\[ \text{FLT2 for exponent } p=3. \]

Let \( x, y, z \) be relatively prime integers with \( 3 \mid z \) and \( x^3 + y^3 + z^3 = 0. \)

Let \( 3^k \mid z \), \( 3^{(k+1)} \nmid z \) for \( k \geq 1 \) integer:

\[
(3x + y) = 3^{3k+3} \quad z = -3^k c \quad 3 \nmid k,
\]

Let \( 2x = 3^{3k+3} - K \)
and \( 2y = 3^{3k+3} + K. \)

Then \( (3^k c - K)^3 + (3^k c + K)^3 = 2^3 \cdot 3^3 \cdot c^3 \cdot 5^3. \)

Thus divisible by 3, R.H.S is not divisible by 3, contradiction!

So no such \( x, y, z \) exist, proves FLT for exponent \( p=3. \)

So \( 2 \mid c, 2 \mid K, \)
so L.H.S divisible by 8, but R.H.S only divisible by 4, contradiction! Proves FLT2 for \( p=3. \)