# N-soliton solutions and the Hirota conditions in (1+1)-dimensions

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## Abstract

We discuss N-soliton solutions and analyze the Hirota N-soliton conditions, starting from Hirota bilinear forms. An algorithm to verify the Hirota conditions is proposed by factoring out common factors for the terms in the conditions and comparing degrees of the involved polynomials containing the common factors. Applications to a class of generalized KdV equations and a class of generalized higher-order KdV equations are made, together with all proofs of the existence of N-soliton solutions to each equation in two classes.

## Hosted file

`ma488-MMAS-(1+1)dHirotaCond.pdf` available at https://authorea.com/users/341761/articles/468638-n-soliton-solutions-and-the-hirota-conditions-in-1-1-dimensions