Unit 1 - Lesson 15

An introduction to Complex Numbers

SWUT:

Imaginary numbers were introduced to solve quadratic equations of the form

Where

The imaginary unit is a number defined as. Additionally.

The powers of repeat in the cyclical pattern:

The set of complex numbers includes imaginary and real numbers. Every complex number can be written in the form , where represents the real part and represents the imaginary part.

The modulus, or absolute value of a complex number, is defined as its distance from the origin in the complex plane.

In the complex number plane, (Argand plane), the point represents the complex number. To graph a complex number, locate the real on the horizontal axis and the imaginary part on the vertical axis.

Complex conjugates are in the form of and.

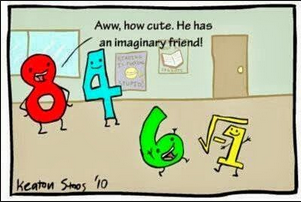
Operations of addition, subtraction, multiplication, and division can be performed on complex numbers.

When performing operations on complex numbers, treat like a variable. Simplify powers of at the completion of the problem.

Simplifying Radicals

1. 2. 3.

4. 5. 6.

The imaginary unit is defined as

Similarly

Basically for any positive number (***the negative comes out from the radical and becomes “i”***)

Try these

1. 2. 3.

The Cyclic nature of How to simplify



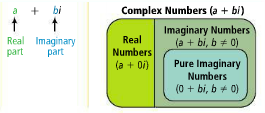
It is important to realize that multiplying two imaginary numbers can result in a real number!

**Operations with *i***

1. 2.
2. 4.
3. 6.
4. 8.

***Question:*** Does result in imaginary numbers?

A whole new number system was formed called the Complex Number System



**Operations with Complex Numbers**

Simplify. Remember all answers must be written in form.

1. 2.
2. 4.

6.

**Complex Conjugates**

Multiply each of the following complex numbers by its conjugate

1. 2.
2. 4.

Dividing complex numbers

1. 6.
2. 8.

***Homework 1-15:***





