

Series solutions around ordinary points

Theorem: Consider the equation

$$A(x)y'' + B(x)y' + C(x)y = 0.$$

If the functions B/A and C/A are analytic at $x = c$, then the equation has two linearly independent power series solutions centered at $x = c$. The radius of convergence of each power series solution is at least as large as the distance from c to the nearest (real or complex) singular point of the equation.