MatematiCAL anal for economists

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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.

Contents

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 rational if it can be represented as something above a line and something below a line.*

Definition 4 *A number is called irrational 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.

2.2 Let's calculate 1 derivative:

$$\cos((x+3)^5) + (\cos(x)+6)\cdot x + (\cos(x)+5)\cdot\cos(x) \tag{2.1}$$

It is easy to see:

$$\frac{df}{dx}(x+3) = 1 \tag{2.2}$$

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

$$\frac{df}{dx}((x+3)^5) = 1\cdot 5\cdot (x+3)^{5-1} \tag{2.3}$$

Should be known from school:

$$\frac{df}{dx}(\cos((x+3)^5)) = 5\cdot (x+3)^4\cdot -1\cdot \sin((x+3)^5) \tag{2.4}$$

A similar one can be proved:

$$\frac{df}{dx}(\cos(x)) = -1\cdot \sin(x) \tag{2.5}$$

A similar one can be proved:

$$\frac{df}{dx}(\cos(x)+6) = -1 \cdot \sin(x) \tag{2.6}$$

As already shown earlier:

$$\frac{df}{dx}((\cos(x)+6) \cdot x) = -1 \cdot \sin(x) \cdot x + \cos(x) + 6 \tag{2.7}$$

As already shown earlier:

$$\begin{aligned}\frac{df}{dx}(\cos((x+3)^5) + (\cos(x)+6) \cdot x) = 5 \cdot (x+3)^4 \cdot -1 \cdot \sin((x+3)^5) \\ + -1 \cdot \sin(x) \cdot x + \cos(x) + 6\end{aligned} \tag{2.8}$$

Should be known from school:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{2.9}$$

Let's imagine this household as:

$$\frac{df}{dx}(\cos(x)+5) = -1 \cdot \sin(x) \tag{2.10}$$

It is common knowledge:

$$\frac{df}{dx}(\cos(x)) = -1 \cdot \sin(x) \tag{2.11}$$

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

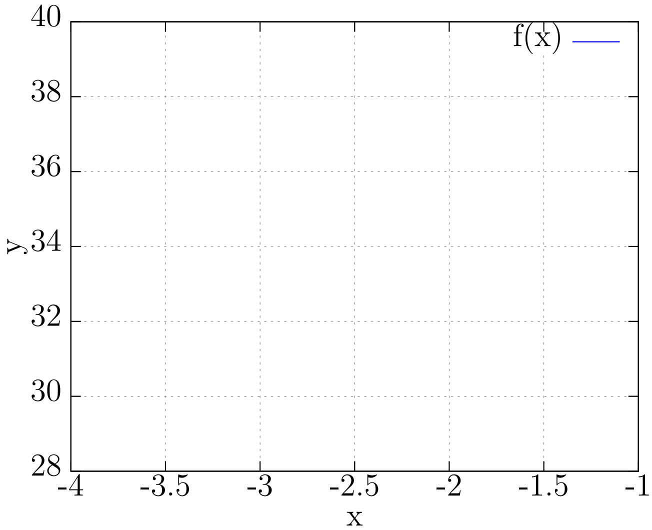
$$\frac{df}{dx}((\cos(x)+5) \cdot \cos(x)) = -1 \cdot \sin(x) \cdot \cos(x) + (\cos(x)+5) \cdot -1 \cdot \sin(x) \tag{2.12}$$

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

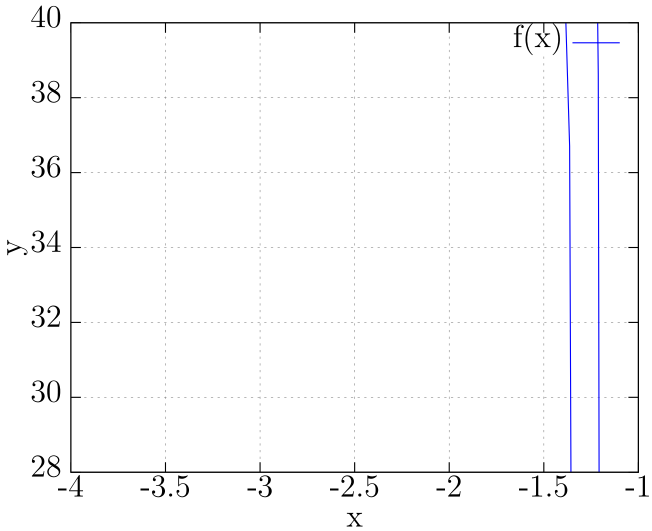
$$\begin{aligned}&\frac{df}{dx}(\cos((x+3)^5) + (\cos(x)+6) \cdot x + (\cos(x)+5) \cdot \cos(x)) \\ &= 5 \cdot (x+3)^4 \cdot -1 \cdot \sin((x+3)^5) + -1 \cdot \sin(x) \cdot x + \cos(x) \\ &\quad + 6 + -1 \cdot \sin(x) \cdot \cos(x) + (\cos(x)+5) \cdot -1 \cdot \sin(x)\end{aligned} \tag{2.13}$$

