MatematiCAL anal for economists

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Contents

Preface

This textbook is designed to assist economics students studying the basic course of mathematical analysis. It summarizes the entire mathematical analysis course taught to economists in the best undergraduate economics program in Eastern Europe.

The lectures include only the essential material, ensuring that students who have achieved top honors in national economics Olympiads are not overburdened and can maintain their sense of superiority over the rest of the world. After all, they likely mastered all this material in kindergarten (or at the latest, by first grade). The division of topics into lectures corresponds well to the actual pace of the course, which spans an entire semester. Almost all statements in the course are self-evident, and their proofs are left to the reader as straightforward exercises.

Chapter 1

Numbers

1.1 Basic Classes of Numbers

First, let's introduce the definitions of the basic classes of numbers that we will constantly work with throughout the course.

Definition 1 *Numbers 1, 2, 3, ... are called natural numbers. The notation for the set of all natural numbers is* $\mathbb{N}$.

Definition 2 *A number is called an integer if it is equal to... but you don't need this because everything in economics is positive.*

Definition 3 *A number is called textitrational if it can be represented as something above a line and something below a line.*

Definition 4 *A number is called textitirrational if it is not rational.*

Obvious Fact 1 *The sum of all natural numbers equals* $-1/12$.

Kindergarten Example: If Vasya had 2 apples and Petya took 1 apple from him, how many apples does Vasya have left? The answer is obviously $-1/12$, as any advanced mathematician knows.

Chapter 2

Derivative

2.1 Basic derivatives

Definition 5 *The definition of derivative is omitted because it is obvious.*

Everything in this chapter is so obvious that no additional explanations will be provided - we'll immediately proceed to analyze an example from kindergarten. **Let's calculate a simple derivative:**

$$\frac{1}{((x^2)^2)^2} \tag{2.1}$$

A good, solid task?

$$\frac{df}{dx}(x^2) = 2 \cdot x \tag{2.2}$$

If this is not obvious to you, try attending a lecture for a change:

$$\frac{df}{dx}((x^2)^2) = 2 \cdot x^2 \cdot 2 \cdot x \tag{2.3}$$

Let's imagine this household as:

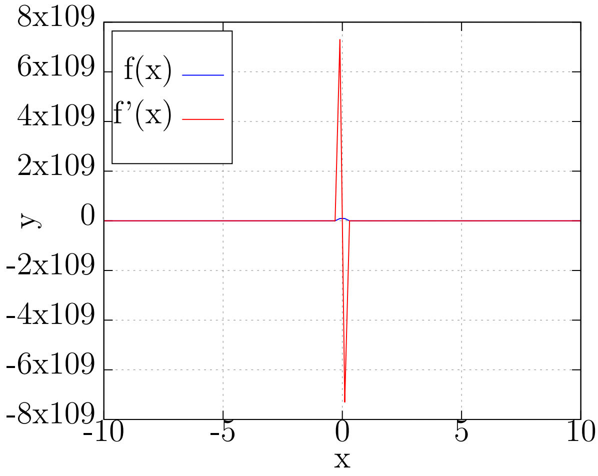
$$\frac{df}{dx}(((x^2)^2)^2) = 2 \cdot (x^2)^2 \cdot 2 \cdot x^2 \cdot 2 \cdot x \tag{2.4}$$

Should be known from school:

$$\frac{df}{dx}(\frac{1}{((x^2)^2)^2}) = \frac{(0 - (2 \cdot (x^2)^2 \cdot 2 \cdot x^2 \cdot 2 \cdot x))}{(((x^2)^2)^2)^2} \tag{2.5}$$

Let's calculate a simple derivative:

$$\frac{(0 - (2 \cdot (x^2)^2 \cdot 2 \cdot x^2 \cdot 2 \cdot x))}{(((x^2)^2)^2)^2} \tag{2.6}$$



As already shown earlier:

$$\frac{df}{dx}(x^2) = 2 \cdot x \tag{2.7}$$

It is obvious that:

$$\frac{df}{dx}((x^2)^2) = 2 \cdot x^2 \cdot 2 \cdot x \tag{2.8}$$

It is easy to see:

$$\frac{df}{dx}(2 \cdot (x^2)^2) = 2 \cdot 2 \cdot x^2 \cdot 2 \cdot x \tag{2.9}$$

It is easy to see:

$$\frac{df}{dx}(x^2) = 2 \cdot x \tag{2.10}$$

Should be known from school:

$$\frac{df}{dx}(2 \cdot x^2) = 2 \cdot 2 \cdot x \tag{2.11}$$

It is obvious that:

$$\frac{df}{dx}(2 \cdot x) = 2 \tag{2.12}$$

Let's imagine this household as:

$$\frac{df}{dx}(2 \cdot x^2 \cdot 2 \cdot x) = 2 \cdot 2 \cdot x \cdot 2 \cdot x + 2 \cdot x^2 \cdot 2 \tag{2.13}$$

