Remark on Last Fermat's Theorem

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Abstract

This remark gives analytical solution of Last Fermat's Theorem

Officially Last Fermat's Theorem is proved by Wiles [1], but he didn't found analytical solution of

$$x^n + y^n = z^n \, , n > 2$$

In case it is extension of of equation for $n = 2$, the solution for $n > 2$ should be extension of solution for $n = 2$. Therefore, it will be shown how to find them. So,

$$x^2 + y^2 = 1 \tag{1}$$

$$y = t(x-1) \tag{2}$$

$$(x-1)(x+1) + t^2(x-1)^2 = 0 \tag{3}$$

dividing by $x - 1$

$$x + 1 + t^2(x-1) = 0 \tag{4}$$

$$x = \frac{t^2 - 1}{t^2 + 1} \tag{5}$$

$$y = \frac{-2t}{t^2 + 1} \tag{6}$$

$$a^n + b^n = c^n \Rightarrow \left(\frac{a}{c}\right)^n + \left(\frac{b}{c}\right)^n = 1 \tag{7}$$

Finally,

$$\frac{a}{c} = \sqrt[n]{\left(\frac{t^2-1}{t^2+1}\right)^2} \Rightarrow \forall n, t \in \mathbb{Z} \& n \geq 3 \& t > 1 \& \frac{a}{c} \in \mathbb{I} || n = 2 \& t > 1 \& \frac{a}{c} \in \mathbb{Q} \tag{8}$$

and

$$\frac{b}{c} = \sqrt[n]{\left(\frac{-2t}{t^2+1}\right)^2} \Rightarrow \forall n, t \in \mathbb{Z} \& n \geq 3 \& t > 1 \& \frac{b}{c} \in \mathbb{I} || n = 2 \& t > 1 \& \frac{b}{c} \in \mathbb{Q} \tag{9}$$

That derivation proves Last Fermat's Theorem too, but in much more shorter way. Furthermore, after inserting analytical solution into Frey's elliptical curve equation [2, 6] we obtain

$$y^2 = x\left(x - a^n\right)\left(x + b^n\right) = x\left(x - (-2t)^2\right)\left(x + (t^2-1)^2\right)$$

Frey's elliptic curve with integer coefficients. It is obviously, because we used solution, but on other hand, such kind of equation shouldn't exist according Wiles. Does that suppose not fullness of his proposed proof of Last Fermat's Theorem?

References

[1] Wiles, Andrew (1995), Modular elliptic curves and Fermat's Last Theorem, Annals of Mathematics, 142, 443-551

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[3] Frey, Gerhard (1982), "Rationale Punkte auf Fermatkurven und getwisteten Modulkurven", J. reine angew. Math., 331: 185–191

[4] Hellegouarch, Yves (2000), "Rectificatif à l'article de H. Darmon intitulé : "La Conjecture de Shimura-Taniyama-Weil est enfin démontré"", Gazette des Mathématiciens, 83, ISSN 0224-8999

[5] Hellegouarch, Yves (1974), "Points d'ordre 2ph sur les courbes elliptiques" (PDF), Polska Akademia Nauk. Instytut Matematyczny. Acta Arithmetica, 26 (3): 253–263, ISSN 0065-1036, MR 0379507

[6] Hellegouarch, Yves (2002), Invitation to the mathematics of Fermat-Wiles, Boston, MA: Academic Press, ISBN 978-0-12-339251-0, MR 1475927