

GUIDED PRACTICE

SEE EXAMPLE 1

p. 531

Factor each polynomial. Check your answer.

- | | |
|------------------------|------------------------|
| 1. $15a - 5a^2$ | 2. $10g^3 - 3g$ |
| 3. $-35x + 42$ | 4. $-4x^2 - 6x$ |
| 5. $12h^4 + 8h^2 - 6h$ | 6. $3x^2 - 9x + 3$ |
| 7. $9m^2 + m$ | 8. $14n^3 + 7n + 7n^2$ |
| 9. $36f + 18f^2 + 3$ | 10. $-15b^2 + 7b$ |

SEE EXAMPLE 2

p. 532

11. **Physics** A model rocket is fired vertically into the air at 320 ft/s. The expression $-16t^2 + 320t$ gives the rocket's height after t seconds. Factor this expression.



SEE EXAMPLE 3

p. 533

Factor each expression.

- | | | |
|---------------------------|----------------------------|---------------------------|
| 12. $5(m - 2) - m(m - 2)$ | 13. $2b(b + 3) + 5(b + 3)$ | 14. $4(x - 3) - x(y + 2)$ |
|---------------------------|----------------------------|---------------------------|

SEE EXAMPLE 4

p. 533

Factor each polynomial by grouping. Check your answer.

- | | | |
|-----------------------------|------------------------------|------------------------------|
| 15. $x^3 + 4x^2 + 2x + 8$ | 16. $6x^3 + 4x^2 + 3x + 2$ | 17. $4b^3 - 6b^2 + 10b - 15$ |
| 18. $2m^3 + 4m^2 + 6m + 12$ | 19. $7r^3 - 35r^2 + 6r - 30$ | 20. $10a^3 + 4a^2 + 5a + 2$ |

SEE EXAMPLE 5

p. 534

- | | | |
|---------------------------|----------------------------|-----------------------------|
| 21. $2r^2 - 6r + 12 - 4r$ | 22. $6b^2 - 3b + 4 - 8b$ | 23. $14q^2 - 21q + 6 - 4q$ |
| 24. $3r - r^2 + 2r - 6$ | 25. $2m^3 - 6m^2 + 9 - 3m$ | 26. $6a^3 - 9a^2 - 12 + 8a$ |

PRACTICE AND PROBLEM SOLVING

Independent Practice

For Exercises	See Example
27–35	1
36	2
37–42	3
43–48	4
49–54	5

Factor each polynomial. Check your answer.

- | | | |
|--------------------|--------------------------|--------------------------|
| 27. $9y^2 + 45y$ | 28. $36d^3 + 24$ | 29. $-14x^4 + 5x^2$ |
| 30. $-15f - 10f^2$ | 31. $-4d^4 + d^3 - 3d^2$ | 32. $14x^3 + 63x^2 - 7x$ |
| 33. $21c^2 + 14c$ | 34. $33d^3 + 22d + 11$ | 35. $-5g^3 - 15g^2$ |
36. **Finance** After t years, the amount of money in a savings account that earns simple interest is $P + Prt$, where P is the starting amount and r is the yearly interest rate. Factor this expression.

Extra Practice

Skills Practice p. S18

Application Practice p. S35

Factor each expression.

- | | | |
|-----------------------------|-----------------------------|-----------------------------|
| 37. $6a(a - 2) - 5b(b + 4)$ | 38. $-4x(x + 2) + 9(x + 2)$ | 39. $6y(y - 7) + (y - 7)$ |
| 40. $a(x - 3) + 2b(x - 3)$ | 41. $-3(2 + b) + 4b(b + 2)$ | 42. $5(3x - 2) + x(3x - 2)$ |

Factor each polynomial by grouping. Check your answer.

- | | | |
|-----------------------------|----------------------------|--------------------------------|
| 43. $2a^3 - 8a^2 + 3a - 12$ | 44. $x^3 + 3x^2 + 5x + 15$ | 45. $6x^3 + 18x^2 + x + 3$ |
| 46. $7x^3 + 2x^2 + 28x + 8$ | 47. $n^3 - 2n^2 + 5n - 10$ | 48. $10b^3 - 16b^2 + 25b - 40$ |
| 49. $2m^3 - 2m^2 + 3 - 3m$ | 50. $2d^3 - d^2 - 3 + 6d$ | 51. $6f^3 - 8f^2 + 20 - 15f$ |
| 52. $5k^2 - k^3 + 3k - 15$ | 53. $b^3 - 2b - 8 + 4b^2$ | 54. $20 - 15x - 6x^2 + 8x$ |

Fill in the missing part of each factorization.

55. $16v + 12v^2 = 4v(4 + \square)$ 56. $15x - 25x^2 = 5x(3 - \square)$
 57. $-16k^3 - 24k^2 = -8k^2(\square + 3)$ 58. $-x - 10 = -1(\square + 10)$

Copy and complete the table.

	Polynomial	Number of Terms	Name	Completely Factored Form
	$3y + 3x + 9$	3	trinomial	$3(y + x + 3)$
59.	$x^2 + 5x$	■	■	■
60.	$28c^2 - 49c$	■	■	■
61.	$a^4 + a^3 + a^2$	■	■	■
62.	$36 + 99r - 40r^2 - 110r^3$	■	■	■

63. **Personal Finance** The final amount of money earned by a certificate of deposit (CD) after n years can be represented by the expression Px^n , where P is the original amount contributed and x is the interest rate.

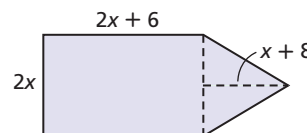
Year	Amount of CD
2004	\$100.00
2005	\$200.00
2006	\$400.00

Justin's aunt purchased CDs to help him pay for college. The table shows the amount of the CD she purchased each year. In 2007, she will pay \$800.00 directly to the college.

- Write expressions for the value of the CDs purchased in 2004, 2005, and 2006 when Justin starts college in 2007.
- Write a polynomial to represent the total value of the CDs purchased in 2004, 2005, and 2006 plus the amount paid to the college in 2007.
- Factor the polynomial in part c by grouping. Evaluate the factored form of the polynomial when the interest rate is 1.09.



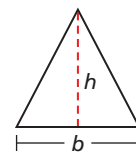
64. **Write About It** Describe how to find the area of the figure shown. Show each step and write your answer in factored form.



65. **Critical Thinking** Show two methods of factoring the expression $3a - 3b - 4a + 4b$.



66. **Geometry** The area of the triangle is represented by the expression $\frac{1}{2}(x^3 - 2x + 2x^2 - 4)$. The height of the triangle is $x + 2$. Write an expression for the base of the triangle. (*Hint:* The formula for the area of a triangle is $A = \frac{1}{2}bh$.)



67. **Write About It** Explain how you know when two binomials are opposites.

**MULTI-STEP
TEST PREP**



68. This problem will prepare you for the Multi-Step Test Prep on page 556.
- The Multiplication Property of Zero states that the product of any number and 0 is 0. What must be true about either a or b to make $ab = 0$?
 - A toy car's distance in feet from the starting point is given by the equation $d = t(3 - t)$. Explain why $t(3 - t) = 0$ means that either $t = 0$ or $(3 - t) = 0$.
 - When $d = 0$, the car is at the starting point. Use the fact that $t = 0$ or $(3 - t) = 0$ when $d = 0$ to find the two times when the car is at the starting point.