BE-1B | TUESDAY 12-4-07

No problems - just HAVE your pencils / looseleaf OUT & be ready to learn AN important factoring technique... it will put together GCF, FBG, AND ZPP.

Keep your hands AND feet inside the car at all times... hang ON....

A second degree trinomial is written in STANDARD FORM as:

$$ax^2 + bx + c$$

- ax^2: all the x^2 terms. → Monomial Degree = 2
- bx: all the x terms → Monomial Degree = 1
- c: All the Numbers → Monomial Degree = 0

Ex) $x^2 + 6x + 8$ $\quad a=1 \quad b=6 \quad c=8$

Ex) $6x^2 + 17x + 5$ $\quad a=6 \quad b=17 \quad c=5$

Is there a way to factor a second degree trinomial in standard form?

NOTE: Assuming it HAS factors. Many second degree trinomials are PRIME, which means they cannot be factored. I will show you a simple test to see if one is prime later.

HERE IS THE FAST (FACTOR A SQUARE TRINOMIAL) TECHNIQUE FOR FACTORING ANY TRINOMIAL IN STANDARD FORM THAT CAN BE FACTORED... i.e., IS NOT PRIME.

(EX) $6x^2 + 17x + 5$ STANDARD FORM ✓

FIND 2 MAGIC NUMBERS WHOSE:

SUM IS $b = 17$

AND PRODUCT IS $ac = 30$

$+2 \quad +15$

SPLIT x^1 TERM, IN THIS CASE $17x$ INTO $+2x + 15x$ THEN FBG (FACTOR BY GROUPING)

$$(6x^2 + 2x) + (15x + 5)$$

$$2x(3x + 1) + 5(3x + 1)$$

$$\boxed{(3x+1)(2x+5)}$$

CK $(3x+1)(2x+5) = 6x^2 + 15x + 2x + 5$

$6x^2 + 17x + 5$ ✓

Ex Factor $3x^2 + 8x + 4$ STD. Form ✓

Sum = b = 8

Prod = ac = 12

$+2 \quad +6$

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

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

$\boxed{(3x+2)(x+2)}$

Solve $3x^2 + 8x + 4 = 0$

since $(3x+2)(x+2) = 0$

$\boxed{x = -\frac{2}{3}, -2}$

Ex $x^2 + 6x + 8$ STD. Form ✓

Sum = b = 6

Prod = ac = $1 \cdot 8 = 8$

$+2 \quad +4$

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

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

$\boxed{(x+2)(x+4)}$

NOTE: IF YOU FIND THE 2 magic numbers, FBG is guaranteed to work.

NOTE: NO magic numbers, PRIME polynomial.

(Ex) $2x^2 + 5x - 3 = 0$ Solve

sum = b = 5

prod = ac = -6

-1 +6

$(2x^2 - 1x) + (6x - 3)$

$x(2x - 1) + 3(2x - 1)$

$(2x - 1)(x + 3) = 0$

$\boxed{x = \frac{1}{2}, -3}$

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14 to 17

19 and 20.

(None of these are prime)

(This completes chapters 9-3 and 9-4)