

Systems of Ordinary Differential Equations > Linear Systems of Two Equations

3.
$$x'_t = f(t)x + g(t)y$$
, $y'_t = g(t)x + f(t)y$.

Solution:

$$x = e^{F}(C_1e^G + C_2e^{-G}), \quad y = e^{F}(C_1e^G - C_2e^{-G}),$$

where C_1 and C_2 are arbitrary constants, and

$$F = \int f(t) dt$$
, $G = \int g(t) dt$.

Reference

Matveev, N. M., Methods of Integration of Ordinary Differential Equations [in Russian], Vysshaya Shkola, Moscow, 1963.

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http://eqworld.ipmnet.ru/en/solutions/sysode/sode0103.pdf