

Factoring trinomials MATH style

(The common method in Kehillah school!)

Assume a trinomial of the form

$$aX^2 + bX + c$$

Create the following table following the directions below it:

M	A	T	H
$a \cdot c$	b	Try the various factors of $a \cdot c$ that sum up to b	☺

1. Put under M (Multiply) the product $a \cdot c$
2. Put under A (Add) the value of b
3. Under T (Tries), put the various factor-pairs of the result in M, and try to see if their sum adds up to A.
4. When you find an appropriate pair, mark a smiley face in H (Happy) !
5. Rewrite the trinomial, by writing the middle term as the sum of two terms, and factor by grouping appropriate terms.

Examples:

I. $3x^2 + 8x + 4$

M	A	T	H
$3 \cdot 4 = 12$	8	1,12 – no 2,6 - YES	☺

$$3x^2 + 8x + 4 = 3x^2 + 6x + 2x + 4 = 3x(x + 2) + 2(x + 2) = \mathbf{(3x + 2)(x + 2)}$$

II. $2x^2 + x - 15$

M	A	T	H
-30	1	-6,5 - no 5,6 - YES	☺

$$2x^2 + 6x - 5x - 15 = 2x(x + 3) - 5(x + 3) = (2x - 5)(x + 3)$$

III. $x^2 - 2x - 24$

M	A	T	H
-24	-2	-2,12 - no -6,4 - YES	☺

$$x^2 - 6x + 4x - 24 = x(x - 6) + 4(x - 6) = (x + 4)(x - 6)$$

Let's try in the case of binomial (though we know the answer already!)

IV. $4x^2 - 9 = 4x^2 + 0x - 9$

M	A	T	H
-36	0	-6,6 - YES	☺

$$4x^2 - 6x + 6x - 9 = 2x(2x - 3) + 3(2x - 3) = (2x - 3)(2x + 3)$$

V. $-2x^2 - x + 6$

M	A	T	H
-12	-1	-4,3 - YES	☺

$$-2x^2 - 4x + 3x + 6 = -2x(x + 2) + 3(x + 2) = (3 - 2x)(x + 2)$$

== END ==