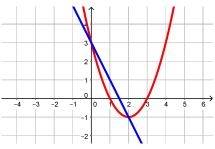
**Example:** Find solutions to the System of Equations:

$$y = x^2 - 4x + 3$$
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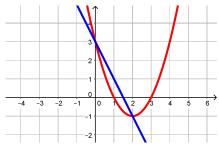
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Graphically, solutions are the Points of Intersection

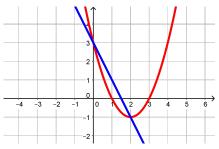


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Algebraically, we look at: y = y



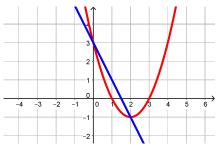
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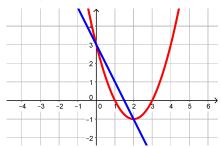
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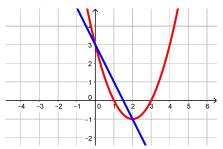
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To solve for x, we want to get 0 on one side of the quadratic equation:

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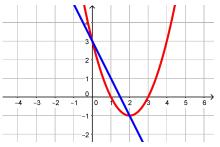
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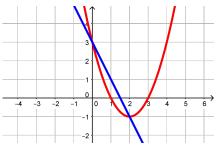
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To solve for x, we want to get 0 on one side of the quadratic equation:  $x^2 - 4x + 3 - (-2x + 3) = -2x + 3 - (-2x + 3) = 0$ 

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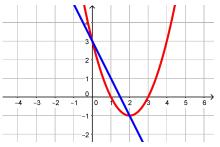
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$$x^{2} - 2x = x^{2} - 4x + 3 - (-2x + 3) = -2x + 3 - (-2x + 3) = 0$$

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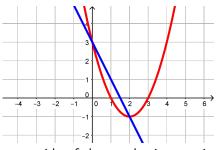
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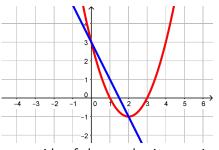
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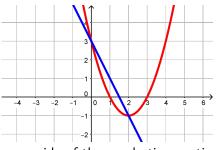
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Algebraically, we look at: y = y

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We can use the x-values of the points x = 0, 2 to find the y-values

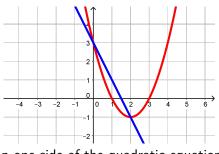
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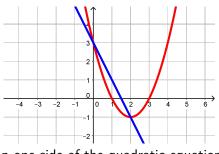
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We can use the x-values of the points x = 0, 2 to find the y-values

For x = 0:  $y = -2 \cdot 0 + 3$ 

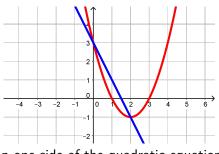
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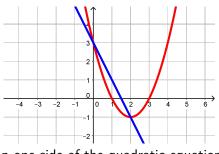
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We can use the x-values of the points x = 0, 2 to find the y-values

For x = 0:  $y = -2 \cdot 0 + 3 = 3 \rightarrow A$  solution is: (0,3)

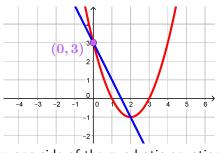
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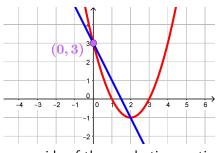
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For x = 2

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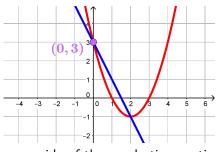
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Graphically, solutions are the Points of Intersection

Algebraically, we look at: y = y

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

Here, we can solve for the x-value of the solution



To solve for x, we want to get 0 on one side of the quadratic equation:  $x^2 - 2x - x^2 - 4x + 3 = (-2x + 3) = -2x + 3 = (-2x + 3) = 0$ 

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For x = 2:  $y = -2 \cdot 2 + 3$ 

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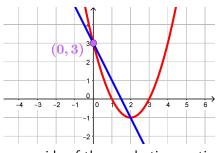
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Algebraically, we look at: y = y

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

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To solve for x, we want to get 0 on one side of the quadratic equation:  $x^2 - 2x - x^2 - 4x + 3 = (-2x + 3) = -2x + 3 = (-2x + 3) = 0$ 

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For 
$$x = 2$$
:  $y = -2 \cdot 2 + 3 = -1$ 

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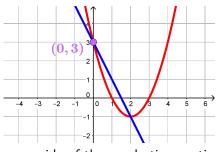
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Graphically, solutions are the Points of Intersection

Algebraically, we look at: y = y $x^2 - 4x + 3 = -2x + 3$ 

Here, we can solve for the 
$$x$$
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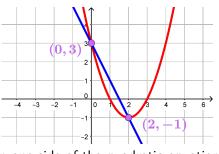
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Algebraically, we look at: y = y

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

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To solve for x, we want to get 0 on one side of the quadratic equation:  $x^2 - 2x = x^2 - 4x + 3 - (-2x + 3) = -2x + 3 - (-2x + 3) = 0$ 

$$(x^2 - 2x) = x^2 - 4x + 5 - (-2x + 5) = -2x + 5 - (-2x + 5)$$

We can solve the quadratic equation  $x^2 - 2x = 0 \rightarrow x = 0, 2$ 

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For x = 0:  $y = -2 \cdot 0 + 3 = 3 \rightarrow A$  solution is: (0,3)

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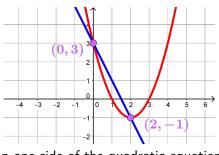
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To solve for x, we want to get 0 on one side of the quadratic equation:  $x^2 - 2x = \frac{x^2}{4x} + \frac{3}{4x} - (-2x + 3) = -2x + 3 - (-2x + 3) = 0$ 

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For x = 0:  $y = -2 \cdot 0 + 3 = 3 \to A$  solution is: (0,3)

For x = 2:  $y = -2 \cdot 2 + 3 = -1 \rightarrow A$  solution is: (2, -1)

Note: The graph was not used to find solutions, only to visualize them