Factoring Trinomials: $x^2 + bx + c$

Algebra 1 •Section 8.2

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 $x^2 + 7x + 10$.

2. Factor $x^2 - 9x + 20$.

3. Factor $x^2 + x - 12$.

4. Factor $x^2 - 2x - 35$.

5. Factor $x^2 + 11x + 24$.

6. Factor $x^2 - 16x + 63$.

7. Factor $x^2 + 5x - 24$.

8. Factor $x^2 - 49$.

9. Factor $x^2 + 2x + 1$.

10. Factor $x^2 + 4x + 9$ over the integers.

Word Problems

11. A rectangular area is $x^2 + 13x + 40$. Factor to find possible side lengths.

12. A quadratic model has zeros from $x^2 - 6x + 8 = 0$. Factor it.

Answer Keys

1. $(x+5)(x+2)$
2. $(x-5)(x-4)$
3. $(x+4)(x-3)$
4. $(x-7)(x+5)$
5. $(x+3)(x+8)$
6. $(x-7)(x-9)$
7. $(x+8)(x-3)$
8. $(x-7)(x+7)$
9. $(x+1)^2$
10. Prime
11. $(x+5)(x+8)$
12. $(x-2)(x-4)=0$

Step-by-Step Explanations

1. Hunt for two numbers hitting 10 when multiplied and 7 when added — that's 5 and 2.
2. You need a product of 20 and a sum of -9, so both numbers go negative: -5 and -4.
3. Looking for a pair that multiplies to -12 and adds to 1 lands you on 4 and -3.
4. The negative product means opposite signs; -7 and 5 multiply to -35 and add to -2.
5. Which two positives give 24 and 11? Three and eight do the job perfectly.
6. A positive product with a negative sum means two negatives: -7 and -9 work.
7. Opposite signs are needed for -24; pick 8 and -3 so they add to 5.
8. There's no middle term — that's the signature of a difference of squares.
9. Both ends are squares and the middle fits twice the product, so it's a perfect square.
10. No whole-number pair multiplies to 9 and adds to 4, so it won't factor — it's prime.
11. Two numbers that reach 40 and 13 at once are 5 and 8.
12. You want a product of 8 and a sum of 6; both negative gives -2 and -4.

Want Even More Algebra 1 Practice?

Florida B.E.S.T. 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.