2.3 Graphics of derivatives

Graphic of function



Graphic of 1 derivative



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:

3.2 Let's calculate 1 derivative:

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

As already shown earlier:

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

As already shown earlier:

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

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

$$\frac{df}{dx}(x^3) = 1 \cdot 3 \cdot x^{3-1} \tag{3.4}$$

It is obvious that:

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

3.3 Let's calculate 2 derivative:

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

As already shown earlier:

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

It is obvious that:

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

A good, solid task?

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

Let's imagine this household as:

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

It is easy to see:

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

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

$$\frac{df}{dx}(x^2) = 1 \cdot 2 \cdot x^{2-1} \tag{3.12}$$

A similar one can be proved:

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

Should be known from school:

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

3.4 Let's calculate 3 derivative:

$$-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + 3 \cdot 2 \cdot x \quad (3.15)$$

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

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

A good, solid task?

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

Should be known from school:

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

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

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

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

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

Let's imagine this household as:

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

Should be known from school:

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

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

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

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

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

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

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

Should be known from school:

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

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

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

Should be known from school:

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

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

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

Let's imagine this household as:

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

Let's imagine this household as:

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

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

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

3.5 Let's calculate 4 derivative:

$$-1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + 6 \tag{3.33}$$

Plus a constant:

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

It is obvious that:

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

It is easy to see:

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

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

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

Let's imagine this household as:

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

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

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

As already shown earlier:

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

A similar one can be proved:

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

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

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

Let's imagine this household as:

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

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

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

A similar one can be proved:

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

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

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

It is easy to see:

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

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

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

A good, solid task?

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

As already shown earlier:

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

It is common knowledge:

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

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

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

A good, solid task?

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

It is easy to see:

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

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

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

A similar one can be proved:

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

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

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

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

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

Let's imagine this household as:

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

Let's imagine this household as:

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

It is easy to see:

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

Should be known from school:

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

Plus a constant:

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

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

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

A similar one can be proved:

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

Plus a constant:

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

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

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

It is easy to see:

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

A similar one can be proved:

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

A good, solid task?

$$\frac{df}{dx}(-1\cdot\sin(x)\cdot\cos(\sin(x)) + \cos(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x))) = -1\cdot\cos(x)\cdot\cos(\sin(x)) + -1\cdot\sin(x)\cdot\cos(x)\cdot -1 \cdot\sin(\sin(x)) + -1\cdot\sin(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x)) + \cos(x) \cdot(-1\cdot\sin(x)\cdot -1\cdot\sin(\sin(x)) + \cos(x)\cdot -1\cdot\cos(x)\cdot\cos(\sin(x))) \tag{3.70}$$

A similar one can be proved:

$$\frac{df}{dx}(-1\cdot(-1\cdot\sin(x)\cdot\cos(\sin(x)) + \cos(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x)))) = -1\cdot(-1\cdot\cos(x)\cdot\cos(\sin(x)) + -1\cdot\sin(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x)) + -1 \cdot\sin(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x)) + \cos(x) \cdot(-1\cdot\sin(x)\cdot -1\cdot\sin(\sin(x)) + \cos(x)\cdot -1\cdot\cos(x)\cdot\cos(\sin(x)))) \tag{3.71}$$

A good, solid task?

$$\frac{df}{dx}(\cos(x)\cdot -1\cdot(-1\cdot\sin(x)\cdot\cos(\sin(x)) + \cos(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x)))) = -1\cdot\sin(x)\cdot -1\cdot(-1\cdot\sin(x)\cdot\cos(\sin(x)) + \cos(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x))) + \cos(x)\cdot -1\cdot(-1\cdot\cos(x)\cdot\cos(\sin(x)) + -1\cdot\sin(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x)) + -1\cdot\sin(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x)) + \cos(x) \cdot(-1\cdot\sin(x)\cdot -1\cdot\sin(\sin(x)) + \cos(x)\cdot -1\cdot\cos(x)\cdot\cos(\sin(x)))) \tag{3.72}$$

A good, solid task?

