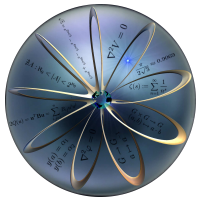

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Elementary Functional Arithmetic

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Elementary Functional Arithmetic, or EFA, is a weak theory of arithmetic created by removing induction from Peano Arithmetic. Because it lacks induction, axioms defining exponentiation must be added.

- $\forall x(x' \neq 0)$ (0 is the first number)
- $\forall x, y(x' = y' \rightarrow x = y)$ (the successor function is one-to-one)
- $\forall x(x + 0 = x)$ (0 is the additive identity)
- $\forall x, y(x + y' = (x + y)')$ (addition is the repeated application of the successor function)
- $\forall x(x \cdot 0 = 0)$
- $\forall x, y(x \cdot (y') = x \cdot y + x$ (multiplication is repeated addition)
- $\forall x(\neg(x < 0))$ (0 is the smallest number)
- $\forall x, y(x < y' \leftrightarrow x < y \vee x = y)$
- $\forall x(x^0 = 1)$
- $\forall x(x^{y'} = x^y \cdot x)$