

Systems of Ordinary Differential Equations > Nonlinear Systems of Two Equations

$$20. \quad x_{tt}'' = f(y_t') \Phi(x,y,t,x_t',y_t'), \quad y_{tt}'' = g(x_t') \Phi(x,y,t,x_t',y_t').$$

First integral:

$$\int g(u) du - \int f(v) dv = C, \qquad u = x'_t, \quad v = y'_t,$$

where C is an arbitrary constant.

Remark. The function Φ can also depend on the second and higher derivatives with respect to t.

Copyright © 2004 Andrei D. Polyanin

http://eqworld.ipmnet.ru/en/solutions/sysode/sode0320.pdf