ice by Example

Example 1 (page 462)

Simplify each product.

1. $8m(m + 6)$
2. $(x + 10)3x$
3. $9k(7k + 4)$
4. $-5a(a - 1)$
5. $2x^2(9 + x)$
6. $-p^2(p - 11)$
7. $2x(6x^3 - x^2 + 5x)$
8. $4y^2(9y^3 + 8y^2 - 11)$
9. $-5c^3(9c^2 - 8c - 5)$
10. $-7q^2(6q^5 - 2q - 7)$
11. $-3g^7(g^4 - 6g^2 + 5)$
12. $-4x^6(10x^3 + 3x^2 - 7)$

Example 2 (page 463)

Find the GCF of the terms of each polynomial.

13. $15w + 21$
14. $6a^2 - 8a$
15. $36v + 24$
16. $x^3 + 7x^2 - 5x$
17. $5b^3 + 15b - 30$
18. $9x^3 - 6x^2 + 12x$

Example 3 (page 463)

Factor each polynomial.

19. $6x - 4$ **20.** $v^2 + 4v$ **21.** $10x^3 - 25x^2 + 20$

22. $2t^2 - 10t^4$ **23.** $15n^3 - 3n^2 + 12n$ **24.** $6p^6 + 24p^5 + 18p^3$

B Apply Your Skills

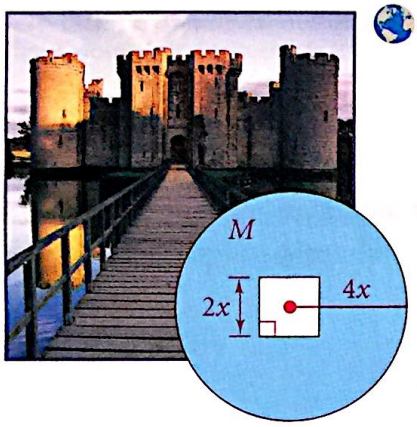
25. Error Analysis Kevin said that $-2x(4x - 3) = -8x^2 - 6x$. Karla said that $-2x(4x - 3) = -8x^2 + 6x$. Who is correct? Explain.

26. Open-Ended Write a polynomial that has a common factor in each term. Factor your polynomial.

Simplify. Write in standard form.

27. $-3a(4a^2 - 5a + 9)$ **28.** $-7p^2(-2p^3 + 5p)$ **29.** $12c(-5c^2 + 3c - 4)$

30. $y(y + 3) - 5y(y - 2)$ **31.** $x^2(x + 1) - x(x^2 - 1)$ **32.** $4t(3t^2 - 4t) - t(7t)$



33. Building Models Suppose you are building a model of the square castle shown at the left. The moat of the model castle is made of blue paper.
a. Find the area of the moat using the diagram with the photo.
b. Write your answer in factored form.

Factor each polynomial.

34. $9m^{12} - 36m^7 + 81m^5$ **35.** $24x^3 - 96x^2 + 48x$ **36.** $16n^3 + 48n^2 - 80n$

37. $5x^4 + 4x^3 + 3x^2$ **38.** $13ab^3 + 39a^2b^4$ **39.** $7g^2k^3 - 35g^5k^2$

40. Critical Thinking The GCF of two numbers p and q is 5. What is the GCF of p^2 and q^2? Explain your answer.

41. a. Factor $n^2 - n$.
b. Writing Suppose n is an integer. Is $n^2 - n$ *always, sometimes,* or *never* even? Justify your answer.

42. A triangular number is a number you can represent with a triangular arrangement of objects. A triangular number can also be written as a product of two factors, as in the table.
a. Find the values of a, b, c, and d, and then write an expression in factored form for the nth triangular number.

	1	2	3	4
Triangular Number	1	3	6	10
Factored Form	$\frac{a}{2}(a + 1)$	$\frac{b}{2}(b + 1)$	$\frac{c}{2}(c + 1)$	$\frac{d}{2}(d + 1)$

b. Use the expression you wrote to find the 100th triangular number.

C Challenge

43. a. Geometry How many sides does the polygon have? How many of its diagonals come from one vertex?
b. Suppose a polygon has n sides. How many diagonals will it have from one vertex?
c. The number of diagonals from all the vertices is $\frac{n}{2}(n - 3)$. Multiply the two factors.
d. For a polygon with 8 sides, what is the total number of diagonals that can be drawn from the vertices?