

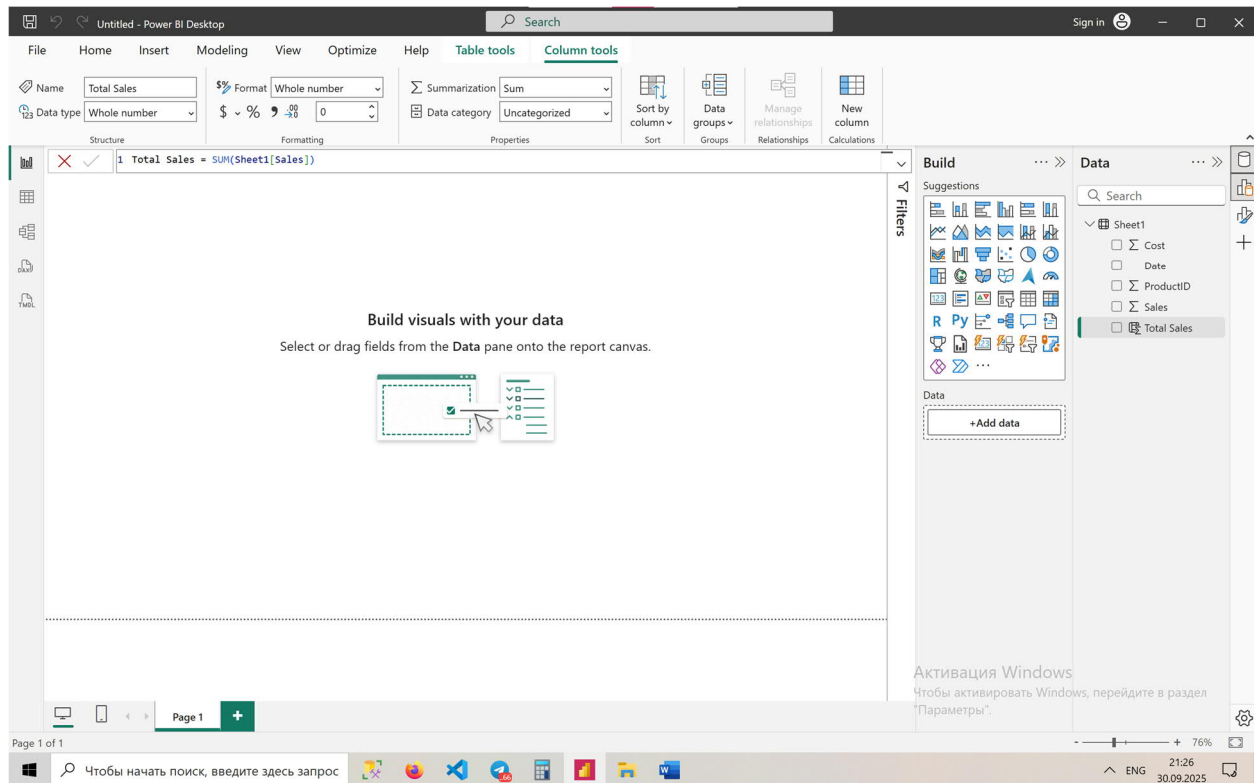
## Lesson 8 – Answers

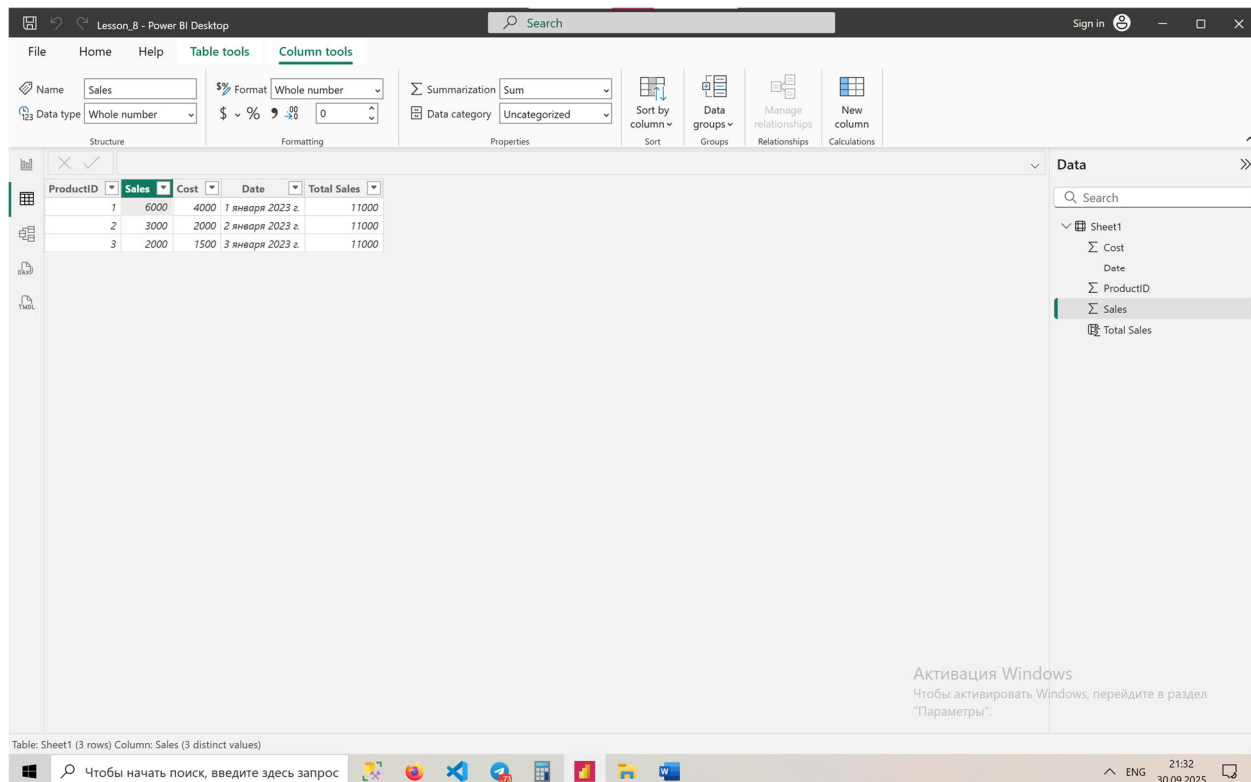
### 1. What does DAX stand for?

DAX stands for **Data Analysis Expressions**. It is a formula language used in Power BI, Excel, and Analysis Services to create custom calculations.

### 2. Write a DAX formula to sum the Sales column.

Total Sales = SUM(Sheet1[Sales])





### 3. What is the difference between a calculated column and a measure?

- A **calculated column** is computed row by row and stored in the data model.  
Profit = Sheet1[Sales] - Sheet1[Cost]
- A **measure** is calculated dynamically based on filters and aggregations in a report.

Total Profit Measure = SUM(Sheet1[Sales]) - SUM(Sheet1[Cost])

### 4. Use the DIVIDE function to calculate Profit Margin (Profit/Sales).

Profit Margin = DIVIDE(SUM(Sheet1[Sales]) - SUM(Sheet1[Cost]),  
SUM(Sheet1[Sales]))

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Search

File Home Help Table tools Column tools

Name Profit Margin Format Percentage Summarization Sum Data type Decimal number Data category Uncategorized Sort by column Sort Data groups Groups Manage relationships Relationships New column Calculations

Structure Formatting Properties

1 Profit Margin =  $\text{DIVIDE}(\text{SUM}(\text{Sheet1}[\text{Sales}]) - \text{SUM}(\text{Sheet1}[\text{Cost}]), \text{SUM}(\text{Sheet1}[\text{Sales}]))$

ProductID	Sales	Cost	Date	Total Sales	Profit Margin
1	6000	4000	1 января 2023 г.	11000	31,82%
2	3000	2000	2 января 2023 г.	11000	31,82%
3	2000	1500	3 января 2023 г.	11000	31,82%

Data

Search

Sheet1

- Cost
- Date
- ProductID
- Profit Margin
- Sales
- Total Sales

Активация Windows

Чтобы активировать Windows, перейдите в раздел "Параметры".

Table: Sheet1 (3 rows) Column: Profit Margin (1 distinct values)

ЧЧтобы начать поиск, введите здесь запрос

ENG 21:50 30.09.2025

## 5. What does COUNTROWS() do in DAX?

COUNTROWS() returns the number of rows in a table or table expression.

Rows = COUNTROWS(Sheet1)

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Search

File Home Help Table tools Column tools

Name Rows Format Whole number Summarization Sum Data type Whole number Data category Uncategorized Sort by column Sort Data groups Groups Manage relationships Relationships New column Calculations

Structure Formatting Properties

1 Rows = COUNTROWS(Sheet1)

ProductID	Sales	Cost	Date	Total Sales	Profit Margin	Rows
1	6000	4000	1 января 2023 г.	11000	31,82%	3
2	3000	2000	2 января 2023 г.	11000	31,82%	3
3	2000	1500	3 января 2023 г.	11000	31,82%	3

Data

Search

Sheet1

- Cost
- Date
- ProductID
- Profit Margin
- Rows
- Sales
- Total Sales

Активация Windows

Чтобы активировать Windows, перейдите в раздел "Параметры".

Table: Sheet1 (3 rows) Column: Rows (1 distinct values)

ЧЧтобы начать поиск, введите здесь запрос

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6. Create a measure: Total Profit that subtracts total cost from total sales.

**Total Profit = SUM(Sheet1[Sales]) - SUM(Sheet1[Cost])**

The screenshot shows the Power BI Desktop interface. In the 'Measure tools' ribbon, the 'Name' field is set to 'Total Profit' and the 'Home table' is 'Sheet1'. The formula bar displays the measure: **1 Total Profit = SUM(Sheet1[Sales]) - SUM(Sheet1[Cost])**. The 'Format' dropdown is set to 'Whole number'. The 'Data category' is 'Uncategorized'. The 'Visuals' pane shows a table visual with columns: Date, ProductID, Sum of Sales, Sum of Cost, Total Profit, and Sum of Profit Margin. The table data is as follows:

Date	ProductID	Sum of Sales	Sum of Cost	Total Profit	Sum of Profit Margin
1 января 2023 г.	1	6000	4000	2000	31.82%
2 января 2023 г.	2	3000	2000	1000	31.82%
3 января 2023 г.	3	2000	1500	500	31.82%
<b>Total</b>		<b>11000</b>	<b>7500</b>	<b>3500</b>	<b>95.45%</b>

The 'Build' pane on the right shows the 'Columns' section with 'Date', 'ProductID', 'Sum of Sales', 'Sum of Cost', 'Total Profit', and 'Sum of Profit Margin' listed. The 'Filters on this visual' section is empty. The 'Filters on this page' section is also empty. The 'Data' pane on the right shows the 'Sheet1' table with columns: Cost, Date, ProductID, Profit Margin, Sales, Total Profit, and Total Sales. The 'Total Profit' measure is highlighted in the 'Data' pane.

