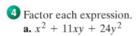
# CHAPTER 9: POLYNOMIALS & FACTORING

Factoring Weirds

## PART 1: WEIRD CASE #1

TWO VARIABLES



**b.**  $v^2 + 2vw - 48w^2$ 

# **OBJECTIVES**

 $\ \square$  I can factor weird things (difference of squares, two variables, special cases)

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

#### 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

Factor each expression.  
**a.** 
$$x^2 + 8x + 16$$

**b.** 
$$4t^2 + 36t + 81$$

## PART 1: WEIRD CASE #3

#### PERFECT SOUARE 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.

$$4x^{2} + 12x + 9$$

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

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

$$4x^{2} + 20x + 9$$

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

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

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

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.** 
$$100v^2 - 25w^2$$

**45.** 
$$100v^2 - 25w^2$$
 **46.**  $16p^2 - 48pq + 36q^2$  **48.**  $\frac{1}{4}m^2 - \frac{1}{9}$  **49.**  $x^2 + x + \frac{1}{4}$ 

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

**49.** 
$$x^2 + x + \frac{1}{2}$$