1 Introduction

$CrInGeCrInGeProduction.Supercringeintroductionhere:$

2 Some basic knowledge about researching problem...

Let's calculate smth with a given function: f(x) = $\arcsin x$
Firstly, let's simplify this expression (if possible): f(x) = $\arcsin x$

3 Exploration of the expression

Calculation value of function in the point BRITISH SCIENTISTS WERE SHOCKED, WHEN THEY COUNT IT!!!
In the point $M_0(x_0) = (0.000)$ **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 x
While preparing for exams, I learned a lot of new things, for example:
$(x)' = ... = [\text{top secret}] = ... =$
$= 1.000$
`2 step:` Finding a derivation of $\arcsin x$
It's really easy to find:
$(\arcsin x)' = ... = [\text{top secret}] = ... =$
$= \frac{1.000}{\sqrt{1.000-x^{2.000}}}$
Congratulations! **The first derivation of the expression** is:
f'(x) = $\frac{1.000}{\sqrt{1.000-x^{2.000}}}$
In the point $M_0(x_0) = (0.000)$ it's value = 1.00000

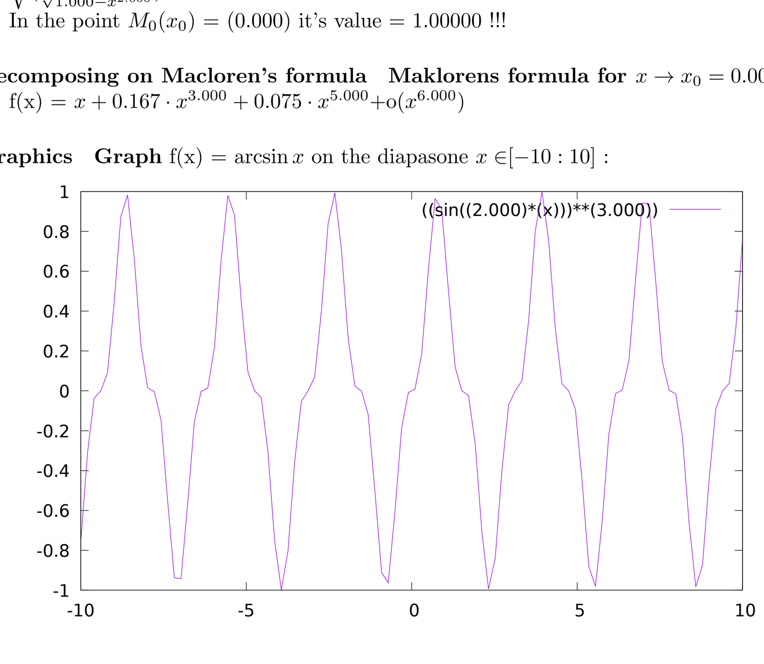
Finding the 3 derivation Let's find **the 1 derivation** of the expression:
`1 step:` Finding a derivation of x
My roommate mumbled it in his sleep all night:
$(x)' = ... = [\text{top secret}] = ... =$
$= 1.000$
`2 step:` Finding a derivation of $\arcsin x$
Sounds logical that it is the same as:
$(\arcsin x)' = ... = [\text{top secret}] = ... =$
$= \frac{1.000}{\sqrt{1.000-x^{2.000}}}$
Let's find **the 2 derivation** of the expression:
`1 step:` Finding a derivation of x
For centuries, people have hunted for the secret knowledge that:
$(x)' = ... = [\text{top secret}] = ... =$
$= 1.000$
`2 step:` Finding a derivation of $x^{2.000}$
Sounds logical that it is the same as:
$(x^{2.000})' = ... = [\text{top secret}] = ... =$
$= 2.000 \cdot x$
`3 step:` Finding a derivation of 1.000
It's really easy to find:
$(1.000)' = ... = [\text{top secret}] = ... =$
$= 0.000$
`4 step:` Finding a derivation of $1.000 - x^{2.000}$
My roommate mumbled it in his sleep all night:
$(1.000 - x^{2.000})' = ... = [\text{top secret}] = ... =$
$= (-1.000) \cdot 2.000 \cdot x$
`5 step:` Finding a derivation of $\sqrt{1.000 - x^{2.000}}$
What if:
$(\sqrt{1.000 - x^{2.000}})' = ... = [\text{top secret}] = ... =$
$= \frac{0.500}{\sqrt{1.000-x^{2.000}}} \cdot (-1.000) \cdot 2.000 \cdot x$
`6 step:` Finding a derivation of 1.000
It's really easy to find:
$(1.000)' = ... = [\text{top secret}] = ... =$
$= 0.000$