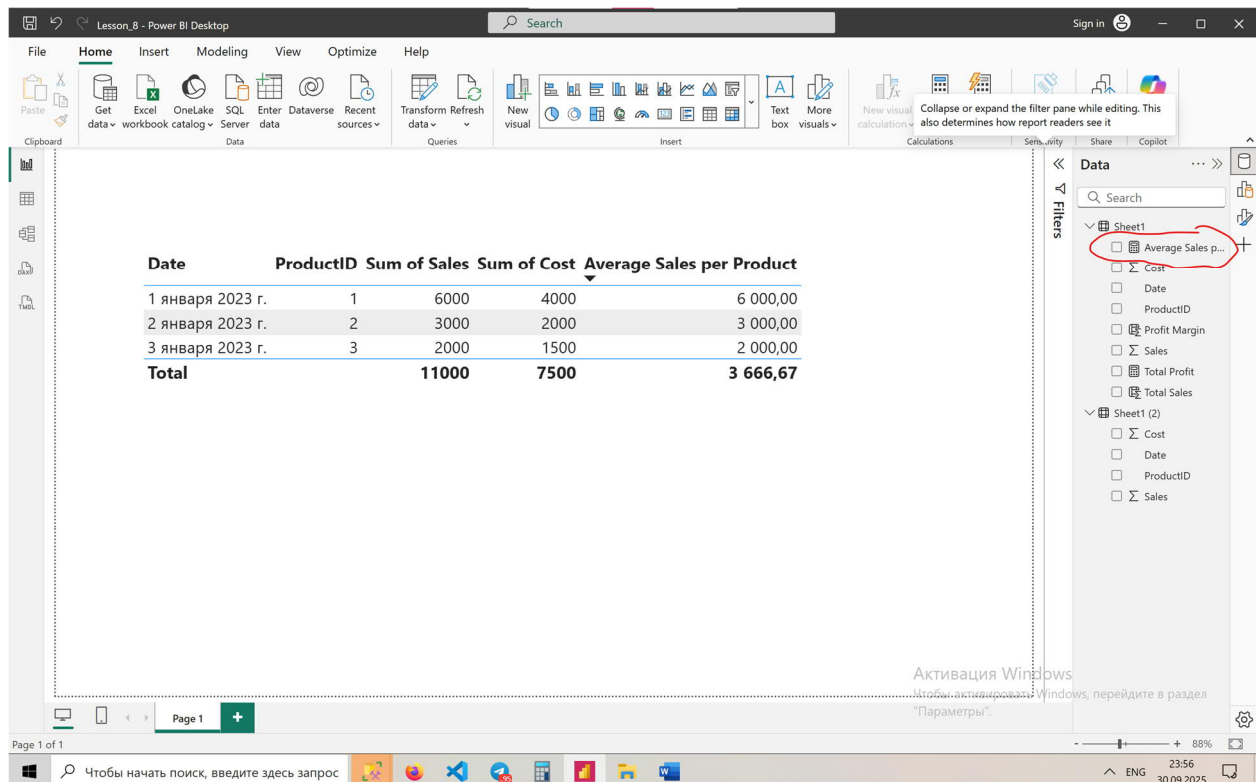
**7. Write a measure to calculate Average Sales per Product.**

**Average Sales per Product = AVERAGE(Sheet1[Sales])**

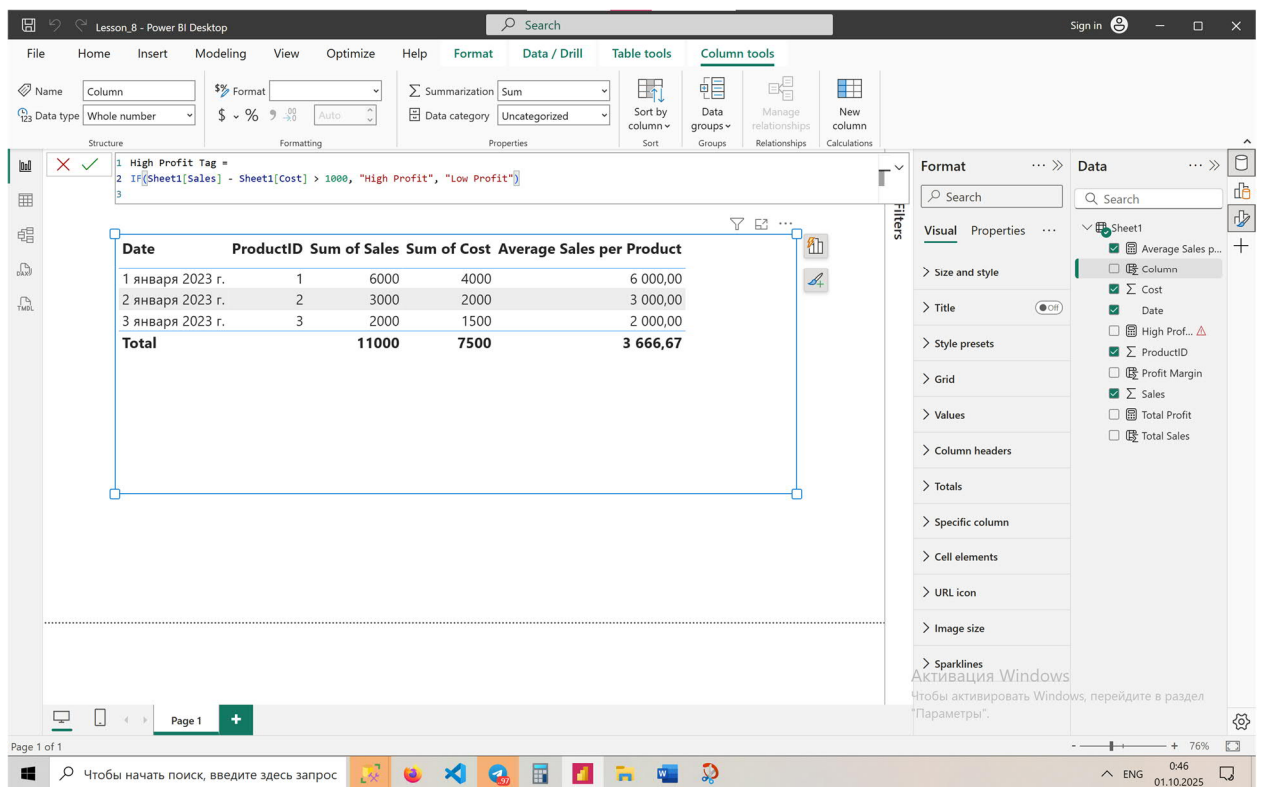
The screenshot shows the Power BI Desktop interface. In the 'Measure tools' ribbon, the 'Name' field is set to 'Measure' and the 'Home table' is 'Sheet1'. The formula bar displays the measure: **1 Average Sales per Product = AVERAGE(Sheet1[Sales])**. The 'Format' dropdown is set to 'Auto'. The 'Data category' is 'Uncategorized'. The 'Visuals' pane shows a table visual with columns: Date, ProductID, Sum of Sales, Sum of Cost, Total Profit, and Sum of Profit Margin. The table data is as follows:

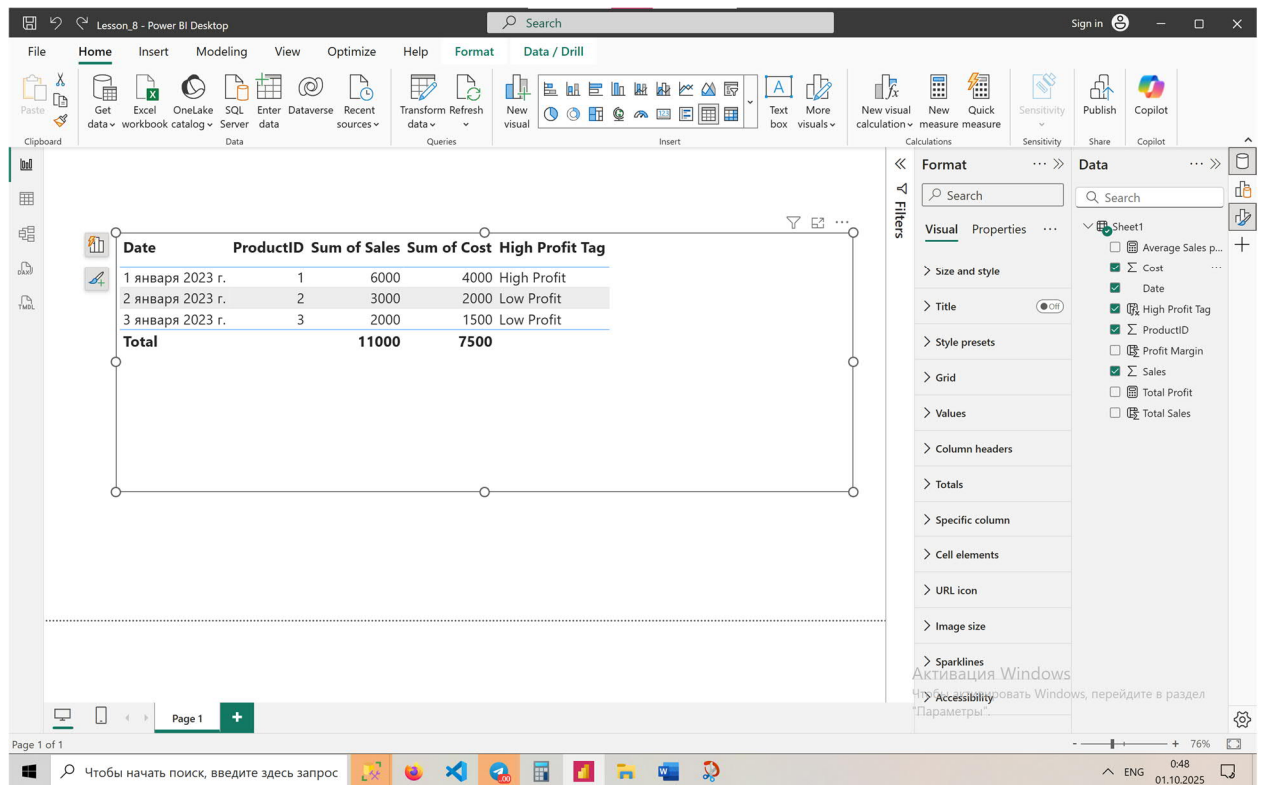
Date	ProductID	Sum of Sales	Sum of Cost	Total Profit	Sum of Profit Margin
1 января 2023 г.	1	6000	4000	2000	31.82%
2 января 2023 г.	2	3000	2000	1000	31.82%
3 января 2023 г.	3	2000	1500	500	31.82%
<b>Total</b>		<b>11000</b>	<b>7500</b>	<b>3500</b>	<b>95.45%</b>

The 'Build' pane on the right shows the 'Columns' section with 'Date', 'ProductID', 'Sum of Sales', 'Sum of Cost', 'Total Profit', and 'Sum of Profit Margin' listed. The 'Filters on this visual' section is empty. The 'Filters on this page' section is also empty. The 'Data' pane on the right shows the 'Sheet1' table with columns: Cost, Date, ProductID, Profit Margin, Sales, Total Profit, and Total Sales. The 'Measure' is highlighted in the 'Data' pane.



**8. Use IF() to tag products as "High Profit" if Profit > 1000.**  
 High Profit Tag = IF(Sheet1[Sales] - Sheet1[Cost] > 1000, "High Profit",  
 "Low Profit")





## 9. What is a circular dependency error in a calculated column?

A circular dependency happens when a column or measure references itself directly or indirectly, creating an endless calculation loop.

## 10. Explain row context vs. filter context.

- **Row context:** evaluation happens for each row individually (like in calculated columns).
- **Filter context:** evaluation happens based on filters applied from visuals, slicers, or CALCULATE().

## 11. Write a measure to calculate YTD Sales using TOTALYTD().

YTD Sales = TOTALYTD(SUM(Sheet1[Sales]), Sheet1[Date])

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File Home Insert Modeling View Optimize Help Table tools Measure tools

Name Measure Format Data category Uncategorized

Home table Sheet1

Structure Formatting Properties

1 YTD Sales = TOTALYTD(SUM(Sheet1[Sales]), Sheet1[Date])

Date	ProductID	Sum of Sales	Sum of Cost	High Profit Tag
1 января 2023 г.	1	6000	4000	High Profit
2 января 2023 г.	2	3000	2000	Low Profit
3 января 2023 г.	3	2000	1500	Low Profit
<b>Total</b>		<b>11000</b>	<b>7500</b>	

Format

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Активация Windows

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Clipboard

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Visual

Date	ProductID	Sum of Sales	YTD Sales
1 января 2023 г.	1	6000	6000
2 января 2023 г.	2	3000	3000
3 января 2023 г.	3	2000	2000
<b>Total</b>		<b>11000</b>	<b>11000</b>

