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Trinary Affinity—Mathematic Verification and Application (1): Construction of Formulas for the Composite and Prime Numbers

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Abstract : Trinary affinity is a description of existence: every object exists as it is known and spoken of, in a system of 2 differences (denoted dif1, dif_2) and 1 similarity (Sim), equivalently expressed as dif_1 / Sim / dif_2 and kn / 0 / tkn (kn = the known, tkn = the 'to be known', 0 = the zero point of knowing). They are mathematically verified and illustrated in this paper by the arrangement of all integers onto 3 columns, where each number exists as a difference in relation to another number as another difference, and the 2 difs as arbitrated by a third number as the Sim, resulting in a trinary affinity or trinity of 3 numbers, of which one is the known, the other the 'to be known', and the third the zero (0) from which both the kn and tkn are measured and specified. Consequently, any number is horizontally specified either as 3n, or as '3n – 1' or '3n + 1', and vertically as 'Cn + c', so that any number seems to occur at the intersection of its X and Y axes and represented by its X and Y coordinates, as any point on Earth's surface by its latitude and longitude. Technically, i) primes are viewed and treated as progenitors, and composites as descending from them, forming families of composites, each capable of being measured and specified from its own zero called in this paper the realistic zero (denoted 0r, as contrasted to the mathematic zero, 0m), which corresponds to the constant c, and the nature of which separates the composite and prime numbers, and ii) any number is considered as having a magnitude as well as a position, so that a number is verified as a prime first by referring to its descriptive formula and then by making sure that no composite number can possibly occur on its position, by dividing it with factors provided by the composite number formulas. The paper consists of 3 parts: 1) a brief explanation of the trinary affinity of things, 2) the 8 formulas that represent ALL the primes, and 3) families of composite numbers, each represented by a formula. A composite number family is described as $3n + f_1 f_2$. Since there are an infinitely large number of composite number families, to verify the primality of a great probable prime, we have to have it divided with several or many a f_1 from a range of composite number formulas, a procedure that is as laborious as it is the surest way to verifying a great number's primality. (So, it is possible to substitute planned division for trial division.)

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