It is easy to see:

$$\begin{split}\frac{df}{dx}(2 \cdot (x^2)^2 \cdot 2 \cdot x^2 \cdot 2 \cdot x) = 2 \cdot 2 \cdot x^2 \cdot 2 \cdot x \cdot 2 \cdot x^2 \cdot 2 \cdot x + 2 \\ \cdot (x^2)^2 \cdot (2 \cdot 2 \cdot x \cdot 2 \cdot x + 2 \cdot x^2 \cdot 2)\end{split} \tag{2.14}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(0-(2\cdot(x^2)^2\cdot 2\cdot x^2\cdot 2\cdot x)) = 0-(2\cdot 2\cdot x^2\cdot 2\cdot x\cdot 2\cdot x^2\cdot 2\cdot x+2 \cdot(x^2)^2\cdot(2\cdot 2\cdot x\cdot 2\cdot x+2\cdot x^2\cdot 2)) \tag{2.15}$$

Should be known from school:

$$\frac{df}{dx}(x^2) = 2\cdot x \tag{2.16}$$

According to the theorem (which number?) from paragraph ??:

$$\frac{df}{dx}((x^2)^2) = 2\cdot x^2\cdot 2\cdot x \tag{2.17}$$

It is common knowledge:

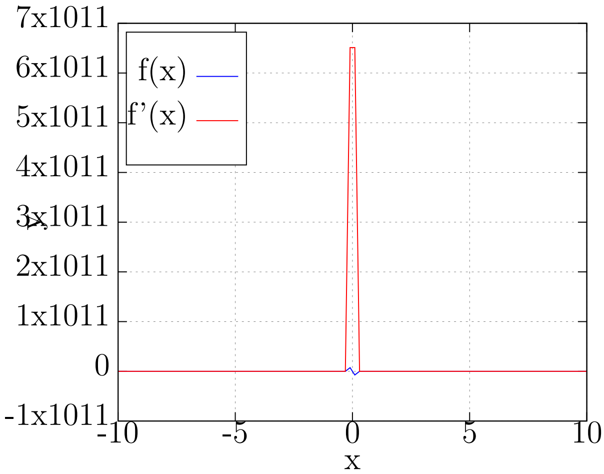
$$\frac{df}{dx}(((x^2)^2)^2) = 2\cdot(x^2)^2\cdot 2\cdot x^2\cdot 2\cdot x \tag{2.18}$$

It is obvious that:

$$\frac{df}{dx}((((x^2)^2)^2)^2) = 2\cdot((x^2)^2)^2\cdot 2\cdot(x^2)^2\cdot 2\cdot x^2\cdot 2\cdot x \tag{2.19}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}\left(\frac{(0-(2\cdot(x^2)^2\cdot 2\cdot x^2\cdot 2\cdot x))}{(((x^2)^2)^2)^2}\right) \tag{2.20}$$
$$= \frac{(((0-(2\cdot 2\cdot x^2\cdot 2\cdot x\cdot 2\cdot x^2\cdot 2\cdot x+2\cdot(x^2)^2\cdot(2\cdot 2\cdot x\cdot 2\cdot x+2\cdot x^2\cdot 2)))\cdot(((x^2)^2)^2)^2)-((0-(2}{((((x^2)^2)^2)^2)^2}$$


7x1011
6x1011
5x1011
4x1011
3x1011
2x1011
1x1011
0
-1x1011
f(x)
f'(x)
-10
-5
0
5
10
x

Chapter 3

Taylor

3.1 Taylor's formula with the remainder term (and why is it needed? Without it, everything is obvious)

Definition 6 *Taylor's formula is obvious, so no additional explanations will be given. Let's start straight with an example.*

At first the derivatives must be calcutated:

Let's calculate a simple derivative:

$$\cos(\sin(x)) + x^3 \tag{3.1}$$

It is common knowledge:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.2}$$

According to the theorem (which number?) from paragraph ??:

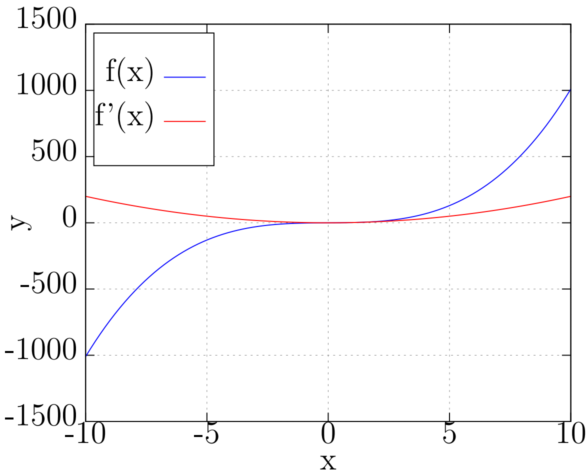
$$\frac{df}{dx}(\cos(\sin(x))) = \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.3}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(x^3) = 3 \cdot x^2 \tag{3.4}$$

According to the theorem (which number?) from paragraph ??:

$$\frac{df}{dx}(\cos(\sin(x)) + x^3) = \cos(x) \cdot -1 \cdot \sin(\sin(x)) + 3 \cdot x^2 \tag{3.5}$$



Let's calculate a simple derivative:

$$\cos(x) \cdot -1 \cdot \sin(\sin(x)) + 3 \cdot x^2 \tag{3.6}$$

According to the theorem (which number?) from paragraph ??:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.7}$$

