The Nyambuya's Proof?

Theorem 1 *The Nyambuya's proof of FLT is false.*

Proof. Suppose that for some $n, x, y, z \in \mathbb{N}_5$ the equation $x^n + y^n = z^n$ has primitive solutions in $\mathbb{N}_5$. Then it must be

$$x^n + y^n = z^n \wedge x^n = z^n - y^n \wedge y^n = z^n - x^n \wedge$$

$$x^2 + y^2 < z^n \wedge \; x^2 + y^2 < z^{\frac{n}{2}} \quad [1],$$

which is obviously. Hence the Nyambuya's proof for $n > 4$ is false. If $n = 2k$, where $k = 3, 4, 5, ...$, then

$$\left[\begin{pmatrix} x^k \\ y^k \\ z^k \end{pmatrix} = \begin{pmatrix} p^2 - q^2 \\ 2pq \\ p^2 + q^2 \end{pmatrix} \quad [2] \right] \Rightarrow \left(z^k = p^2 + q^2 \equiv 1 \right).$$

Let $k = 4$. Then for some relatively prime natural numbers $u > v$ such that $u - v \in \{3, 5, 7, ...\}$ and $u^2 - v^2 > 2uv$:

$$\left(z^4 = \left(z^2 \right)^2 = p^2 + q^2 \equiv 1 \right) \Rightarrow$$

$$\left[p = \left(u^2 - v^2 \right)^2 - \left(2uv \right)^2 \wedge q = 4 \left(u^2 - v^2 \right) uv \wedge z^2 = \left(u^2 - v^2 \right)^2 + \left(2uv \right)^2 \right].$$

Hence the Nyambuya's proof for even $n > 4$ is false.

For some $k \in \mathbb{N}_2$, $x^{2k} + y^{2k} = z^{2k}$ and

$$\begin{pmatrix} x^k \\ y^k \\ z^k \end{pmatrix} = \begin{pmatrix} p^{2k} - q^{2k} \\ 2p^k q^k \\ p^{2k} + q^{2k} \end{pmatrix}. \quad [3]$$

If $p, q \in \mathbb{N}_1$, then $y \notin \{4, 6, 8, ...\}$, which is obviously. This case $p, q \notin \mathbb{N}_1$ is false. If $p \in \{1, 3, 5, ...\}$, then $q = 2^{\frac{k-1}{k}} q_0$, where $q_0 \in \{1, 3, 5, ...\}$. Hence the Nyambuya's proof for even n is false.

If for some $n = 2k + 1$, where $k = 3, 4, 5, ...$,

$$\left[\left(x^k \sqrt{x} \right)^2 + \left(y^k \sqrt{y} \right)^2 = \left(z^k \sqrt{z} \right)^2 \wedge \right.$$

$$\left. \begin{pmatrix} x^{\frac{n}{2}} = x^k \sqrt{x} \\ y^{\frac{n}{2}} = y^k \sqrt{y} \\ z^{\frac{n}{2}} = z^k \sqrt{z} \end{pmatrix} = \begin{pmatrix} p^2 - q^2 \\ 2pq \\ p^2 + q^2 \end{pmatrix} \quad [2] \right] \Rightarrow$$

$$\left[z^{\frac{n}{2}} = \left(w^2 \right)^{\frac{n}{2}} = w^n = w^{2k+1} = p^2 + q^2 \right].$$

Further we get – for some $p_0, q_0 \in \{1,3,5,...\}$:

$$y^{\frac{n}{2}} = 2p_0^{\frac{n}{2}}\left(2^{\frac{n-2}{2}}q_0^{\frac{n}{2}}\right) = (2p_0q_0)^{\frac{n}{2}},$$

where

$$p_0^{\frac{n}{2}} = p \wedge 2^{\frac{n-2}{2}}q_0^{\frac{n}{2}} = q.$$

Thus for some $w, s \in \{3,5,7,...\}$:

$$\left[w^n = z^{\frac{n}{2}} = \left(p_0^{\frac{n}{2}}\right)^2 + \left(2^{\frac{n-2}{2}}q_0^{\frac{n}{2}}\right)^2 = p_0^n + 2^{n-2}q_0^n \wedge z = w^2 \wedge\right.$$

$$s^n = x^{\frac{n}{2}} = \left(p_0^{\frac{n}{2}}\right)^2 - \left(2^{\frac{n-2}{2}}q_0^{\frac{n}{2}}\right)^2 = p_0^n - 2^{n-2}q_0^n \wedge x = s^2 \wedge$$

$$\left.(2p_0q_0)^n = (w^n)^2 - (s^n)^2 = \left(p_0^n + 2^{n-2}q_0^n\right)^2 - \left(p_0^n - 2^{n-2}q_0^n\right)^2\right].$$

Or

$$\left[\begin{pmatrix} x^{\frac{n}{2}} = x^k\sqrt{x} \\ y^{\frac{n}{2}} = y^k\sqrt{y} \\ z^{\frac{n}{2}} = z^k\sqrt{z} \end{pmatrix} = \begin{pmatrix} p^{2n} - q^{2n} \\ 2p^nq^n \\ p^{2n} + q^{2n} \end{pmatrix} \quad [3]\right] \Rightarrow$$

$$\left(z = w^2 \wedge x = s^2 \wedge w, s \text{ are odd}\right).$$

For some $p_0, q_0 \in \{1,3,5,...\}$:

$$y^k\sqrt{y} = y^{k+\frac{1}{2}} = y^{\frac{n}{2}} = 2p^nq^n \Rightarrow y = 2^{\frac{2}{n}}p^2q^2 = 2^{\frac{2}{n}}\left(2^{\frac{n-2}{2n}}p_0^{\frac{1}{2}}q_0^{\frac{1}{2}}\right)^2 =$$

$$= 2^{\frac{2}{n}}2^{\frac{n-2}{n}}p_0q_0 = 2p_0q_0 \Rightarrow y^{\frac{n}{2}} = 2p_0^{\frac{n}{2}}\left(2^{\frac{n-2}{2}}q_0^{\frac{n}{2}}\right) = (2p_0q_0)^{\frac{n}{2}},$$

where

$$p_0^{\frac{1}{2}} = p \wedge 2^{\frac{n-2}{2n}}q_0^{\frac{1}{2}} = q.$$

Thus for some $w, s \in \{3,5,7,...\}$:

$$\left[w^n = z^{\frac{n}{2}} = \left(p_0^{\frac{n}{2}}\right)^2 + \left(2^{\frac{n-2}{2}}q_0^{\frac{n}{2}}\right)^2 = p_0^n + 2^{n-2}q_0^n \wedge z = w^2 \wedge\right.$$

$$s^n = x^{\frac{n}{2}} = \left(p_0^{\frac{n}{2}}\right)^2 - \left(2^{\frac{n-2}{2}}q_0^{\frac{n}{2}}\right)^2 = p_0^n - 2^{n-2}q_0^n \wedge x = s^2 \wedge$$

$$\left.(2p_0q_0)^n = (w^n)^2 - (s^n)^2 = \left(p_0^n + 2^{n-2}q_0^n\right)^2 - \left(p_0^n - 2^{n-2}q_0^n\right)^2\right].$$

Further we get: http://zadajpytanie.pl/attachments/get/2936

Hence the Nyambuya's proof for odd n is false. This is the proof. ■

References

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