Name _____ Date _____ Class _____

LESSON 7-7

Practice B

Multiplying Polynomials

Multiply.

1. $(6m^4)(8m^2)$

2. $(5x^3)(4xy^2)$

3. $(10s^5t)(7st^4)$

4. $4(x^2 + 5x + 6)$

5. $2x(3x - 4)$

6. $7xy(3x^2 + 4y + 2)$

7. $(x + 3)(x + 4)$

8. $(x - 6)(x - 6)$

9. $(x - 2)(x - 5)$

10. $(2x + 5)(x + 6)$

11. $(m^2 + 3)(5m + n)$

12. $(a^2 + b^2)(a + b)$

13. $(x + 4)(x^2 + 3x + 5)$

14. $(3m + 4)(m^2 - 3m + 5)$

15. $(2x - 5)(4x^2 - 3x + 1)$

16. The length of a rectangle is 3 inches greater than the width.

a. Write a polynomial that represents the area of the rectangle. _____

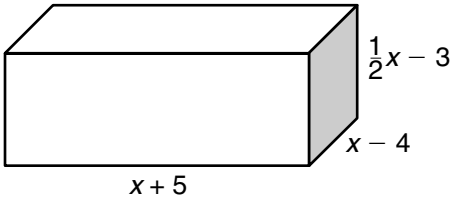
b. Find the area of the rectangle when the width is 4 inches. _____

17. The length of a rectangle is 8 centimeters less than 3 times the width.

a. Write a polynomial that represents the area of the rectangle. _____

b. Find the area of the rectangle when the width is 10 centimeters. _____

18. Write a polynomial to represent the volume of the rectangular prism.



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LESSON 7-1

Practice A

Multiplying Polynomials

Multiply.

1. $(4x)(5x)$ — $20x^2$
2. $(3x^2)(5x)$ — $15x^3$
3. $(6y^2)(3y^3)$ — $18y^5$
4. $3(5x + 7)$ — $15x + 21$
5. $4x(2x^2 + 7x + 3)$ — $8x^3 + 28x^2 + 12x$

Fill in the blanks by multiplying the First, Inner, Outer, and Last terms. Then simplify.

6. $(x + 5)(x + 2)$

x^2	$2x$	$5x$	10
F	O	I	L

Simplify: $x^2 + 7x + 10$

7. $(x + 4)(x - 3)$

x^2	$-3x$	$4x$	-12
F	O	I	L

Simplify: $x^2 + x - 12$

Fill in the blanks below. Then simplify.

8. $(x + 3)(x^2 + 4x + 7) = x(x^2 + 4x + 7) + 3(x^2 + 4x + 7)$

Distribute: $x^3 \ 4x^2 \ 7x + 3x^2 \ 12x \ 21$

Simplify: $x^3 + 7x^2 + 19x + 21$

9. $(2x - 1)(4x^3 - 3x^2 + 5) = 2x(4x^3 - 3x^2 + 5) + -1(4x^3 - 3x^2 + 5)$

Distribute: $8x^4 \ -6x^3 \ 10x + -4x^3 \ 3x^2 \ -5$

Simplify: $8x^4 - 10x^3 + 3x^2 + 10x - 5$

10. **The length of a rectangle is 5 inches greater than the width.**
   - **a.** Write an expression for the width of the rectangle. — w
   - **b.** Write an expression for the length of the rectangle. — $w + 5$
   - **c.** Write a simplified expression for the area of the rectangle. (Area = length × width) — $w^2 + 5w$
   - **d.** Find the area of the rectangle when the width is 3 inches. — $24\ \text{in}^2$
   - **e.** Find the area of the rectangle when the length is 9 inches. — $36\ \text{in}^2$

LESSON 7-1

Practice B

Multiplying Polynomials

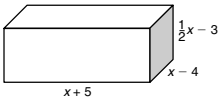
Multiply.

1. $(6m^4)(8m^2)$ — $48m^6$
2. $(5x^3)(4xy^2)$ — $20x^4y^2$
3. $(10s^5t)(7st^4)$ — $70s^6t^5$
4. $4(x^2 + 5x + 6)$ — $4x^2 + 20x + 24$
5. $2x(3x - 4)$ — $6x^2 - 8x$
6. $7xy(3x^2 + 4y + 2)$ — $21x^3y + 28xy^2 + 14xy$
7. $(x + 3)(x + 4)$ — $x^2 + 7x + 12$
8. $(x - 6)(x - 6)$ — $x^2 - 12x + 36$
9. $(x - 2)(x - 5)$ — $x^2 - 7x + 10$
10. $(2x + 5)(x + 6)$ — $2x^2 + 17x + 30$
11. $(m^2 + 3)(5m + n)$ — $5m^3 + m^2n + 15m + 3n$
12. $(a^2 + b^2)(a + b)$ — $a^3 + a^2b + ab^2 + b^3$
13. $(x + 4)(x^2 + 3x + 5)$ — $x^3 + 7x^2 + 17x + 20$
14. $(3m + 4)(m^2 - 3m + 5)$ — $3m^3 - 5m^2 + 3m + 20$
15. $(2x - 5)(4x^2 - 3x + 1)$ — $8x^3 - 26x^2 + 17x - 5$

