

38.
$$xy_{xx}'' + (xf + a)y_x' + (a - 1)fy = 0,$$
 $f = f(x).$

Particular solution: $y_0 = x^{1-a}$.

Solution:

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

 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.

Copyright © 2004 Andrei D. Polyanin

http://eqworld.ipmnet.ru/en/solutions/ode/ode0238.pdf