

3.1 - Quadratic Equations

Quadratic equations are closely related to quadratic functions...

A QE ("quadratic equation") is an equation of the form _____ and $a \neq 0$

In solving a QE, you are finding the _____ or _____ or _____ of the related quadratic function. This is done by factoring or using the quadratic formula.

Solving by factoring

For an equation like $ab = 0$, there are only two solutions:

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No other combination of a and b will give a zero result.

Similarly, for the equation $(x - s)(x - t) = 0$, there are only two solutions as well

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If we solve each for "x" then we get the two possible solutions to the equation. Either,

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This also works for equations such as $k(x - s)(x - t) = 0$. This is simply the factored form of a QF, where s and t are the roots of the function.

***To find the solution to a QE, find the roots of the related function.

Example#1: Find the solution to the QE $x^2 + 5x + 6 = 0$

In some cases, the equation will need to be manipulated into the form $ax^2 + bx + c = 0$

Example #2: Solve the following QE's

a) $x^2 - 6x = -9$

b) $2x^2 + 7x + 11 = 8$

Warning: In certain cases, there will be no solution to the QE. Visually, this corresponds to the graph of the related QF having no "zeros" or x-intercepts.

Example: Solve $x^2 + 9 = 0$