$$\frac{df}{dx}(-1\cdot\sin(x)\cdot -1\cdot\cos(x)\cdot\cos(\sin(x)) + \cos(x)\cdot -1 \cdot(-1\cdot\sin(x)\cdot\cos(\sin(x)) + \cos(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x)))) = -1\cdot\cos(x)\cdot -1\cdot\cos(x)\cdot\cos(\sin(x)) + -1\cdot\sin(x)\cdot -1 \cdot(-1\cdot\sin(x)\cdot\cos(\sin(x)) + \cos(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x))) + -1\cdot\sin(x)\cdot -1\cdot(-1\cdot\sin(x)\cdot\cos(\sin(x)) + \cos(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x))) + \cos(x)\cdot -1 \cdot(-1\cdot\cos(x)\cdot\cos(\sin(x)) + -1\cdot\sin(x)\cdot\cos(x)\cdot -1\cdot\sin(\sin(x)) + -1\cdot\sin(x) \cdot\cos(x)\cdot -1\cdot\sin(\sin(x)) + \cos(x) \cdot(-1\cdot\sin(x)\cdot -1\cdot\sin(\sin(x)) + \cos(x)\cdot -1\cdot\cos(x)\cdot\cos(\sin(x)))) \tag{3.73}$$

It is easy to see:

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

Let's imagine this household as:

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

3.6 Let's calculate 5 derivative:

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

As already shown earlier:

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

Let's imagine this household as:

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

It is common knowledge:

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

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

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

A good, solid task?

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

It is obvious that:

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

It is easy to see:

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

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

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

It is obvious that:

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

A similar one can be proved:

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

It is obvious that:

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

As already shown earlier:

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

A similar one can be proved:

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

A good, solid task?

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

It is obvious that:

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

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

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

It is obvious that:

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

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

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

It is common knowledge:

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

Let's imagine this household as:

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

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

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

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

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

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

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

It is easy to see:

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

Should be known from school:

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

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

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

As already shown earlier:

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

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

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

Plus a constant:

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

It is easy to see:

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

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

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

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

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

Plus a constant:

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

A good, solid task?

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

Plus a constant:

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

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

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

It is obvious that:

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

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

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

A similar one can be proved:

$$\frac{df}{dx}(-1\cdot \sin(x)\cdot \cos(\sin(x)) + \cos(x)\cdot \cos(x)\cdot -1\cdot \sin(\sin(x))) = -1\cdot \cos(x)\cdot \cos(\sin(x)) + -1\cdot \sin(x)\cdot \cos(x)\cdot -1 \cdot \sin(\sin(x)) + -1\cdot \sin(x)\cdot \cos(x)\cdot -1\cdot \sin(\sin(x)) + \cos(x) \cdot (-1\cdot \sin(x)\cdot -1\cdot \sin(\sin(x)) + \cos(x)\cdot -1\cdot \cos(x)\cdot \cos(\sin(x))) \tag{3.115}$$

Should be known from school:

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

Let's imagine this household as:

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

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

$$\begin{aligned}
&\frac{df}{dx}(-1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot -1 \\
&\quad \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))) = \\
&\qquad -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \\
&\qquad \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \cos(x) \cdot \\
&\qquad -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \\
&\qquad \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \\
&\qquad\qquad \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\
&\qquad\qquad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))))
\end{aligned} \tag{3.118}$$

It is obvious that:

$$\begin{aligned}
&\frac{df}{dx}(-1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \\
&\quad \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \\
&\quad -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))) = \\
&\qquad -1 \cdot -1 \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \\
&\qquad \cdot \cos(\sin(x)) + -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \\
&\qquad \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \\
&\qquad + -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \\
&\qquad \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \cos(x) \cdot \\
&\qquad -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + -1 \cdot \sin(x) \\
&\qquad \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \\
&\qquad\qquad \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\
&\qquad\qquad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))))
\end{aligned} \tag{3.119}$$

Let's imagine this household as:

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

A similar one can be proved:

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

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

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

It is common knowledge:

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

As already shown earlier:

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

Plus a constant:

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

It is easy to see:

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

A similar one can be proved:

$$\begin{split}&\frac{df}{dx}(-1 \cdot \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \\ &= -1 \cdot -1 \cdot \sin(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot -1 \\ &\quad \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))\end{split} \tag{3.127}$$

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

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

Let's imagine this household as:

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

A similar one can be proved:

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

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

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

Should be known from school:

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

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

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

As already shown earlier:

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

It is easy to see:

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

It is obvious that:

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

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

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

It is common knowledge:

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

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

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

It is easy to see:

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

It is easy to see:

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

A good, solid task?

$$\frac{df}{dx}(-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))$$
$$= -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))) \tag{3.142}$$

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

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

It is obvious that:

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

It is easy to see:

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

As already shown earlier:

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

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

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

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

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

It is common knowledge:

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

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

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

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

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

It is obvious that:

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

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

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

A similar one can be proved:

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

A good, solid task?

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

A good, solid task?

