

Pre-Algebra

Aim: How do we factor trinomials in the form of $x^2 + bx + c$? (AM Method)

Do Now: Multiply the following pairs of binomials.

a. $(x + 4)(x + 5)$

b. $(x + 2)(x + 6)$

c. $(x + 1)(x + 5)$

Factoring $x^2 + bx + c$

| Product (Factored Form) | Simplified Trinomial | b | c |
|-------------------------|----------------------|---|---|
| $(x + 4)(x + 5)$ | | | |
| $(x + 2)(x + 6)$ | | | |
| $(x + 1)(x + 5)$ | | | |

Rule: $x^2 + bx + c$ factors into $(x + p)(x + q)$ where $p + q = b$ and $pq = c$

Step 1: Start with 2 sets of parenthesis whose first term is x .

Step 2: Identify all pairs of factors that multiply to the c value (last term).

Step 3: Determine which pair adds to be the b value (middle term).

Step 4: Place the factors in the parentheses to create a product of binomials.

Step 5: Check by multiplying the binomials.

Factor: $x^2 + 6x + 8$

Examples: Factor each trinomial into two binomials.

Ask yourself, "what numbers multiply to the last term and add to the middle term?"

1. $x^2 + 5x + 6$

2. $x^2 + 9x + 18$

3. $x^2 + 8x + 7$

4. $x^2 + 7x + 10$

5. $x^2 + 8x + 15$

6. $x^2 + 29x + 100$

7. $x^2 - 10x + 16$

8. $x^2 - 7x + 6$

9. $x^2 - 9x + 8$

10. $x^2 + 6x - 16$

11. $x^2 - 8x - 20$

12. $x^2 + 5x - 50$

****Patterns to Notice:**

1. If b and c are both positive, both of the binomials have _____ signs.
2. If c is negative, one binomial has a _____ sign and one has a _____ sign.
3. If c is positive and b is negative, both binomials have a _____ sign.

Examples of Patterns

a. $x^2 + 5x + 6$

b. $x^2 - 2x - 8$

c. $x^2 - 6x + 5$