8-4: MULTIPLYING SPECIAL CASES

Lesson Objectives:

- *Finding the square of a binomial*
- *Finding the difference of two squares*

1 Finding the Square of a Binomial

The expressions $(a+b)^2$ and $(a-b)^2$ are squares of binomials. To square a binomial, you can use FOIL or the following shortcut.

RULE: THE SQUARE OF A BINOMIAL

and

The square of a binomial is the square of the first term, plus twice the product of the two terms, plus the square of the last term.

EXAMPLE 1: SQUARRING A BINOMIAL
Simplify.

1. $(x+4)^2$
2. $(y-3)^2$
3. $(y+11)^2$
4. $(3w-5)^2$
5. $(t+6)^2$
6. $(x-7)^2$
7. $(9c-8)^2$
8. $(3m+2n)^2$
9. $(x^2+y^2)^2$
10. $(2x^2+y^2)^2$
11. $(y^2-4w^2)^2$
12. $(5x^4-3x^2)^2$

EXAMPLE 2: MENTAL MATH
Simplify in your mind.

13. 81^2
14. 59^2
15. 31^2

16. 29^2 17. 98^2 18. 203^2

2 Difference of Squares

The product of the sum and difference of the same two terms also produces a pattern.

RULE: THE DIFFERENCE OF TWO SQUARES

$(a+b)(a-b) =$

The product of the sum and difference of the same two terms is the difference of their squares.

EXAMPLE 3: FINDING THE DIFFERENCE OF TWO SQUARES
Simplify.

19. $(x+4)(x-4)$ 20. $(3x-5)(3x+5)$ 21. $(p^4-8)(p^4+8)$ 22. $(d+11)(d-11)$

23. $(c^2+8)(c^2-8)$ 24. $(9v^3+w^4)(9v^3-w^4)$ 25. $(x^2-2y)(x^2+2y)$ 26. $(3x+4)(3x+4)$

EXAMPLE 4: MENTAL MATH
Simplify in your brains.

27. $(18)(22)$ 28. $(19)(21)$ 29. $(59)(61)$

30. $(87)(93)$ 31. $(96)(104)$ 32. $(33)(47)$

33. Find the area of the shaded region that is (eventually) drawn on the board.

34. Simplify.

a) $(x+4)(x+3)$

b) $(x+4)(x-4)$

c) $(x-4)^2$

d) $(2x-7)(2x+7)$

e) $(2x-1)(2x+3)$

f) $(2x+5)^2$

Name _____ ***8-4 Practice Worksheet*** Period _____

Simplify each product.

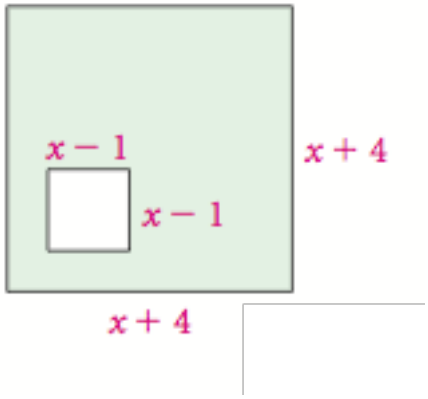
1. $(x+4)^2$
2. $(3m+7)^2$
3. $(b-5)^2$
4. $(9j-2)^2$
5. $(a+8)(a-8)$
6. $(h+15)(h-15)$
7. $(k+5)(k-5)$
8. $(x-7y)^2$
9. $(6a+11b)^2$
10. $(y^5-9x^4)^2$
11. $(2d+7g)(2d-7g)$
12. $(g^3-7h^2)(g^3+7h^2)$

Use mental math to find each product. Show the setup step.

13. 302^2
14. 499^2
15. (197)(203)
16. (299)(301)

Find an expression for the area of the shaded region.

17. A_{square} = (length of a side)^2



MIXED REVIEW

Evaluate each expression for *x=3, y=-1, and z=2*.

18. $-xyz$
19. $-z^3 - 2z + z$
20. $y^2-(-y)^2$

Suppose you have a bag containing 3 red, 4 blue, 5 white, and 2 black marbles. You select one marble at random. Find each probability or odds.

21. *P*(not white)

22. *P*(red or blue)

23. *P*(orange)

24. *P*(not black)

25. odds in favor of red

26. odds against blue

27. odds against black or white

28. odds in favor of red, white, or blue

You have 8 red checkers and 8 black checkers in a bag. You choose two checkers. Find each probability.

29. *P*(red and red) with replacing

30. *P*(red then black) without replacing

31. *P*(black and red) with replacing