Power Series Expansion for a Number System

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The power series expansion in any number system of base R: Any positive integer R ($R > 1$) can be chosen as the radix or base of a number system. If the base is R, then R digits ($0, 1, \cdots, R - 1$) are used.

$$N = (a_4 a_3 a_2 a_1 a_0 . a_{-1} a_{-2} a_{-3})_R$$

$$= a_4 \times R^4 + a_3 \times R^3 + a_2 \times R^2 + a_1 \times R^1 + a_0 \times R^0 + a_{-1} \times R^{-1} + a_{-2} \times R^{-2} + a_{-3} \times R^{-3}$$