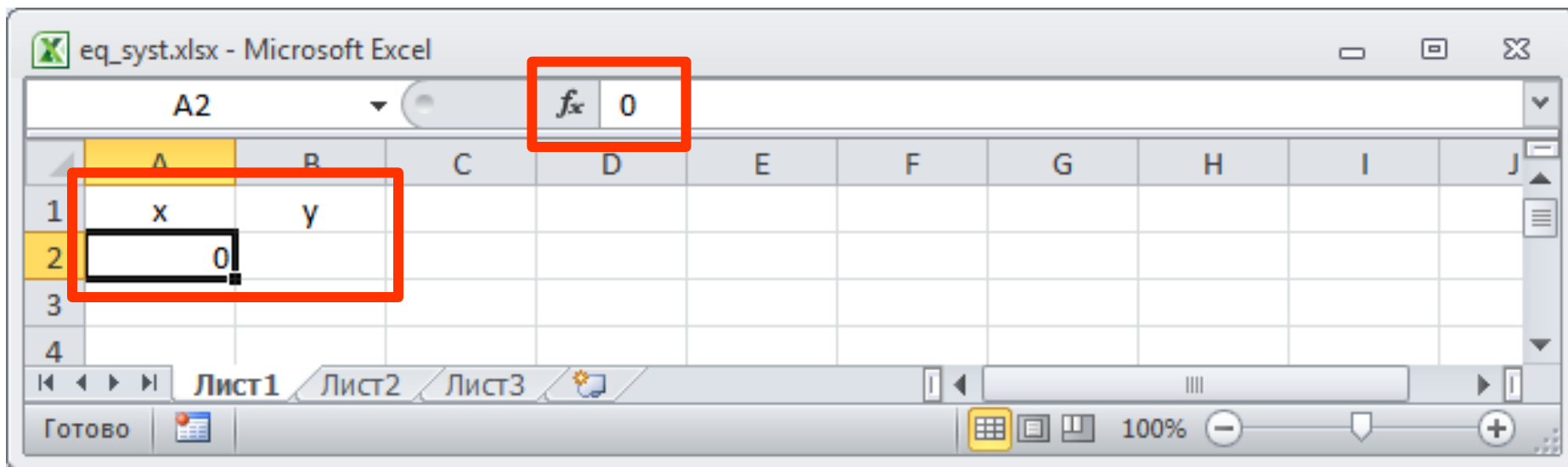


Equation solving: $f(x) = 0$

$$\cos(4x^2 - 3x - 2) = 0$$

Typing initial argument value



$$\cos(4x^2-3x-2)=0$$

Creating the expression for a function calculation

The screenshot shows the Microsoft Excel interface. The formula bar at the top displays the formula $\text{=COS}(4*A2*A2-3*A2-2)$. The spreadsheet grid shows the following data:

	A	B	C	D	E	F	G	H	I	J
1	x	y								
2	0	-0,41615								
3										
4										

The formula bar and the B2 cell are highlighted with red boxes. The status bar at the bottom shows "Готово" (Ready) and a zoom level of 100%.

$$\cos(4x^2-3x-2)=0$$

Set the aim value and adjusting parameter location

Подбор параметра (Goal-seek) > Установить в ячейке (Set cell), Значение (To value), Изменяя значение ячейки (By changing cell)

The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F
1	x	y				
2	0	-0,41615				
3						

The formula bar shows: f_x =COS(4*A2*A2-3*A2-2)

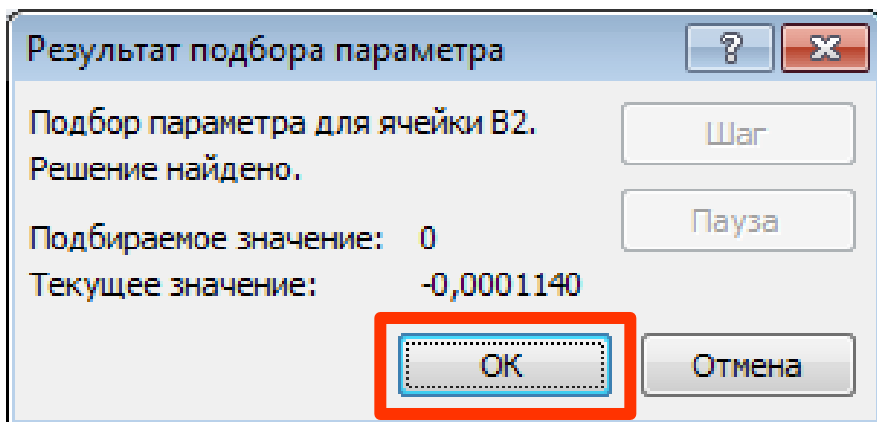
The Goal Seek dialog box is open with the following settings:

- Установить в ячейке: B2
- Значение: 0
- Изменяя значение ячейки: \$A\$2

The 'OK' button is highlighted with a red box.

$$\cos(4x^2-3x-2)=0$$

Checking for the result of calculation



	A	B	C	D	E	F
1	x	y				
2	-0,12289	-0,00011				
3						

Готово

Лист1 Лист2 Лист3

100%

$$\cos(4x^2-3x-2)=0$$

Setting the link to a result value into the same column

	A	B	C	D	E	F
1	x	y				
2	-0,12289	-0,00011				
3						
4						
5						
6	-0,12289					

Setting the step value for the argument

	A	B	C	D	E	F
1	x	y		x step		
2	-0,12289	-0,00011		0,2		
3						
4						
5						
6	-0,12289					

$$\cos(4x^2-3x-2)=0$$

Creating expression to calculate "previous" argument value

	A	B	C	D	E	F
1	x	y		x step		
2	-0,12289	-0,00011		0,2		
3						
4						
5	-0,32289					
6	-0,12289					

Formula bar: =A6-D\$2

Copying expression for argument values on "negative" side

	A	B	C	D
1	x	y		x step
2	-0,12289	-0,00011		0,2
3				
4				
5	-0,32289			
6	-0,12289			

Formula bar: =A6-D\$2

	A	B	C	D	E
1	x	y		x step	
2	-0,12289	-0,00011		0,2	
3					
4	-0,52289				
5	-0,32289				
6	-0,12289				

Formula bar: =A5-D\$2

$$\cos(4x^2 - 3x - 2) = 0$$

Creating expression to calculate "next" argument value

A7		fx =A6+D\$2			
	A	B	C	D	E
1	x	y		x step	
2	-0,12289	-0,00011		0,2	
3					
4	-0,52289				
5	-0,32289				
6	-0,12289				
7	0,077107				
8					

Copying expression for argument values on "positive" side

A7		fx =A6+D\$2			
	A	B	C	D	E
1	x	y		x step	
2	-0,12289	-0,00011		0,2	
3					
4	-0,52289				
5	-0,32289				
6	-0,12289				
7	0,077107				
8					

A8		fx =A7+D\$2			
	A	B	C	D	E
1	x	y		x step	
2	-0,12289	-0,00011		0,2	
3					
4	-0,52289				
5	-0,32289				
6	-0,12289				
7	0,077107				
8	0,277107				

$$\cos(4x^2-3x-2)=0$$

Copying expression for all function values

	A	B	C	D	E	F
1	x	y		x step		
2	-0,12289	-0,00011		0,2		
3						
4	-0,52289					
5	-0,32289					
6	-0,12289					
7	0,077107					
8	0,277107					

	A	B	C	D	E	F
1	x	y		x step		
2	-0,12289	-0,00011		0,2		
3		-0,41615				
4	-0,52289	0,788551				
5	-0,32289	0,817188				
6	-0,12289	-0,00011				
7	0,077107	0,59458				
8	0,277107	-0,81537				

$$\cos(4x^2-3x-2)=0$$

Running command for a graph creation

Вставка (Insert) > Графики (Charts > Line with markers)

The screenshot shows the Microsoft Excel interface with the following elements highlighted in red boxes:

- The **Вставка** (Insert) tab on the ribbon.
- The **Графики** (Charts) button in the ribbon.
- The **График** (Line) button in the Charts task pane.
- The **График с маркерами** (Line with markers) chart type icon in the task pane.

The spreadsheet data is as follows:

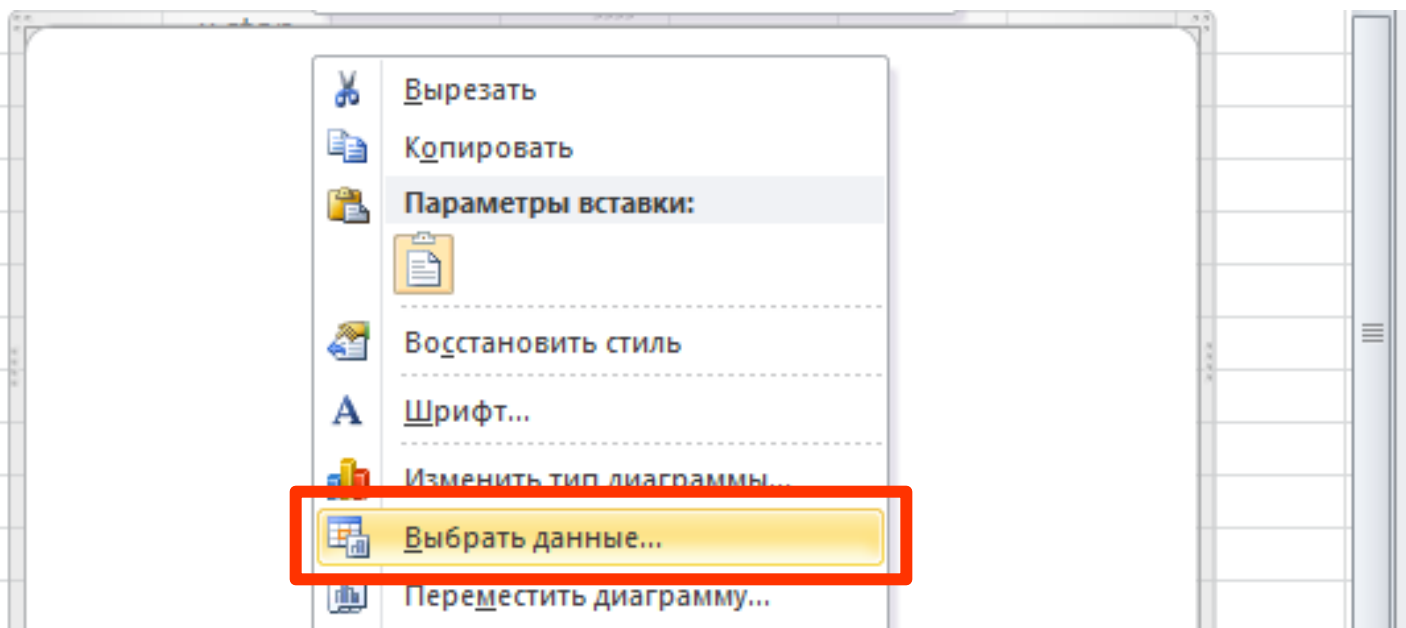
	A	B	C
1	x	y	
2	-0,12289	-0,00011	
3		-0,41615	
4	-0,52289	0,788551	
5	-0,32289	0,817188	
6	-0,12289	-0,00011	
7	0,077107	-0,59458	
8	0,277107	-0,81537	

$$\cos(4x^2-3x-2)=0$$

Running command to link selected graph with data

Chart > RMC > Выбрать данные (Select Data)

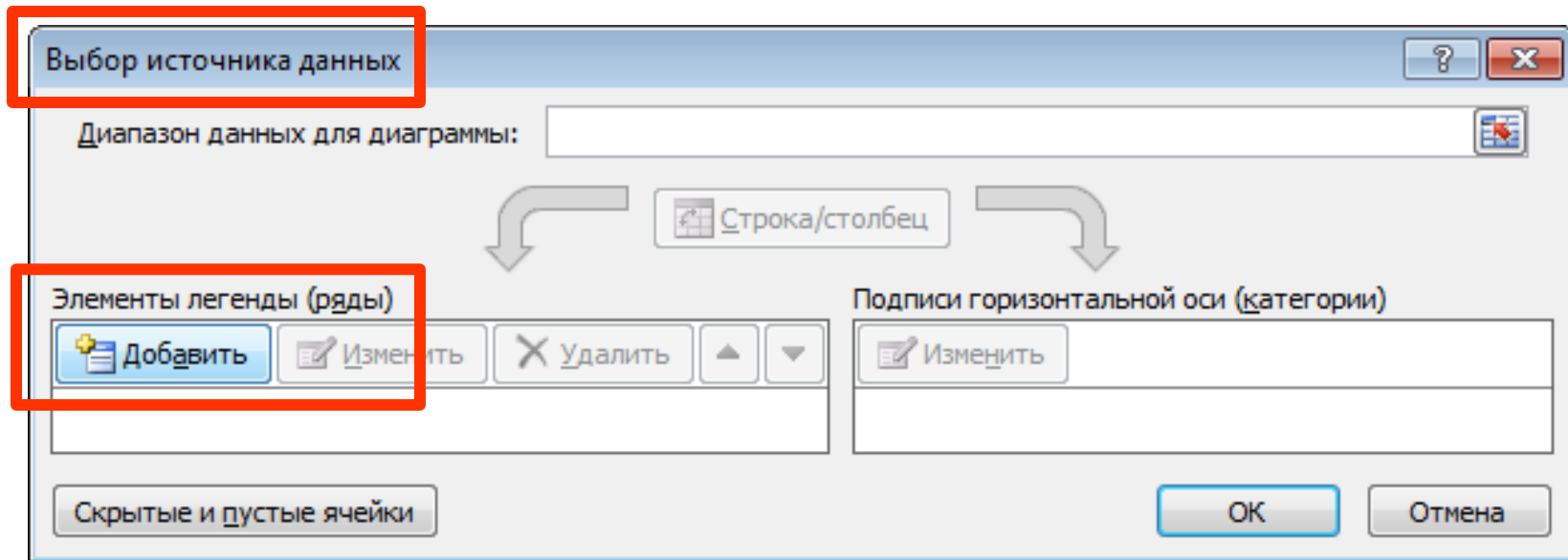
1	x	y
2	-0,12289	-0,00011
3		-0,41615
4	-0,52289	0,788551
5	-0,32289	0,817188
6	-0,12289	-0,00011
7	0,077107	-0,59458
8	0,277107	-0,81537
9		
10		
11		
12		



