



44. $y''_{xx} + 2fy'_x + (f^2 + f'_x)y = 0, \quad f = f(x).$

Solution:

$$y = (C_2x + C_1) \exp\left(-\int f dx\right).$$

Reference

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