

## Operations with Complex Numbers

LTAATA  
Imaginary  
numbers

How do I add, subtract, multiply  
and divide? s/q



How do we find  
the roots (x-intercepts)

$$i = \sqrt{-1}$$

$$i^2 = -1$$

$$i^3 = -i$$

$$i^4 = 1$$

Add

$$2i + 3i = 5i$$

Subtract

$$4i - 3i = 1i$$

$$4 + 3i + 2 + 5i$$

$$6 + 8i$$

$$4 - 2i - (5 + 3i)$$

$$4 - 2i - 5 - 3i$$

$$-1 - 5i$$

$$\sqrt{3} \cdot \sqrt{3} = 3$$

$$\sqrt{-1} \cdot \sqrt{-1} = -1$$

$$\sqrt{-1} \cdot \sqrt{-1} \cdot \sqrt{-1} = -1 \cdot \sqrt{-1}$$

Multiply  
 $(3i)(4i)$

$$12i^2$$

$$12(-1) = -12$$

$$(4-3i)(5+2i)$$

	5	2i	
4	20	8i	
-3i	-15i	-6i <sup>2</sup>	= 6

$$20 - 7i - 6i^2$$

$$20 - 7i - 6(-1)$$

$$20 - 7i + 6$$

Complex Number:  $26 - 7i$

$$a + bi$$

↑

real

↑

imaginary

↑

real

↑

imaginary