Annex to [Theorem no. 92: The Quadratic Formula] at [theoremoftheday.org]

Poster

.robin. @robinhouston · 24 avr. 2019

Yes! I don't know why this isn't more commonly done.

> **Laurens Gunnarsen** @MathPrinceps · 3 mars 2019
>
> @jamestanton God wants us to write our polynomials like this:
>
> 1ax^0
> 1ax^1 + 1bx^0
> 1ax^2 + 2bx^1 + 1cx^0
> 1ax^3 + 3bx^2 + 3cx^1 + 1dx^0
> 1ax^4 + 4bx^3 + 6cx^2 + 4dx^1 + 1ex^0,
>
> with their coefficients multiplied by entries drawn from Pascal's triangle. Makes everything nicer.

1 · 2

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Gauss knew this. (Disquisitiones Arithmeticae 152)

ci possunt. Proposita congruentia

$$axx + bx + c \equiv 0$$

secundum mod. m solvenda, huic aequivalebit congruentia

$$4aaxx + 4abx + 4ac \equiv 0 \pmod{4am}$$

i. e. quivis numerus alteri satisfaciens etiam alteri satisfaciet. Haec vero ita exhiberi potest

$$(2ax + b)^2 \equiv bb - 4ac \pmod{4am}$$

unde omnes valores ipsius $2ax + b$ minores quam $4am$ si qui dantur inveniri possunt. Quibus per r, r', r'' etc. designatis, omnes solutiones congr. prop. deducentur ex solutionibus congruentiarum

$$2ax \equiv r - b,\ 2ax \equiv r' - b \text{ etc. } \pmod{4am}$$

quas in Sect. II invenire docuimus. Ceterum observamus, solutionem plerumque per varia artificia contrahi posse, *ex. gr.* loco congr. prop. aliam inveniri posse

$$a'xx + 2b'x + c' \equiv 0$$

illi aequipollentem, et in qua a' ipsum m metiatur; haec vero de quibus Sect. ultima conferri potest, hic explicare brevitas non permittit.

6:48 PM · 24 avr. 2019

Laurens Gunnarsen @MathPrinceps · 24 avr. 2019

In fact, this is a celebrated point of disagreement between Lagrange and Gauss, who held opposing views on the question of whether a quadratic form's "middle coefficient" ought, or ought not, to have a preliminary factor of 2. (These days, expert opinion agrees with Lagrange.)

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.robin. @robinhouston · 24 avr. 2019

Interesting! I take it you are on Gauss's side in this?

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