

Daily Agenda

Learning Target:  
I can perform operations with complex numbers.

Homework 4)  $-3 \pm \sqrt{2}i$  Assessments  
3.4 Formative Day 2 Chapter Test 10/24  
- Calc and No Calc

1)  $5i$  2)  $3\sqrt{2}i$  3)  $4\sqrt{3}i$  5)  $2 \pm \sqrt{6}i$

The best and most beautiful things in the world cannot be seen or even touched - they can be felt with the heart.  
-Helen Keller

Nov 15-8:24 PM

### 3.4 Complex Numbers

$a+bi$   
↑ real ↑ imaginary

$i = i$  R1  $i^5 = i$  } Exp = 4  
 $i^2 = -1$  R2  $i^6 = -1$   
 $i^3 = -i$  R3  $i^7 = -i$   
 $i^4 = 1$  R0  $i^8 = 1$

Nov 15-8:30 PM

### Simplify

$i^{12678} = -1$

$i^{216} = 1$

$i^{-342} = \frac{1}{i^{342}} = \frac{1}{-1} = -1$

$i^{-341} = \frac{1}{i^{341}} = \frac{1}{i} = -i$

$i = \sqrt{-1}$

$\frac{i}{i^2} = \frac{i}{-1} = -i$

*(Handwritten division problems for exponents: 3169/12678 R.2, 216/20, 342/85 R.2, 342/32)*

Jan 6-8:24 AM

### Simplify

$(3+2i) + (4-5i) = 7-3i$   
 • add real #'s  
 • add imag. #'s

$(3+2i) - (4-5i) = -1+7i$

Jan 6-8:24 AM

### Simplify

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

$12 - 15i + 8i - 10i^2$

$12 - 7i + 10$

$22 - 7i$

Jan 6-8:24 AM

### Simplify

$\frac{(3+2i)(4+5i)}{(4-5i)(4+5i)} = \frac{12+15i+8i+10i^2}{16-25i^2}$

$\frac{12+23i-10}{16+25} = \frac{2+23i}{41}$

Jan 6-8:24 AM

What did you notice about quadratics with complex solutions?

Visually, doesn't touch x-axis  
i.e. no x-int.

$$\textcircled{4} \quad -3 \pm \sqrt{2}i \quad \text{conjugates}$$

$$\textcircled{5} \quad \frac{2 \pm \sqrt{6}i}{2} \quad a \pm bi$$

Oct 14-6:50 AM

Write the equation of a quadratic with solutions

$$4+i \quad 4-i$$

$$x = 4 \pm i$$

$$\begin{array}{r} -4 \quad -4 \\ \hline (x-4)^2 = (\pm i)^2 \end{array}$$

$$\begin{array}{r} x^2 - 8x + 16 = -1 \\ +1 \quad +1 \\ \hline x^2 - 8x + 17 = 0 \end{array}$$

Oct 13-9:04 AM

Write the equation of a quadratic with solutions

$$5+2i \quad 5-2i$$

$$x = 5 \pm 2i$$

$$(x-5) = (\pm 2i)^2$$

$$x^2 - 10x + 25 = 4i^2$$

$$\begin{array}{r} x^2 - 10x + 25 = -4 \\ +4 \quad +4 \end{array}$$

$$x^2 - 10x + 29 = 0$$

Oct 13-9:04 AM