`7 step:` Finding a derivation of $\frac{1.000}{\sqrt{1.000-x^{2.000}}}$
Even my two-aged sister knows that:
$(\frac{1.000}{\sqrt{1.000-x^{2.000}}})' = ... = [\text{top secret}] = ... =$
$= \frac{(-1.000)\cdot\frac{0.500}{\sqrt{1.000-x^{2.000}}}\cdot(-1.000)\cdot 2.000\cdot x}{(\sqrt{1.000-x^{2.000}})^{2.000}}$
Let's find **the 3 derivation** of the expression:
`1 step:` Finding a derivation of x
When I was child, my father always told me: "Remember, son:
$(x)' = ... = [\text{top secret}] = ... =$
$= 1.000$
`2 step:` Finding a derivation of $x^{2.000}$
I spend the hole of my life to find the answer and finally it's:
$(x^{2.000})' = ... = [\text{top secret}] = ... =$
$= 2.000 \cdot x$
`3 step:` Finding a derivation of 1.000
Man... Just look:
$(1.000)' = ... = [\text{top secret}] = ... =$
$= 0.000$
`4 step:` Finding a derivation of $1.000 - x^{2.000}$
For centuries, people have hunted for the secret knowledge that:
$(1.000 - x^{2.000})' = ... = [\text{top secret}] = ... =$
$= (-1.000) \cdot 2.000 \cdot x$
`5 step:` Finding a derivation of $\sqrt{1.000 - x^{2.000}}$
It's really easy to find:
$(\sqrt{1.000 - x^{2.000}})' = ... = [\text{top secret}] = ... =$
$= \frac{0.500}{\sqrt{1.000-x^{2.000}}} \cdot (-1.000) \cdot 2.000 \cdot x$
`6 step:` Finding a derivation of $(\sqrt{1.000 - x^{2.000}})^{2.000}$
It's simple as fuck:
$((\sqrt{1.000 - x^{2.000}})^{2.000})' = ... = [\text{top secret}] = ... =$
$= 2.000 \cdot \sqrt{1.000 - x^{2.000}} \cdot \frac{0.500}{\sqrt{1.000-x^{2.000}}} \cdot (-1.000) \cdot 2.000 \cdot x$
`7 step:` Finding a derivation of x
thanks to the results of my colleagues' scientific work, I know that:
$(x)' = ... = [\text{top secret}] = ... =$
$= 1.000$
`8 step:` Finding a derivation of 2.000
When I was child, my father always told me: "Remember, son:
$(2.000)' = ... = [\text{top secret}] = ... =$
$= 0.000$
`9 step:` Finding a derivation of $2.000 \cdot x$
It's really easy to find:
$(2.000 \cdot x)' = ... = [\text{top secret}] = ... =$
$= 2.000$
`10 step:` Finding a derivation of -1.000
I was asked not to tell anyone that:
$(-1.000)' = ... = [\text{top secret}] = ... =$
$= 0.000$
`11 step:` Finding a derivation of $(-1.000) \cdot 2.000 \cdot x$
For centuries, people have hunted for the secret knowledge that:
$((-1.000) \cdot 2.000 \cdot x)' = ... = [\text{top secret}] = ... =$
$= -2.000$
`12 step:` Finding a derivation of x
My roommate mumbled it in his sleep all night:
$(x)' = ... = [\text{top secret}] = ... =$
$= 1.000$
`13 step:` Finding a derivation of $x^{2.000}$
What if:
$(x^{2.000})' = ... = [\text{top secret}] = ... =$
$= 2.000 \cdot x$
`14 step:` Finding a derivation of 1.000
Even my two-aged sister knows that:
$(1.000)' = ... = [\text{top secret}] = ... =$
$= 0.000$
`15 step:` Finding a derivation of $1.000 - x^{2.000}$
I spend the hole of my life to find the answer and finally it's:
$(1.000 - x^{2.000})' = ... = [\text{top secret}] = ... =$
$= (-1.000) \cdot 2.000 \cdot x$
`16 step:` Finding a derivation of $\sqrt{1.000 - x^{2.000}}$
Even my two-aged sister knows that:
$(\sqrt{1.000 - x^{2.000}})' = ... = [\text{top secret}] = ... =$
$= \frac{0.500}{\sqrt{1.000-x^{2.000}}} \cdot (-1.000) \cdot 2.000 \cdot x$
`17 step:` Finding a derivation of 0.500
While preparing for exams, I learned a lot of new things, for example:
$(0.500)' = ... = [\text{top secret}] = ... =$
$= 0.000$
`18 step:` Finding a derivation of $\frac{0.500}{\sqrt{1.000-x^{2.000}}}$
When I was child, my father always told me: "Remember, son:
$(\frac{0.500}{\sqrt{1.000-x^{2.000}}})' = ... = [\text{top secret}] = ... =$
$= \frac{(-1.000)\cdot 0.500\cdot\frac{0.500}{\sqrt{1.000-x^{2.000}}}\cdot(-1.000)\cdot 2.000\cdot x}{(\sqrt{1.000-x^{2.000}})^{2.000}}$
`19 step:` Finding a derivation of $\frac{0.500}{\sqrt{1.000-x^{2.000}}} \cdot (-1.000) \cdot 2.000 \cdot x$
Sounds logical that it is the same as:
$(\frac{0.500}{\sqrt{1.000-x^{2.000}}} \cdot (-1.000) \cdot 2.000 \cdot x)' = ... = [\text{top secret}] = ... =$
$= \frac{(-1.000)\cdot 0.500\cdot\frac{0.500}{\sqrt{1.000-x^{2.000}}}\cdot(-1.000)\cdot 2.000\cdot x}{(\sqrt{1.000-x^{2.000}})^{2.000}} \cdot (-1.000) \cdot 2.000 \cdot x + (-2.000) \cdot \frac{0.500}{\sqrt{1.000-x^{2.000}}}$
`20 step:` Finding a derivation of -1.000
A true prince must know that:
$(-1.000)' = ... = [\text{top secret}] = ... =$
$= 0.000$
`21 step:` Finding a derivation of $(-1.000) \cdot \frac{0.500}{\sqrt{1.000-x^{2.000}}} \cdot (-1.000) \cdot 2.000 \cdot x$
My roommate mumbled it in his sleep all night:
$((-1.000) \cdot \frac{0.500}{\sqrt{1.000-x^{2.000}}} \cdot (-1.000) \cdot 2.000 \cdot x)' = ... = [\text{top secret}] = ... =$
$= (-1.000) \cdot (\frac{(-1.000)\cdot 0.500\cdot\frac{0.500}{\sqrt{1.000-x^{2.000}}}\cdot(-1.000)\cdot 2.000\cdot x}{(\sqrt{1.000-x^{2.000}})^{2.000}} \cdot (-1.000) \cdot 2.000 \cdot x + (-2.000) \cdot \frac{0.500}{\sqrt{1.000-x^{2.000}}})$