Format

Visual Properties

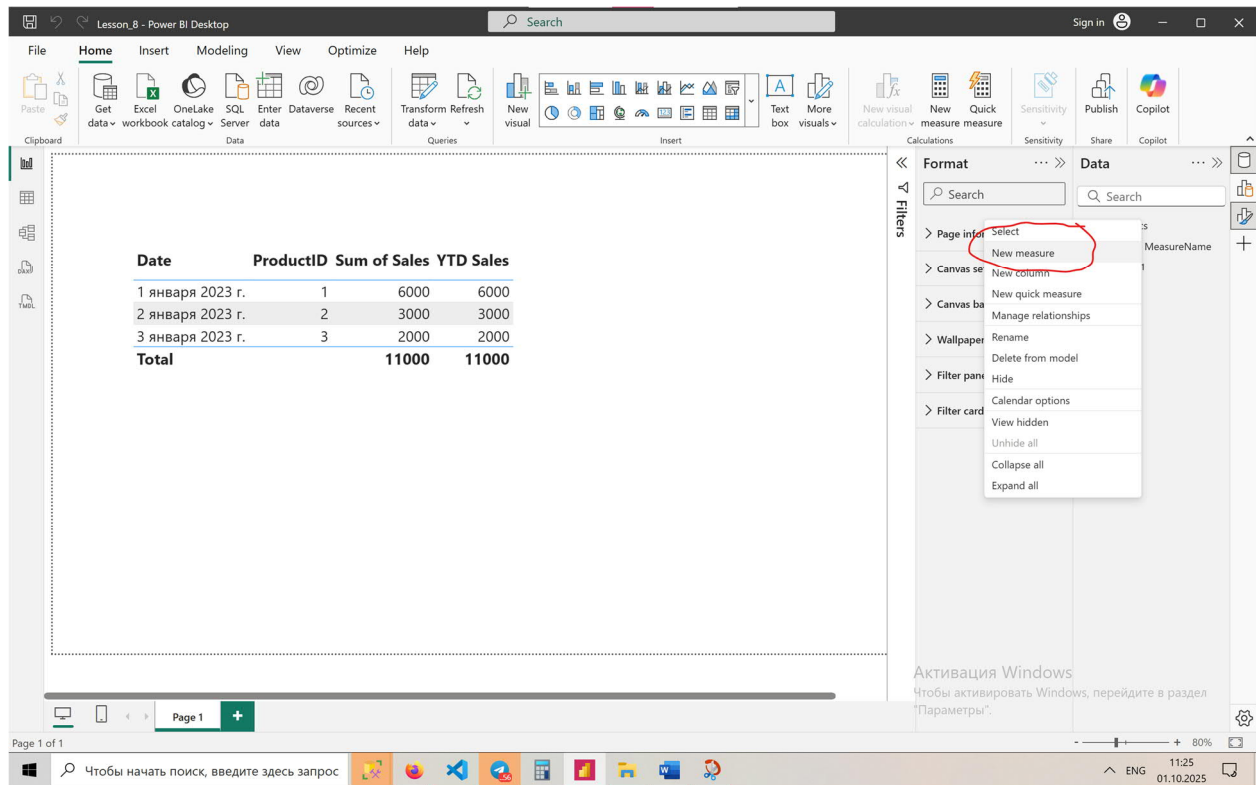
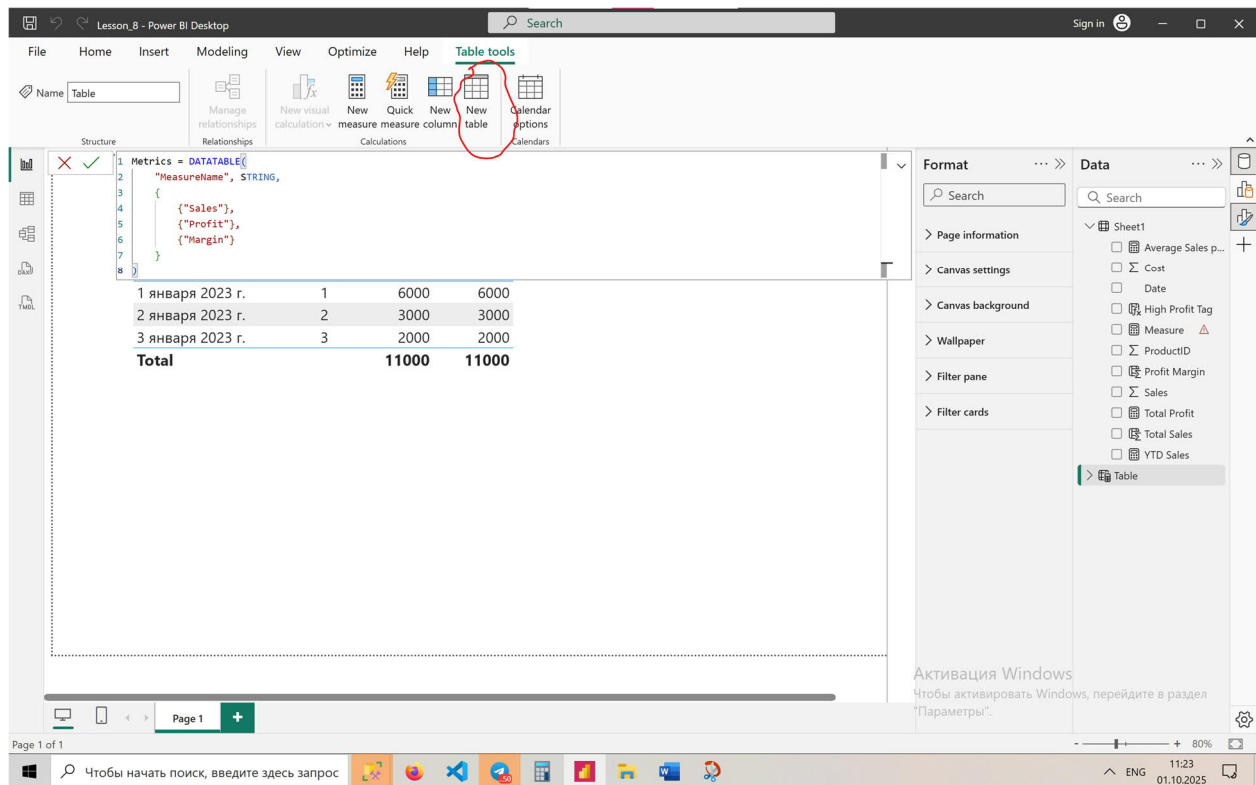
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Активация Windows

