25. $xy''_{xx} = \left[x^k f(y) + k - 1\right] y'_x$.

Solution:

$$\int \frac{dy}{F(y) + C_1} = C_2 + \frac{1}{k} x^k, \qquad F(y) = \int f(y)\, dy,$$

where 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.

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