Factoring Special Products

Algebra 1 •Section 8.4

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. Factor $x^2 - 36$. ______

2. Factor $4x^2 - 81$. ______

3. Factor $x^2 + 12x + 36$. ______

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

5. Factor $25y^2 - 1$. ______

6. Factor $16m^2 + 40m + 25$. ______

7. Factor $49p^2 - 64$. ______

8. Factor $x^2 - 18x + 81$. ______

9. Factor $36r^2 + 12r + 1$. ______

10. Is $x^2 + 25$ factorable over the real numbers? ______

Word Problems

11. A square area is $x^2 + 14x + 49$. Factor to find side length. ______

12. A border area uses $y^2 - 100$. Factor it. ______

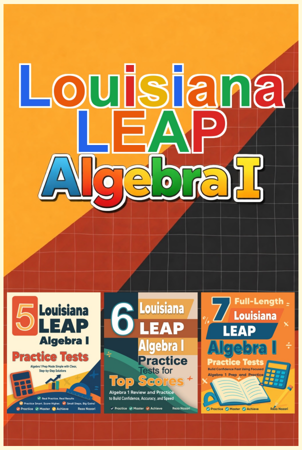
Answer Keys

1. $(x-6)(x+6)$
2. $(2x-9)(2x+9)$
3. $(x+6)^2$
4. $(3a-4)^2$
5. $(5y-1)(5y+1)$
6. $(4m+5)^2$
7. $(7p-8)(7p+8)$
8. $(x-9)^2$
9. $(6r+1)^2$
10. No
11. $(x+7)^2$; side $x+7$
12. $(y-10)(y+10)$

Step-by-Step Explanations

1. Two squares with a subtraction sign means split into a sum and difference.
2. Both $4x^2$ and 81 are perfect squares, so the difference-of-squares pattern fits.
3. The ends square nicely and $12x$ is twice x times 6 — that makes it a perfect square.
4. Since $9a^2$ and 16 are squares and $-24a$ is twice their product, fold it into a square.
5. This is $(5y)^2 - 1^2$, so the difference of squares splits it apart.
6. It lines up with $(a+b)^2$: $4m$ and 5 squared, with $40m$ as twice their product.
7. Recognize $(7p)^2 - 8^2$ and let the difference-of-squares rule do the work.
8. Check the middle: twice x times -9 is $-18x$, confirming a perfect-square trinomial.
9. Both ends are squares and $12r$ equals $2(6r)(1)$, so it collapses to one square.
10. This is a sum of squares, and that pattern simply doesn't factor with real numbers.
11. The trinomial is a perfect square, so the side length is just $x+7$.
12. Spot $y^2 - 10^2$ and apply the difference-of-squares pattern directly.

Want Even More Algebra 1 Practice?



Louisiana LEAP 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.