

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

$$x^2 + 9x + 20$$

$$x^2 + 8x + 12$$

$$x^2 + 6x + 5$$

Factoring $x^2 + bx + c$

Product (Factored Form)	Simplified Trinomial	b	c
$(x + 4)(x + 5)$	$x^2 + 9x + 20$	9	20
$(x + 2)(x + 6)$	$x^2 + 8x + 12$	8	12
$(x + 1)(x + 5)$	$x^2 + 6x + 5$	6	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: $x^2 + 6x + 8$

$(x + 4)(x + 2)$

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. $x^2 + 8x + 7$

$$(x + 2)(x + 3)$$

$$(x + 6)(x + 3)$$

$$(x + 7)(x + 1)$$

$$4. \overset{A}{x^2} + \overset{M}{7x} + 10$$

$$(x+5)(x+2)$$

$$5. \overset{A}{x^2} + \overset{M}{8x} + 15$$

$$(x+5)(x+3)$$

$$6. \overset{A}{x^2} + \overset{M}{29x} + 100$$

$$(x+25)(x+4)$$

$$7. \overset{A}{x^2} - \overset{M}{10x} + 16$$

$$(x-8)(x-2)$$

$$8. \overset{A}{x^2} - \overset{M}{7x} + 6$$

$$(x-6)(x-1)$$

$$9. \overset{A}{x^2} - \overset{M}{9x} + 8$$

$$(x-8)(x-1)$$

$$10. \overset{A}{x^2} + \overset{M}{6x} - 16$$

$$(x+8)(x-2)$$

$$11. \overset{A}{x^2} - \overset{M}{8x} - 20$$

$$(x-10)(x+2)$$

$$12. \overset{A}{x^2} + \overset{M}{5x} - 50$$

$$(x+10)(x-5)$$

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

$$(x+2)(x+3)$$

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

$$(x+2)(x-4)$$

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

$$(x-5)(x-1)$$