of the expression is:
 $\cos x \cdot y^{2.000} + 2.000 \cdot y \cdot \sin x$ In the point (x = 3.000, y = 2.000) it's value = -3.395
Let's calculate the 4 derivation of the expression:
Calculating the 1 derivation of the expression:
1 step. finding a derivation of:
 y
Sounds logical that it is the same as:
 $(y)' =$
=1.000
2 step. finding a derivation of:
 $y^{2.000}$
It's really easy to find:
 $(y^{2.000})' =$
=2.000 $\cdot y$
3 step. finding a derivation of:
 x
My roommate mumbled it in his sleep all night:
 $(x)' =$
=1.000
4 step. finding a derivation of:
 $\sin x$
What if it equals:
 $(\sin x)' =$
=cos x
5 step. finding a derivation of:
 $\sin x \cdot y^{2.000}$
It's really easy to find:
 $(\sin x \cdot y^{2.000})' =$
=cos $x \cdot y^{2.000} + 2.000 \cdot y \cdot \sin x$
Calculating the 2 derivation of the expression:
1 step. finding a derivation of:
 x
Even my two-aged sister knows that it equals:
 $(x)' =$
=1.000
2 step. finding a derivation of:
 $\sin x$
When I was child, my father always told me: "Remember, son:
 $(\sin x)' =$
=cos x
3 step. finding a derivation of:
 y
I spend the hole of my life to find the answer and finally it's:
 $(y)' =$
=1.000
4 step. finding a derivation of:
2.000
Man... Just look:
 $(2.000)' =$
=0.000
5 step. finding a derivation of:
2.000 $\cdot y$

For centuries, people have hunted for the secret knowledge that:

$$(2.000 \cdot y)' =$$

=2.000

6 step. finding a derivation of:

$$2.000 \cdot y \cdot \sin x$$

It's really easy to find:

$$(2.000 \cdot y \cdot \sin x)' =$$

= $2.000 \cdot \sin x + \cos x \cdot 2.000 \cdot y$

7 step. finding a derivation of:

$$y$$

It's simple as fuck:

$$(y)' =$$

=1.000

8 step. finding a derivation of:

$$y^{2.000}$$

thanks to the results of my colleagues' scientific work, I know that it equals:

$$(y^{2.000})' =$$

= $2.000 \cdot y$

9 step. finding a derivation of:

$$x$$

When I was child, my father always told me: "Remember, son:

$$(x)' =$$

=1.000

10 step. finding a derivation of:

$$\cos x$$

It's really easy to find:

$$(\cos x)' =$$

= $(-1.000) \cdot \sin x$

11 step. finding a derivation of:

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

I was asked not to tell anyone that:

$$(\cos x \cdot y^{2.000})' =$$

= $(-1.000) \cdot \sin x \cdot y^{2.000} + 2.000 \cdot y \cdot \cos x$

12 step. finding a derivation of:

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

For centuries, people have hunted for the secret knowledge that:

$$(\cos x \cdot y^{2.000} + 2.000 \cdot y \cdot \sin x)' =$$

= $(-1.000) \cdot \sin x \cdot y^{2.000} + 2.000 \cdot y \cdot \cos x + 2.000 \cdot \sin x + \cos x \cdot 2.000 \cdot y$

Calculating the 3 derivation of the expression:

1 step. finding a derivation of:

$$y$$

My roommate mumbled it in his sleep all night:

$$(y)' =$$

=1.000

2 step. finding a derivation of:

$$2.000$$

What if it equals:

$$(2.000)' =$$

=0.000

3 step. finding a derivation of:

$$2.000 \cdot y$$

Even my two-aged sister knows that it equals:

$$(2.000 \cdot y)' =$$

=2.000

4 step. finding a derivation of:

$$x$$

I spend the hole of my life to find the answer and finally it's:

$$(x)' =$$

=1.000

5 step. finding a derivation of:

$$\cos x$$

Even my two-aged sister knows that it equals:

$$(\cos x)' =$$

= $(-1.000) \cdot \sin x$

6 step. finding a derivation of:

$$\cos x \cdot 2.000 \cdot y$$

While preparing for exams, I learned a lot of new things, for example:

$$(\cos x \cdot 2.000 \cdot y)' =$$

= $(-1.000) \cdot \sin x \cdot 2.000 \cdot y + 2.000 \cdot \cos x$

7 step. finding a derivation of:

$$x$$

When I was child, my father always told me: "Remember, son:

$$(x)' =$$

=1.000

8 step. finding a derivation of:

$$\sin x$$

Sounds logical that it is the same as:

$$(\sin x)' =$$

= $\cos x$

9 step. finding a derivation of:

$$2.000$$

A true prince must know that it equals:

$$(2.000)' =$$

=0.000

10 step. finding a derivation of:

