Advanced Algebra 3/4 Name:___________

Solving Quadratics by Undoing

Many quadratic equations can be solved by undoing operations on both sides of the equation. These quadratics are in what is called **vertex form** (more on that in Unit 2). Remember that these equations often have **2 solutions** (but can also have 1 or no solutions).

Example: Compare these two equations. Notice how similar the steps for solving are.

Algebra Words	Algebra Words
$3(x+5)-2=25$	$3(x+5)^2-2=25$
Check your solution(s)	Check your solution(s)

Remember that solving an equation means finding a number (or numbers) that make the equation true. You can feel confident in your solution(s) by plugging in the value(s).

Solve the following equations and check your answers.

- $x+5=30$
- $x^2+5=30$
- $2(x+5)=32$
- $2(x+5)^2=32$
- $-3(x+5)+1=-26$
- $-3(x+5)^2+1=-26$

Not all quadratic equations are written in **vertex form.** When they are in **standard form** or in **factored form,** we use different techniques to solve them. Below are examples of each form:

Vertex Form	**Standard Form**	**Factored Form**
$-5(x-3)^2-3=-122$ $(x+1)^2-5=31$ You can solve by undoing because "x" is isolated	$x^2-4x-5=0$ $x^2+7x+12=0$ You **cannot** solve by undoing because "x" is in two locations	$-3(x-5)(3x-2)=0$ $(x+5)(x+2)=0$ You **cannot** solve by undoing because "x" is in two locations

The following quadratic equations are mixed up. Your task is to **identify** what form the equation is in, and then **solve** the equations in **vertex form.** If you finish early, try to reach back in your memory bank and remember how to solve equations in **standard form** or **factored form.**

$(x-3)^2+2=11$	$x^2-7x-8=0$	$3(x+5)^2=48$
$(x-3)(x+5)=0$	$x^2-9=0$	$x^2-9x-22=0$
$-5(x-7)^2+5=0$	$2(x+5)(x-3)=0$	$-2(x+3)^2+7=-1$

Write yourself a summary of what you have learned about solving quadratic equations: