

1 Some basic knowledge about researching problem...

Let's calculate smth with a given function:  $f(x, y) = (\sin x \cdot y)^{3.000}$   
Firstly, let's simplify this expression (if possible):  $f(x, y) = (\sin x \cdot y)^{3.000}$

2 Exploration of the expression as a function of multiple variables

Calculation value of function in the point BRITISH SCIENTISTS WERE SHOCKED, WHEN THEY COUNT IT!!!

In the point  $M_0(x_0, y_0) = (3.142, 2.000)$  it's value = -0.00000  
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:  
 $(y)' = \dots = [\text{top secret}] = \dots =$

= 1.000  
2 step: Finding a derivation of  $x$   
It's really easy to find:  
 $(x)' = \dots = [\text{top secret}] = \dots =$

= 1.000  
3 step: Finding a derivation of  $x \cdot y$   
My roommate mumbled it in his sleep all night:  
 $(x \cdot y)' = \dots = [\text{top secret}] = \dots =$

=  $y + x$   
4 step: Finding a derivation of  $\sin x \cdot y$   
Sounds logical that it is the same as:  
 $(\sin x \cdot y)' = \dots = [\text{top secret}] = \dots =$

=  $\cos x \cdot y \cdot (y + x)$   
5 step: Finding a derivation of  $(\sin x \cdot y)^{3.000}$   
For centuries, people have hunted for the secret knowledge that:  
 $((\sin x \cdot y)^{3.000})' = \dots = [\text{top secret}] = \dots =$

=  $3.000 \cdot (\sin x \cdot y)^{2.000} \cdot \cos x \cdot y \cdot (y + x)$   
Congratulations! The first derivation of the expression is:  
 $f'(x, y) = 3.000 \cdot (\sin x \cdot y)^{2.000} \cdot \cos x \cdot y \cdot (y + x)$

In the point  $M_0(x_0, y_0) = (3.142, 2.000)$  it's value = 0.00000

Finding the 3 derivation Let's find the 1 derivation of the expression:

1 step: Finding a derivation of  $y$   
Sounds logical that it is the same as:  
 $(y)' = \dots = [\text{top secret}] = \dots =$

= 1.000  
2 step: Finding a derivation of  $x$   
It's really easy to find:  
 $(x)' = \dots = [\text{top secret}] = \dots =$

= 1.000  
3 step: Finding a derivation of  $x \cdot y$   
My roommate mumbled it in his sleep all night:  
 $(x \cdot y)' = \dots = [\text{top secret}] = \dots =$

=  $y + x$   
4 step: Finding a derivation of  $\sin x \cdot y$   
What if:  
 $(\sin x \cdot y)' = \dots = [\text{top secret}] = \dots =$

=  $\cos x \cdot y \cdot (y + x)$   
5 step: Finding a derivation of  $(\sin x \cdot y)^{3.000}$   
It's really easy to find:  
 $((\sin x \cdot y)^{3.000})' = \dots = [\text{top secret}] = \dots =$

=  $3.000 \cdot (\sin x \cdot y)^{2.000} \cdot \cos x \cdot y \cdot (y + x)$   
Let's find the 2 derivation of the expression:  
1 step: Finding a derivation of  $x$

Even my two-aged sister knows that:  
 $(x)' = \dots = [\text{top secret}] = \dots =$

= 1.000  
2 step: Finding a derivation of  $y$   
When I was child, my father always told me: "Remember, son:  
 $(y)' = \dots = [\text{top secret}] = \dots =$

= 1.000  
3 step: Finding a derivation of  $y + x$   
I spend the hole of my life to find the answer and finally it's:  
 $(y + x)' = \dots = [\text{top secret}] = \dots =$

= 2.000  
4 step: Finding a derivation of  $y$   
Man... Just look:  
 $(y)' = \dots = [\text{top secret}] = \dots =$

= 1.000

5 step: Finding a derivation of  $x$   
For centuries, people have hunted for the secret knowledge that:  
 $(x)' = \dots = \text{[top secret]} = \dots =$   
 $= 1.000$   
6 step: Finding a derivation of  $x \cdot y$   
It's really easy to find:  
 $(x \cdot y)' = \dots = \text{[top secret]} = \dots =$   
 $= y + x$   
7 step: Finding a derivation of  $\cos x \cdot y$   
It's simple as fuck:  
 $(\cos x \cdot y)' = \dots = \text{[top secret]} = \dots =$   
 $= (-1.000) \cdot \sin x \cdot y \cdot (y + x)$   
8 step: Finding a derivation of  $\cos x \cdot y \cdot (y + x)$   
thanks to the results of my colleagues' scientific work, I know that:  
 $(\cos x \cdot y \cdot (y + x))' = \dots = \text{[top secret]} = \dots =$   
 $= (-1.000) \cdot \sin x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot \cos x \cdot y$   
9 step: Finding a derivation of  $y$   
When I was child, my father always told me: "Remember, son:  
 $(y)' = \dots = \text{[top secret]} = \dots =$   
 $= 1.000$   
10 step: Finding a derivation of  $x$   
It's really easy to find:  
 $(x)' = \dots = \text{[top secret]} = \dots =$   
 $= 1.000$   
11 step: Finding a derivation of  $x \cdot y$   
I was asked not to tell anyone that:  
 $(x \cdot y)' = \dots = \text{[top secret]} = \dots =$   
 $= y + x$   
12 step: Finding a derivation of  $\sin x \cdot y$   
For centuries, people have hunted for the secret knowledge that:  
 $(\sin x \cdot y)' = \dots = \text{[top secret]} = \dots =$   
 $= \cos x \cdot y \cdot (y + x)$   
13 step: Finding a derivation of  $(\sin x \cdot y)^{2.000}$   
My roommate mumbled it in his sleep all night:  
 $((\sin x \cdot y)^{2.000})' = \dots = \text{[top secret]} = \dots =$   
 $= 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x)$   
14 step: Finding a derivation of 3.000  
What if:  
 $(3.000)' = \dots = \text{[top secret]} = \dots =$   
 $= 0.000$   
15 step: Finding a derivation of  $3.000 \cdot (\sin x \cdot y)^{2.000}$   
Even my two-aged sister knows that:  
 $(3.000 \cdot (\sin x \cdot y)^{2.000})' = \dots = \text{[top secret]} = \dots =$   
 $= 3.000 \cdot 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x)$   
16 step: Finding a derivation of  $3.000 \cdot (\sin x \cdot y)^{2.000} \cdot \cos x \cdot y \cdot (y + x)$   
I spend the hole of my life to find the answer and finally it's:  
 $(3.000 \cdot (\sin x \cdot y)^{2.000} \cdot \cos x \cdot y \cdot (y + x))' = \dots = \text{[top secret]} = \dots =$   
 $= 3.000 \cdot 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x) \cdot \cos x \cdot y \cdot (y + x) + ((-1.000) \cdot \sin x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot \cos x \cdot y) \cdot 3.000 \cdot (\sin x \cdot y)^{2.000}$   
Let's find **the 3 derivation** of the expression:  
1 step: Finding a derivation of  $y$   
Even my two-aged sister knows that:  
 $(y)' = \dots = \text{[top secret]} = \dots =$   
 $= 1.000$   
2 step: Finding a derivation of  $x$   
While preparing for exams, I learned a lot of new things, for example:  
 $(x)' = \dots = \text{[top secret]} = \dots =$   
 $= 1.000$   
3 step: Finding a derivation of  $x \cdot y$   
When I was child, my father always told me: "Remember, son:  
 $(x \cdot y)' = \dots = \text{[top secret]} = \dots =$   
 $= y + x$   
4 step: Finding a derivation of  $\sin x \cdot y$   
Sounds logical that it is the same as:  
 $(\sin x \cdot y)' = \dots = \text{[top secret]} = \dots =$   
 $= \cos x \cdot y \cdot (y + x)$   
5 step: Finding a derivation of  $(\sin x \cdot y)^{2.000}$   
A true prince must know that:  
 $((\sin x \cdot y)^{2.000})' = \dots = \text{[top secret]} = \dots =$   
 $= 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x)$   
6 step: Finding a derivation of 3.000  
My roommate mumbled it in his sleep all night:  
 $(3.000)' = \dots = \text{[top secret]} = \dots =$   
 $= 0.000$   
7 step: Finding a derivation of  $3.000 \cdot (\sin x \cdot y)^{2.000}$   
My roommate mumbled it in his sleep all night:  
 $(3.000 \cdot (\sin x \cdot y)^{2.000})' = \dots = \text{[top secret]} = \dots =$   
 $= 3.000 \cdot 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x)$   
8 step: Finding a derivation of  $y$