## 12. Create a dynamic measure that switches between Sales, Profit, and Margin.

At first we should create a new table

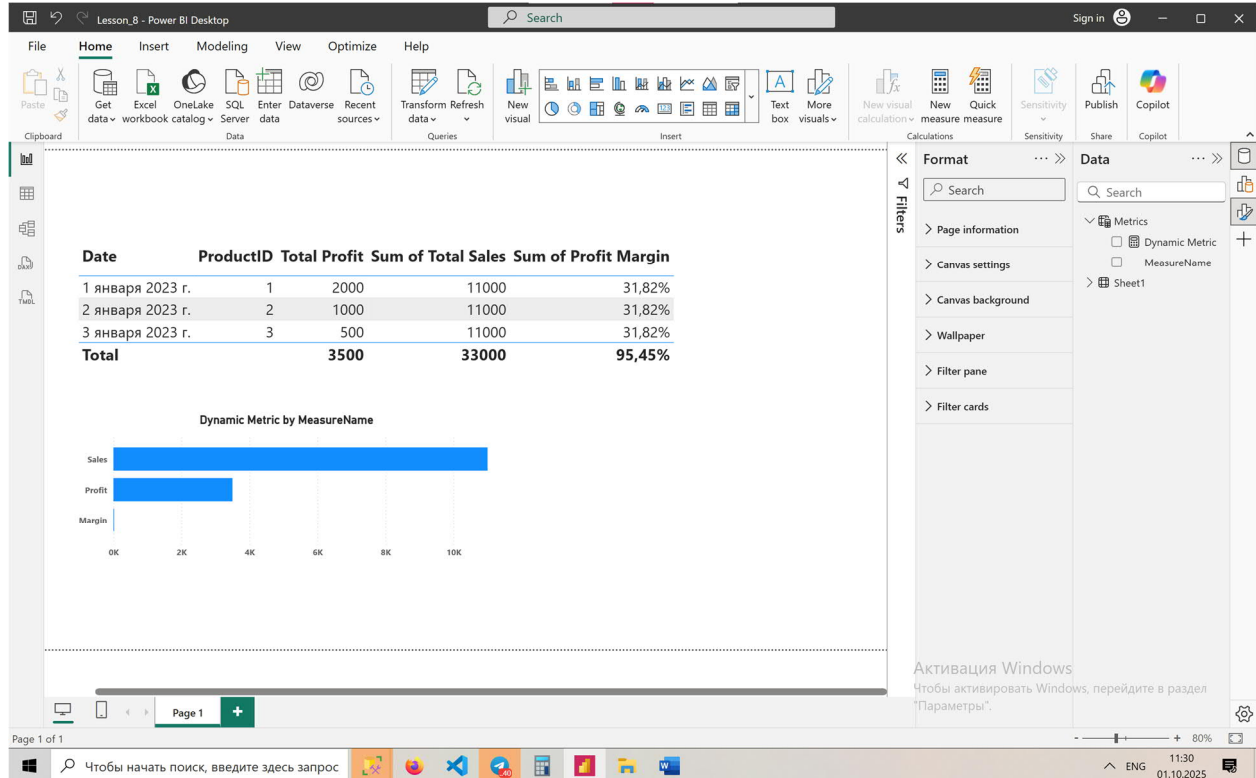




Dynamic Metric =  
 SWITCH(  
 SELECTEDVALUE(Metrics[MeasureName]),  
 "Sales", SUM(Sheet1[Sales]),  
 "Profit", SUM(Sheet1[Sales]) - SUM(Sheet1[Cost]),



"Margin", DIVIDE(SUM(Sheet1[Sales]) - SUM(Sheet1[Cost]),  
SUM(Sheet1[Sales]))  
)  
(Here Metrics is a helper table with values: Sales, Profit, Margin.)



