

How Do We Solve A Linear-Quadratic System Algebraically?

To obtain an algebraic solution for a linear-quadratic system:

1. *Rewrite the linear equation so that one variable is expressed in terms of the other, for example, y in terms of x .*
2. *Substitute the expression for y obtained from the linear equation into the quadratic equation, thus obtaining a quadratic equation in one variable, x .*
3. *Solve the quadratic equation in one variable, thus obtaining two values for x .*
4. *Substitute each value of x into the linear equation to obtain the corresponding y -values.*
5. *Check both sets of ordered pairs in each of the original equations.*

Examples: Solve the following systems of equations and check.

$$\begin{array}{l} 1) y = x^2 - 4x + 3 \\ y = 2x - 2 \end{array}$$

$$\begin{array}{l} 2) y = x^2 + 3x + 1 \\ y - x = 4 \end{array}$$

$$3) y = x^2 + 3x - 7$$

$$y - 3x = 9$$

$$4) y = x^2 - 4x - 2$$

$$y = x - 2$$

$$5) x + y = 1$$

$$y = -x^2 + 4x - 3$$