$$\cos(4x^2 - 3x - 2) = 0$$

Selection of the tool to specify function values

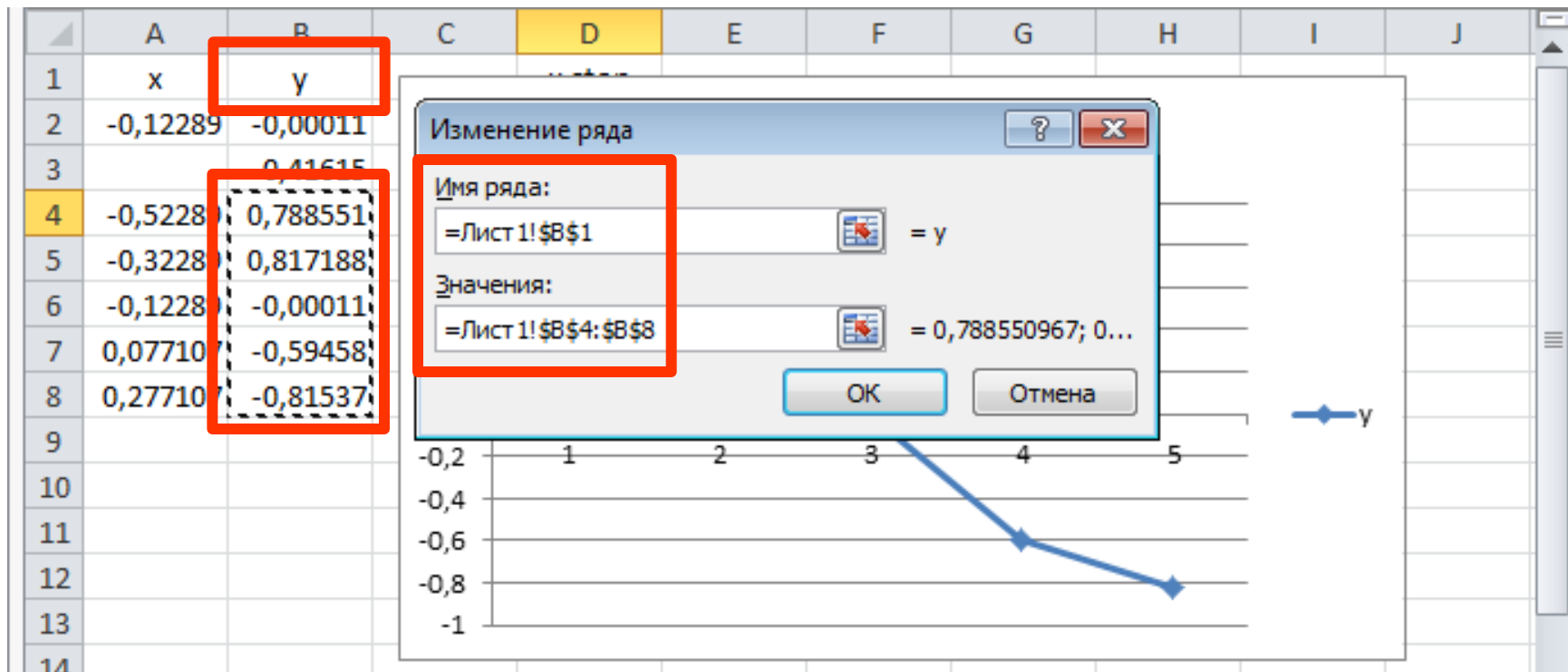
Выбор источника данных (Select data source) > Ряды (Series entries) > Добавить (Add)



$$\cos(4x^2-3x-2)=0$$

Setting the links to a title of the function and list values

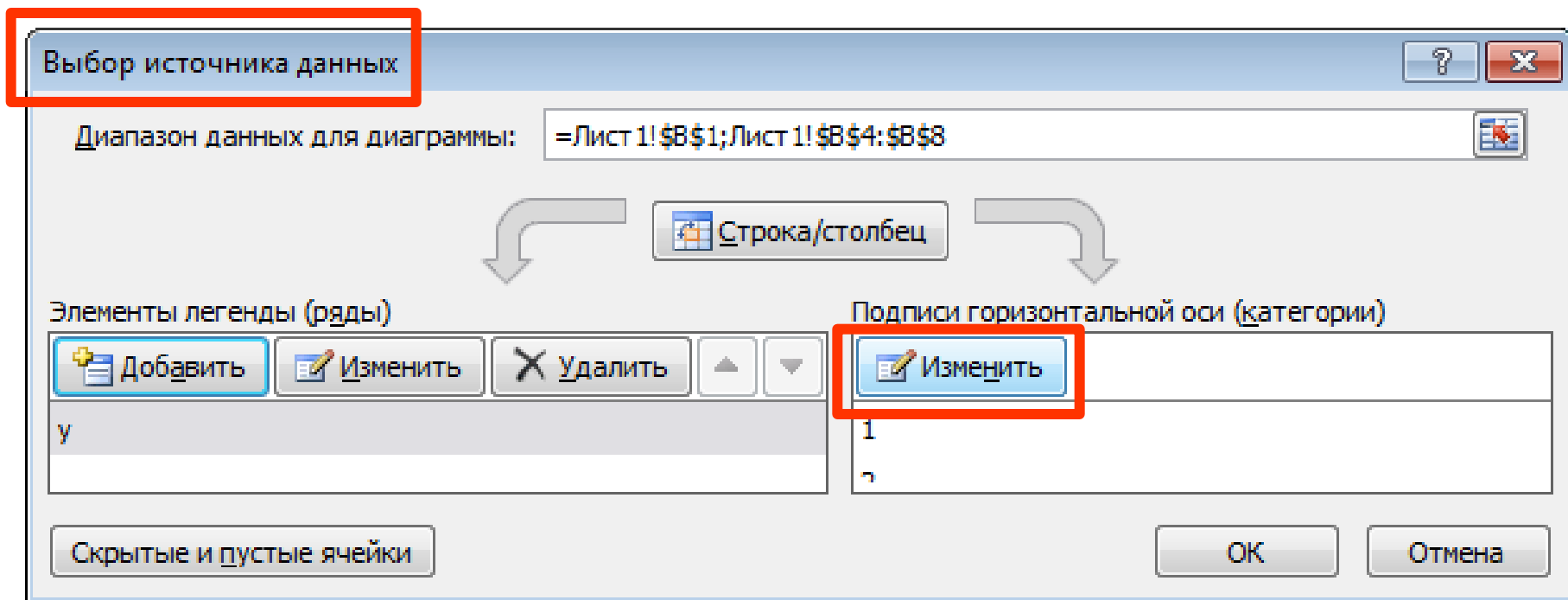
Изменение ряда (Edit series) > Имя ... (Name), Значения (Values)



$$\cos(4x^2-3x-2)=0$$

Selection of the tool to specify argument values

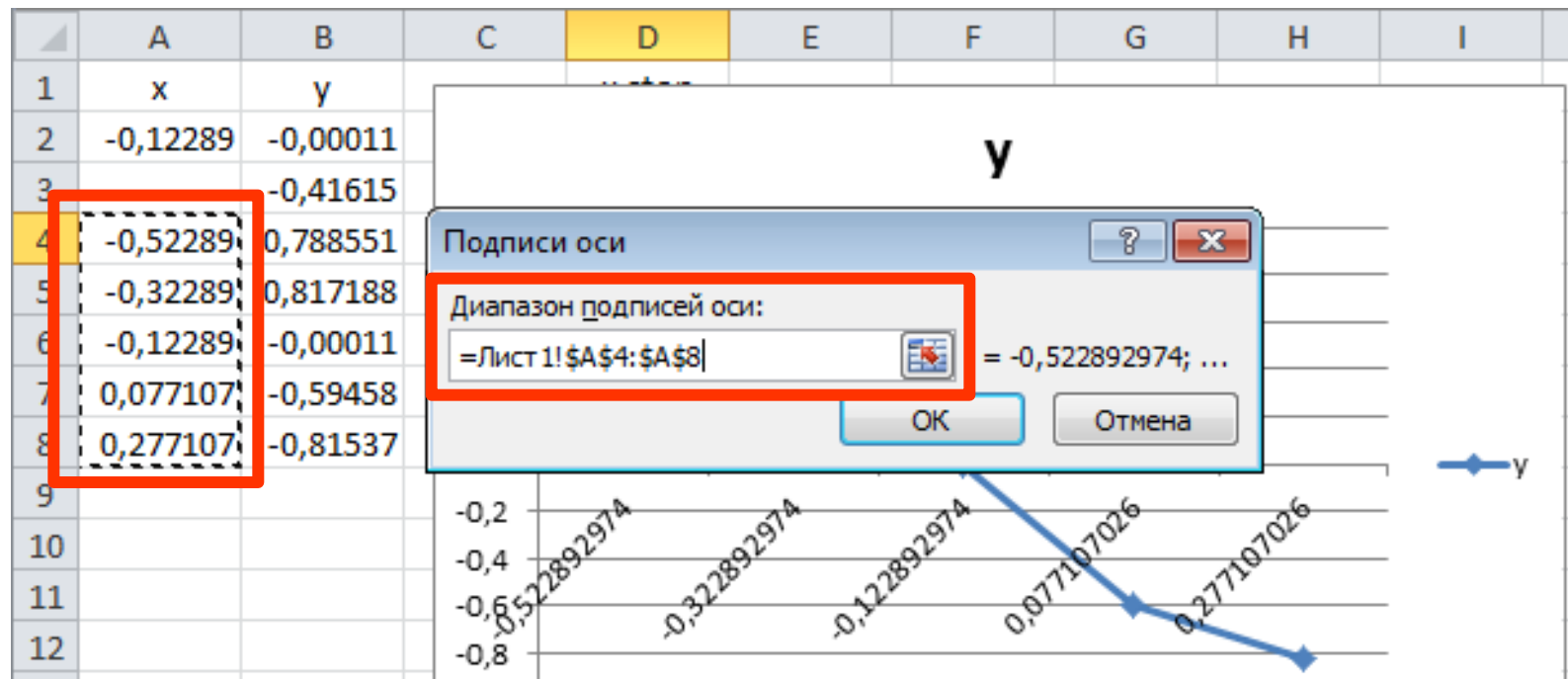
Выбор источника данных (Select data source) > Подписи горизонтальной оси (Horizontal axis labels) > Изменить (Edit)



$$\cos(4x^2-3x-2)=0$$

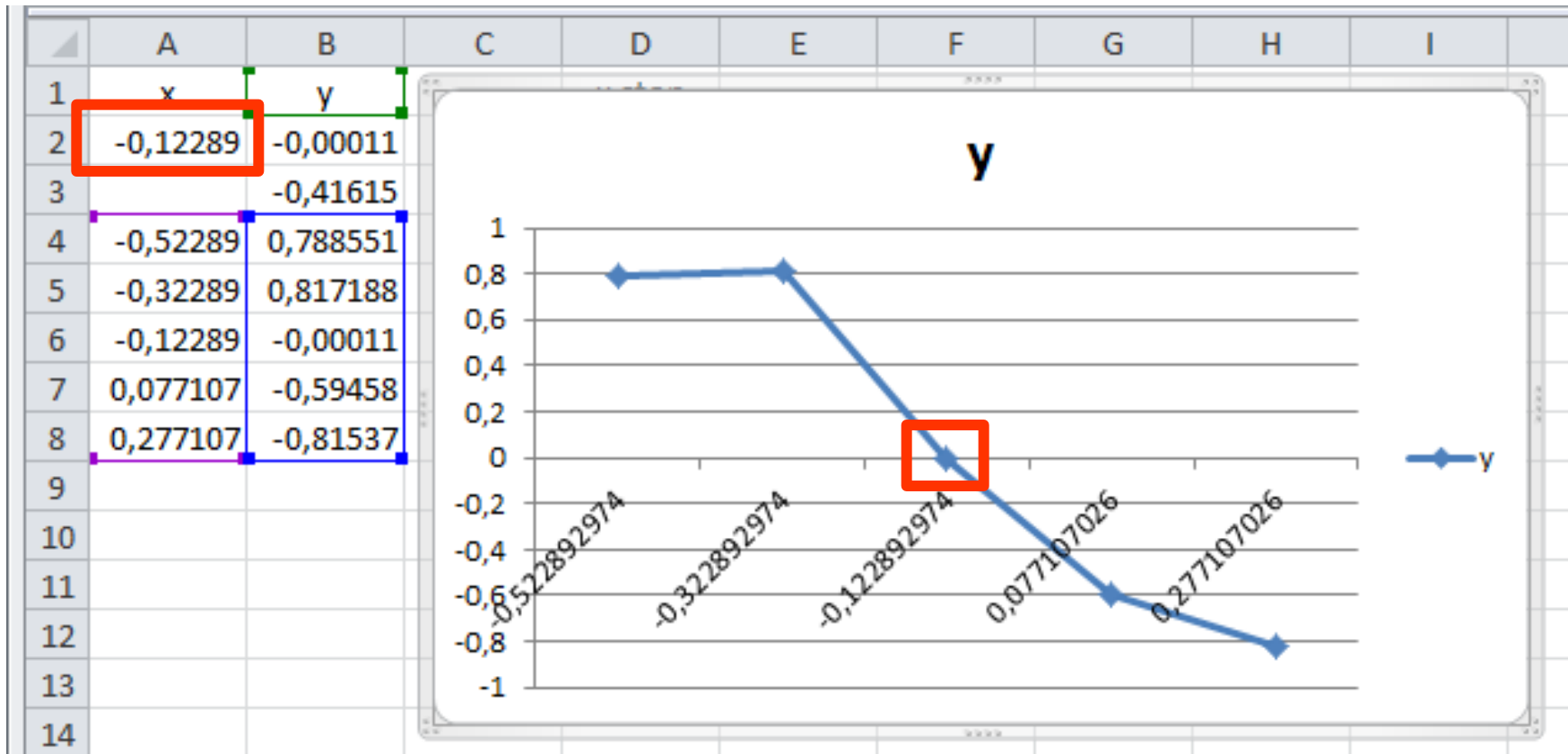
Setting links to a list of argument values