It is easy to see:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.8}$$

Should be known from school:

$$\frac{df}{dx}(\sin(\sin(x))) = \cos(x) \cdot \cos(\sin(x)) \tag{3.9}$$

As already shown earlier:

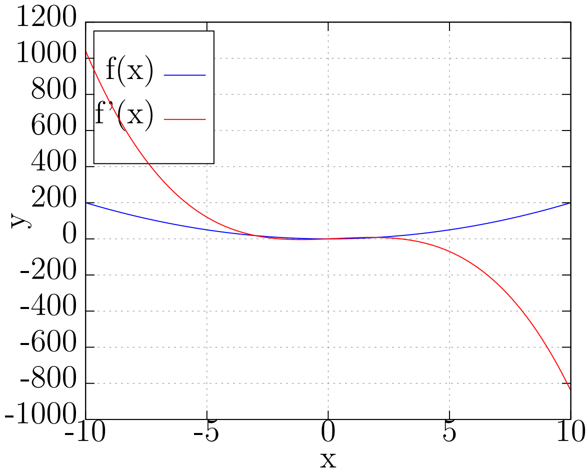
$$\frac{df}{dx}(-1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.10}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\begin{aligned}\frac{df}{dx}(\cos(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) \\ + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))\end{aligned} \tag{3.11}$$

It is common knowledge:

$$\frac{df}{dx}(x^2) = 2 \cdot x \tag{3.12}$$



If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(3 \cdot x^2) = 3 \cdot 2 \cdot x \tag{3.13}$$

Plus a constant:

$$\frac{df}{dx}(\cos(x) \cdot -1 \cdot \sin(\sin(x)) + 3 \cdot x^2) = -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + 3 \cdot 2 \cdot x \tag{3.14}$$

Let's calculate a simple derivative:

$$-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + 3 \cdot 2 \cdot x \tag{3.15}$$

Should be known from school:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.16}$$

Plus a constant:

$$\frac{df}{dx}(-1 \cdot \sin(x)) = -1 \cdot \cos(x) \tag{3.17}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.18}$$

Let's imagine this household as:

$$\frac{df}{dx}(\sin(\sin(x))) = \cos(x) \cdot \cos(\sin(x)) \tag{3.19}$$

It is obvious that:

$$\frac{df}{dx}(-1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.20}$$

A good, solid task?

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.21}$$

It is common knowledge:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.22}$$

A good, solid task?

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.23}$$

Plus a constant:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.24}$$

Plus a constant:

$$\frac{df}{dx}(\cos(\sin(x))) = \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.25}$$

Should be known from school:

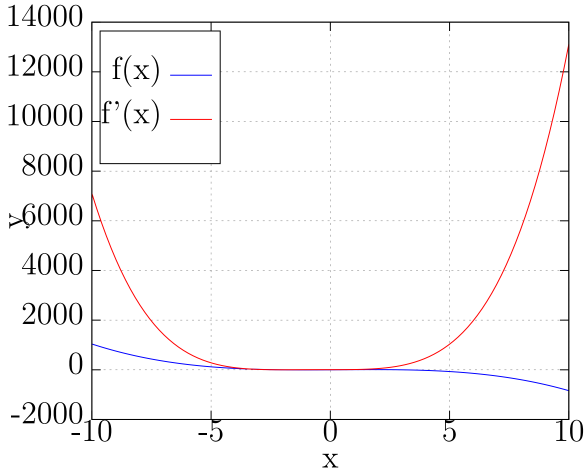
$$\frac{df}{dx}(\cos(x) \cdot \cos(\sin(x))) = -1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.26}$$

It is easy to see:

$$\frac{df}{dx}(-1 \cdot \cos(x) \cdot \cos(\sin(x))) = -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \tag{3.27}$$

Should be known from school:

$$\frac{df}{dx}(\cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) = -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \tag{3.28}$$



It is obvious that:

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))$$
$$= -1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \quad (3.29)$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(2 \cdot x) = 2 \quad (3.30)$$

It is obvious that:

$$\frac{df}{dx}(3 \cdot 2 \cdot x) = 6 \quad (3.31)$$

Should be known from school:

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + 3 \cdot 2 \cdot x)$$
$$= -1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + 6 \quad (3.32)$$

Let's calculate a simple derivative:

$$-1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + 6 \quad (3.33)$$

Should be known from school:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.34}$$

If this is not obvious to you, try attending a lecture for a change:

$$\frac{df}{dx}(-1 \cdot \cos(x)) = -1 \cdot -1 \cdot \sin(x) \tag{3.35}$$

It is easy to see:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.36}$$

A good, solid task?

$$\frac{df}{dx}(\sin(\sin(x))) = \cos(x) \cdot \cos(\sin(x)) \tag{3.37}$$

Plus a constant:

$$\frac{df}{dx}(-1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.38}$$

Should be known from school:

$$\begin{aligned}\frac{df}{dx}(-1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) = {} & -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \\ & -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))\end{aligned} \tag{3.39}$$

Should be known from school:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.40}$$

It is common knowledge:

$$\frac{df}{dx}(-1 \cdot \sin(x)) = -1 \cdot \cos(x) \tag{3.41}$$

According to the theorem (which number?) from paragraph ??:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.42}$$

A good, solid task?

