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11-3B Lesson Master

Questions on SPUR Objectives
See Student Edition pages 792–795 for objectives.

SKILLS Objective B

In 1–26, work by hand to factor over the rational numbers (if possible). If it is not factorable, write "prime over the rational numbers." Check by expanding or by using a CAS if necessary.

In 1–7, factor out the greatest common monomial factor.

1. $19m^2n - 114mn^2 =$ _____

2. $5wz + 25w^2z - 35w^3z =$ _____

3. $24p^3t + 60p^3 =$ _____

4. $6g^2h - 15gh^3 =$ _____

5. $16x^3y + 20x^2 =$ _____

6. $-18x^3y^2z^2 + 14x^2y^2 - 30y^3z =$ _____

7. $a^3b^4c^7 - a^2b^2c^5 + a^2b^2c^4 =$ _____

In 8–11, factor as a difference of squares.

8. $a^2 - 81 =$ _____

9. $49 - 9u^2 =$ _____

10. $x^6 - 1 =$ _____

11. $9g^2 - 64h^6 =$ _____

In 12–15, factor as the square of a binomial.

12. $a^2 - 12a + 36 =$ _____

13. $9c^2 + 6c + 1 =$ _____

14. $36x^2 - 60xy + 25y^2 =$ _____

15. $a^2c^2 + 14ac + 49 =$ _____

In 16–19, factor by considering the factors of the constant term.

16. $x^2 + 10x + 21 =$ _____

17. $t^2 - 3t - 4 =$ _____

18. $x^2 - 15x + 54 =$ _____

19. $p^2 + 12p + 32 =$ _____

In 20–26, use one or more of the above methods.

20. $x^2 - 100 =$ _____

21. $4n^3 + 20n^2 - 24n =$ _____

22. $a^2b^4c^2 - 81d^2 =$ _____

23. $49g^2 + 42g + 9 =$ _____

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24. $9x^3 - 30x^2 + 25x =$ _____

25. $30x^3 - 60x^2 + 30x =$ _____

26. $k^4 - 25k^2 =$ _____

27. a. Factor $x^4 - 81$ as a difference of squares. _____

b. One of the terms in your answer to Part a is also a difference of squares. Use this fact to completely factor $x^4 - 81$ over the rationals. _____

PROPERTIES Objective E

In 28–30, use a CAS as needed to help answer the question.

28. Consider the polynomial $P(x) = x^2 - 6x + 7$.

a. Is $P(x)$ prime over the integers? If not, factor it. _____

b. Is $P(x)$ prime over the reals? If not, factor it. _____

29. For which, if any, integers n from 1 to 10 is $x^2 - n$ prime over the real numbers? _____

30. Factor $x^2 + 121$ over each set, if possible.

a. the rational numbers _____ b. the real numbers _____

c. the complex numbers _____

Multiple Choice **In 31–34, determine a factorization of the given expression over the complex numbers.**

31. $3x^2 - y^2$ _____

A $(x\sqrt{3} + y)(x\sqrt{3} - y)$ B $(x\sqrt{3} + y)^2$ C $(3x + y)(x - y)$

32. $9a^2 + b^2$ _____

A $(3a + bi)^2$ B $(3a - bi)^2$ C $(3a + bi)(3a - bi)$

33. $x^2 + 2bx + b^2$ _____

A $(x + b)^2$ B $(x - b)^2$ C $(x + b)(x - b)$

34. $16x^2 - 7$ _____

A $(8x - 7)(2x + 1)$ B $(4x - \sqrt{7})(4x + \sqrt{7})$ C $(4x - 7)(4x + 7)$