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

$((-1.000) \cdot \sin x \cdot y \cdot (y+x) \cdot (y+x))' = \dots = [\text{top secret}] = \dots =$   
 $= ((-1.000) \cdot \cos x \cdot y \cdot (y+x) \cdot (y+x) + 2.000 \cdot (-1.000) \cdot \sin x \cdot y \cdot (y+x) + 2.000 \cdot (-1.000) \cdot \sin x \cdot y \cdot (y+x))$   
**28 step:** Finding a derivation of  $(-1.000) \cdot \sin x \cdot y \cdot (y+x) \cdot (y+x) + 2.000 \cdot \cos x \cdot y$   
 I spend the hole of my life to find the answer and finally it's:  
 $((-1.000) \cdot \sin x \cdot y \cdot (y+x) \cdot (y+x) + 2.000 \cdot \cos x \cdot y)' = \dots = [\text{top secret}] = \dots =$   
 $= ((-1.000) \cdot \cos x \cdot y \cdot (y+x) \cdot (y+x) + 2.000 \cdot (-1.000) \cdot \sin x \cdot y \cdot (y+x) + 2.000 \cdot (-1.000) \cdot \sin x \cdot y \cdot (y+x) + 2.000 \cdot (-1.000) \cdot \sin x \cdot y \cdot (y+x))$   
**29 step:** Finding a derivation of  $((-1.000) \cdot \sin x \cdot y \cdot (y+x) \cdot (y+x) + 2.000 \cdot \cos x \cdot y) \cdot 3.000 \cdot (\sin x \cdot y)^{2.000}$   
 I was asked not to tell anyone that:  
 $(((-1.000) \cdot \sin x \cdot y \cdot (y+x) \cdot (y+x) + 2.000 \cdot \cos x \cdot y) \cdot 3.000 \cdot (\sin x \cdot y)^{2.000})' = \dots = [\text{top secret}] = \dots =$   
 $= (((-1.000) \cdot \cos x \cdot y \cdot (y+x) \cdot (y+x) + 2.000 \cdot (-1.000) \cdot \sin x \cdot y \cdot (y+x) + 2.000 \cdot (-1.000) \cdot \sin x \cdot y \cdot (y+x) + 2.000 \cdot (-1.000) \cdot \sin x \cdot y \cdot (y+x)) \cdot 3.000 \cdot (\sin x \cdot y)^{2.000} + 3.000 \cdot 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y+x) \cdot ((-1.000) \cdot \sin x \cdot y \cdot (y+x) \cdot (y+x) + 2.000 \cdot \cos x \cdot y))$   
**30 step:** Finding a derivation of  $x$   
 If someone asked me that in the middle of the night, I wouldn't hesitate to say:  
 $(x)' = \dots = [\text{top secret}] = \dots =$   
 $= 1.000$   
**31 step:** Finding a derivation of  $y$   
 Even my two-aged sister knows that:  
 $(y)' = \dots = [\text{top secret}] = \dots =$   
 $= 1.000$   
**32 step:** Finding a derivation of  $y+x$   
 I spend the hole of my life to find the answer and finally it's:  
 $(y+x)' = \dots = [\text{top secret}] = \dots =$   
 $= 2.000$   
**33 step:** Finding a derivation of  $y$   
 It's really easy to find:  