### 13. Optimize a slow DAX measure using variables (VAR).

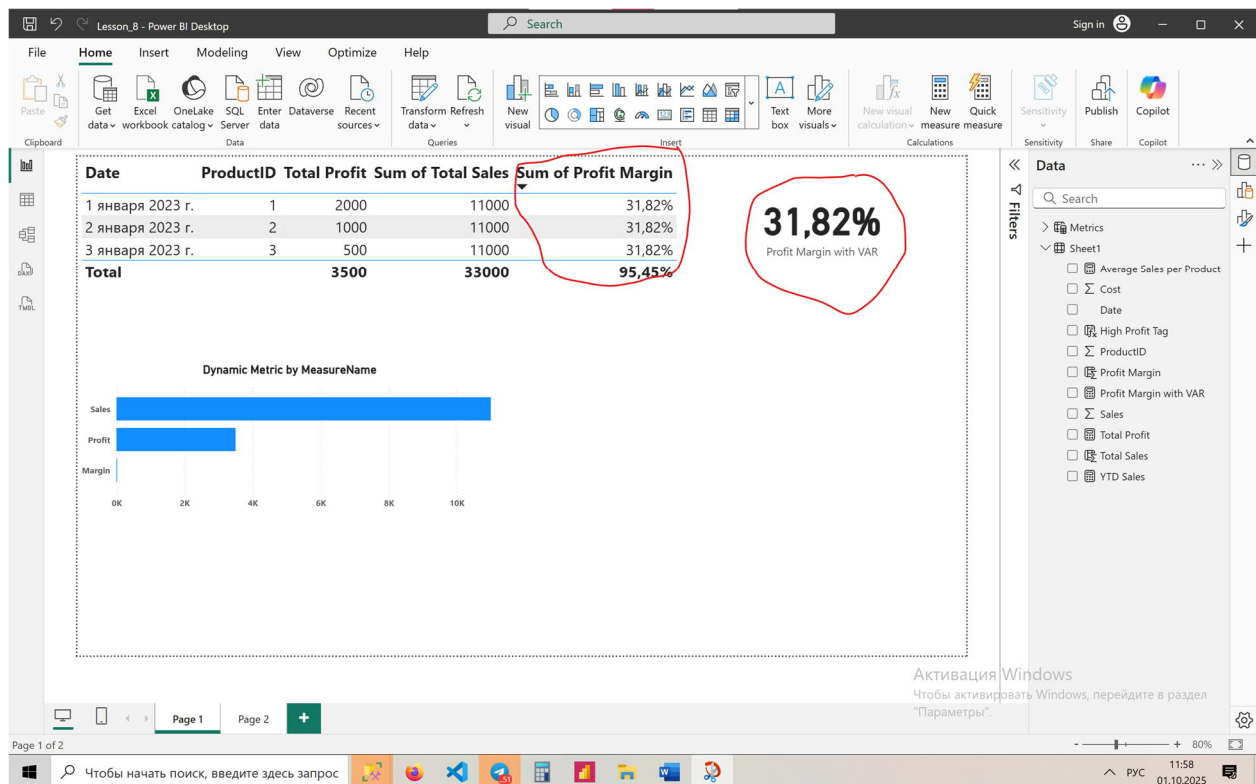
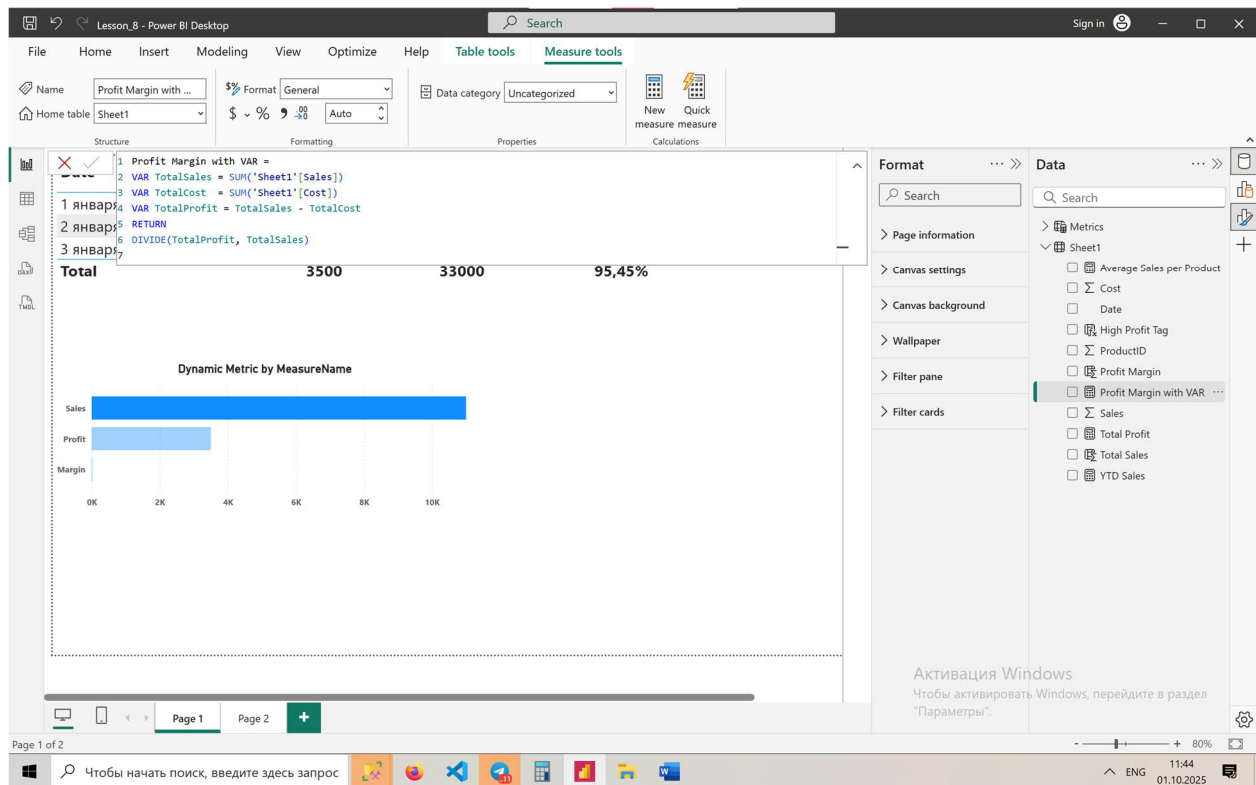
Profit Margin Optimized =

VAR TotalSales = SUM(Sheet1[Sales])

VAR TotalCost = SUM(Sheet1[Cost])

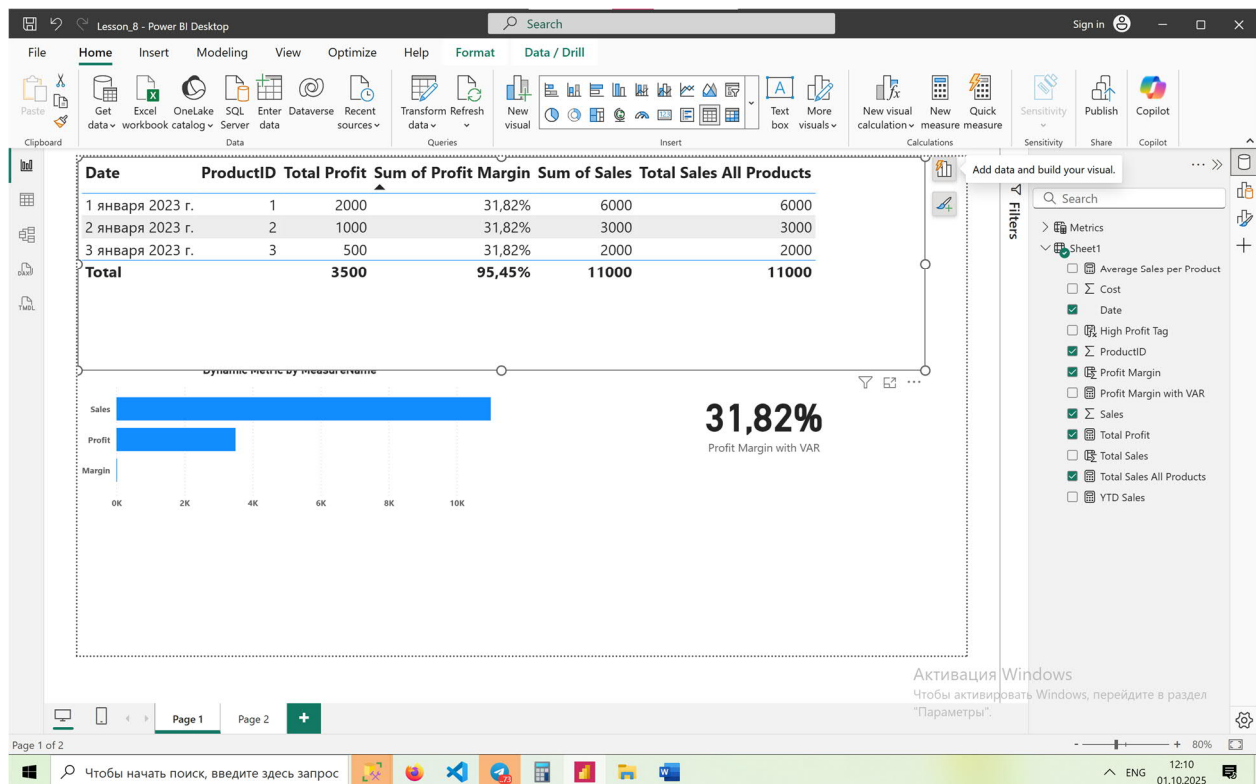
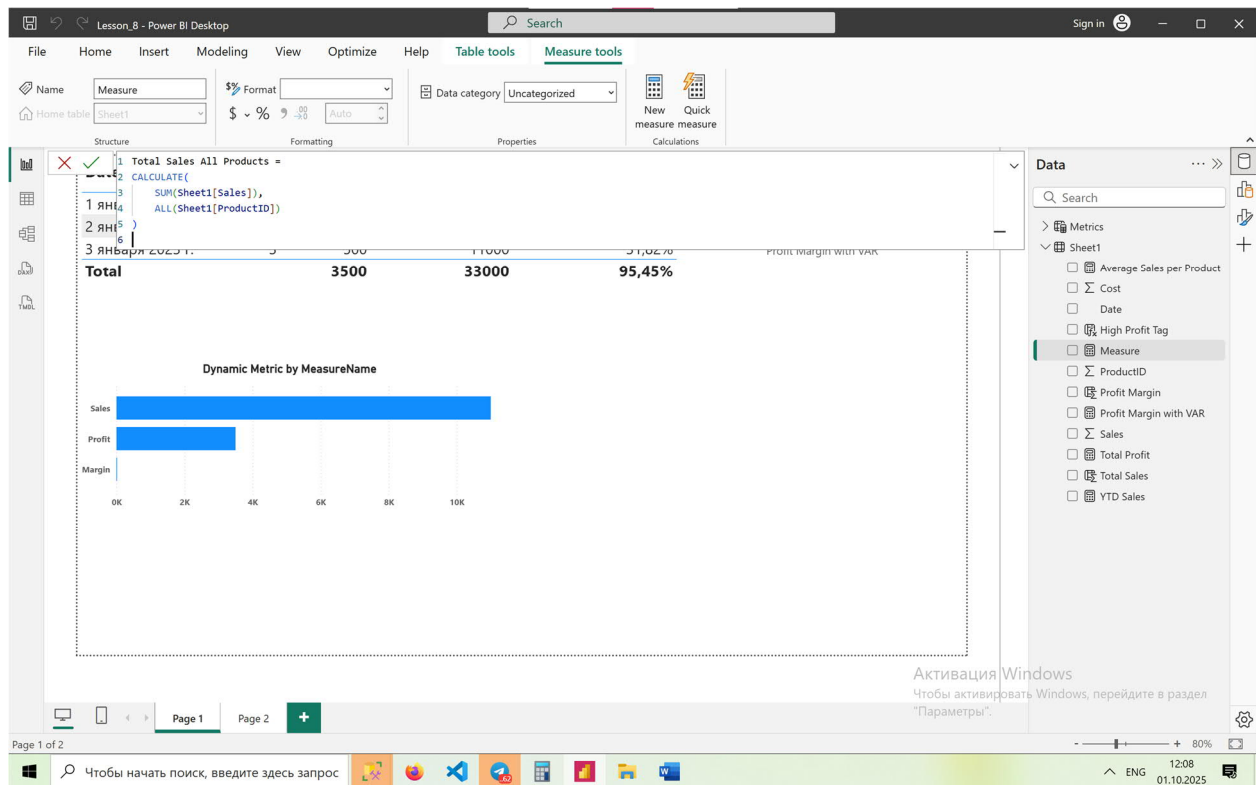
RETURN

DIVIDE(TotalSales - TotalCost, TotalSales)



#### 14. Use CALCULATE() to override a filter.

Sales All Products = CALCULATE(SUM(Sheet1[Sales]),  
ALL(Sheet1[ProductID]))



**15. Write a measure that returns the highest sales amount.**  
**Max Sales = MAX(Sheet1[Sales])**

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New visual

Insert

Text boxMore visuals

New visual calculationNew measure measureQuick measureCalculations

SensitivityPublishCopilot

Table

Table

Table

Table

Date	ProductID	Total Profit	Sum of Profit Margin	Sum of Sales	Total Sales All Products
1 января 2023 г.	1	2000	31,82%	6000	6000
2 января 2023 г.	2	1000	31,82%	3000	3000
3 января 2023 г.	3	500	31,82%	2000	2000
Total		3500	95,45%	11000	11000

Dynamic Metric by MeasureName

Sales

Profit

Margin

0K

2K

4K

6K

8K

10K

31,82%

Profit Margin with VAR

6000

Max Sales

Filters

Search

Metrics

Sheet1

Average Sales per Product

Cost

Date

High Profit Tag

Max Sales

ProductID

Profit Margin

Profit Margin with VAR

Sales

Total Profit

Total Sales

Total Sales All Products

YTD Sales

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ENG12:1901.10.2025

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