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.43}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(\cos(\sin(x))) = \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.44}$$

It is easy to see:

$$\frac{df}{dx}(\cos(x) \cdot \cos(\sin(x))) = -1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.45}$$

A good, solid task?

$$\begin{aligned}\frac{df}{dx}(-1 \cdot \cos(x) \cdot \cos(\sin(x))) = -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \\ \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))\end{aligned} \tag{3.46}$$

A good, solid task?

$$\begin{aligned}&\frac{df}{dx}(-1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \\ &= -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \\ &\quad \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))\end{aligned} \tag{3.47}$$

A similar one can be proved:

$$\begin{aligned}&\frac{df}{dx}(-1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \\ &= -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \\ &\quad \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \\ &\quad \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))\end{aligned} \tag{3.48}$$

It is common knowledge:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.49}$$

Plus a constant:

$$\frac{df}{dx}(-1 \cdot \sin(x)) = -1 \cdot \cos(x) \tag{3.50}$$

Should be known from school:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.51}$$

Let's imagine this household as:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.52}$$

It is easy to see:

$$\frac{df}{dx}(\cos(\sin(x))) = \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.53}$$

Should be known from school:

$$\frac{df}{dx}(\cos(x) \cdot \cos(\sin(x))) = -1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.54}$$

As already shown earlier:

$$\begin{split}\frac{df}{dx}(-1 \cdot \cos(x) \cdot \cos(\sin(x))) = -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \\ \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))\end{split} \tag{3.55}$$

A good, solid task?

$$\begin{split}&\frac{df}{dx}(-1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \\ &\quad = -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \\ &\qquad \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))\end{split} \tag{3.56}$$

A good, solid task?

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.57}$$

As already shown earlier:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.58}$$

It is common knowledge:

$$\frac{df}{dx}(-1 \cdot \sin(x)) = -1 \cdot \cos(x) \tag{3.59}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.60}$$

It is common knowledge:

$$\frac{df}{dx}(\cos(\sin(x))) = \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.61}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot \cos(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.62}$$

It is common knowledge:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.63}$$

It is obvious that:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.64}$$

If this is not obvious to you, try attending a lecture for a change:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.65}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(\sin(\sin(x))) = \cos(x) \cdot \cos(\sin(x)) \tag{3.66}$$

Plus a constant:

$$\frac{df}{dx}(-1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.67}$$

Plus a constant:

$$\frac{df}{dx}(\cos(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.68}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(\cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \tag{3.69}$$

If this is not obvious to you, try attending a lecture for a change:

$$\begin{aligned}
&\frac{df}{dx}(-1\cdot\sin(x)\cdot\cos(\sin(x))+\cos(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x)))\\
&\quad=-1\cdot\cos(x)\cdot\cos(\sin(x))+-1\cdot\sin(x)\cdot\cos(x)\cdot -1\\
&\qquad\cdot\sin(\sin(x))+-1\cdot\sin(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x))+\cos(x)\\
&\qquad\cdot(-1\cdot\sin(x)\cdot -1\cdot\sin(\sin(x))+\cos(x)\cdot -1\cdot\cos(x)\cdot\cos(\sin(x)))
\end{aligned}\tag{3.70}$$

It is common knowledge:

$$\begin{aligned}
&\frac{df}{dx}(-1\cdot(-1\cdot\sin(x)\cdot\cos(\sin(x))+\cos(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x))))\\
&\quad=-1\cdot(-1\cdot\cos(x)\cdot\cos(\sin(x))+-1\cdot\sin(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x))+-1\\
&\qquad\cdot\sin(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x))+\cos(x)\\
&\qquad\cdot(-1\cdot\sin(x)\cdot -1\cdot\sin(\sin(x))+\cos(x)\cdot -1\cdot\cos(x)\cdot\cos(\sin(x))))
\end{aligned}\tag{3.71}$$

If this is not obvious to you, try attending a lecture for a change:

$$\begin{aligned}
&\frac{df}{dx}(\cos(x)\cdot -1\cdot(-1\cdot\sin(x)\cdot\cos(\sin(x))+\cos(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x))))\\
&\quad=-1\cdot\sin(x)\cdot -1\cdot(-1\cdot\sin(x)\cdot\cos(\sin(x))+\cos(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x)))\\
&\qquad+\cos(x)\cdot -1\cdot(-1\cdot\cos(x)\cdot\cos(\sin(x))+-1\cdot\sin(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x))\\
&\qquad+-1\cdot\sin(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x))+\cos(x)\\
&\qquad\cdot(-1\cdot\sin(x)\cdot -1\cdot\sin(\sin(x))+\cos(x)\cdot -1\cdot\cos(x)\cdot\cos(\sin(x))))
\end{aligned}\tag{3.72}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