 $(y)' = \dots = [\text{top secret}] = \dots =$   
 $= 1.000$   
**34 step:** Finding a derivation of  $x$   
 It's really easy to find:  
 $(x)' = \dots = [\text{top secret}] = \dots =$   
 $= 1.000$   
**35 step:** Finding a derivation of  $x \cdot y$   
 It's simple as fuck:  
 $(x \cdot y)' = \dots = [\text{top secret}] = \dots =$   
 $= y+x$   
**36 step:** Finding a derivation of  $\cos x \cdot y$   
 It's simple as fuck:  
 $(\cos x \cdot y)' = \dots = [\text{top secret}] = \dots =$   
 $= (-1.000) \cdot \sin x \cdot y \cdot (y+x)$   
**37 step:** Finding a derivation of  $\cos x \cdot y \cdot (y+x)$   
 A true prince must know that:  
 $(\cos x \cdot y \cdot (y+x))' = \dots = [\text{top secret}] = \dots =$   
 $= (-1.000) \cdot \sin x \cdot y \cdot (y+x) \cdot (y+x) + 2.000 \cdot \cos x \cdot y$   
**38 step:** Finding a derivation of  $x$   
 My roommate mumbled it in his sleep all night:  
 $(x)' = \dots = [\text{top secret}] = \dots =$   
 $= 1.000$   
**39 step:** Finding a derivation of  $y$   
 I was asked not to tell anyone that:  
 $(y)' = \dots = [\text{top secret}] = \dots =$   
 $= 1.000$   
**40 step:** Finding a derivation of  $y+x$   
 I spend the hole of my life to find the answer and finally it's:  
 $(y+x)' = \dots = [\text{top secret}] = \dots =$   
 $= 2.000$   
**41 step:** Finding a derivation of  $y$   
 It's really easy to find:  
 $(y)' = \dots = [\text{top secret}] = \dots =$   
 $= 1.000$   
**42 step:** Finding a derivation of  $x$   
 What if:  
 $(x)' = \dots = [\text{top secret}] = \dots =$   
 $= 1.000$   
**43 step:** Finding a derivation of  $x \cdot y$   
 While preparing for exams, I learned a lot of new things, for example:  
 $(x \cdot y)' = \dots = [\text{top secret}] = \dots =$   
 $= y+x$   
**44 step:** Finding a derivation of  $\cos x \cdot y$   
 Even my two-aged sister knows that:  
 $(\cos x \cdot y)' = \dots = [\text{top secret}] = \dots =$   
 $= (-1.000) \cdot \sin x \cdot y \cdot (y+x)$   
**45 step:** Finding a derivation of  $\cos x \cdot y \cdot (y+x)$   
 What if:  
 $(\cos x \cdot y \cdot (y+x))' = \dots = [\text{top secret}] = \dots =$   
 $= (-1.000) \cdot \sin x \cdot y \cdot (y+x) \cdot (y+x) + 2.000 \cdot \cos x \cdot y$   
**46 step:** Finding a derivation of  $y$   
 It's simple as fuck:  
 $(y)' = \dots = [\text{top secret}] = \dots =$   
 $= 1.000$

