

Example 3 Use a System to Solve a Quadratic Equation

Use a system of equations to solve $x^2 - 2x + 6 = 4x + 1$.

Step 1 Create a system of equations.

$$y = x^2 - 2x + 6 \quad (1)$$

$$y = 4x + 1 \quad (2)$$

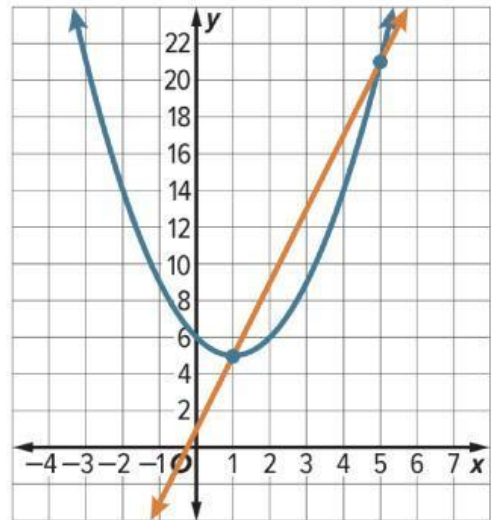
Step 2 Graph the system.

The functions appear to intersect at (1, 5) and (5, 21), so the solutions of $x^2 - 2x + 6 = 4x + 1$ are

$$x = \underline{\hspace{2cm}}$$

and

$$x = \underline{\hspace{2cm}}$$



Different method

$$x^2 - 2x + 6 = 4x + 1$$

$$x^2 - 2x + 6 - \square - \square = 0$$

$$x^2 - \square + \square = 0$$

$$(x - \square)(x - \square) = 0$$

$$x = \square \text{ and } x = \square$$

original equation

move everything to the left side

simplify

solve by factoring

solve x for each bracket