

Name: _____ **Course/Section:** _____ **Instructor:** _____

Chapter 7 Radical Expressions and Functions
7.7 Complex Numbers

Basic Concepts ~ Addition, Subtraction, and Multiplication ~ Powers of i ~ Complex Conjugates and Division

STUDY PLAN

Read: Read Section 7.7 on pages 555-561 in your textbook or eText.

Practice: Do your assigned exercises in your Book MyMathLab Worksheets

Review: Keep your corrected assignments in an organized notebook and use them to review for the test.

Key Terms

Exercises 1-6: Use the vocabulary terms listed below to complete each statement. Note that some terms or expressions may not be used. Some terms may be used more than once.

**real
complex
standard form**

**imaginary
pure imaginary
complex conjugate**

1. A(n) _____ number can be written in _____, as $a + bi$, where a and b are real numbers. The _____ part is a and the _____ part is b .
2. A complex number $a + bi$ with $b \neq 0$ is a(n) _____ number.
3. The _____ of $a + bi$ is $a - bi$.
4. A complex number $a + bi$ with $a = 0$ and $b \neq 0$ is sometimes called a(n) _____ number.
5. A number i , defined by $i = \sqrt{-1}$ or $i^2 = -1$, is called the _____ unit.
6. A complex number $a + bi$ with $b = 0$ is a(n) _____ number.

Basic Concepts

Exercises 1-3: Refer to Example 1 on page 556 in your text and the Section 7.7 lecture video.

Write each square root using the imaginary unit i .

1. $\sqrt{-16}$ 1. _____

2. $\sqrt{-5}$ 2. _____

3. $\sqrt{-50}$ 3. _____

Addition, Subtraction, and Multiplication

Exercises 4-7: Refer to Examples 2-3 on pages 557-558 in your text and the Section 7.7 lecture video.

Write each sum or difference in standard form.

4. $(2+9i)+7$ 4. _____

5. $(-4+3i)-(6+i)$ 5. _____

Write each product in standard form.

6. $(2+i)(3+4i)$ 6. _____

7. $(-2+6i)(-2-6i)$ 7. _____

Powers of i

Exercises 8-10: Refer to Example 4 on page 559 in your text and the Section 7.7 lecture video.

Evaluate each expression.

8. i^8 8. _____

9. i^{13} 9. _____

10. i^{102} 10. _____

Complex Conjugates and Division

Exercises 11-16: Refer to Examples 5-6 on pages 559-560 in your text and the Section 7.7 lecture video.

Find the complex conjugate of each number.

11. $4+i$ 11. _____

12. $-5-2i$ 12. _____

13. $6i$ 13. _____

14. 3 14. _____

Write each quotient in standard form.

15. $\frac{3-4i}{1+3i}$

15. _____

16. $-\frac{9}{3i}$

16. _____