42. $\quad y''_{xx} + (f + ae^{\lambda x})y'_x + ae^{\lambda x}(f + \lambda)y = 0, \qquad f = f(x).$

Particular solution: $\quad y_0 = \exp\left(-\dfrac{a}{\lambda}e^{\lambda x}\right).$

   Solution:

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

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.