



6. $y(x+1) - f(x)y(x) = 0$.

Here, $f(x) = f(x+1)$ is a prescribed periodic function with unit period

Solution:

$$y(x) = \Theta(x)[f(x)]^x,$$

where $\Theta(x) = \Theta(x+1)$ is an arbitrary periodic function with unit period.

For $\Theta(x) \equiv \text{const}$, there is a particular solution $y(x) = C[f(x)]^x$, where C is an arbitrary constant.

Reference

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