LESSON 2.3

Exercise Set A

MM1A2c Add, subtract, multiply, and divide polynomials.

Find the product of the square of the binomial.

1. $(x - 9)^2$
2. $(m + 11)^2$
3. $(5s + 2)^2$
4. $(3m + 7)^2$
5. $(4p - 5)^2$
6. $(7a - 6)^2$
7. $(10z - 3)^2$
8. $(2x + y)^2$
9. $(3y - x)^2$

Find the product of the sum and difference.

10. $(a - 9)(a + 9)$
11. $(z - 20)(z + 20)$
12. $(5r + 1)(5r - 1)$
13. $(6m + 10)(6m - 10)$
14. $(7p - 2)(7p + 2)$
15. $(9c - 1)(9c + 1)$
16. $(4x + 3)(4x - 3)$
17. $(4 - w)(4 + w)$
18. $(5 - 2y)(5 + 2y)$

Describe **how you can use mental math to find the product.**

19. $15 \cdot 25$
20. $43 \cdot 57$
21. 18^2

Perform the indicated operation using the functions $f(x) = 4x + 0.5$ and $g(x) = 4x - 0.5$.

22. $f(x) \cdot g(x)$
23. $(f(x))^2$
24. $(g(x))^2$

25. **Error Analysis** *Describe* and correct the error in multiplying $(s - 5)^2$.

$$(s - 5)^2 = s^2 - 2(s)(-5) + (-5)^2$$
$$= s^2 + 10s + 25$$

26. **Multiple Representations** You are building a square patio with a side length of x inches. You want a brick border that is 8 inches wide around the outer edge of the patio.
    a. **Drawing a Model** Draw an area model.
    b. **Writing an Expression** Use the square of a binomial pattern to write an expression for the total area of the patio including the brick border.
    c. **Evaluating an Expression** Find the total area of the patio including the brick border if the side length of the patio is 96 inches.

UNIT 2

LESSON 2.3

Exercise Set B

MM1A2c Add, subtract, multiply, and divide polynomials.

Find the product.

1. $(8x - 5)^2$
2. $(4p + 4)^2$
3. $(10m - 11)^2$
4. $(11s - 10)^2$
5. $(20b - 15)^2$
6. $(m + 4n)^2$
7. $(r - 8s)^2$
8. $(10a + 3b)^2$
9. $(2x - 4y)^2$
10. $(8p - 3)(8p + 3)$
11. $(11t + 4)(11t - 4)$
12. $(7n - 5)(7n + 5)$
13. $(9z + 12)(9z - 12)$
14. $(15 - w)(15 + w)$
15. $(6 - 5p)(6 + 5p)$
16. $(20 - 3m)(20 + 3m)$
17. $(10a - 5b)(10a + 5b)$
18. $(4x - 3y)(4x + 3y)$

Describe **how you can use mental math to find the product.**

19. $36 \cdot 44$
20. 23^2
21. 49^2

Perform the indicated operation using the functions $f(x) = 9x - 0.5$ and $g(x) = 9x + 0.5$.

22. $f(x) \cdot g(x)$
23. $(f(x) + g(x))^2$
24. $(f(x) - g(x))^2$

25. Write two binomials that have the product $x^2 - 144$. *Explain* how you found your answer.

26. Write a pattern for the cube of a binomial $(a - b)^3$. *Justify* your answer.

27. **Total Profit** For 1995 through 2005, the number N (in thousands) of units produced by a manufacturing company can be modeled by $N = 1.4t + 2.1$ and the profit P (in dollars per unit) can be modeled by $P = 1.4t - 2.1$ where t is the number of years since 1995.
    a. Write a polynomial that models the company total profit T (in thousands of dollars) in terms of the number of years since 1995.
    b. What was the company's total profit in 2002?
    c. In which years from 1995 through 2005 were the company's total profits negative?

28. **Fencing** You use 120 feet of fencing to form a square with a side length of 30 feet. You want to change the dimensions of the enclosed region. For every 1 foot you increase the width, you must decrease the length by 1 foot. Write a polynomial that gives the area of the rectangle after you increase the width by x feet and decrease the length by x feet. *Explain* why any change in dimensions results in an area less than that of the original square.