



## 2-4 Additional Practice

### Complex Numbers and Operations

Use square roots to solve each equation. Write your solutions using the imaginary unit,  $i$ .

1.  $x^2 = -81$

2.  $x^2 = -625$

3.  $x^2 = -144$

Solve each problem.

4.  $(-2 + 3i) + (5 - 2i)$

5.  $(-6 + 7i) + (6 - 7i)$

6.  $(8 + 5i) + (6 - 7i)$

Write each product in the form  $a + bi$ .

7.  $(4 - 3i)(-5 + 4i)$

8.  $(2 - i)(-3 + 6i)$

9.  $(5 - 3i)(5 + 3i)$

Write the quotient in the form  $a + bi$ .

10.  $\frac{5 + 2i}{4i}$

11.  $\frac{3 - 2i}{4 - 3i}$

12.  $\frac{3i}{-2 + i}$

13. Why does multiplying  $a + bi$  by the complex conjugate  $a - bi$  eliminate  $i$  from the expression?

Solve the equations below using factoring.

14.  $x^2 + 36$

15.  $x^2 + 4$

16.  $x^2 + 1$

17. The total resistance of a circuit is given by the formula  $R_T = \frac{1}{R_1} + \frac{1}{R_2}$ .  $R_1 = 4 + 6i$  ohms and  $R_2 = 2 - 4i$  ohms. What is  $R_T$ ?