Complex Numbers

Introduction to Complex Numbers

★ The **imaginary number**, *i*, is defined as the number whose ______ is -1.



- * _____ and _____ numbers together make up the set of ______ numbers.
- ★ A complex number is any number of the form _____ (or ____), where *a* and *b* are _____ numbers.



Simplifying Radicals Involving Complex #s

Product Property of Square Roots		Ir	Imaginary Roots	
$\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$		For any non–negative real number, $\sqrt{-x} = i\sqrt{x}$		
<i>For #s 1–8, simpli</i> 1) $\sqrt{-2}$	<i>ify the radical.</i> 2) $2\sqrt{-8}$	3) 2√−48	4) 4√−50	
5) √-98	6) −3√−24	7) √−9	8) √-32	

Powers of i

By hand, Divide the EXPONENT OF i^n by 4. The result is:			If divided in the calculator, your decimal value is
<i>i</i> ¹ =	If the remainder is	0	No decimal
$i^2 =$	If the remainder is	1	.25
$i^{3} =$	If the remainder is	2	.5
$i^4 =$	If the remainder is	3	.75

For #s 9-12, Simplify.

9) $i^{26} =$ 10) $i^{44} =$ 11) i^{29} 12) $i^{79} =$

Operations with Complex Numbers				
Adding Complex Numbers	Example	(-3+4i)+(-3+i)		
Subtracting Complex Numbers	Example	(4-5i) - (5+8i)		
Multriplying Complex Numbers	Example	(-2+4i)(-1+3i)		
Dividing Complex Numbers	Example	(−3 + <i>i</i>) ÷ (4 − 3 <i>i</i>)		