SOLUTION OF HIGHER DEGREE EQUATION SYSTEMS WITH THE HELP OF EXCEL

Amonov Zikrillo Shukrullo ugli
Student at Bukhara State University
Amonovzikrillo7@gmail.com

Annotation: This article highlights the practical aspect of the Excel features.

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Today, there is a rising demand to improve educational efficiency through the broad application of novel pedagogical and information technologies in the educational process. The use of new information and communication technologies in mathematics lessons saves time, increases students' comprehensive knowledge by solving many problems and examples, allows them to think independently, independently fulfill the conditions of the task, gain a deep understanding of the subject, and independently express their ideas. When using Excel to solve some examples and problems, an accurate and simple solution can be obtained in a much shorter period of time. At the same time, an image of the exact solution of the system is created in the Excel window. This, in turn, allows students to learn by listening, seeing and doing. The following systems of higher power equations can be solved in an easier way using Excel:

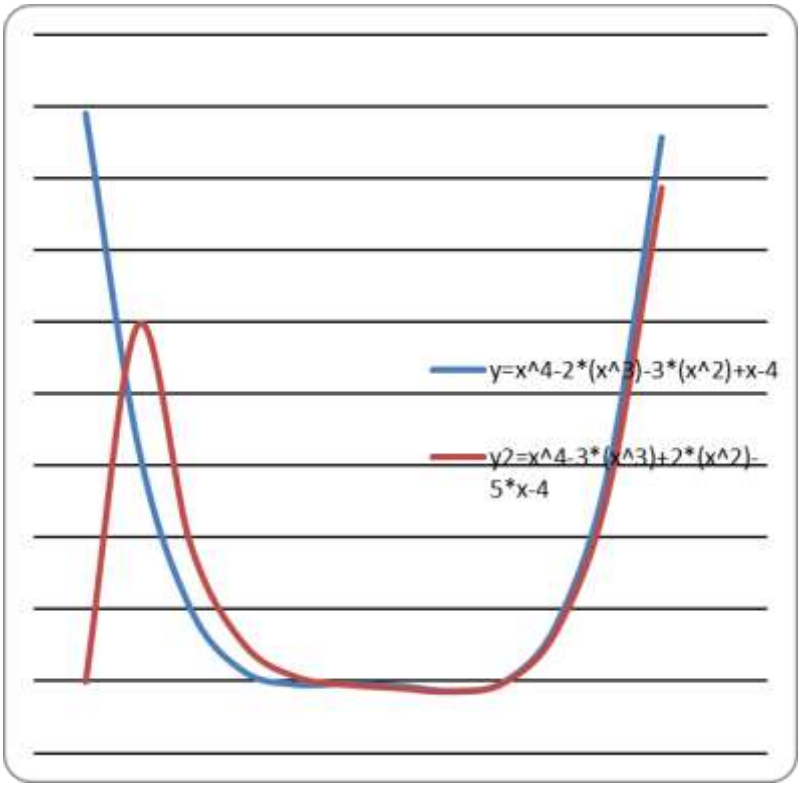
Example 1: Solve system of equations with the use of graphics:

$$\begin{cases} x^4 - 2x^3 - 3x^2 + x = y + 4 \\ x^4 - 3x^3 + 2x^2 - 5x - 10 = y + 5x - 6 \end{cases}$$

To determine this answer, we first express y from the system's first equation in terms of x. We enter the values of x in the first column and their values below it, y1 in the first cell of the second column, and the expression for y expressed through x obtained from the system's first equation in the cell below it, and press the "ENTER" button. As a result, we receive the variable x-dependent value y1. Then, move the cursor to the cell's bottom right corner. When a thick black cursor (cross) appears, left click and drag the pointer over the same number of cells in column y1 as there are in column x. As a consequence, we identify all y1 values that correspond to the specified x values. We insert the expression y expressed in terms of x from the system's second equation in the first cell of the third column and continue the process for the values of y1. Then, from the Insert menu, pick all three columns and click the Dot command. As a result, we get a graph of both equations in a single coordinate plane, and the place where these lines connect is a solution to the system.

	y=x^4-2*(x^3)-3*(x^2)+x-4	y2=x^4-3*(x^3)+2*(x^2)-5*x-4
5	791	
4	328	496
3	101	191
2	14	54
1	-5	7
	-4	-4
	-7	-9
	-14	-14

	-1	-1
	80	72
	301	271
	758	686



As a result, the solution to this system (0; -4); (2; -14): (3; -1).

