

$X^3 - Y^3 = Z^3$  has no solution in Natural Numbers

Proof

$$Z^3 = (x-y)(x^2+xy+y^2)$$

$$\Rightarrow \text{A) } Z^3 = ZZ^2$$

$$Z^2 = (x^2+xy+y^2) \text{ contradiction to Binom 1 no square number ; } (x-y) = Z$$

$$\Rightarrow \text{B) } Z^3 = Z^2Z$$

$$Z^2 = (x-y) \text{ contradiction because } (x-y) < (x^2+xy+y^2); (x^2+xy+y^2) = Z$$

$$\Rightarrow \text{No number solution for } x^3 - y^3 = z^3$$

$\Leftrightarrow A^3 + B^3 = C^3$  has no solution for A,B,C in Natural Numbers

q.e.d.

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