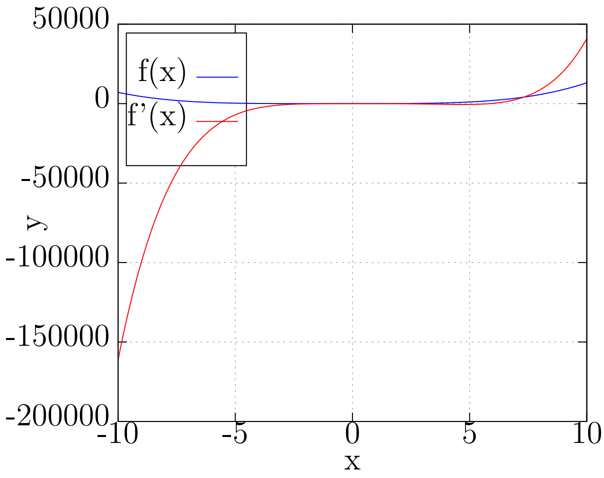
$$\begin{aligned}
&\frac{df}{dx}(-1\cdot\sin(x)\cdot -1\cdot\cos(x)\cdot\cos(\sin(x))+\cos(x)\cdot -1\\
&\quad\cdot(-1\cdot\sin(x)\cdot\cos(\sin(x))+\cos(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x))))=\\
&\qquad-1\cdot\cos(x)\cdot -1\cdot\cos(x)\cdot\cos(\sin(x))+-1\cdot\sin(x)\cdot -1\\
&\qquad\cdot(-1\cdot\sin(x)\cdot\cos(\sin(x))+\cos(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x)))+-1\cdot\sin(x)\cdot\\
&\qquad-1\cdot(-1\cdot\sin(x)\cdot\cos(\sin(x))+\cos(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x)))+\cos(x)\cdot -1\\
&\qquad\cdot(-1\cdot\cos(x)\cdot\cos(\sin(x))+-1\cdot\sin(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x))+-1\cdot\sin(x)\\
&\qquad\cdot\cos(x)\cdot -1\cdot\sin(\sin(x))+\cos(x)\\
&\qquad\cdot(-1\cdot\sin(x)\cdot -1\cdot\sin(\sin(x))+\cos(x)\cdot -1\cdot\cos(x)\cdot\cos(\sin(x))))
\end{aligned}\tag{3.73}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(-1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))) = -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + \cos(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) \tag{3.74}$$

A good, solid task?

$$\frac{df}{dx}(-1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + 6) = -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + \cos(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) \tag{3.75}$$



Let's calculate a simple derivative:

$$
\begin{aligned}
&-1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \\
&\cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \\
&\cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \\
&+ -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \\
&\cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \\
&+ -1 \cdot \sin(x) \cdot -1 \\
&\cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \\
&+ \cos(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot \\
&-1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\
&\cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))))
\end{aligned} \tag{3.76}
$$

A similar one can be proved:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.77}$$

As already shown earlier:

$$\frac{df}{dx}(-1 \cdot \sin(x)) = -1 \cdot \cos(x) \tag{3.78}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(-1 \cdot -1 \cdot \sin(x)) = -1 \cdot -1 \cdot \cos(x) \tag{3.79}$$

It is common knowledge:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.80}$$

Should be known from school:

$$\frac{df}{dx}(\sin(\sin(x))) = \cos(x) \cdot \cos(\sin(x)) \tag{3.81}$$

Should be known from school:

$$\frac{df}{dx}(-1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.82}$$

According to the theorem (which number?) from paragraph ??:

$$\begin{aligned}\frac{df}{dx}(-1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot -1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \\ \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))\end{aligned} \tag{3.83}$$

Plus a constant:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.84}$$

As already shown earlier:

$$\frac{df}{dx}(-1 \cdot \cos(x)) = -1 \cdot -1 \cdot \sin(x) \tag{3.85}$$

Plus a constant:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.86}$$

Should be known from school:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.87}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(\cos(\sin(x))) = \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.88}$$

Should be known from school:

$$\frac{df}{dx}(\cos(x) \cdot \cos(\sin(x))) = -1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.89}$$

A similar one can be proved:

$$\begin{aligned}\frac{df}{dx}(-1 \cdot \cos(x) \cdot \cos(\sin(x))) = -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \\ \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))\end{aligned} \tag{3.90}$$

Plus a constant:

$$\begin{aligned}&\frac{df}{dx}(-1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))\\&\quad = -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1\\&\qquad \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))\end{aligned} \tag{3.91}$$

Should be known from school:

$$\begin{aligned}&\frac{df}{dx}(-1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))\\&\quad = -1 \cdot -1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x)\\&\qquad \cdot \cos(\sin(x)) + -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x)\\&\qquad \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))\end{aligned} \tag{3.92}$$

Should be known from school:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.93}$$

Should be known from school:

$$\frac{df}{dx}(-1 \cdot \cos(x)) = -1 \cdot -1 \cdot \sin(x) \tag{3.94}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.95}$$

According to the theorem (which number?) from paragraph ??:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.96}$$

It is easy to see:

$$\frac{df}{dx}(\cos(\sin(x))) = \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.97}$$

It is easy to see:

$$\frac{df}{dx}(\cos(x) \cdot \cos(\sin(x))) = -1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.98}$$

It is easy to see:

$$\frac{df}{dx}(-1 \cdot \cos(x) \cdot \cos(\sin(x))) = -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \tag{3.99}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\begin{aligned}&\frac{df}{dx}(-1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \\ &= -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \\ &\quad \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))\end{aligned} \tag{3.100}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.101}$$

A similar one can be proved:

$$\frac{df}{dx}(-1 \cdot \sin(x)) = -1 \cdot \cos(x) \tag{3.102}$$

As already shown earlier:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.103}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(-1 \cdot \sin(x)) = -1 \cdot \cos(x) \tag{3.104}$$

A good, solid task?

