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.** $x^2 = -144$

Simplify each expression.

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. $x^2 + 360 = 0$ **15.** $x^2 + 40 = 0$ **16.** $x^2 + 10 = 0$

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?