LESSON 2.2

Exercise Set A

MM1A2c Add, subtract, multiply, and divide polynomials.

MM1A2g Use area and volume models for polynomial arithmetic.

Find the product.

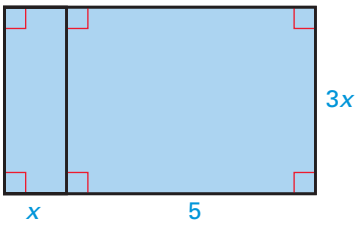
1. $x^2(6x^2 - 3x - 1)$
2. $-5a^3(4a^4 - 3a + 1)$
3. $4d^2(-2d^3 + 5d^2 - 6d + 2)$
4. $(3x + 1)(2x - 5)$
5. $(2y + 3)(y - 5)$
6. $(6a - 3)(4a - 1)$
7. $(b - 8)(5b - 2)$
8. $(8m + 7)(2m + 3)$
9. $(-p + 2)(3p^2 + 1)$
10. $(2z - 7)(-z + 3)$
11. $(-3d + 10)(2d - 1)$
12. $(n + 1)(n^2 + 4n + 5)$
13. $(w - 3)(w^2 + 8w + 1)$
14. $(2s + 5)(s^2 + 3s - 1)$
15. $(x^2 - 4xy + y^2)(5xy)$

Simplify the expression.

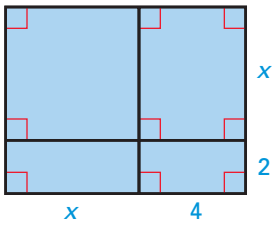
16. $a(3a + 1) + (a + 1)(a - 1)$
17. $(x + 2)(x + 5) - x(4x - 1)$
18. $(m + 7)(m - 3) + (m - 4)(m + 5)$

Write a polynomial for the area of the model.

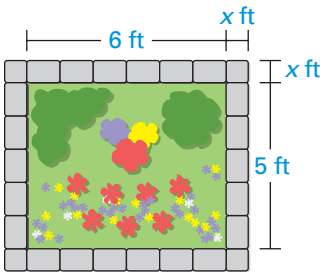
19.



20.



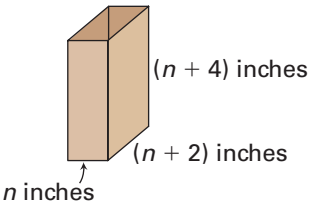
21. **Flower Bed** You are designing a rectangular flower bed that you will border using brick pavers. The width of the border around the bed will be the same on every side, as shown.



   a. Write a polynomial that represents the total area of the flower bed and the border.

   b. Find the total area of the flower bed and border when the width of the border is 1.5 feet.

22. **Shipping** A box used for shipping is shown at the right.



   a. Write a polynomial that represents the area of the base of the box.

   b. Write a polynomial that represents the volume of the box.

   c. What is the volume if the length of the shortest side is 8 inches?

UNIT 2

LESSON 2.2

Exercise Set B

MM1A2c Add, subtract, multiply, and divide polynomials.

MM1A2g Use area and volume models for polynomial arithmetic.

Find the product.

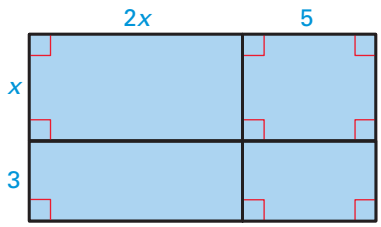
1. $-8y^3(2y^4 - 5y^2 + 3)$
2. $(b + 3)(3b^2 - 2b + 1)$
3. $(6w - 3)(4 - 3w)$
4. $(9m^3 + 1)(4m^2 - 1)$
5. $(2x^2 + 5x - 2)(x + 3)$
6. $(8n^2 - 1)(3n^2 - 4n + 5)$
7. $(3p^4 - 5)(2p^2 + 4)$
8. $(-8r^3 + 2)(6r^2 - 1)$
9. $(-5z^2 - 3)(-2z^2 + 9)$
10. $xy(x^2 + 2y)$
11. $-3x(2xy + 5y)$
12. $y^2(x^2y + y^2x)$
13. $(x - y)(5x + 6y)$
14. $(xy^2 + 70)(3x + 2y)$
15. $(x^2 - 4xy + y^2)(5xy)$

Simplify the expression.

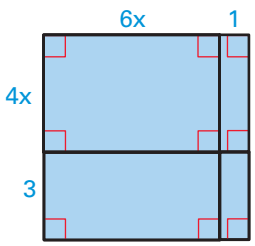
16. $(7n + 1)(3n + 5) + (4n - 2)(3n + 1)$
17. $5w^2(3w^3 - 2w + 1) + w^4(w^2 - 2w + 3)$

Write a polynomial for the area of the model.

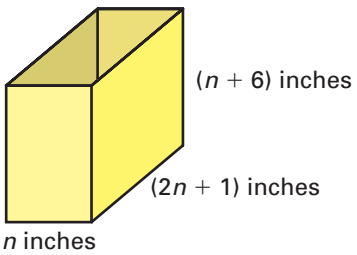
18.



19.



20. **Gifts** An open gift box is shown at the right.



   a. Write a polynomial that represents the area of the base of the box.

   b. Write a polynomial that represents the volume of the box.

   c. Write a polynomial for the area of the base if the length and width increase by 4.

21. **Sporting Goods Equipment** During the period 1990–2002, the amount of money E (in millions of dollars) spent on sporting goods equipment in the U.S. and the percent P (in decimal form) of this amount that is spent on exercise equipment can be modeled by

$$E = -5.56t^4 + 149.93t^3 - 1314.65t^2 + 4396.75t + 14{,}439.09$$

and $P = -0.00002t^4 - 0.0005t^3 + 0.0028t^2 + 0.001t + 0.126$

where t is the number of years since 1990.

   a. Find the values of E and P for $t = 0$. What does the product $E \cdot P$ mean for $t = 0$ in the context of this problem?

   b. Write an equation that models the amount spent on exercise equipment as a function of the number of years since 1990.

   c. How much money was spent in the U.S. on exercise equipment in 1990?

UNIT 2