

Shortest proof in the world of The Fermat's Last Theorem

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Fermat's Last Theorem (FLT) :

$$a^n + b^n \neq c^n \quad , \quad \text{no positive integer } a, b, c \quad \text{if } n > 2 \quad , \quad n \in \mathbb{N}^+$$

Let see the Pythagorean Equation

$$3^2 + 4^2 = 5^2 \quad \text{_____} \quad (1)$$

Transform (1) into
$$(((3)(5)^{k-1})^{1/k})^d + (((4)(5)^{k-1})^{1/k})^d = 5^d \quad \text{_____} \quad (2)$$

$$d = kn \quad , \quad \text{Let } n = 2 \quad , \quad k = \frac{d}{2}$$

$$d = \left(\frac{d}{2}\right)(2) \quad , \quad d \in \mathbb{N}^+$$

Consider $((3)(5)^{k-1})^{1/k}$ and $((4)(5)^{k-1})^{1/k}$, the both are the irrational number for all of k.

But in the right hand, 5 is rational number.

From (2) , when we multiply any rational numbers $\left(\frac{x}{5}\right)^d$ in (2) ,

In the right hand is always rational number such as 1 , 2 , 3 , 4 , 5 , ...

But in the left hand, it still be irrational number

because irrational x rational = irrational

So, no way to let a , b , c are the interger in the same time FLT is proved.