$2.000 \cdot \sin x$
 My roommate mumbled it in his sleep all night:
 $(2.000 \cdot \sin x)' =$
 $=2.000 \cdot \cos x$
 11 step. finding a derivation of:
 $2.000 \cdot \sin x + \cos x \cdot 2.000 \cdot y$
 My roommate mumbled it in his sleep all night:
 $(2.000 \cdot \sin x + \cos x \cdot 2.000 \cdot y)' =$
 $=2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y + 2.000 \cdot \cos x$
 12 step. finding a derivation of:
 x
 If someone asked me that in the middle of the night, I wouldn't hesitate to say:
 $(x)' =$
 $=1.000$
 13 step. finding a derivation of:
 $\cos x$
 A true prince must know that it equals:
 $(\cos x)' =$
 $=(-1.000) \cdot \sin x$
 14 step. finding a derivation of:
 y
 My roommate mumbled it in his sleep all night:
 $(y)' =$
 $=1.000$
 15 step. finding a derivation of:
 2.000
 While preparing for exams, I learned a lot of new things, for example:
 $(2.000)' =$
 $=0.000$
 16 step. finding a derivation of:
 $2.000 \cdot y$
 It's really easy to find:
 $(2.000 \cdot y)' =$
 $=2.000$
 17 step. finding a derivation of:
 $2.000 \cdot y \cdot \cos x$
 It's really easy to find:
 $(2.000 \cdot y \cdot \cos x)' =$
 $=2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y$
 18 step. finding a derivation of:
 y
 When I was child, my father always told me: "Remember, son:
 $(y)' =$
 $=1.000$
 19 step. finding a derivation of:
 $y^{2.000}$
 What if it equals:
 $(y^{2.000})' =$
 $=2.000 \cdot y$
 20 step. finding a derivation of:
 x
 If someone asked me that in the middle of the night, I wouldn't hesitate to say:
 $(x)' =$
 $=1.000$
 21 step. finding a derivation of:
 $\sin x$
 thanks to the results of my colleagues' scientific work, I know that it equals:
 $(\sin x)' =$
 $=\cos x$
 22 step. finding a derivation of:
 (-1.000)
 A true prince must know that it equals:
 $((-1.000))' =$
 $=0.000$
 23 step. finding a derivation of:
 $(-1.000) \cdot \sin x$
 A true prince must know that it equals:
 $((-1.000) \cdot \sin x)' =$
 $=(-1.000) \cdot \cos x$
 24 step. finding a derivation of:
 $(-1.000) \cdot \sin x \cdot y^{2.000}$
 When I was child, my father always told me: "Remember, son:
 $((-1.000) \cdot \sin x \cdot y^{2.000})' =$
 $=(-1.000) \cdot \cos x \cdot y^{2.000} + 2.000 \cdot y \cdot (-1.000) \cdot \sin x$
 25 step. finding a derivation of:
 $(-1.000) \cdot \sin x \cdot y^{2.000} + 2.000 \cdot y \cdot \cos x$
 For centuries, people have hunted for the secret knowledge that:
 $((-1.000) \cdot \sin x \cdot y^{2.000} + 2.000 \cdot y \cdot \cos x)' =$
 $=(-1.000) \cdot \cos x \cdot y^{2.000} + 2.000 \cdot y \cdot (-1.000) \cdot \sin x + 2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y$
 26 step. finding a derivation of:
 $(-1.000) \cdot \sin x \cdot y^{2.000} + 2.000 \cdot y \cdot \cos x + 2.000 \cdot \sin x + \cos x \cdot 2.000 \cdot y$
 A true prince must know that it equals:
 $((-1.000) \cdot \sin x \cdot y^{2.000} + 2.000 \cdot y \cdot \cos x + 2.000 \cdot \sin x + \cos x \cdot 2.000 \cdot y)' =$
 $=(-1.000) \cdot \cos x \cdot y^{2.000} + 2.000 \cdot y \cdot (-1.000) \cdot \sin x + 2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y + 2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y + 2.000 \cdot \cos x$
 Calculating the 4 derivation of the expression:

