Abstract

For each one of the well-known six Painlevé equations, it is proved that there exists a unique analytic solution which together with its first two derivatives converge absolutely in a specified region of the complex plane. Moreover, we give a bound of the solution for all six Painlevé equations and a bound of the first two derivatives of the solution for the last four Painlevé equations. Finally for all of them we give a region, depending on the initial conditions and the parameters of the equations, in which the solution holds.