

# 9.7 Factor Special Products

TEKS A.4.A, A.10.A

**Before**

You factored polynomials of the form  $ax^2 + bx + c$ .

**Now**

You will factor special products.

**Why?**

So you can use a scientific model, as in Ex. 48.



## Key Vocabulary

- perfect square trinomial

You can use the special product patterns you studied in Lesson 9.3 to factor polynomials, such as the difference of two squares.

### KEY CONCEPT

*For Your Notebook*

#### Difference of Two Squares Pattern

Algebra

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

Example

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

### EXAMPLE 1 Factor the difference of two squares

Factor the polynomial.

$$\begin{aligned} \text{a. } y^2 - 16 &= y^2 - 4^2 \\ &= (y + 4)(y - 4) \end{aligned}$$

Write as  $a^2 - b^2$ .

Difference of two squares pattern

$$\begin{aligned} \text{b. } 25m^2 - 36 &= (5m)^2 - 6^2 \\ &= (5m + 6)(5m - 6) \end{aligned}$$

Write as  $a^2 - b^2$ .

Difference of two squares pattern

$$\begin{aligned} \text{c. } x^2 - 49y^2 &= x^2 - (7y)^2 \\ &= (x + 7y)(x - 7y) \end{aligned}$$

Write as  $a^2 - b^2$ .

Difference of two squares pattern

### EXAMPLE 2 Factor the difference of two squares

Factor the polynomial  $8 - 18n^2$ .

$$\begin{aligned} 8 - 18n^2 &= 2(4 - 9n^2) \\ &= 2[2^2 - (3n)^2] \\ &= 2(2 + 3n)(2 - 3n) \end{aligned}$$

Factor out common factor.

Write  $4 - 9n^2$  as  $a^2 - b^2$ .

Difference of two squares pattern



### GUIDED PRACTICE for Examples 1 and 2

1. Factor the polynomial  $4y^2 - 64$ .