

Pythagorean Complex

On truth and falseness superpositions

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March 17, 2025

Pythagoras' Theorem stands true under algebra and epistemology and represents the equation of a circumference centered at the origin of Cartesian coordinate system, just like any complex number ($c = a+bi$) expresses a point on a circumference (and the whole circumference itself):

$$r^2 = x^2 + y^2 \quad [1]$$

$$r^2 = (x+yi)(x-yi) \quad [2]$$

$$r^2 = rr^* \quad [3]$$

Equation [1] can be expressed alternatively as equation [2], which stands true under algebra, given the peculiar property ($i^2 = -1$) of complex numbers: roots rely on the complex domain (which relates triangles and circles). As a fact, we can compute sums, differences, products and divisions; but we cannot calculate roots, having to suppose their solutions by attempts and *imagining* (*i*) them.

Given a complex number ($r = x+yi$), equation [2] implies the identity [3], which stands true under algebra (given $r^* = x-yi$ as a property of complex domain) but stands false under epistemology (the square of complex numbers, $r^2 = x^2 - y^2 + 2xyi$, differing from the product by complex conjugate, rr^*).

That way, equation [3] *superposes a true statement with a false statement*, just like any complex number superposes itself (r) with its conjugate (r^*): operating with one statement makes the other one "to collapse"; and the inner nature of complex numbers (*i*) reveals the superposition of contrary and complementary states (see 1947 N. Bohr's motto, "*contraria sunt complementa*") as a recursive property of the very mathematical thinking.

Equation [3] implies:

$$x^2 - y^2 + 2xyi = x^2 + y^2 \quad [4.1]$$

$$y^2 - xyi = 0 \quad [4.2]$$

Equation [4.2] renders a null *modulus* (0) for the complex number, it transfers the real part (x) to the imaginary part (xyi) and displaces the original imaginary part (y) to the real part: read about Freud's *Transference*, *Displacement* and *Absence of negation* concepts as functions of the embodied mathematics in O.D. Rossi (2021) [Unconscious Foundations of Mathematics](#) and read about mysticism and mystery cults delving into perception and mental processes in O.D. Rossi (2024) [\(A\)simmetria della percezione: appunti per un'epistemologia mist\(er\)ica](#).

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