



37.  $y''_{xx} + xfy'_x - fy = 0, \quad f = f(x).$

Particular solution:  $y_0 = x.$

Solution:

$$y = y_0 \left( C_1 + C_2 \int \frac{e^{-F}}{y_0^2} dx \right), \quad \text{where } F = \int x f dx,$$

$C_1$  and  $C_2$  are arbitrary constants.

### Reference

**Polyanin, A. D. and Zaitsev, V. F.,** *Handbook of Exact Solutions for Ordinary Differential Equations, 2nd Edition*, Chapman & Hall/CRC, Boca Raton, 2003.