ACTIVITY

1.6

Special Products When Multiplying Binomials

In this activity you will investigate the product of two linear factors when one is the sum of two terms and the other is the difference of the same two terms, and when the two linear factors are the same.

1. Determine each product.

a. $(x - 4)(x + 4) =$ ________________

$(x + 4)(x + 4) =$ ________________

$(x - 4)(x - 4) =$ ________________

b. $(x - 3)(x + 3) =$ ________________

$(x + 3)(x + 3) =$ ________________

$(x - 3)(x - 3) =$ ________________

c. $(3x - 1)(3x + 1) =$ ________________

$(3x + 1)(3x + 1) =$ ________________

$(3x - 1)(3x - 1) =$ ________________

d. $(2x - 1)(2x + 1) =$ ________________

$(2x + 1)(2x + 1) =$ ________________

$(2x - 1)(2x - 1) =$ ________________

2. What patterns do you notice between the factors and the products?

3. Multiply each pair of binomials.

$(ax - b)(ax + b) =$ ________________

$(ax + b)(ax + b) =$ ________________

$(ax - b)(ax - b) =$ ________________

In Questions 1 and 3, you should have observed a few special products. The first type of special product is called the *difference of two squares*. The **difference of two squares** is an expression in the form $a^2 - b^2$ that has factors $(a - b)(a + b)$.

4. **Label the expressions in Questions 1 and 3 that are examples of the difference of two squares.**

The second type of special product is called a *perfect square trinomial*. A **perfect square trinomial** is an expression in the form $a^2 + 2ab + b^2$ or the form $a^2 - 2ab + b^2$. A perfect square trinomial can be written as the square of a binomial.

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

5. **Label the expressions in Questions 1 and 3 that are examples of perfect square trinomials.**

6. **Use special products to determine each product.**

a. $\mathbf{(x - 8)(x - 8)}$

b. $\mathbf{(x + 8)(x - 8)}$

c. $\mathbf{(x + 8)^2}$

d. $\mathbf{(3x + 2)^2}$

e. $\mathbf{(3x - 2)(3x - 2)}$

f. $\mathbf{(3x - 2)(3x + 2)}$