

Special Products of Polynomials

Algebra 1 • Section 7.4

Name: _____

Date: _____

Score: _____ / 12

Quick Review and Helpful Hints

Polynomial work is pattern work. Keep like terms together, apply exponent rules only when the bases match, and check factoring by multiplying the factors back together.

▷ **Example:** Factor $x^2 + 9x + 20$.

Work: Look for two numbers that multiply to 20 and add to 9. The numbers are 4 and 5.

★ **Answer:** $(x + 4)(x + 5)$

◆ Practice Problems

Solve each problem. Show enough work that another student could follow your thinking.

1. Expand $(x + 5)^2$. _____

6. Multiply $(5y + 2)(5y - 2)$. _____

2. Expand $(x - 7)^2$. _____

7. Expand $(m + \frac{1}{2})^2$. _____

3. Expand $(2x + 3)^2$. _____

8. Expand $(4p - 1)^2$. _____

4. Expand $(3a - 4)^2$. _____

9. Multiply $(2x + 9)(2x - 9)$. _____

5. Multiply $(x + 6)(x - 6)$. _____

10. Expand $(x - 10)^2$. _____

◆ Word Problems

11. A square garden side is $x + 4$. Write its area. _____

12. A frame has outer side $x + 3$ and inner side $x - 3$. Multiply to compare areas. _____



Answer Keys

1. $x^2 + 10x + 25$

2. $x^2 - 14x + 49$

3. $4x^2 + 12x + 9$

4. $9a^2 - 24a + 16$

5. $x^2 - 36$

6. $25y^2 - 4$

7. $m^2 + m + \frac{1}{4}$

8. $16p^2 - 8p + 1$

9. $4x^2 - 81$

10. $x^2 - 20x + 100$

11. $x^2 + 8x + 16$

12. $x^2 - 9$

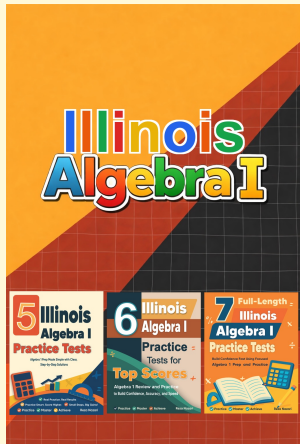
Step-by-Step Explanations

1. Squaring a sum follows a pattern: first squared, twice the product, last squared.
2. The middle is twice x times -7 , which lands you on $-14x$.
3. Square the front, double the product for the middle, square the back — done.
4. Doubling the product gives $2(3a)(-4) = -24a$ for that center term.
5. These are conjugates, so the middle terms wipe each other out, leaving a difference of squares.
6. Same sign, opposite sign — that's the $a^2 - b^2$ shortcut, so just square each piece.

7. Double the product $m \cdot \frac{1}{2}$ to get the middle m , then square the $\frac{1}{2}$.
8. Walk the pattern: $4p$ squared, twice $(4p)(-1)$, then 1 squared.
9. Because the signs are opposite, the cross terms vanish and only the squares survive.
10. That center term is twice x times -10 , giving you $-20x$.
11. A square's area is its side squared, and $(x + 4)^2$ is a perfect-square trinomial.
12. Those conjugate sides multiply into a clean difference of squares.



Want Even More Algebra 1 Practice?



Illinois Algebra I Preparation Bundle

18 full-length practice tests across three books
Fresh test practice, detailed explanations, and
organized review



18 Tests
3 Books
One Bundle

Important: These Algebra 1 resources are made for extra practice after the worksheet. Use the QR code for the state or program bundle connected with this worksheet.

Skill Review

- ✓ Strengthens equations, functions, systems, and modeling
- ✓ Supports steady review before tests
- ✓ Good for tutoring, homework, and independent practice

Build the foundation.

Test Practice

- ✓ Full-length practice tests for realistic pacing
- ✓ Detailed answer explanations for every test
- ✓ Useful after students finish topic worksheets

Practice with purpose.

Confidence

- ✓ Turns mistakes into targeted review
- ✓ Helps students see progress over time
- ✓ Keeps preparation organized and calm

Move forward prepared.