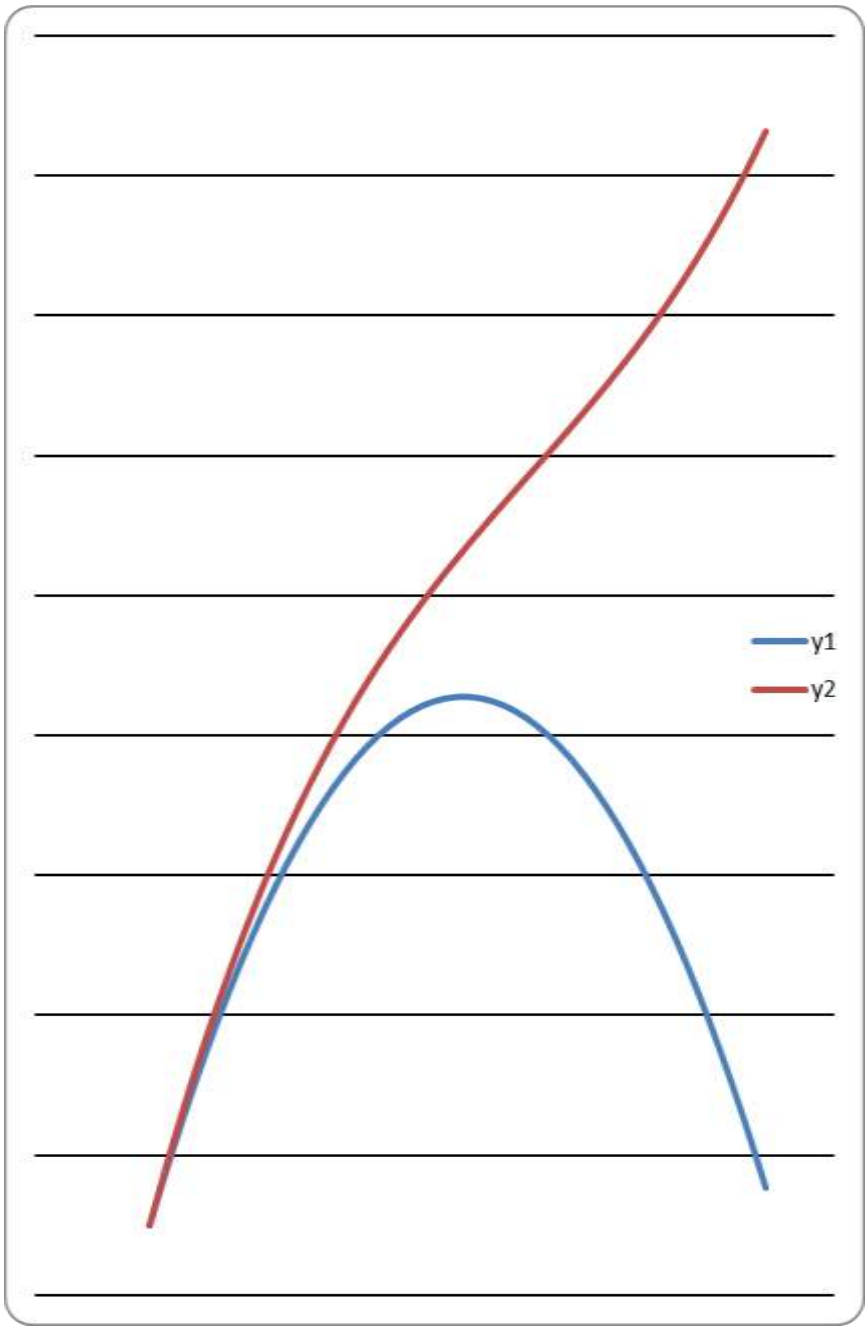
Example 2. The solution to the following system of equations is located in which quadrant of the coordinate system:

$$\begin{cases} -4x^2 + 3x = y - 2 \\ x^3 - 2x^2 + 5x = y - 3 \end{cases}$$

X	y_1	y_2
-0,6	-1,24	-0,936
-0,5	-0,5	-0,125
-0,4	0,16	0,616
-0,3	0,74	1,293

-0,2	1,24	1,912
-0,1	1,66	2,479
0	2	3
0,1	2,26	3,481
0,2	2,44	3,928
0,3	2,54	4,347
0,4	2,56	4,744
0,5	2,5	5,125
0,6	2,36	5,496
0,7	2,14	5,863
0,8	1,84	6,232
0,9	1,46	6,609
1	1	7
1,1	0,46	7,411
1,2	-0,16	7,848

The strategy described above is used to solve this system.

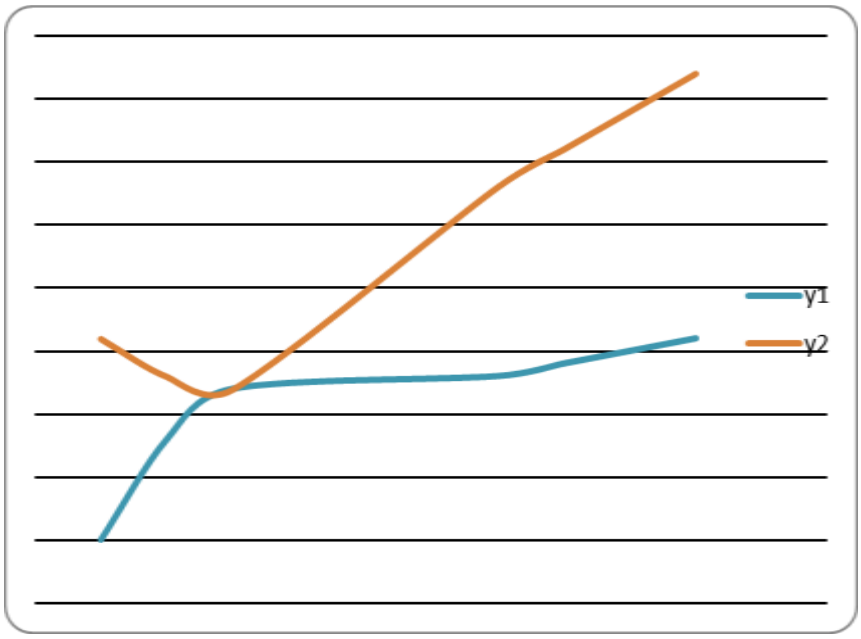


Therefore, the solution to this system is the point (-1; -5), and this point is in the third quarter of the coordinate system.

Example 3. How many solutions does the following system of equations have:

$$\begin{cases} x^5 + +4x^3 - 2x^2 + x - 7 - y = 0 \\ x^4 - 5x^3 = y - 3x - 2 \end{cases}?$$

	y	
	1	2
2	-81	8
1	-15	
	-7	2
	-3	3
	5 1	20
	3 29	47
	1 245	54
	-2	3
	-1	6
	0	9
	1	2



As a result, there is only one solution to this system of equations.

This article demonstrates how Excel can be utilized in a variety of mathematical applications. Solving problems with Excel has a lot of benefits, including improved worldview, logical thinking, and simplified solution.

Literature:

1.M.A. Mirzaaxmedov, Sh. N. Ismailov, A.Q.Amanov “10 – sinf Matematika darsligi” Toshkent - 2017 y

2. “Matematika fanidan mavzulashtirilgan testlar to’plami”.

3. Internet ресурсы.