



19. $y(a_n x) + b_{n-1}y(a_{n-1}x) + \dots + b_1y(a_1x) + b_0y(x) = 0.$

There are particular solutions of the form $y = Cx^\beta$, where C is an arbitrary constant, and β is a root of the transcendental equation

$$a_n^\beta + b_{n-1}a_{n-1}^\beta + \dots + b_1a_1^\beta + b_0 = 0.$$

Reference

Polyanin, A. D. and Manzhirov, A. V., *Handbook of Integral Equations: Exact Solutions (Supplement. Some Functional Equations)* [in Russian], Faktorial, Moscow, 1998.