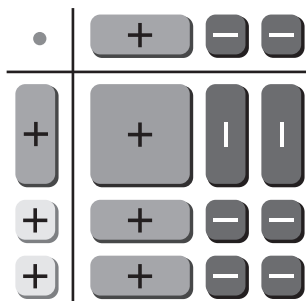Name _____ Date _____

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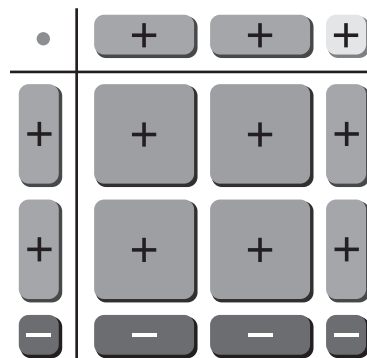$(a + b)(a - b)$, $(a + b)^2$, and $(a - b)^2$?

1 EXPLORATION: Finding a Sum and Difference Pattern

Work with a partner. Write the product of two binomials modeled by each rectangular
array of algebra tiles.

a. $(x + 2)(x - 2) =$ _____
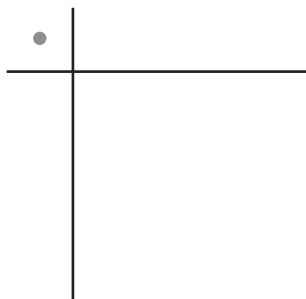
b. $(2x - 1)(2x + 1) =$ _____

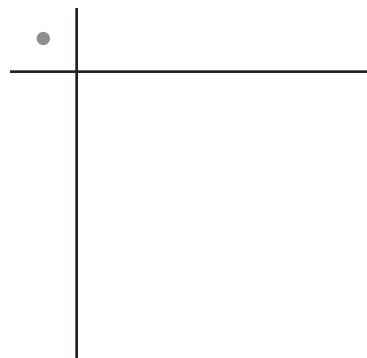**2 EXPLORATION: Finding the Square of a Binomial Pattern**

Go to *BigIdeasMath.com* for an interactive tool to investigate this exploration.

Work with a partner. Draw the rectangular array of algebra tiles that models each
product of two binomials. Write the product.

a. $(x + 2)^2 =$ _____

b. $(2x - 1)^2 =$ _____

7.3 **Special Products of Polynomials** (continued)

Communicate Your Answer

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

4. Use the appropriate special product pattern to find each product. Check your answers using algebra tiles.

a. $(x + 3)(x - 3)$ **b.** $(x - 4)(x + 4)$ **c.** $(3x + 1)(3x - 1)$

d. $(x + 3)^2$ **e.** $(x - 2)^2$ **f.** $(3x + 1)^2$

Name _____ Date _____

In your own words, write the meaning of each vocabulary term.

binomial

Core Concepts

Square of a Binomial Pattern

Algebra

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

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

Example

$$(x + 5)^2 = (x)^2 + 2(x)(5) + (5)^2$$
$$= x^2 + 10x + 25$$

$$(2x - 3)^2 = (2x)^2 - 2(2x)(3) + (3)^2$$
$$= 4x^2 - 12x + 9$$

Notes:

Sum and Difference Pattern

Algebra

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

Example

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

Notes:

7.3 Notetaking with Vocabulary (continued)

Extra Practice

In Exercises 1–18, find the product.

1. $(a + 3)^2$

2. $(b - 2)^2$

3. $(c + 4)^2$

4. $(-2x + 1)^2$

5. $(3x - 2)^2$

6. $(-4p - 3)^2$

7. $(3x + 2y)^2$

8. $(2a - 3b)^2$

9. $(-4c + 5d)^2$

10. $(x - 3)(x + 3)$

11. $(q + 5)(q - 5)$

12. $(t - 11)(t + 11)$

7.3 **Notetaking with Vocabulary** (continued)

13. $(5a - 1)(5a + 1)$ **14.** $\left(\dfrac{1}{4}b + 1\right)\left(\dfrac{1}{4}b - 1\right)$ **15.** $\left(\dfrac{1}{2}c + \dfrac{1}{3}\right)\left(\dfrac{1}{2}c - \dfrac{1}{3}\right)$

16. $(-m + 2n)(-m - 2n)$ **17.** $(-3j - 2k)(-3j + 2k)$ **18.** $\left(6a + \dfrac{1}{2}b\right)\left(-6a + \dfrac{1}{2}b\right)$

In Exercises 19–24, use special product patterns to find the product.

19. $18 \bullet 22$ **20.** $49 \bullet 51$ **21.** $19\dfrac{3}{5} \bullet 20\dfrac{2}{5}$

22. $(31)^2$ **23.** $(20.7)^2$ **24.** $(109)^2$

25. Find k so that $kx^2 - 12x + 9$ is the square of a binomial.