Basic Algebra 1

5-7 Factoring Pattern for $x^2 + bx + c$, with c positive

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Bas. Algebra 1: 5-7 Factoring x^2+bx+c, c>0

Warmup:

Multiply:

1. $(x + 1)^2$
2. $(w - 3)^2$
3. $(q + 6)^2$

Factor:

4. $x^2 + 2x + 1$
5. $w^2 - 6w + 9$
6. $q^2 + 12q + 36$
7. $x^2 - 100$
8. $x^2 + 25$
9. $x^2 - 15x + 64$

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Objective:

To factor quadratic trinomials whose quadratic coefficient is 1 and whose constant term is positive.

Reminder:

$x^2 + bx + c$

quadratic term

linear term

constant term

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Let's look for more patterns:

$(x + 3)(x + 5) = x^2 + 8x + 15$

sum of 3 and 5

product of 3 and 5

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This is another pattern that always holds:

$(x + 4)(x + 2) = x^2 + 6x + 8$

sum of 4 and 2

product of 4 and 2

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How about this one:

$(x - 4)(x - 2) = x^2 - 6x + 8$

sum of -4 and -2

product of -4 and -2

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The pattern holds for perfect square trinomials:

$(x - 4)(x - 4) = x^2 - 8x + 16$

sum of -4 and -4

product of -4 and -4

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This suggests a way to factor ANY trinomial.
Let's start with an easy one: FACTOR:

$x^2 + 5x + 6$

What are the FACTORS of 6?

What are the SUMS of these factors?

FACTORS	SUM of factors
1 and 6	7
2 and 3	5
-1 and -6	-7
-2 and -3	-5

The factors 2 and 3 sum to 5.

So let's try that: $(x + 2)(x + 3)$

Does that work?

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Will it work on a perfect square trinomial?

Factor: $x^2 + 12x + 36$

Factor Pairs for Constant term __	Sum of the Factors

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How about with negatives?

Factor: $x^2 - 8x + 16$

Factor Pairs for Constant term __	Sum of the Factors

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Factor Pairs for Constant term __	Sum of the Factors

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