Course Number
Instructor
Date

Section 1.5 Complex Numbers

Objective: In this lesson you learned how to perform operations with complex numbers.

Important Vocabulary	Define each term or concept.
Complex number	
Imaginary number	
Complex conjugates	

I. The Imaginary Unit *i* (Page 124)

What you should learn How to use the imaginary unit i to write complex numbers

Mathematicians created an expanded system of numbers using the **imaginary unit *i*,** defined as i = ____________, because . . .

By definition, i^2 = _____________.

For the complex number $a + bi$, if $b = 0$, the number $a + bi = a$ is a ____________________. If $a = 0$, the number $a + bi = bi$ is a ____________________________.

The set of complex numbers consists of the set of _________ ____________ and the set of __________________________.

Two complex numbers $a + bi$ and $c + di$, written in standard form, are equal to each other if . . .

II. Operations with Complex Numbers (Pages 125–126)

What you should learn How to add, subtract, and multiply complex numbers

To add two complex numbers, . . .

To subtract two complex numbers, . . .

The **additive identity** in the complex number system is ______.

The **additive inverse** of the complex number $a + bi$ is

______________________.

Example 1: Perform the operations:
$(5 - 6i) - (3 - 2i) + 4i$

To multiply two complex numbers $a + bi$ and $c + di$, . . .

Example 2: Multiply: $(5 - 6i)(3 - 2i)$

III. Complex Conjugates and Division (Page 127)

> ***What you should learn***
> How to use complex conjugates to divide complex numbers

The product of a pair of complex conjugates is a(n) ______________________ number.

To find the quotient of the complex numbers $a + bi$ and $c + di$, where c and d are not both zero, . . .

Example 3: Divide $(1 + i)$ by $(2 - i)$. Write the result in standard form.

IV. Complex Solutions of Quadratic Equations (Page 128)

> ***What you should learn***
> How to use the Quadratic Formula to find complex solutions of quadratic equations

If a is a positive number, the **principal square root** of the negative number $-a$ is defined as ______________________.

To avoid problems with multiplying square roots of negative numbers, be sure to convert to ______________________ before multiplying.

Example 4: Perform the operation and write the result in standard form: $(5-\sqrt{-4})^2$

Given the existence of the set of complex numbers, if the discriminant b^2-4ac of the quadratic equation $ax^2+bx+c=0$, $a\neq 0$, is negative, then . . .

Example 5: Use the discriminant to find the number and type of solutions of the quadratic equation $4x^2-4x+5=0$. Then find the solutions of the equation.

Additional notes

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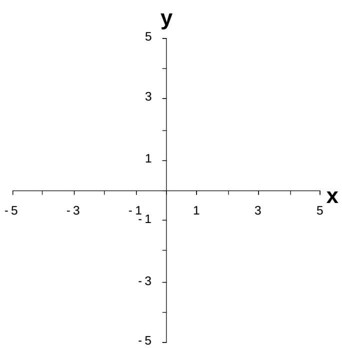

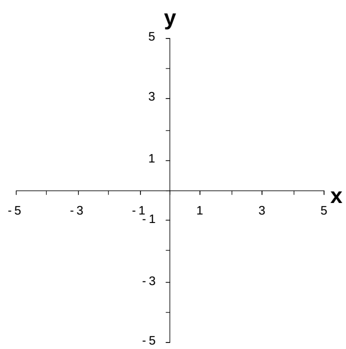

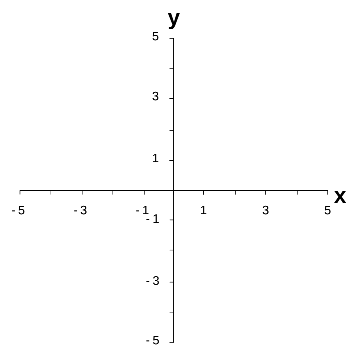

Homework Assignment

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