



Graphing Calculator Investigation

A Follow-Up of Lesson 10-4

TI-73

Solving Quadratic-Linear Systems

Since you can graph multiple functions on a graphing calculator, it is a useful tool when finding the intersection points or solutions of a system of equations in which one equation is quadratic and one is linear.

Solve the following quadratic-linear system of equations.

$$y + 1 = x$$
$$y = -x^2 + 2x + 5$$

Step 1 Solve each equation for y .

- $y + 1 = x$
 $y = x - 1$
- $y = -x^2 + 2x + 5$

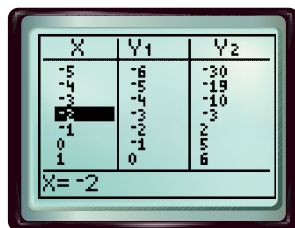
Step 2 Graph the equations on the same screen.

- Enter $y = x - 1$ as Y_1 .
- Enter $y = -x^2 + 2x + 5$ as Y_2 .
- Graph both in the standard viewing window.

Step 3 Approximate the intersection point.

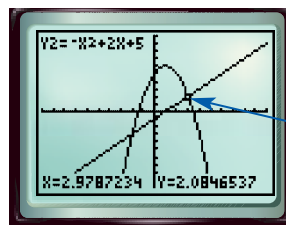
- Use a table to approximate the first intersection point. Look for places where $Y_1 = Y_2$.

KEYSTROKES: **2nd** [TBLSET] **-3** **ENTER** **1** **ENTER**
ENTER **2nd** [TABLE]



Step 4 Approximate the other intersection point.

- Use the TRACE feature with the right and left arrow keys to move the cursor near the other intersection point.



A second solution is (3, 2).

Thus, the solutions of the quadratic-linear system are $(-2, -3)$ and $(3, 2)$.

Exercises

Use the intersect feature to solve each quadratic-linear system of equations. State any decimal solutions to the nearest tenth.

- $y = -2(2x + 3)$
 $y = x^2 + 2x + 3$ **$(-3, 6)$**
- $y - 5 = 0$
 $y = -x^2$ **no solution**
- $1.8x + y = 3.6$
 $y = x^2 - 3x - 1$ **$(-1.6, 6.5)$, $(2.8, -1.5)$**
- $y = -1.4x - 2.88$
 $y = x^2 + 0.4x - 3.14$ **$(-1.9, -0.2)$, $(0.1, -3.1)$**
- $y = x^2 - 3.5x + 2.2$
 $y = 2x - 5.3625$ **$(2.8, 0.1)$**
- $y = 0.35x - 1.648$
 $y = -0.2x^2 + 0.28x + 1.01$
 $(-3.8, -3.0)$, $(3.5, -0.4)$



www.algebra1.com/other_calculator_keystrokes