1 step. finding a derivation of:
 x
I spend the hole of my life to find the answer and finally it's:
 $(x)' =$
=1.000
2 step. finding a derivation of:
 $\cos x$
It's simple as fuck:
 $(\cos x)' =$
= $(-1.000) \cdot \sin x$
3 step. finding a derivation of:
2.000
For centuries, people have hunted for the secret knowledge that:
 $(2.000)' =$
=0.000
4 step. finding a derivation of:
 $2.000 \cdot \cos x$
It's really easy to find:
 $(2.000 \cdot \cos x)' =$
= $2.000 \cdot (-1.000) \cdot \sin x$
5 step. finding a derivation of:
 y
It's really easy to find:
 $(y)' =$
=1.000
6 step. finding a derivation of:
2.000
I spend the hole of my life to find the answer and finally it's:
 $(2.000)' =$
=0.000
7 step. finding a derivation of:
 $2.000 \cdot y$
I was asked not to tell anyone that:
 $(2.000 \cdot y)' =$
=2.000
8 step. finding a derivation of:
 x
If someone asked me that in the middle of the night, I wouldn't hesitate to say:
 $(x)' =$
=1.000
9 step. finding a derivation of:
 $\sin x$
Even my two-aged sister knows that it equals:
 $(\sin x)' =$
= $\cos x$
10 step. finding a derivation of:
 (-1.000)
I spend the hole of my life to find the answer and finally it's:
 $((-1.000))' =$
=0.000
11 step. finding a derivation of:
 $(-1.000) \cdot \sin x$
It's really easy to find:
 $((-1.000) \cdot \sin x)' =$
= $(-1.000) \cdot \cos x$
12 step. finding a derivation of:
 $(-1.000) \cdot \sin x \cdot 2.000 \cdot y$
It's really easy to find:
 $((-1.000) \cdot \sin x \cdot 2.000 \cdot y)' =$
= $(-1.000) \cdot \cos x \cdot 2.000 \cdot y + 2.000 \cdot (-1.000) \cdot \sin x$
13 step. finding a derivation of:
 $(-1.000) \cdot \sin x \cdot 2.000 \cdot y + 2.000 \cdot \cos x$
It's simple as fuck:
 $((-1.000) \cdot \sin x \cdot 2.000 \cdot y + 2.000 \cdot \cos x)' =$
= $(-1.000) \cdot \cos x \cdot 2.000 \cdot y + 2.000 \cdot (-1.000) \cdot \sin x + 2.000 \cdot (-1.000) \cdot \sin x$
14 step. finding a derivation of:
 x
It's simple as fuck:
 $(x)' =$
=1.000
15 step. finding a derivation of:
 $\cos x$
A true prince must know that it equals:
 $(\cos x)' =$
= $(-1.000) \cdot \sin x$
16 step. finding a derivation of:
2.000
My roommate mumbled it in his sleep all night:
 $(2.000)' =$
=0.000
17 step. finding a derivation of:
 $2.000 \cdot \cos x$
I was asked not to tell anyone that:
 $(2.000 \cdot \cos x)' =$
= $2.000 \cdot (-1.000) \cdot \sin x$

18 step. finding a derivation of:
 $2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y + 2.000 \cdot \cos x$
I spend the hole of my life to find the answer and finally it's:
 $(2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y + 2.000 \cdot \cos x)' =$
 $= 2.000 \cdot (-1.000) \cdot \sin x + (-1.000) \cdot \cos x \cdot 2.000 \cdot y + 2.000 \cdot (-1.000) \cdot \sin x + 2.000 \cdot (-1.000) \cdot \sin x$
19 step. finding a derivation of:
 y
It's really easy to find:
 $(y)' =$
 $= 1.000$
20 step. finding a derivation of:
 2.000
What if it equals:
 $(2.000)' =$
 $= 0.000$
21 step. finding a derivation of:
 $2.000 \cdot y$
While preparing for exams, I learned a lot of new things, for example:
 $(2.000 \cdot y)' =$
 $= 2.000$
22 step. finding a derivation of:
 x
Even my two-aged sister knows that it equals:
 $(x)' =$
 $= 1.000$
23 step. finding a derivation of:
 $\sin x$
What if it equals:
 $(\sin x)' =$
 $= \cos x$
24 step. finding a derivation of:
 (-1.000)
It's simple as fuck:
 $((-1.000))' =$
 $= 0.000$
25 step. finding a derivation of:
 $(-1.000) \cdot \sin x$
My roommate mumbled it in his sleep all night:
 $((-1.000) \cdot \sin x)' =$
 $= (-1.000) \cdot \cos x$
26 step. finding a derivation of:
 $(-1.000) \cdot \sin x \cdot 2.000 \cdot y$
It's simple as fuck:
 $((-1.000) \cdot \sin x \cdot 2.000 \cdot y)' =$
 $= (-1.000) \cdot \cos x \cdot 2.000 \cdot y + 2.000 \cdot (-1.000) \cdot \sin x$
27 step. finding a derivation of:
 x
A true prince must know that it equals:
 $(x)' =$
 $= 1.000$
28 step. finding a derivation of:
 $\cos x$
My roommate mumbled it in his sleep all night:
 $(\cos x)' =$
 $= (-1.000) \cdot \sin x$
29 step. finding a derivation of:
 2.000
A true prince must know that it equals:
 $(2.000)' =$
 $= 0.000$
30 step. finding a derivation of:
 $2.000 \cdot \cos x$
A true prince must know that it equals:
 $(2.000 \cdot \cos x)' =$
 $= 2.000 \cdot (-1.000) \cdot \sin x$
31 step. finding a derivation of:
 $2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y$
If someone asked me that in the middle of the night, I wouldn't hesitate to say:
 $(2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y)' =$
 $= 2.000 \cdot (-1.000) \cdot \sin x + (-1.000) \cdot \cos x \cdot 2.000 \cdot y + 2.000 \cdot (-1.000) \cdot \sin x$
32 step. finding a derivation of:
 x
I spend the hole of my life to find the answer and finally it's:
 $(x)' =$
 $= 1.000$
33 step. finding a derivation of:
 $\sin x$
When I was child, my father always told me: "Remember, son:
 $(\sin x)' =$
 $= \cos x$
34 step. finding a derivation of:
 (-1.000)
If someone asked me that in the middle of the night, I wouldn't hesitate to say:
 $((-1.000))' =$
 $= 0.000$

