CHAPTER 9: POLYNOMIALS & FACTORING

Factoring Weirds

OBJECTIVES

- I can factor weird things (difference of squares, two variables, special cases)

PART 1: WEIRD CASE #1

TWO VARIABLES

4 Factor each expression.

a. $x^2 + 11xy + 24y^2$ **b.** $v^2 + 2vw - 48w^2$

PART 1: WEIRD CASE #2

DIFFERENCE OF TWO SQUARES

3 Factor each expression. Check your answer.

a. $x^2 - 36$ **b.** $m^2 - 100$ **c.** $4w^2 - 49$

PART 1: WEIRD CASE #2

DIFFERENCE OF TWO SQUARES

Rule **Difference of Two Squares**

For every real number a and b:

$a^2 - b^2 = (a + b)(a - b)$

Examples $x^2 - 81 = (x + 9)(x - 9)$

$16x^2 - 49 = (4x + 7)(4x - 7)$

PART 1: WEIRD CASE #3

PERFECT SQUARE TRINOMIALS

1 Factor each expression.

a. $x^2 + 8x + 16$ **b.** $4t^2 + 36t + 81$

PART 1: WEIRD CASE #3

PERFECT SQUARE TRINOMIALS

Rule **Perfect-Square Trinomials**

For every real number a and b:

$a^2 + 2ab + b^2 = (a + b)(a + b) = (a + b)^2$

$a^2 - 2ab + b^2 = (a - b)(a - b) = (a - b)^2$

Examples $x^2 + 10x + 25 = (x + 5)(x + 5) = (x + 5)^2$

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

PART 1: WEIRD CASE #3

PERFECT SQUARE TRINOMIALS

Here is how to recognize a perfect-square trinomial.

- The first and the last terms can both be written as the product of two identical factors.
- The middle term is twice the product of one factor from the first term and one factor from the last term.

Consider the following trinomials.

$4x^2 + 12x + 9$

$2x \cdot 2x \qquad 3 \cdot 3$

$2(2x \cdot 3) = 12x$

This is a perfect-square trinomial. In factored form the trinomial is $(2x + 3)(2x + 3)$, or $(2x + 3)^2$.

$4x^2 + 20x + 9$

$2x \cdot 2x \qquad 3 \cdot 3$

$2(2x \cdot 3) \neq 20x$

This is not a perfect-square trinomial. Factor by listing factors, as shown in Lesson 9-6.

CAN YOU?? PROVE IT!!

- I can factor weirds

Factor each expression.

45. $100v^2 - 25w^2$ **46.** $16p^2 - 48pq + 36q^2$

48. $\frac{1}{4}m^2 - \frac{1}{9}$ **49.** $x^2 + x + \frac{1}{4}$