47 **step**: Finding a derivation of  $x$   
My roommate mumbled it in his sleep all night:  
 $(x)' = \dots =$  [top secret]  $= \dots =$   
 $= 1.000$   
48 **step**: Finding a derivation of  $x \cdot y$   
It's simple as fuck:  
 $(x \cdot y)' = \dots =$  [top secret]  $= \dots =$   
 $= y + x$   
49 **step**: Finding a derivation of  $\sin x \cdot y$   
A true prince must know that:  
 $(\sin x \cdot y)' = \dots =$  [top secret]  $= \dots =$   
 $= \cos x \cdot y \cdot (y + x)$   
50 **step**: Finding a derivation of 2.000  
My roommate mumbled it in his sleep all night:  
 $(2.000)' = \dots =$  [top secret]  $= \dots =$   
 $= 0.000$   
51 **step**: Finding a derivation of  $2.000 \cdot \sin x \cdot y$   
A true prince must know that:  
 $(2.000 \cdot \sin x \cdot y)' = \dots =$  [top secret]  $= \dots =$   
 $= 2.000 \cdot \cos x \cdot y \cdot (y + x)$   
52 **step**: Finding a derivation of  $2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x)$   
A true prince must know that:  
 $(2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x))' = \dots =$  [top secret]  $= \dots =$   
 $= 2.000 \cdot \cos x \cdot y \cdot (y + x) \cdot \cos x \cdot y \cdot (y + x) + ((-1.000) \cdot \sin x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot \cos x \cdot y) \cdot 2.000 \cdot \sin x \cdot y$   
53 **step**: Finding a derivation of 3.000  
If someone asked me that in the middle of the night, I wouldn't hesitate to say:  
 $(3.000)' = \dots =$  [top secret]  $= \dots =$   
 $= 0.000$   
54 **step**: Finding a derivation of  $3.000 \cdot 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x)$   
I spend the hole of my life to find the answer and finally it's:  
 $(3.000 \cdot 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x))' = \dots =$  [top secret]  $= \dots =$   
 $= 3.000 \cdot (2.000 \cdot \cos x \cdot y \cdot (y + x) \cdot \cos x \cdot y \cdot (y + x) + ((-1.000) \cdot \sin x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot \cos x \cdot y) \cdot 2.000 \cdot \sin x \cdot y)$   
55 **step**: Finding a derivation of  $3.000 \cdot 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x) \cdot \cos x \cdot y \cdot (y + x)$   
When I was child, my father always told me: "Remember, son:  
 $(3.000 \cdot 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x) \cdot \cos x \cdot y \cdot (y + x))' = \dots =$  [top secret]  $= \dots =$   
 $= 3.000 \cdot (2.000 \cdot \cos x \cdot y \cdot (y + x) \cdot \cos x \cdot y \cdot (y + x) + ((-1.000) \cdot \sin x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot \cos x \cdot y) \cdot 2.000 \cdot \sin x \cdot y) \cdot \cos x \cdot y \cdot (y + x) + ((-1.000) \cdot \sin x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot \cos x \cdot y) \cdot 3.000 \cdot 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x)$   
56 **step**: Finding a derivation of  $3.000 \cdot 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x) \cdot \cos x \cdot y \cdot (y + x) + ((-1.000) \cdot \sin x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot \cos x \cdot y) \cdot 3.000 \cdot (\sin x \cdot y)^{2.000}$   
If someone asked me that in the middle of the night, I wouldn't hesitate to say:  
 $(3.000 \cdot 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x) \cdot \cos x \cdot y \cdot (y + x) + ((-1.000) \cdot \sin x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot \cos x \cdot y) \cdot 3.000 \cdot (\sin x \cdot y)^{2.000})' = \dots =$  [top secret]  $= \dots =$   
 $= 3.000 \cdot (2.000 \cdot \cos x \cdot y \cdot (y + x) \cdot \cos x \cdot y \cdot (y + x) + ((-1.000) \cdot \sin x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot \cos x \cdot y) \cdot 2.000 \cdot \sin x \cdot y) \cdot \cos x \cdot y \cdot (y + x) + (((-1.000) \cdot \cos x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot (-1.000) \cdot \sin x \cdot y \cdot (y + x) + 2.000 \cdot (-1.000) \cdot \sin x \cdot y \cdot (y + x) + 2.000 \cdot (-1.000) \cdot \sin x \cdot y \cdot (y + x)) \cdot 3.000 \cdot (\sin x \cdot y)^{2.000} + 3.000 \cdot 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x) \cdot ((-1.000) \cdot \sin x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot \cos x \cdot y)$   
**Finally... The 3 derivation of the expression:**  
 $f^{(3)}(x, y) = 3.000 \cdot (2.000 \cdot \cos x \cdot y \cdot (y + x) \cdot \cos x \cdot y \cdot (y + x) + ((-1.000) \cdot \sin x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot \cos x \cdot y) \cdot 2.000 \cdot \sin x \cdot y) \cdot \cos x \cdot y \cdot (y + x) + ((-1.000) \cdot \sin x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot \cos x \cdot y) \cdot 3.000 \cdot 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x) + (((-1.000) \cdot \cos x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot (-1.000) \cdot \sin x \cdot y \cdot (y + x) + 2.000 \cdot (-1.000) \cdot \sin x \cdot y \cdot (y + x) + 2.000 \cdot (-1.000) \cdot \sin x \cdot y \cdot (y + x)) \cdot 3.000 \cdot (\sin x \cdot y)^{2.000} + 3.000 \cdot 2.000 \cdot \sin x \cdot y \cdot \cos x \cdot y \cdot (y + x) \cdot ((-1.000) \cdot \sin x \cdot y \cdot (y + x) \cdot (y + x) + 2.000 \cdot \cos x \cdot y)$   
BRITISH SCIENTISTS WERE SHOCKED AGAIN, WHEN THEY COUNT THE 3 DERIVATION OF THIS EXPRESSION!!!  
In the point  $M_0(x_0, y_0) = (3.142, 2.000)$  it's value = 815.45956