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

Let's imagine this household as:

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

Let's imagine this household as:

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

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

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

A similar one can be proved:

$$\begin{aligned}&\frac{df}{dx}(-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \\ &= -1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \\ &\quad \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\ &\quad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))\end{aligned} \tag{3.160}$$

It is easy to see:

$$\begin{aligned}&\frac{df}{dx}(-1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))) \\ &= -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \\ &\quad \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\ &\quad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))))\end{aligned} \tag{3.161}$$

Should be known from school:

$$\begin{aligned}&\frac{df}{dx}(-1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)))) \\ &= -1 \cdot \cos(x) \cdot -1 \cdot (-1 \cdot \sin(x) \cdot \cos(\sin(x)) + \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) + \\ &\quad -1 \cdot \sin(x) \cdot -1 \cdot (-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) \\ &\quad + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \\ &\quad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x))))\end{aligned} \tag{3.162}$$

It is easy to see:

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

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

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

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

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

A good, solid task?

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

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

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

It is obvious that:

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

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

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

As already shown earlier:

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

As already shown earlier:

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

It is obvious that:

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

As already shown earlier:

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

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

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

It is common knowledge:

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

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

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

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

$$\begin{aligned}&\frac{df}{dx}(-1 \cdot \cos(x) \cdot \cos(\sin(x)) + -1 \cdot \sin(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x))) \\ &= -1 \cdot -1 \cdot \sin(x) \cdot \cos(\sin(x)) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \\ &\quad \cdot \sin(\sin(x)) + -1 \cdot \cos(x) \cdot \cos(x) \cdot -1 \cdot \sin(\sin(x)) + -1 \cdot \sin(x) \\ &\quad \cdot (-1 \cdot \sin(x) \cdot -1 \cdot \sin(\sin(x)) + \cos(x) \cdot -1 \cdot \cos(x) \cdot \cos(\sin(x)))\end{aligned} \tag{3.177}$$

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

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

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

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

It is easy to see:

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

Let's imagine this household as:

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

Should be known from school:

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

As already shown earlier:

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

It is obvious that:

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

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

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

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

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

A good, solid task?

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

It is easy to see:

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

Let's imagine this household as:

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

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

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

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

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

It is common knowledge:

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

A good, solid task?

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

Let's imagine this household as:

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

It is common knowledge:

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

A similar one can be proved:

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

Let's imagine this household as:

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

It is obvious that:

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

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

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

It is easy to see:

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

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

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

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

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

A similar one can be proved:

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

A similar one can be proved:

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

A similar one can be proved:

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

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

$$\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}$$

It is easy to see:

$$
\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}
$$

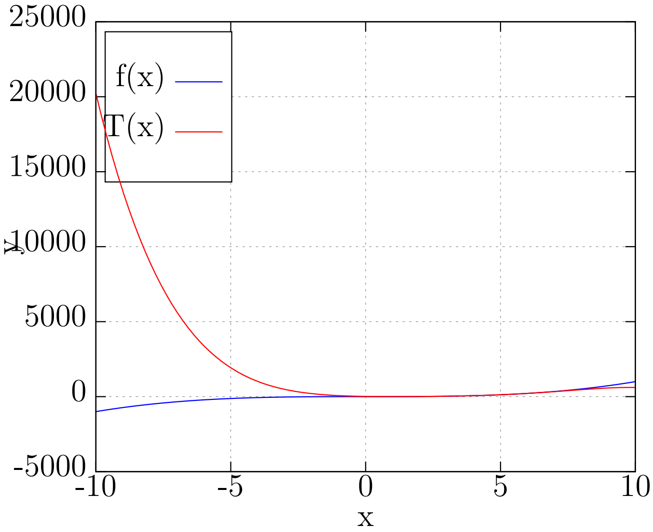
Should be known from school:

$$
\begin{split}
&\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 \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{split}
\tag{3.208}
$$

Taylor Series:

$$T(\cos(\sin(x)) + x^3) = 64.727 + 47.5512 \cdot (x-4) + 12.1045 \cdot (x-4)^2 + 1.28658 \cdot (x-4)^3 + -0.0719033 \cdot (x-4)^4 + -0.0460319 \cdot (x-4)^5 ... \tag{3.209}$$

3.7 Taylor graphics



Afterword

Dear readers, I hope you have been able to spare a moment of your attention for this textbook and to realize its incredible obviousness. You will now excel in your exam, and if not, good luck next year.

The author also expresses great gratitude for the help in preparing this textbook to the students and professors of MIPT, namely to DED, mentor Kolya, and co-mentor Artyom, for actively seeking out the cringe in the code, which undoubtedly improved the quality of the materials. For this important work, the author wholeheartedly thanks all the assistants.

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