16. **The length of a rectangle is 3 inches greater than the width.**
   - **a.** Write a polynomial that represents the area of the rectangle. — $w^2 + 3w$
   - **b.** Find the area of the rectangle when the width is 4 inches. — $28\ \text{in}^2$

17. **The length of a rectangle is 8 centimeters less than 3 times the width.**
   - **a.** Write a polynomial that represents the area of the rectangle. — $3w^2 - 8w$
   - **b.** Find the area of the rectangle when the width is 10 centimeters. — $220\ \text{cm}^2$

18. Write a polynomial to represent the volume of the rectangular prism.



$\frac{1}{2}x^3 - \frac{5}{2}x^2 - 13x + 60$

LESSON 7-1

Practice C

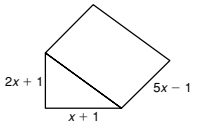
Multiplying Polynomials

Multiply.

1. $\left(\frac{1}{2}m^3\right)(6m)(2m^2)$ — $6m^6$
2. $(-3x^4)(2x)(0.75x^4)$ — $-4.5x^9$
3. $\left(\frac{1}{4}x^3y^2\right)(xy)\left(\frac{1}{4}x\right)$ — $\frac{1}{16}x^5y^3$
4. $\frac{1}{2}x(6x^2 + 10x + 5)$ — $3x^3 + 5x^2 + \frac{5}{2}x$
5. $x^2y(3xy - 2x^2y)$ — $3x^3y^2 - 2x^4y^2$
6. $0.4x(0.6x - 8y)$ — $0.24x^2 - 3.2xy$
7. $(2x + 1)(x + 2)$ — $2x^2 + 5x + 2$
8. $(3x - 4)(2x - 5)$ — $6x^2 - 23x + 20$
9. $(x^2 + 3)(x - 4)$ — $x^3 - 4x^2 + 3x - 12$
10. $(x^2 + y^2)(x^2 + y^2)$ — $x^4 + 2x^2y^2 + y^4$
11. $\left(x + \frac{1}{2}\right)\left(x + \frac{1}{4}\right)$ — $x^2 + \frac{3}{4}x + \frac{1}{8}$
12. $(3x^2 - 1)(x - 1)$ — $3x^3 - 3x^2 - x + 1$
13. $(x^2 + 1)(x^2 + 4x + 3)$ — $x^4 + 4x^3 + 4x^2 + 4x + 3$
14. $(5x + y)(x^2 + xy + y^2)$ — $5x^3 + 6x^2y + 6xy^2 + y^3$
15. $(a + b + c)(a + b + c)$ — $a^2 + 2ab + 2ac + b^2 + 2bc + c^2$

16. **The length of a rectangle is 2 inches more than 3 times the width.**
   - **a.** Write a polynomial that represents the area of the rectangle. — $3w^2 + 2w$
   - **b.** Find the area of the rectangle when the width is 2.5 inches. — $23.75\ \text{in}^2$

17. Write a polynomial to represent the volume of the triangular prism. (The volume of a prism is equal to the area of its base times its height.) — $5x^3 + \frac{13}{2}x^2 + x - \frac{1}{2}$



18. If $x = 3$, what are the dimensions of the triangular prism? — $7 \times 4 \times 14$

What is the volume? — 196

LESSON 7-1

Reteach

Multiplying Polynomials

To multiply monomials, multiply the constants, then multiply variables with the same base.

Multiply $(3a^2b)(4ab^3)$.

$(3a^2b)(4ab^3)$

$(3 \cdot 4)(a^2 \cdot a)(b \cdot b^3)$ — *Rearrange so that the constants and the variables with the same bases are together.*

$12a^3b^4$ — *Multiply.*

To multiply a polynomial by a monomial, distribute the monomial to each term in the polynomial.

Multiply $2x(x^2 + 3x + 7)$.

$2x(x^2 + 3x + 7)$

$(2x)x^2 + (2x)3x + (2x)7$ — *Distribute.*

$2x^3 + 6x^2 + 14x$ — *Multiply.*

Multiply.

1. $(-5x^2y^3)(2xy)$ — $-10x^3y^4$
2. $(2xyz)(-4x^2yz)$ — $-8x^3y^2z^2$
3. $(3x)(x^2y^3)$ — $3x^3y^3$

Fill in the blanks below. Then finish multiplying.

4. $4(x - 5)$

$(\boxed{4})_x - (\boxed{4})_5$

$4x - 20$

5. $3x(x + 8)$

$(\boxed{3x})_x + (\boxed{3x})_8$

$3x^2 + 24x$

6. $2x(x^2 - 6x + 3)$

$(\boxed{2x})_{x^2} - (\boxed{2x})_{6x} + (\boxed{2x})_3$

$2x^3 - 12x^2 + 6x$

Multiply.

7. $5(x + 9)$ — $5x + 45$
8. $-4x(x^2 + 8)$ — $-4x^3 - 32x$
9. $3x^2(2x^2 + 5x + 4)$ — $6x^4 + 15x^3 + 12x^2$
10. $-3(5 - x^2 + 2)$ — $3x^2 - 21$
11. $(5a^3b)(2ab)$ — $10a^4b^2$
12. $5y(-y^2 + 7y - 2)$ — $-5y^3 + 35y^2 - 10y$