**Finding partial derivations** Partial derivation of the expression on the variable x:  
 $\frac{\partial f}{\partial x} = 3.000 \cdot (\sin 2.000 \cdot x)^{2.000} \cdot 2.000 \cdot \cos 2.000 \cdot x$   
In the point  $M_0(x_0, y_0) = (3.142, 2.000)$  it's value = 0.00000 !!!  
Partial derivation of the expression on the variable y:  
 $\frac{\partial f}{\partial y} = 3.000 \cdot (\sin 3.142 \cdot y)^{2.000} \cdot 3.142 \cdot \cos 3.142 \cdot y$   
In the point  $M_0(x_0, y_0) = (3.142, 2.000)$  it's value = 0.00000 !!!

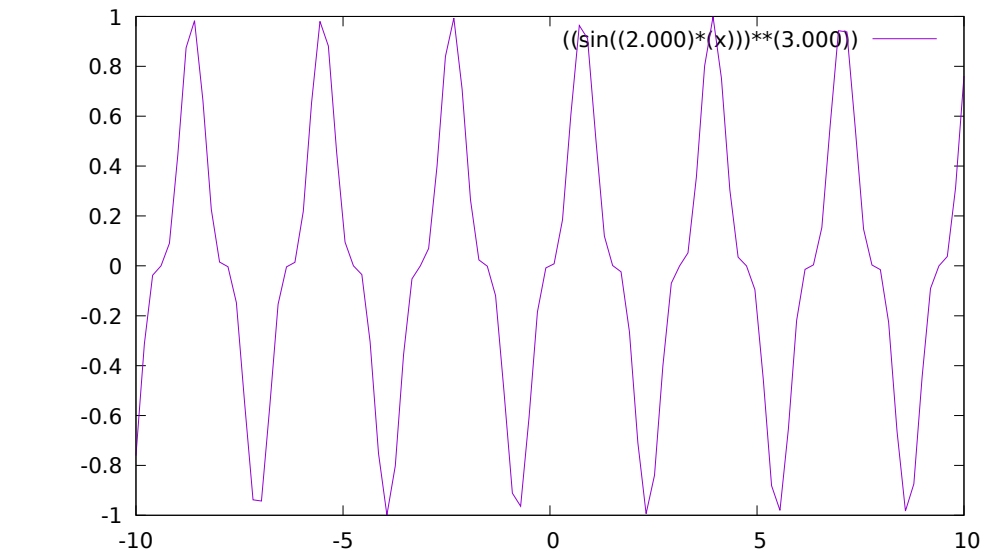
**Finding full derivation** Full derivation:  
 $\sqrt{(3.000 \cdot (\sin 2.000 \cdot x)^{2.000} \cdot 2.000 \cdot \cos 2.000 \cdot x)^{2.000} + (3.000 \cdot (\sin 3.142 \cdot y)^{2.000} \cdot 3.142 \cdot \cos 3.142 \cdot y)^{2.000}}$   
In the point  $M_0(x_0, y_0) = (3.142, 2.000)$  it's value = 0.00000 !!!

### 3 Exploration the expression as a function of the first variable

Now let's consider the expression as a function of x variable:  $f(x) = (\sin 2.000 \cdot x)^{3.000}$

**Decomposing on Macloren's formula** **Maklorens formula** for  $x \rightarrow x_0 = 3.142$ :  
 $f(x) = (-0.000) + 0.000 \cdot (x - 3.142) + (-0.002) \cdot (x - 3.142)^{2.000} + 8.000 \cdot (x - 3.142)^{3.000} + 0.007 \cdot (x - 3.142)^{4.000} + o((x - 3.142)^{4.000})$

**Graphics** **Graph**  $f(x) = (\sin 2.000 \cdot x)^{3.000}$  on the diasapoxe  $x \in [-10 : 10]$  :



**Equations in the point**    **Tangent equation** in the point  $x_0 = 1.000$ :

$$f(x) = (-2.064) \cdot (x - 1.000) + 0.752$$

**Normal equation** in the point  $x_0 = 1.000$ :

$$f(x) = 0.484 \cdot (x - 1.000) + 0.752$$

