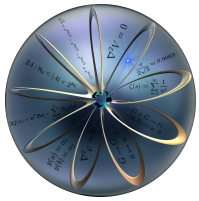

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Presburger arithmetic

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Presburger arithmetic is a weakened form of arithmetic which includes the structure $\mathbb{N}$, the constant 0, the unary function S, the binary function $+$, and the binary relation $<$. Essentially, it is Peano arithmetic without multiplication.

The axioms are:

1. $0 \neq Sx$
2. $Sx = Sy \rightarrow x = y$
3. $x + 0 = x$
4. $x + Sy = S(x + y)$
5. For each first order formula $P(x)$, $P(0) \wedge \forall x[P(x) \rightarrow P(x + 1)] \rightarrow \forall x P(x)$

Presburger arithmetic is decidable, but is consequently very limited in what it can express.