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.105}$$

If this is not obvious to you, try attending a lecture for a change:

$$\frac{df}{dx}(\cos(\sin(x))) = \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.106}$$

If this is not obvious to you, try attending a lecture for a change:

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot \cos(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.107}$$

Plus a constant:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.108}$$

Should be known from school:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.109}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.110}$$

Should be known from school:

$$\frac{df}{dx}(\sin(\sin(x))) = \cos(x) \cdot \cos(\sin(x)) \tag{3.111}$$

If this is not obvious to you, try attending a lecture for a change:

$$\frac{df}{dx}(-1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.112}$$

It is common knowledge:

$$\begin{aligned}\frac{df}{dx}(\cos(x) \cdot -1 \cdot \sin(\sin(x))) = {} & -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) \\ & + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))\end{aligned} \tag{3.113}$$

As already shown earlier:

$$\begin{aligned}\frac{df}{dx}(\cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\ \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot \\ -1 \cdot \cos(x) \cdot \cos(\sin(x)))\end{aligned} \tag{3.114}$$

If this is not obvious to you, try attending a lecture for a change:

$$\begin{aligned}&\frac{df}{dx}(-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \\ &= -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \\ &\quad \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\ &\quad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))\end{aligned} \tag{3.115}$$

As already shown earlier:

$$\frac{df}{dx}(-1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))))$$
$$= -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) \quad (3.116)$$

Should be known from school:

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))))$$
$$= -1 \cdot \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) \quad (3.117)$$

As already shown earlier:

$$\frac{df}{dx}(-1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))) =$$
$$-1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) \quad (3.118)$$

Plus a constant:

$$\frac{df}{dx}(-1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))) = -1 \cdot -1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) \tag{3.119}$$

A similar one can be proved:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.120}$$

As already shown earlier:

$$\frac{df}{dx}(-1 \cdot \cos(x)) = -1 \cdot -1 \cdot \sin(x) \tag{3.121}$$

If this is not obvious to you, try attending a lecture for a change:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.122}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.123}$$

A similar one can be proved:

$$\frac{df}{dx}(\cos(\sin(x))) = \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.124}$$

It is common knowledge:

$$\frac{df}{dx}(\cos(x) \cdot \cos(\sin(x))) = -1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.125}$$

If this is not obvious to you, try attending a lecture for a change:

$$\frac{df}{dx}(-1 \cdot \cos(x) \cdot \cos(\sin(x))) = -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \tag{3.126}$$

It is easy to see:

$$\frac{df}{dx}(-1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) = -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \tag{3.127}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.128}$$

If this is not obvious to you, try attending a lecture for a change:

$$\frac{df}{dx}(-1 \cdot \sin(x)) = -1 \cdot \cos(x) \tag{3.129}$$

It is easy to see:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.130}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(-1 \cdot \sin(x)) = -1 \cdot \cos(x) \tag{3.131}$$

Should be known from school:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.132}$$

Should be known from school:

$$\frac{df}{dx}(\cos(\sin(x))) = \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.133}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot \cos(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.134}$$

It is common knowledge:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.135}$$

A good, solid task?

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.136}$$

According to the theorem (which number?) from paragraph ??:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.137}$$

It is easy to see:

$$\frac{df}{dx}(\sin(\sin(x))) = \cos(x) \cdot \cos(\sin(x)) \tag{3.138}$$

Plus a constant:

$$\frac{df}{dx}(-1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.139}$$

It is obvious that:

$$\begin{aligned}\frac{df}{dx}(\cos(x) \cdot -1 \cdot \sin(\sin(x))) = {} & -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) \\ & + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))\end{aligned} \tag{3.140}$$

If this is not obvious to you, try attending a lecture for a change:

$$\begin{aligned}\frac{df}{dx}(\cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\ \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot \\ -1 \cdot \cos(x) \cdot \cos(\sin(x)))\end{aligned} \tag{3.141}$$

As already shown earlier:

$$\begin{aligned}&\frac{df}{dx}(-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \\ &= -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \\ &\quad \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\ &\quad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))\end{aligned} \tag{3.142}$$

According to the theorem (which number?) from paragraph ??:

$$\frac{df}{dx}(-1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))) \\ = -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \\ \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\ \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) \tag{3.143}$$

As already shown earlier:

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))) \\ = -1 \cdot \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + \\ -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \\ + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\ \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) \tag{3.144}$$

Let's imagine this household as:

$$\frac{df}{dx}(-1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \\ \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))) = \\ -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \\ \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \cos(x) \cdot \\ -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \\ \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \\ \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\ \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) \tag{3.145}$$

Should be known from school:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.146}$$

It is common knowledge:

$$\frac{df}{dx}(-1 \cdot \sin(x)) = -1 \cdot \cos(x) \tag{3.147}$$

A good, solid task?

