Name _____ Date _____

7.7 Factoring Special Products

For use with Exploration 7.7

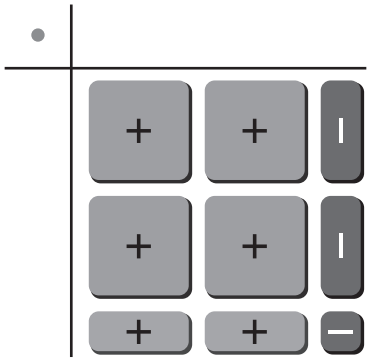
Essential Question How can you recognize and factor special products?

1 EXPLORATION: Factoring Special Products

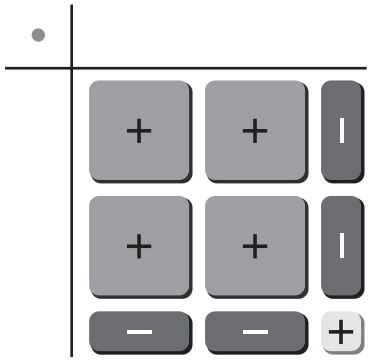
Go to *BigIdeasMath.com* for an interactive tool to investigate this exploration.

Work with a partner. Use algebra tiles to write each polynomial as the product of two binomials. Check your answer by multiplying. State whether the product is a "special product" that you studied in Section 7.3.

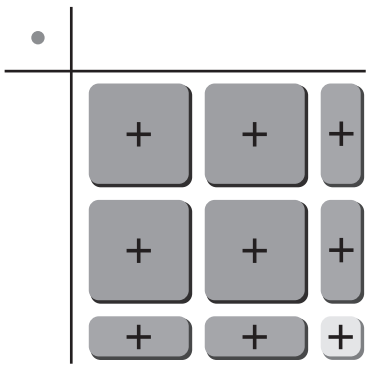
a. $4x^2 - 1 =$ _____



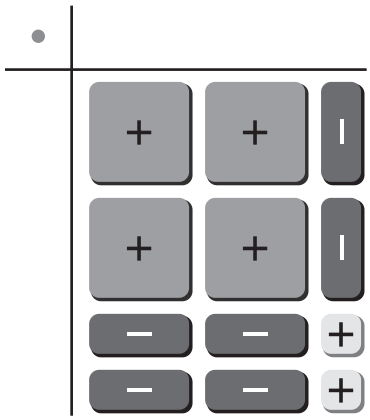
b. $4x^2 - 4x + 1 =$ _____



c. $4x^2 + 4x + 1 =$ _____



d. $4x^2 - 6x + 2 =$ _____

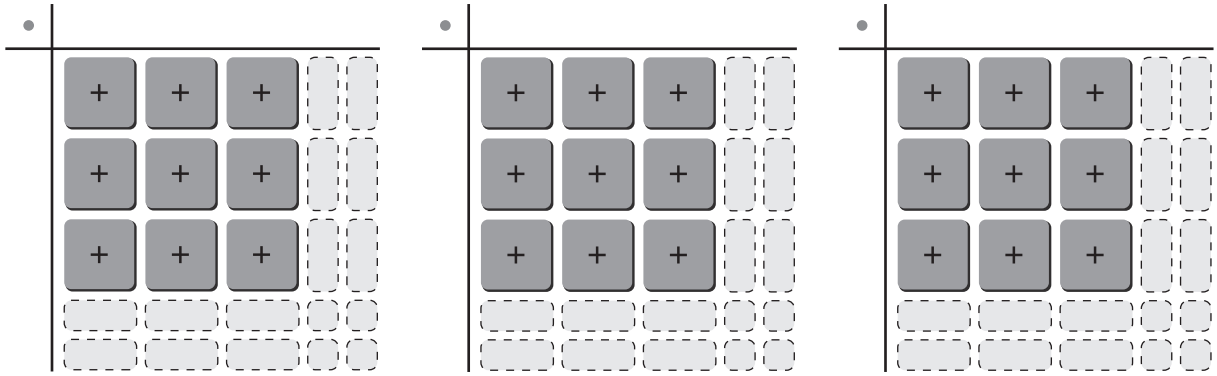


7.7 Factoring Special Products (continued)

2 EXPLORATION: Factoring Special Products

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

Work with a partner. Use algebra tiles to complete the rectangular arrays in three different ways, so that each way represents a different special product. Write each special product in standard form and in factored form.



Communicate Your Answer

3. How can you recognize and factor special products? Describe a strategy for recognizing which polynomials can be factored as special products.

4. Use the strategy you described in Question 3 to factor each polynomial.

a. $25x^2 + 10x + 1$ **b.** $25x^2 - 10x + 1$ **c.** $25x^2 - 1$

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7.7 Notetaking with Vocabulary

For use after Lesson 7.7

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

polynomial

trinomial

Core Concepts

Difference of Two Squares Pattern

Algebra	Example
$a^2 - b^2 = (a + b)(a - b)$	$x^2 - 9 = x^2 - 3^2 = (x + 3)(x - 3)$

Notes:

Perfect Square Trinomial Pattern

Algebra	Example
$a^2 + 2ab + b^2 = (a + b)^2$	$x^2 + 6x + 9 = x^2 + 2(x)(3) + 3^2 = (x + 3)^2$
$a^2 - 2ab + b^2 = (a - b)^2$	$x^2 - 6x + 9 = x^2 - 2(x)(3) + 3^2 = (x - 3)^2$

Notes:

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7.7 Notetaking with Vocabulary (continued)

Extra Practice

In Exercises 1–6, factor the polynomial.

1. $s^2 - 49$

2. $t^2 - 81$

3. $16 - x^2$

4. $4g^2 - 25$

5. $36h^2 - 121$

6. $81 - 49k^2$

In Exercises 7–12, use a special product pattern to evaluate the expression.

7. $57^2 - 53^2$

8. $38^2 - 32^2$

9. $68^2 - 64^2$

10. $45^2 - 40^2$

11. $79^2 - 71^2$

12. $86^2 - 84^2$

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7.7 Notetaking with Vocabulary (continued)

In Exercises 13–18, factor the polynomial.

13. $x^2 + 16x + 64$

14. $p^2 + 28p + 196$

15. $r^2 - 26r + 169$

16. $a^2 - 18a + 81$

17. $36c^2 + 84c + 49$

18. $100x^2 - 20x + 1$

In Exercises 19–24, solve the equation.

19. $x^2 - 144 = 0$

20. $9y^2 = 49$

21. $c^2 + 14c + 49 = 0$

22. $d^2 - 4d + 4 = 0$

23. $n^2 + \frac{2}{3}n = -\frac{1}{9}$

24. $-\frac{6}{5}k + \frac{9}{25} = -k^2$

25. The dimensions of a rectangular prism are $(x + 1)$ feet by $(x + 2)$ feet by 4 feet. The volume of the prism is $(24x - 1)$ cubic feet. What is the value of x?