35 step. finding a derivation of:
 $(-1.000) \cdot \sin x$
thanks to the results of my colleagues' scientific work, I know that it equals:
 $((-1.000) \cdot \sin x)' =$
 $=(-1.000) \cdot \cos x$
36 step. finding a derivation of:
 y
For centuries, people have hunted for the secret knowledge that:
 $(y)' =$
 $=1.000$
37 step. finding a derivation of:
 2.000
For centuries, people have hunted for the secret knowledge that:
 $(2.000)' =$
 $=0.000$
38 step. finding a derivation of:
 $2.000 \cdot y$
What if it equals:
 $(2.000 \cdot y)' =$
 $=2.000$
39 step. finding a derivation of:
 $2.000 \cdot y \cdot (-1.000) \cdot \sin x$
If someone asked me that in the middle of the night, I wouldn't hesitate to say:
 $(2.000 \cdot y \cdot (-1.000) \cdot \sin x)' =$
 $=2.000 \cdot (-1.000) \cdot \sin x + (-1.000) \cdot \cos x \cdot 2.000 \cdot y$
40 step. finding a derivation of:
 y
I was asked not to tell anyone that:
 $(y)' =$
 $=1.000$
41 step. finding a derivation of:
 $y^{2.000}$
A true prince must know that it equals:
 $(y^{2.000})' =$
 $=2.000 \cdot y$
42 step. finding a derivation of:
 x
Man... Just look:
 $(x)' =$
 $=1.000$
43 step. finding a derivation of:
 $\cos x$
My roommate mumbled it in his sleep all night:
 $(\cos x)' =$
 $=(-1.000) \cdot \sin x$
44 step. finding a derivation of:
 (-1.000)
It's simple as fuck:
 $((-1.000))' =$
 $=0.000$
45 step. finding a derivation of:
 $(-1.000) \cdot \cos x$
I was asked not to tell anyone that:
 $((-1.000) \cdot \cos x)' =$
 $=(-1.000) \cdot (-1.000) \cdot \sin x$
46 step. finding a derivation of:
 $(-1.000) \cdot \cos x \cdot y^{2.000}$
If someone asked me that in the middle of the night, I wouldn't hesitate to say:
 $((-1.000) \cdot \cos x \cdot y^{2.000})' =$
 $=(-1.000) \cdot (-1.000) \cdot \sin x \cdot y^{2.000} + 2.000 \cdot y \cdot (-1.000) \cdot \cos x$
47 step. finding a derivation of:
 $(-1.000) \cdot \cos x \cdot y^{2.000} + 2.000 \cdot y \cdot (-1.000) \cdot \sin x$
Man... Just look:
 $((-1.000) \cdot \cos x \cdot y^{2.000} + 2.000 \cdot y \cdot (-1.000) \cdot \sin x)' =$
 $=(-1.000) \cdot (-1.000) \cdot \sin x \cdot y^{2.000} + 2.000 \cdot y \cdot (-1.000) \cdot \cos x + 2.000 \cdot (-1.000) \cdot \sin x + (-1.000) \cdot \cos x \cdot 2.000 \cdot y$
48 step. finding a derivation of:
 $(-1.000) \cdot \cos x \cdot y^{2.000} + 2.000 \cdot y \cdot (-1.000) \cdot \sin x + 2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y$
When I was child, my father always told me: "Remember, son:
 $((-1.000) \cdot \cos x \cdot y^{2.000} + 2.000 \cdot y \cdot (-1.000) \cdot \sin x + 2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y)' =$
