

Solving Quadratics

1. Factoring
2. Square Roots
3. Completing the Square
4. Quadratic Formula

	Looks Like	How to Factor	Examples
Factoring	$ax^2 - bx = 0$ $x^2 + bx + c = 0$ $ax^2 + bx + c = 0$ No parentheses in original equation	Must be set equal to zero before solving Factor (See Factoring Sheet) <ul style="list-style-type: none"> • Use Area Model to put into 2 binomials () () = 0 • Or GCF ____ () = 0 • Then use the Zero Product Property (ZPP) • Write answers as: $x = \{ \quad , \quad \}$ 	$4x^2 + 8x = 0$ (GCF) (GCF, then Factor) $3x^3 - 21x^2 + 24x = 0$
Square Roots	$ax^2 = c$ $ax^2 - c = 0$ $a(x - \#)^2 = c$ No b term	<ul style="list-style-type: none"> • Does not have to be set equal to zero before solving • Isolate the expression being squared • Take the square root on both sides of the equation (include \pm) • Solve both equations if necessary • Write answers as: $x = \{ \quad , \quad \}$ 	$2x^2 + 5 = 55$ $2(x + 4)^2 = 90$

<p style="text-align: center;">Completing the Square</p>	<p style="text-align: center;">$x^2 + bx + c$</p> <p style="text-align: center;">$a = 1$ b is even</p>	<ul style="list-style-type: none"> • Collect variables on the left, numbers on the right • Take half of b and square this number, $\left(\frac{b}{2}\right)^2$ • Add this number to BOTH sides of the equation • Factor the left side of the equation – you should get ()² • Take the square root on both sides; include (\pm) • Write 2 equations and solve for the variable (simplify all roots) • Write answers as: $x = \{ \quad , \quad \}$ 	<p style="text-align: center;">$x^2 - 8x + 15 = 0$</p>
<p style="text-align: center;">Quadratic Formula</p>	<p style="text-align: center;">$ax^2 + bx + c = 0$</p> <p style="text-align: center;">Use for ANY quadratic written in standard form</p>	<ul style="list-style-type: none"> • Put into standard form ($ax^2 + bx + c = 0$) • List $a = \underline{\quad}$, $b = \underline{\quad}$, $c = \underline{\quad}$ • Plug a, b, and c into, $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ <ul style="list-style-type: none"> • Simplify all roots • Reduce only if ALL terms can divide evenly by the same factor • Write answers as: $x = \{ \quad , \quad \}$ 	<p style="text-align: center;">$4x^2 + 7x - 15 = 0$</p>