

Simplify.

1. $(x - 2)(x - 2)$

2. $(y - 2)(y + 9)$

3. $(z - 2)(z - 6)$

4. $(3x + 4)(x + 6)$

5. $(4x - 6)(4x - 10)$

6. $(4a + b)(3a + 6b)$

Essential Question

What are the patterns in the special products
 $(a + b)(a - b)$, $(a + b)^2$, and $(a - b)^2$?

Warm Up

Essential Question

 **Core Concept****Square of a Binomial Pattern****Algebra**

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

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

Example

$$(x + 5)^2 = (x)^2 + 2(x)(5) + (5)^2$$

$$= x^2 + 10x + 25$$

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

$$= 4x^2 - 12x + 9$$

Find each product.

a. $(3x + 4)^2$

b. $(5x - 2y)^2$

Core Concept

Example 1

Find the product.

1. $(x + 7)^2$

2. $(7x - 3)^2$

3. $(4x - y)^2$

4. $(3m + n)^2$

 **Core Concept****Sum and Difference Pattern****Algebra**

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

Example

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

Monitoring Progress 1-4

Core Concept

Find each product.

a. $(t + 5)(t - 5)$

b. $(3x + y)(3x - y)$

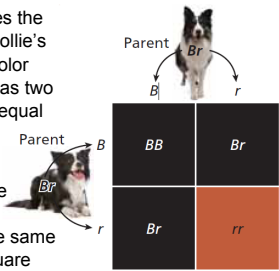
Use special product patterns to find the product 26 • 34.

Example 2

Example 3

A combination of two genes determines the color of the dark patches of a border collie's coat. An offspring inherits one patch color gene from each parent. Each parent has two color genes, and the offspring has an equal chance of inheriting either one.

The gene B is for black patches, and the gene r is for red patches. Any gene combination with a B results in black patches. Suppose each parent has the same gene combination Br . The Punnett square shows the possible gene combinations of the offspring and the resulting patch colors.



Parent	B	r
Parent	B	r
	BB	Br
	Br	rr

a. What percent of the possible gene combinations result in black patches?

b. Show how you could use a polynomial to model the possible gene combinations.

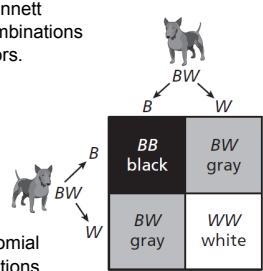
Example 4

Example 4a-b

9. Each of two dogs has one black gene (B) and one white gene (W). The Punnett square shows the possible gene combinations of an offspring and the resulting colors.

a. What percent of the possible gene combinations result in black?

b. Show how you could use a polynomial to model the possible gene combinations of the offspring.



Parent	B	W
Parent	B	W
	BB black	BW gray
	BW gray	WW white