Подписи оси (Axis labels) > ...



$$\cos(4x^2-3x-2)=0$$

Checking the position of equation result (cross between graph and x axis)

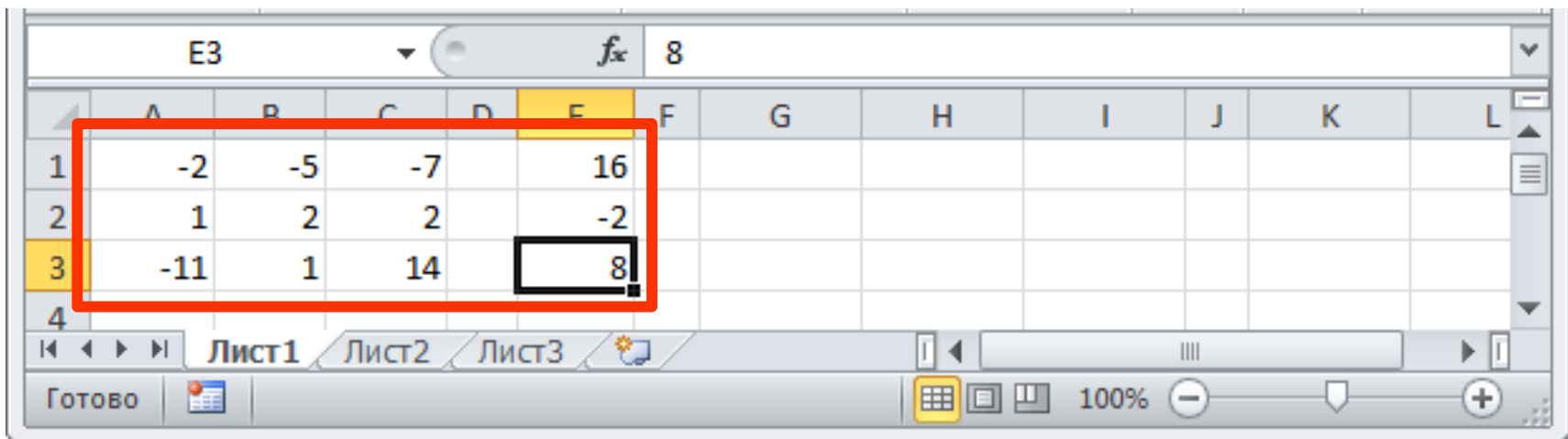


System of equations solving

$$\begin{cases} -2x - 5y - 7z = 16 \\ x + 2y + 2z = -2 \\ -11x + y + 14z = 8 \end{cases}$$

