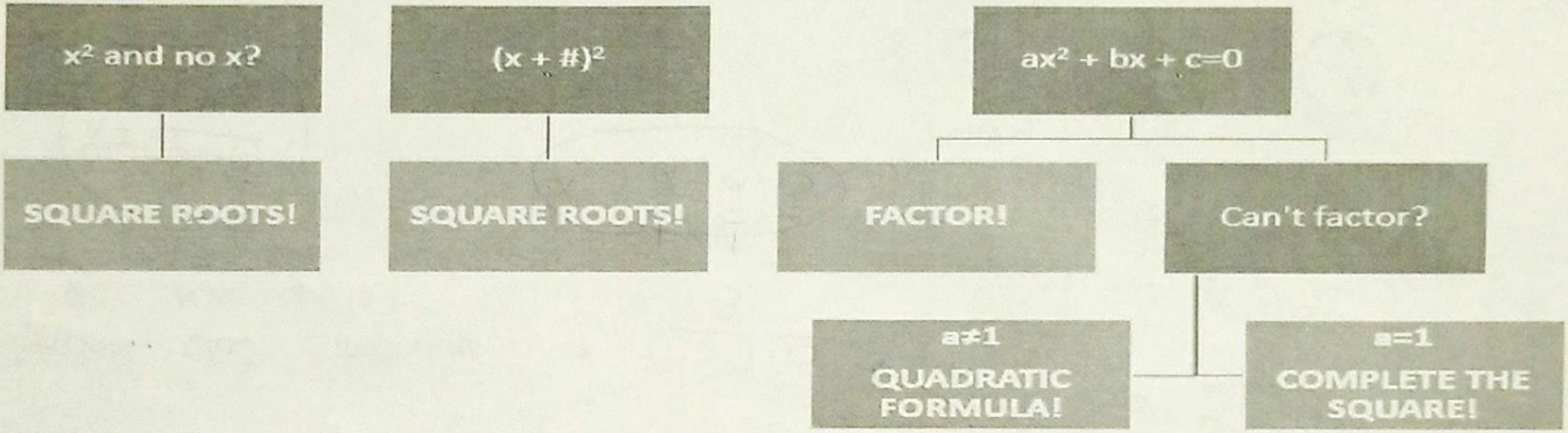
NOTES: The Quadratic Formula **Date:**



Example:	Method:	Example:	Method:
$-16x^2 + 256 = 0$	SQUARE ROOTS	$(x-4)^2 + 5 = 29$	SQUARE ROOTS
$-256 \quad -256$ $\frac{-16x^2}{-16} = \frac{-256}{-16}$ $\sqrt{x^2} = \sqrt{4}$ $x = \pm 2$		$-5 \quad -5$ $\sqrt{(x-4)^2} = \sqrt{24}$ $x - 4 = \pm 2\sqrt{6}$ $+4 \quad +4$	$x = \pm 2\sqrt{6} + 4$
Example:	Method	Example:	Method:
$x^2 - 10x + 24 = 0$	FACTOR	$x^2 - 10x - 26 = 0$	COMPLETE THE SQUARE
$(x-6)(x-4) = 0$ $x = 6 \quad x = 4$		$x^2 - 10x = 26$ $x^2 - 10x + 25 = 51$ $\sqrt{(x-5)^2} = \sqrt{51}$ $x - 5 = \pm\sqrt{51}$ $x = \pm\sqrt{51} + 5$	

The Quadratic Formula: This magic formula will solve ANY QUADRATIC EQUATION. No. Matter. What. When in doubt of which method to use, *you can always use the quadratic formula*

The standard form of a quadratic equation is $ax^2 + bx + c$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Example 1: The radical will **NOT SIMPLIFY**	Example 2: The radical **WILL SIMPLIFY**	Example 3: The radical is a **PERFECT SQUARE!**
$3x^2 + 5x + 1 = 0$	$4x^2 + 4x - 14 = 0$	$3x^2 + 5x - 12 = 0$
$a=3 \quad b=5 \quad c=1$	$a=4 \quad b=4 \quad c=-14$	$a=3 \quad b=5 \quad c=-12$
$x = \frac{-5 \pm \sqrt{(5)^2 - 4(3)(1)}}{2(3)}$	$x = \frac{-4 \pm \sqrt{(4)^2 - 4(4)(-14)}}{2(4)}$	$x = \frac{-5 \pm \sqrt{(5)^2 - 4(3)(-12)}}{2(3)}$
$x = \frac{-5 \pm \sqrt{13}}{6}$	$x = \frac{-4 \pm \sqrt{240}}{8}$	$x = \frac{-5 \pm \sqrt{169}}{6}$
NOTHING CAN SIMPLIFY SO OUR ANSWER IS	$x = \frac{-4 \pm 4\sqrt{15}}{8}$ SIMPLIFY	$x = \frac{-5 \pm 16}{6}$
$x = \frac{-5 \pm \sqrt{13}}{6}$	$x = -\frac{1}{2} \pm \frac{1}{2}\sqrt{15}$ → 8 CAN DIVIDE INTO -4 AND 4	$\frac{-5+16}{6} \quad \frac{-5-16}{6}$
	So $\frac{-4}{8} = \frac{-1}{2}$	$x = \frac{11}{6} \quad x = \frac{-7}{2}$