20. $y^{[n]}(x) + a_{n-1}y^{[n-1]}(x) + \dots + a_1 y(x) + a_0 x = 0.$

Notation: $y^{[2]}(x) = y\big(y(x)\big)$, ..., $y^{[n]}(x) = y\big(y^{[n-1]}(x)\big)$.

Solutions may be sought in the form

$$x = w(t), \quad y = w(t+1).$$

Then the original equation is reduced to the following nth-order linear finite-difference equation (see equation 15 in the current subsection):

$$w(t+n) + a_{n-1}w(t+n-1) + \dots + a_1 w(t+1) + a_0 w(t) = 0.$$

Reference

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

