Name: Key Algebra II Period: _____

Homework: Solving Quadratics with Complex Roots

The Quadratic Formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$		
	1	Write the equation in **standard form**, $ax^2 + bx + c$
	2	Identify a, b, and c. **Substitute** them into the formula.
	3	**Simplify!**

Directions: Solve each equation using the Quadratic Formula.

1.) $x^2 + 2x + 2 = 0$

$a=1\ b=2\ c=2$

$\frac{-(2) \pm \sqrt{(2)^2-4(1)(2)}}{2(1)} \Rightarrow \frac{-2 \pm \sqrt{-4}}{2}$

$\Rightarrow \frac{-2 \pm 2i}{2} \Rightarrow \boxed{-1 \pm i}$

2.) $x^2 + 4x + 8 = 0$

$a=1\ b=4\ c=8$

$\frac{-(4) \pm \sqrt{(4)^2-4(1)(8)}}{2(1)} \Rightarrow \frac{-4 \pm \sqrt{-16}}{2}$

$\Rightarrow \frac{-4 \pm 4i}{2} \Rightarrow \boxed{-2 \pm 2i}$

3.) $2x^2 + x + 5 = 0$

$a=2\ b=1\ c=5$

$\frac{-(1) \pm \sqrt{(1)^2-4(2)(5)}}{2(2)} \Rightarrow \frac{-1 \pm \sqrt{-39}}{4}$

$\Rightarrow \boxed{\frac{-1 \pm i\sqrt{39}}{4}}$

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3 13

4.) $3x^2 + 7x + 6 = 0$

$a=3\ b=7\ c=6$

$\frac{-(7) \pm \sqrt{(7)^2-4(3)(6)}}{2(3)} \Rightarrow \frac{-7 \pm \sqrt{-23}}{6}$

$\Rightarrow \boxed{\frac{-7 \pm i\sqrt{23}}{6}}$

5.) $x^2 + 7 = 2x$

$-2x \quad -2x$

$x^2 - 2x + 7 = 0$

$a=1\ b=-2\ c=7$

$\frac{-(-2) \pm \sqrt{(-2)^2-4(1)(7)}}{2(1)} \Rightarrow \frac{2 \pm \sqrt{-24}}{2}$

$\Rightarrow \frac{2 \pm 2i\sqrt{6}}{2} \Rightarrow \boxed{1 \pm i\sqrt{6}}$

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4 6

11.) $3x^2 + 5 = 4x + x^2$

$-x^2 - 4x \quad -4x \quad -x^2$

$2x^2 - 4x + 5 = 0$

$a=2\ b=-4\ c=5$

$\frac{-(-4) \pm \sqrt{(-4)^2-4(2)(5)}}{2(2)} \Rightarrow \frac{4 \pm \sqrt{-24}}{4}$

$\Rightarrow \frac{4 \pm -2\sqrt{6}}{4} \Rightarrow \boxed{\frac{1 \pm i\sqrt{6}}{2}}$

-24
4 6