

Systems of Ordinary Differential Equations > Nonlinear Systems of Two Equations

2.
$$x'_t = e^{\lambda x} F(x, y)$$
, $y'_t = g(y) F(x, y)$.

Solution:

$$x = \varphi(y), \quad \int \frac{dy}{g(y)F(\varphi(y),y)} = t + C_2,$$

where

$$\varphi(y) = \begin{cases} -\frac{1}{\lambda} \ln \left[C_1 - \lambda \int \frac{dy}{g(y)} \right] & \text{if } \lambda \neq 0, \\ C_1 + \int \frac{dy}{g(y)} & \text{if } \lambda = 0, \end{cases}$$

 C_1 and C_2 are arbitrary constants.

Copyright © 2004 Andrei D. Polyanin

http://eqworld.ipmnet.ru/en/solutions/sysode/sode0302.pdf