UNIT 1 Review

Solve each equation for x. Give exact answers in simplest form.

1. $x^2 + 9x - 36 = 0$

2. $2x^2 = 7x + 4$

3. $x^2 + 10x = -18$

4. $2x^2 + 2 = 20x$

5. $5x^2 - 85 = 0$

6. $15x^2 + 25x + 10 = 0$

Write each expression in the requested form.

7. $\sqrt[5]{x^3}$ in exponential form

8. $x^{\frac{1}{4}}$ in radical form

Find each sum, difference, product, or quotient.

9. $(8 + 5i) + (3 - 3i)$

10. $(9i) - (4 - 2i)$

11. $(1 - 6i) \div (5 - 2i)$

12. $(2 + 4i)(5 - 3i)$

13. $(3 - i)^2$

14. $(9 + 15i) \div (4 + i)$

Choose the best answer.

15. Which of the following is **not** a true statement?

A. The quantity i is defined as $\sqrt{-1}$.

B. In a complex number $a + bi$, a and b are real numbers.

C. The numbers $4 + 2i$ and $2 + 4i$ are complex conjugates.

D. Every complex number has a complex conjugate.

16. Which equation is true?

A. $p^{0.75} = \sqrt[4]{p^3}$

B. $a^{1.5} = \sqrt[3]{a^2}$

C. $\sqrt[3]{z} = z^{-3}$

D. $\sqrt{n^5} = 5n^{10}$

Find all real and imaginary solutions.

17. $x^2 + 164 = 20$

18. $x^2 + 2x = -6$

19. $4x^2 = -5x - 4$

Factor each expression using complex numbers.

20. $x^2 + 25$

21. $x^2 + 4x + 5$

22. Find the value of i^{37}.

23. Solve. $x^2 - 5x + 6 > 0$. Write your answer in inequality and interval notation.

24. FORMULATE A quadratic equation has solutions $x = 1 + i$ and $x = 1 - i$. Write the equation in standard form—that is, as $ax^2 + bx + c = 0$.

25. Find the values of k for which the equation $x^2 + 2kx = k - 6$ has real roots.

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