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The asymptotic properties of solutions to a class of third-order differential equations.

Summary: In this paper, we studied the asymptotic behavior of the solution of a class of third-order differential equations. On the left side of the equation, there are not only the unknown function but also its first and second derivatives in the continuous function. We obtained a new kind of asymptotic behavior of the solution of this kind of equation under given fixed conditions by using the Gronwall-Bellman-Bihari inequality and combining with calculus techniques and l'Hopital’s rule. Finally, we gave an application example to verify the validity of the results.

MSC:
34D05 Asymptotic properties of solutions to ordinary differential equations

Keywords:
third-order differential equation; integral inequality; calculus skills; asymptotic property