



**4.  $y(x+1) - a(x-b)(x-c)y(x) = 0.$**

Solution:

$$y(x) = \Theta(x)a^x\Gamma(x-b)\Gamma(x-c),$$

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

### References

**Miroljubov, A. A., and Soldatov, M. A.,** *Linear Homogeneous Difference Equations* [in Russian], Nauka, Moscow, 1981 (page 52).

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