Course Number

Instructor

Date

Section 2.4 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 162)

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, $i^2 =$ _____.

If *a* and b are real numbers, then the complex number $a + bi$ is said to be written in _____. If $b = 0$, the number $a + bi = a$ is a(n) _____. If $b \neq 0$, the number $a + bi$ is a(n) _____.If $a = 0$, the number $a + bi = bi$, where $b \neq 0$, is a(n) _____ _____.

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 163–164)

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

To add two complex numbers, . . .

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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 (Page 165)

What you should learn
How to use complex conjugates to write the quotient of two complex numbers in standard form

The product of a pair of complex conjugates is a(n)

_____ number.

To write the quotient of the complex numbers $a + bi$ and $c + di$ in standard form, 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 166)

What you should learn
How 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 _____.

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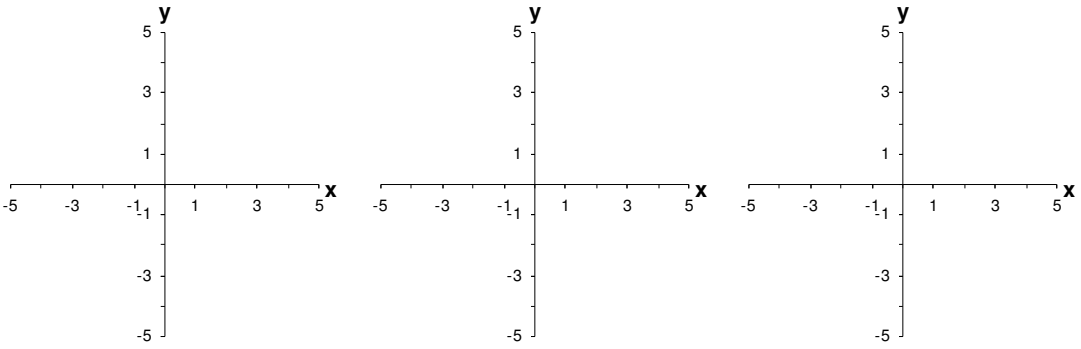
To avoid problems with square roots of negative numbers, be sure to convert complex numbers to _____ before multiplying.

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

Additional notes



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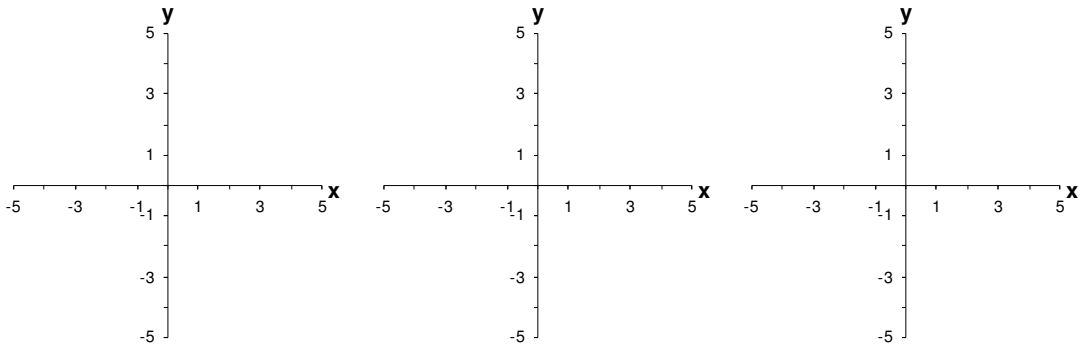
Additional notes



Homework Assignment
Page(s)

Exercises

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