$$AX=b, X=A^{-1}b$$

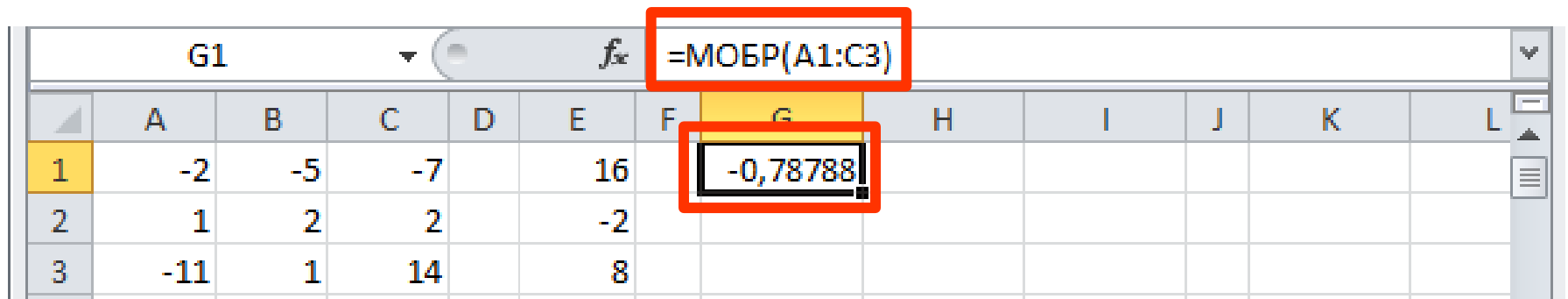
Typing values of all the system coefficients



$$\begin{cases} -2x - 5y - 7z = 16 \\ x + 2y + 2z = -2 \\ -11x + y + 14z = 8 \end{cases}$$

$$AX=b, X=A^{-1}b$$

Making expression to calculate reverse matrix (MINVERSE)



The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H	I	J	K	L
1	-2	-5	-7		16		=МОБР(A1:C3)					
2	1	2	2		-2		-0,78788					
3	-11	1	14		8							

$$\begin{cases} -2x - 5y - 7z = 16 \\ x + 2y + 2z = -2 \\ -11x + y + 14z = 8 \end{cases}$$

$$AX=b, X=A^{-1}b$$

Selecting appropriate region to place reverse matrix

G1		fx = =МОБР(A1:C3)										
	A	B	C	D	E	F	G	H	I	J	K	L
1	-2	-5	-7		16		-0,78788					
2	1	2	2		-2							
3	-11	1	14		8							

Activating expression field

СТЕПЕНЬ		fx = =МОБР(A1:C3)										
	A	B	C	D	E	F	G	H	I	J	K	L
1	-2	-5	-7		16		=МОБР(A1:C3)					
2	1	2	2		-2							
3	-11	1	14		8							

$$\begin{cases} -2x - 5y - 7z = 16 \\ x + 2y + 2z = -2 \\ -11x + y + 14z = 8 \end{cases} \quad AX=b, X=A^{-1}b$$

Selection of appropriate region to place result matrix

K1		fx =МУМНОЖ(G1:I3;E1:E3)										
	A	B	C	D	E	F	G	H	I	J	K	L
1	-2	-5	-7		16		-0,78788	-1,90909	-0,12121		-9,75758	
2	1	2	2		-2		1,090909	3,181818	0,090909			
3	-11	1	14		8		-0,69697	-1,72727	-0,0303			

Activation of expression field

СТЕПЕНЬ		fx =МУМНОЖ(G1:I3;E1:E3)										
	A	B	C	D	E	F	G	H	I	J	K	L
1	-2	-5	-7		16		-0,78788	-1,90909	-0,12121		=МУМНОЖ	
2	1	2	2		-2		1,090909	3,181818	0,090909			
3	-11	1	14		8		-0,69697	-1,72727	-0,0303			

$$\begin{cases} -2x - 5y - 7z = 16 \\ x + 2y + 2z = -2 \\ -11x + y + 14z = 8 \end{cases} \quad AX=b, X=A^{-1}b$$

Pressing keyboard combination: CTRL+SHIFT+ENTER

	A	B	C	D	E	F	G	H	I	J	K	L
1	-2	-5	-7		16		-0,78788	-1,90909	-0,12121		-9,75758	
2	1	2	2		-2		1,090909	3,181818	0,090909		11,81818	
3	-11	1	14		8		-0,69697	-1,72727	-0,0303		-7,93939	

Checking results of calculation (from last matrix-column).

	A	B	C	D	E	F	G	H	I	J	K	L
1	-2	-5	-7		16		-0,78788	-1,90909	-0,12121		-9,75758	
2	1	2	2		-2		1,090909	3,181818	0,090909		11,81818	
3	-11	1	14		8		-0,69697	-1,72727	-0,0303		-7,93939	
4												
5					16							