

## Lesson 11-6

## Example 1

Can you find binomial factors for the following?

a.  $x^2 - 2xy + y^2$

b.  $t^2 - 6t + 9$

## Solution

- a. The first term,  $x^2$ , is a perfect square. Therefore, the binomial's first terms would be  $x$  or  $-x$ .

The last term,  $y^2$ , is also a perfect square, so the binomial's last terms would be  $y$  or  $-y$ .

The middle term ( $-2xy$ ) is  $x$   $\cdot$  ( $-y$ )  $\cdot$  2, so the trinomial is a perfect square.

$$x^2 - 2xy + y^2 = (x - y)(x - y)$$

- b. The first term,  $t^2$ , is a perfect square. Therefore, the binomial's first terms would be  $t$  or  $-t$ .

The last term, 9, is also a perfect square, so the binomial's last terms would be 3 or  $-3$ .

The middle term ( $-6t$ ) is  $t$   $\cdot$  ( $-3$ )  $\cdot$  2, so the trinomial is a perfect square.

$$t^2 - 6t + 9 = (t - 3)(t - 3)$$

**Example 2**

**MANUFACTURING** Two rectangular metal covers have areas of  $y^2 - 49$  and  $9a^2 - 16b^2$ . Both areas are examples of the difference of two squares. Find the dimensions of the metal covers by finding the binomial factors of each.

a.  $y^2 - 49$

b.  $9a^2 - 16b^2$

**Solution**

- a. The first term,  $y^2$ , is a perfect square, so the first term of both binomials will be  $y$ . The second term,  $49$ , is also a perfect square, so the binomial's second terms will be  $7$  and  $-7$ , respectively.

$$y^2 - 49 = (y + 7)(y - 7)$$

- b. The first term,  $9a^2$ , is a perfect square, so the first term of both binomials will be  $3a$ . The second term,  $16b^2$ , is also a perfect square, so the binomial's second terms will be  $4b$  and  $-4b$ , respectively.

$$9a^2 - 16b^2 = (3a + 4b)(3a - 4b)$$

**Example 3**

Determine the possible solutions for  $y^2 + 36 = 12y$ .

**Solution**

Isolate a 0 on the right side of the equation:  $y^2 - 12y + 36 = 0$ .

Then factor the expression on the left side:  $(y - 6)(y - 6) = 0$ .

Either one or the other factor must be equal to 0. Since both factors are the same, both must be equal to 0. Solve the equation:  $y - 6 = 0$ , so  $y = 6$ .