`22 step:` Finding a derivation of $\frac{(-1.000)\cdot\frac{0.500}{\sqrt{1.000-x^{2.000}}}\cdot(-1.000)\cdot 2.000\cdot x}{(\sqrt{1.000-x^{2.000}})^{2.000}}$
My roommate mumbled it in his sleep all night:
$(\frac{(-1.000)\cdot\frac{0.500}{\sqrt{1.000-x^{2.000}}}\cdot(-1.000)\cdot 2.000\cdot x}{(\sqrt{1.000-x^{2.000}})^{2.000}})' = ... = [\text{top secret}] = ... =$
$$= \frac{(-1.000)\cdot(\frac{(-1.000)\cdot 0.500\cdot\frac{0.500}{\sqrt{1.000-x^{2.000}}}\cdot(-1.000)\cdot 2.000\cdot x}{(\sqrt{1.000-x^{2.000}})^{2.000}}\cdot(-1.000)\cdot 2.000\cdot x+(-2.000)\cdot\frac{0.500}{\sqrt{1.000-x^{2.000}}})\cdot(\sqrt{1.000-x^{2.000}})^{2.000}-2.000\cdot\sqrt{1.000-x^{2.000}}\cdot\frac{0.500}{\sqrt{1.000-x^{2.000}}}\cdot(-1.000)\cdot 2.000\cdot x\cdot(-1.000)\cdot\frac{0.500}{\sqrt{1.000-x^{2.000}}}\cdot(-1.000)\cdot 2.000\cdot x}{((\sqrt{1.000-x^{2.000}})^{2.000})^{2.000}}$$
Finally... The 3 derivation of the expression:
$$f^{(3)}(\mathrm{x}) = \frac{(-1.000)\cdot(\frac{(-1.000)\cdot 0.500\cdot\frac{0.500}{\sqrt{1.000-x^{2.000}}}\cdot(-1.000)\cdot 2.000\cdot x}{(\sqrt{1.000-x^{2.000}})^{2.000}}\cdot(-1.000)\cdot 2.000\cdot x+(-2.000)\cdot\frac{0.500}{\sqrt{1.000-x^{2.000}}})\cdot(\sqrt{1.000-x^{2.000}})^{2.000}-2.000\cdot\sqrt{1.000-x^{2.000}}\cdot\frac{0.500}{\sqrt{1.000-x^{2.000}}}\cdot(-1.000)\cdot 2.000\cdot x\cdot(-1.000)\cdot\frac{0.500}{\sqrt{1.000-x^{2.000}}}\cdot(-1.000)\cdot 2.000\cdot x}{((\sqrt{1.000-x^{2.000}})^{2.000})^{2.000}}$$
BRITISH SCIENTISTS WERE SHOCKED AGAIN, WHEN THEY COUNT THE 3 DERIVATION OF THIS EXPRESSION!!!
In the point $M_0(x_0) = (0.000)$ it's value = 1.00000

Finding partical derivations Partial derivation of the expression on the variable x:
$\frac{\partial f}{\partial x} = \frac{1.000}{\sqrt{1.000-x^{2.000}}}$
In the point $M_0(x_0) = (0.000)$ it's value = 1.00000 !!!

Finding full derivation Full derivation:
$\sqrt{(\frac{1.000}{\sqrt{1.000-x^{2.000}}})^{2.000}}$
In the point $M_0(x_0) = (0.000)$ it's value = 1.00000 !!!

Decomposing on Macloren's formula Maklorens formula for $x \to x_0 = 0.000$:
f(x) = $x + 0.167 \cdot x^{3.000} + 0.075 \cdot x^{5.000}$+o($x^{6.000}$)

Graphics Graph f(x) = $\arcsin x$ on the diapasone $x \in [-10:10]$:



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

f(x) $= inf \cdot (x - 1.000) + 1.571$

Normal equation in the point $x_0 = 1.000$:

f(x) $= 1.571$