



Systems of Ordinary Differential Equations > Nonlinear Systems of Three and More Equations

6. $x'_t = x(cF_2 - bF_3)$, $y'_t = y(aF_3 - cF_1)$, $z'_t = z(bF_1 - aF_2)$, where $F_n = F_n(x, y, z, t)$.

Here, $F_n = F_n(x, y, z, t)$ are arbitrary functions.

First integral:

$$|x|^a |y|^b |z|^c = C_1,$$

where C is an arbitrary constant. If the function F_n is independent of t , then, by eliminating t and z from the first two equations of the system (with the above integral), one arrives at a first-order equation.