Algebra 1 | Monday 4-1-13 | Class Notes

Ch. 7-3 and 7-4 ⇒

* Factoring ax^2+bx+c
  * if it can be factored.

Steps: ① Put in standard form
ax^2+bx+c

② Find 2 "magic numbers"
whose sum = b
and product = ac

these are the magic numbers.

③ split the "bx" term
into two magic number terms

(Ex) $4x = -1x + 5x$
(magic numbers)

④ *FBG
* if the magic numbers exist, the ax^2+bx+c is factorable and FBG will work.

Examples from Ch. 7-3 & 7-4

(Ex) $4x^2 + 19x - 5$

(Ex) $2x^2 - 7x - 15$

(Ex) $2x^2 + 11x + 12$

(Ex) $5x^2 - 14x + 8$

Can you verify your answer?

Yes, multiply your two factors and see if you get the original trinomial.

(Ex) $x^2 + 16x + 48$

↑ There is a shortcut if $a = +1$

(Ex) $4x^2 + 19x - 5$ {Magic Number Method}

sum = b = 19

prod = ac = −20

? ?
−{1} + {20}

~~4, 5~~
~~2, 10~~

$-1x \quad +20x$ split middle term

$(4x^2 - 1x) + (20x - 5)$

$x(4x - 1) + 5(4x - 1)$

Why? $x\underline{a} + 5\underline{a}$
$\underline{a}(x+5)$

Factors of trinomial: $(4x-1)(x+5)$

CK $(4x-1)(x+5)$

$4x^2 + 20x - 1x - 5$

$4x^2 + 19x - 5$ ✓

Trap

$(4x^2 + 20x) + (-1x - 5)$ ✱ 3rd term ⊖

$4x(x+5) + -1(x+5)$

$(x+5)(4x-1)$

(Ex) $2x^2 - 7x - 15 = 0$

sum $= b = -7$

prod $= ac = -30$

	1, 30
	2, 15
$+3\ -10$	5, 6
	3, 10

$(2x^2 - 10x) + (3x - 15)$

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

$(x-5)(2x+3) = 0$ ✓

$\left\{x = 5, -\frac{3}{2}\right\}$ ✓ ✓

Ex $2x^2 + 11x + 12$

sum = b = 11

prod = ac = 24

$+3x \quad +8x$

$(2x^2 + 3x) + (8x + 12)$

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

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

Ex $5x^2 - 14x + 8$

Sum = -14

prod = 40

$-10 \quad -4$

$(5x^2 - 10x) + (-4x + 8)$

$5x(x-2) + -4(x-2)$

$(x-2)(5x-4)$ ✓

Ex $x^2 + 16x + 48$ $a = +1$

IFF SHORTCUT

Sum = $b = 16$ 4, 12 ?

prod = $ac = 48$

$+4x \quad +12$

$(x+4)(x+12)$ ✓

Ex 4 pg 483

$-2x^2 - 15x - 7$

sum = b = −15

prod = ac = 14

−1 −14

$(-2x^2 - 1x) + (14x - 7)$

change "−" to "+(−"

$-x(+2x+1) + -7(2x+1)$

$\boxed{(2x+1)(-x-7)}$

or $(2x+1)(-1)(x+7)$

$= -1(2x+1)(x+7)$