



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)

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.

***What you should learn***

How to use complex conjugates to divide complex numbers

### IV. Complex Solutions of Quadratic Equations (Page 128)

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.

***What you should learn***

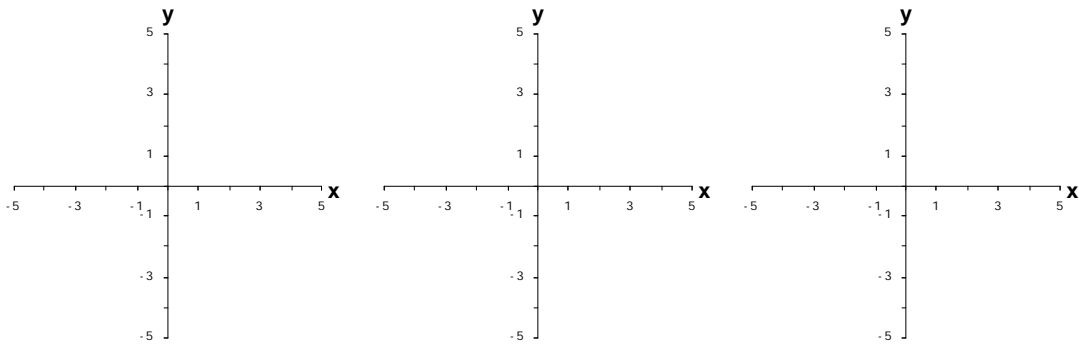
How to use the Quadratic Formula to find complex solutions of quadratic equations

**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

**Additional notes****Homework Assignment**

Page(s)

Exercises