

Solving a System of Equations by Graphing or Tool Feature

A system of equations is made up of two or more equations. The calculator provides the Calculate feature and Tool feature to solve a system of equations. The Calculate feature finds the solution by calculating the intersections of the graphs of equations and is useful for solving a system when there are two variables, while the Tool feature can solve a linear system with up to six variables and six equations.

Example

Solve a system of equations using the Calculate or Tool feature. First, use the Calculate feature. Enter the equations, draw the graph, and find the intersections. Then, use the Tool feature to solve a system of equations.

1. Solve the system using the Calculate feature.

$$\begin{cases} y = x^2 - 1 \\ y = 2x \end{cases}$$

2. Solve the system using the Tool feature.

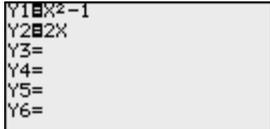
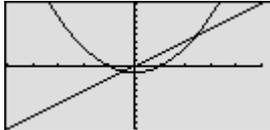
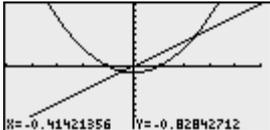
$$\begin{cases} 5x + y = 1 \\ -3x + y = -5 \end{cases}$$

Before Starting

There may be differences in the results of calculations and graph plotting depending on the setting. Return all settings to the default value and delete all data. Set viewing window to “-5 < X < 5”, “-10 < Y < 10”.

WINDOW **(-)** **5** **ENTER** **5** **ENTER**

As the Tool feature is only available on the Advanced keyboard, example 2 does not apply to the Basic keyboard.

<u>Step & Key Operation</u>	<u>Display</u>	<u>Notes</u>
<p>1-1 Enter the system of equations $y = x^2 - 1$ for Y1 and $y = 2x$ for Y2.</p> <p>Y= X/θ/T/π X² - 1 ENTER</p> <p>2 X/θ/T/π</p>		
<p>1-2 View the graphs.</p> <p>GRAPH</p>		
<p>1-3 Find the left-hand intersection using the Calculate feature.</p> <p>2nd F CALC 2</p>		Note that the x and y coordinates are shown at the bottom of the screen. The answer is : $x = -0.41$ $y = -0.83$
<p>1-4 Find the right-hand intersection by accessing the Calculate feature again.</p> <p>2nd F CALC 2</p>		The answer is : $x = 2.41$ $y = 4.83$

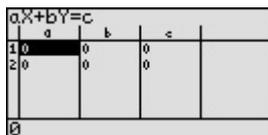
Step & Key Operation

Display

Notes

2-1 Access the Tool menu. Select the number of variables.

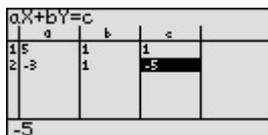
2nd F **TOOL** **B** **2**



Using the system function, it is possible to solve simultaneous linear equations. Systems up to six variables and six equations can be solved.

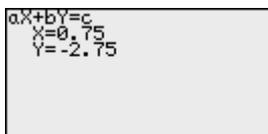
2-2 Enter the system of equations.

5 **ENTER** **1** **ENTER** **1** **ENTER**
(-) **3** **ENTER** **1** **ENTER** **(-)** **5**
ENTER



2-3 Solve the system.

2nd F **EXE**



$x = 0.75$
 $y = -2.75$



A system of equations can be solved easily by using the Calculate feature or Tool feature.