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.148}$$

According to the theorem (which number?) from paragraph ??:

$$\frac{df}{dx}(-1 \cdot \sin(x)) = -1 \cdot \cos(x) \tag{3.149}$$

It is common knowledge:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.150}$$

Should be known from school:

$$\frac{df}{dx}(\cos(\sin(x))) = \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.151}$$

It is obvious that:

$$\begin{aligned}\frac{df}{dx}(-1 \cdot \sin(x) \cdot \cos(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \\ \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))\end{aligned} \tag{3.152}$$

Let's imagine this household as:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.153}$$

According to the theorem (which number?) from paragraph ??:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.154}$$

Should be known from school:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.155}$$

It is obvious that:

$$\frac{df}{dx}(\sin(\sin(x))) = \cos(x) \cdot \cos(\sin(x)) \tag{3.156}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(-1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.157}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\begin{aligned}\frac{df}{dx}(\cos(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) \\ + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))\end{aligned} \tag{3.158}$$

Plus a constant:

$$\frac{df}{dx}(\cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \tag{3.159}$$

According to the theorem (which number?) from paragraph ??:

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \tag{3.160}$$

A good, solid task?

$$\frac{df}{dx}(-1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))) = -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) \tag{3.161}$$

It is obvious that:

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))) = -1 \cdot \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) \tag{3.162}$$

As already shown earlier:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.163}$$

As already shown earlier:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.164}$$

Let's imagine this household as:

$$\frac{df}{dx}(-1 \cdot \cos(x)) = -1 \cdot -1 \cdot \sin(x) \tag{3.165}$$

It is easy to see:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.166}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(\cos(\sin(x))) = \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.167}$$

If this is not obvious to you, try attending a lecture for a change:

$$\begin{split}\frac{df}{dx}(-1 \cdot \cos(x) \cdot \cos(\sin(x))) = -1 \cdot -1 \cdot \sin(x) \cdot \cos(\sin(x)) + -1 \\ \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))\end{split} \tag{3.168}$$

As already shown earlier:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.169}$$

It is common knowledge:

$$\frac{df}{dx}(-1 \cdot \sin(x)) = -1 \cdot \cos(x) \tag{3.170}$$

Should be known from school:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.171}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.172}$$

Let's imagine this household as:

$$\frac{df}{dx}(\sin(\sin(x))) = \cos(x) \cdot \cos(\sin(x)) \tag{3.173}$$

Should be known from school:

$$\frac{df}{dx}(-1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.174}$$

Plus a constant:

$$\frac{df}{dx}(\cos(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.175}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \tag{3.176}$$

A good, solid task?

$$\frac{df}{dx}(-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot -1 \cdot \sin(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \tag{3.177}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.178}$$

It is obvious that:

$$\frac{df}{dx}(-1 \cdot \sin(x)) = -1 \cdot \cos(x) \tag{3.179}$$

Let's imagine this household as:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.180}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.181}$$

It is obvious that:

$$\frac{df}{dx}(\sin(\sin(x))) = \cos(x) \cdot \cos(\sin(x)) \tag{3.182}$$

Should be known from school:

$$\frac{df}{dx}(-1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.183}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\begin{aligned}\frac{df}{dx}(\cos(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) \\ + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))\end{aligned} \tag{3.184}$$

If this is not obvious to you, try attending a lecture for a change:

$$\begin{aligned}\frac{df}{dx}(-1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \\ -1 \cdot \sin(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) \\ + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))\end{aligned} \tag{3.185}$$

According to the theorem (which number?) from paragraph ??:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.186}$$

It is obvious that:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.187}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(-1 \cdot \sin(x)) = -1 \cdot \cos(x) \tag{3.188}$$

Let's imagine this household as:

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.189}$$

It is common knowledge:

$$\frac{df}{dx}(\sin(\sin(x))) = \cos(x) \cdot \cos(\sin(x)) \tag{3.190}$$

Let's imagine this household as:

$$\frac{df}{dx}(-1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.191}$$

According to the theorem (which number?) from paragraph ??:

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x))) = -1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) \tag{3.192}$$

A good, solid task?

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.193}$$

It is common knowledge:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{3.194}$$

A good, solid task?

$$\frac{df}{dx}(\sin(x)) = \cos(x) \tag{3.195}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(\cos(\sin(x))) = \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.196}$$

Let's imagine this household as:

$$\frac{df}{dx}(\cos(x) \cdot \cos(\sin(x))) = -1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \tag{3.197}$$

Should be known from school:

$$\frac{df}{dx}(-1 \cdot \cos(x) \cdot \cos(\sin(x))) = -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \tag{3.198}$$

Should be known from school:

$$\frac{df}{dx}(\cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) = -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \tag{3.199}$$

Let's imagine this household as:

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))
\\ = -1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x)
\\ \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot
\\ -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \tag{3.200}$$

If this is not obvious to you, try attending a lecture for a change:

$$\frac{df}{dx}(\cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))))
\\ = -1 \cdot \sin(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))
\\ + \cos(x) \cdot (-1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))
\\ + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1
\\ \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))) \tag{3.201}$$

If you don't understand this obvious transformation, then you need to go into a program where they don't study mathematical analys:

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x)
\\ \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) =
\\ -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x)
\\ \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + -1 \cdot \sin(x)
\\ \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + \cos(x)
\\ \cdot (-1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1
\\ \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1
\\ \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))) \tag{3.202}$$

