Solving Quadratics without Factoring - Example

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Example: Find the solution(s) to:

$$(x+2)^2 - 3 = 0$$

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To solve for x we have to undo 3 operations, which are:

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Example: Find the solution(s) to:

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To solve for x we have to undo 3 operations, which are:
Add 2

Solving Quadratics without Factoring - Example

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$$(x+2)^2 - 3 = 0$$

To solve for x we have to undo 3 operations, which are:
Add 2
Square it

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Example: Find the solution(s) to:

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To solve for x we have to undo 3 operations, which are:
Add 2
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Subtract 3

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Like Frog and Toad we undo these operations in the opposite order.

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Take the Square Root

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Since $|x+2|=\sqrt{3}$, we know that $x+2=\pm\sqrt{3}$

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Subtracting 2 from both sides gives the solutions: $x=-2\pm\sqrt{3}$

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Since $|x+2|=\sqrt{3}$, we know that $x+2=\pm\sqrt{3}$

Subtracting 2 from both sides gives the solutions: $x=-2\pm\sqrt{3}$

We can write the solutions as a list:

$$x=-2+\sqrt{3},-2-\sqrt{3}$$

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$$(x + 2) \cdot (x + 2) - 3 = 0$$

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$\mathbf{x^2}$

$$= (\mathbf{x} + 2) \cdot (\mathbf{x} + 2) - 3 = 0$$

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$$x^2 + 4x + 1 = 0$$

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$$x^2 + 4x + 1 = (x+2)^2 - 3$$

x only shows up in one place if we write the quadratic as: $(x+2)^2 - 3$

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This question becomes:
If we are given an equation in the form: $ax^2 + bx + c = 0$
How do we write it in the form: $a(x-h)^2 + k$

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Because once we write the quadratic in this form, we can solve it!

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Because once we write the quadratic in this form, we can solve it!
Note: In this example, $a = 1$, $h = -2$, and $k = -3$
We will see soon why having $-h$ and $+k$, is useful