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Tarski–Kuratowski algorithm

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In [computability theory](#) and [mathematical logic](#) the **Tarski–Kuratowski algorithm** is a [non-deterministic algorithm](#) which provides an upper bound for the complexity of formulas in the [arithmetical hierarchy](#) and [analytical hierarchy](#).

The algorithm is named after [Alfred Tarski](#) and [Kazimierz Kuratowski](#).

Algorithm [\[edit\]](#)

The Tarski–Kuratowski algorithm for the arithmetical hierarchy:

- Convert the formula to [prenex normal form](#).
- If the formula is quantifier-free, it is in Σ_0^0 and Π_0^0 .
- Otherwise, count the number of alternations of quantifiers; call this *k*.
- If the first quantifier is \exists , the formula is in Σ_{k+1}^0 .
- If the first quantifier is \forall , the formula is in Π_{k+1}^0 .

References [\[edit\]](#)

- Rogers, H. *The Theory of Recursive Functions and Effective Computability*, MIT Press. [ISBN 0-262-68052-1](#); [ISBN 0-07-053522-1](#)

²^N⁰ This *mathematical logic*-related article is a *stub*. You can help Wikipedia by [expanding it](#).

Categories: [Mathematical logic hierarchies](#) | [Computability theory](#) | [Theory of computation](#)
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