

Example 1 Solve a Linear-Quadratic System by Using Substitution

Solve the system of equations.

$$x = 2y^2 + 3y + 1 \quad (1)$$

$$-x + y = -1 \quad (2)$$

Step 1 Solve Equation (2) for x .

$$-x + y = -1$$

Equation (2)

$$-x = \square - 1$$

Subtract y from each side.

$$x = \square + \square$$

Divide each side by -1 .

Step 2 Substitute for x in Equation (1). Then solve for y .

$$x = 2y^2 + 3y + 1$$

Equation (1)

$$\square = 2y^2 + 3y + 1$$

$$0 = 2y^2 + \square$$

Simplify.

$$0 = 2y(\square)$$

Factor out $2y$.

$$y = \square \text{ or } y = \square$$

Zero Product Property

Step 3 Substitute the y -values and solve for x .

Case 1

Case 2

$$x = y + 1$$

Equation (2)

$$x = y + 1$$

$$= \square + 1 = \square$$

Substitute for y and simplify.

$$= \square + 1 = \square$$

The two solutions of the system are $(1, \square)$ and $(0, \square)$.