 $=(-1.000) \cdot (-1.000) \cdot \sin x \cdot y^{2.000} + 2.000 \cdot y \cdot (-1.000) \cdot \cos x + 2.000 \cdot (-1.000) \cdot \sin x + (-1.000) \cdot \cos x \cdot 2.000 \cdot y + 2.000 \cdot (-1.000) \cdot \sin x$
49 step. finding a derivation of:
 $(-1.000) \cdot \cos x \cdot y^{2.000} + 2.000 \cdot y \cdot (-1.000) \cdot \sin x + 2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y + 2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y + 2.000 \cdot \cos x$
It's really easy to find:
 $((-1.000) \cdot \cos x \cdot y^{2.000} + 2.000 \cdot y \cdot (-1.000) \cdot \sin x + 2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y + 2.000 \cdot \cos x + (-1.000) \cdot \sin x \cdot 2.000 \cdot y + 2.000 \cdot \cos x)' =$
 $=(-1.000) \cdot (-1.000) \cdot \sin x \cdot y^{2.000} + 2.000 \cdot y \cdot (-1.000) \cdot \cos x + 2.000 \cdot (-1.000) \cdot \sin x + (-1.000) \cdot \cos x \cdot 2.000 \cdot y + 2.000 \cdot (-1.000) \cdot \sin x + 2.000 \cdot (-1.000) \cdot \sin x + (-1.000) \cdot \cos x \cdot 2.000 \cdot y + 2.000 \cdot (-1.000) \cdot \sin x + 2.000 \cdot (-1.000) \cdot \sin x$
Finally... The 4 derivation of the expression:
 $(-1.000) \cdot (-1.000) \cdot \sin x \cdot y^{2.000} + 2.000 \cdot y \cdot (-1.000) \cdot \cos x + 2.000 \cdot (-1.000) \cdot \sin x + (-1.000) \cdot \cos x \cdot 2.000 \cdot y + 2.000 \cdot (-1.000) \cdot \sin x + (-1.000) \cdot \cos x \cdot 2.000 \cdot y + 2.000 \cdot (-1.000) \cdot \sin x + 2.000 \cdot (-1.000) \cdot \sin x + (-1.000) \cdot \cos x \cdot 2.000 \cdot y + 2.000 \cdot (-1.000) \cdot \sin x + 2.000 \cdot (-1.000) \cdot \sin x$
BRITISH SCIENTISTS WERE SHOCKED AGAIN, WHEN THEY COUNT THE 4 DERIVATION OF THIS EXPRESSION!!!
In the point (x = 3.000, y = 2.000) it's value = 14.711
Partial derivation of the expression on the variable x:
 $\frac{\partial f}{\partial x} = 4.000 \cdot \cos x$
In the point (x = 3.000, y = 2.000) it's value = -3.959970 !!!
Partial derivation of the expression on the variable y:
 $\frac{\partial f}{\partial y} = 0.141 \cdot 2.000 \cdot y$
In the point (x = 3.000, y = 2.000) it's value = 0.564480 !!!

Full derivation:

$$\sqrt{(4.000 \cdot \cos x)^{2.000} + (0.141 \cdot 2.000 \cdot y)^{2.000}}$$

In the point (x = 3.000, y = 2.000) it's value = 4.000 !!!

Let's consider the expression as a function of x variable: $f(x) = 4.000 \cdot \sin x$

Maklorens formula for $x \rightarrow 3.000$: $f(x) = 0.564 + (-3.960) \cdot (x - 3.000) + (-0.282) \cdot (x - 3.000)^{2.000} + 0.660 \cdot (x - 3.000)^{3.000} + 0.024 \cdot (x - 3.000)^{4.000} + (-0.033) \cdot (x - 3.000)^{5.000} + o((x - 3.000)^{5.000})$

Graph f(x):

Tangent equation in the point x = 0.000: $f(x) = 4.000 \cdot x$

Normal equation in the point x = 0.000: $f(x) = (-0.250) \cdot (x - 0.000) + 0.000$