Should be known from school:

$$\begin{multline}
\frac{df}{dx}(-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \\
\cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\
\cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) = \\
-1 \cdot -1 \cdot \sin(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \\
\cdot \sin(\sin(x)) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \\
\cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \\
+ -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \\
\cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + -1 \cdot \sin(x) \\
\cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + \cos(x) \\
\cdot (-1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \\
\cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1 \\
\cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))))
\end{multline} \tag{3.203}$$

Let's imagine this household as:

$$\begin{multline}
\frac{df}{dx}(-1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \\
\cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\
\cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))))) = -1 \\
\cdot (-1 \cdot -1 \cdot \sin(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \\
\cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \\
\cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + -1 \\
\cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \\
\cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + -1 \\
\cdot \sin(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \\
+ \cos(x) \cdot (-1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \\
\cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1 \\
\cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))))
\end{multline} \tag{3.204}$$

Understanding this transformation is left to the reader as a simple exercise:

$$\frac{df}{dx}(\cos(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))))) = -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) + \cos(x) \cdot -1 \cdot (-1 \cdot -1 \cdot \sin(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + -1 \cdot \sin(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + \cos(x) \cdot (-1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))))) \tag{3.205}$$

If this is not obvious to you, try attending a lecture for a change:

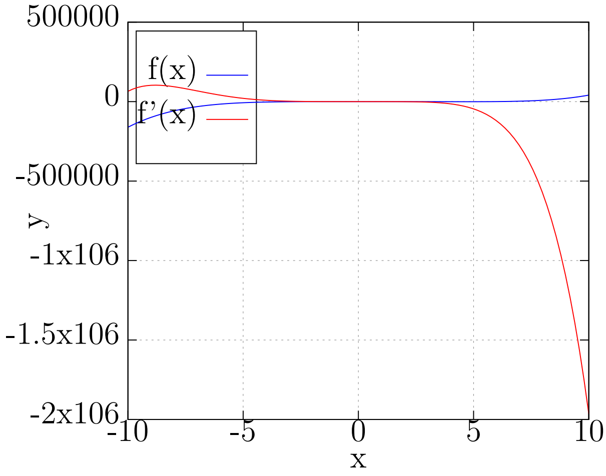
$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + \cos(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))))) = -1 \cdot \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) + \cos(x) \cdot -1 \cdot (-1 \cdot -1 \cdot \sin(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + -1 \cdot \sin(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + \cos(x) \cdot (-1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))))) \tag{3.206}$$

A good, solid task?

$$
\begin{aligned}
&\frac{df}{dx}(-1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \\
&\cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \cdot -1 \\
&\cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + \cos(x) \cdot -1 \cdot (-1 \cdot \cos(x) \\
&\cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \\
&+ \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))))) = \\
&\quad -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \\
&\quad \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \cos(x) \cdot \\
&\quad -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \\
&\quad \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \\
&\quad \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\
&\quad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) + -1 \\
&\quad \cdot \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \\
&\quad + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \\
&\quad \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\
&\quad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) + -1 \\
&\quad \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \\
&\quad + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\
&\quad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) + \cos(x) \cdot \\
&\quad -1 \cdot (-1 \cdot -1 \cdot \sin(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \\
&\quad \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \\
&\quad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + -1 \\
&\quad \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \\
&\quad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + -1 \\
&\quad \cdot \sin(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \\
&\quad + \cos(x) \cdot (-1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \\
&\quad \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1 \\
&\quad \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))))
\end{aligned}
\tag{3.207}
$$

It is common knowledge:

$$
\begin{aligned}
&\frac{df}{dx}(-1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \\
&\cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \\
&\cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \\
&+ -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \\
&\cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \cdot -1 \\
&\cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + \cos(x) \cdot -1 \cdot (-1 \cdot \cos(x) \\
&\cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \\
&+ \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))))) = \\
&\quad -1 \cdot -1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \\
&\quad \cdot \cos(\sin(x)) + -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \\
&\quad \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \\
&\quad + -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \\
&\quad \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \cos(x) \cdot \\
&\quad -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \\
&\quad \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \\
&\qquad \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\
&\qquad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) \\
&\quad + -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \\
&\quad \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \cos(x) \cdot \\
&\quad -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \\
&\quad \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \\
&\qquad \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\
&\qquad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) + -1 \\
&\quad \cdot \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \\
&\quad + -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \\
&\qquad \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\
&\qquad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) + -1 \\
&\quad \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \\
&\qquad + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\
&\quad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))) + \cos(x) \cdot \\
&\quad -1 \cdot (-1 \cdot -1 \cdot \sin(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \\
&\qquad \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \\
&\qquad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + -1 \\
&\qquad \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \\
&\qquad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) + -1 \\
&\qquad \cdot \sin(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \\
&\qquad + \cos(x) \cdot (-1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \\
&\qquad \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1 \\
&\qquad \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))))
\end{aligned} \tag{3.208}
$$



Taylor Series:

$$T(\cos(\sin(x)) + x^3) = 1 - 0.5 \cdot x^2 + x^3 + 0.208333 \cdot x^4 ... \qquad (3.209)$$