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Upper and lower solution method for n th order BVP's on an infinite interval

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Abstract: This work is devoted to study a n th order ordinary differential equation on a half-line with Sturm-Liouville boundary conditions. The existence results of a solution and triple solutions are established by employing a generalized version of the upper and lower solution method, Schauder fixed point theorem, and topological degree theory. In our problem the nonlinearity depends on derivatives, and we allow solutions to be unbounded, which is an extra interesting feature. To demonstrate the usefulness of our results we illustrate two examples.

Keywords: ordinary differential equation, upper and lower solution, nonlinearity depends on derivatives.