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20. $\quad y'_x = f(x)y^2 + \lambda y + ae^{2\lambda x} f(x).$

Riccati equation, special case 14.

Solution:

$$
y = \begin{cases} \sqrt{a}\, e^{\lambda x} \tan\left[\sqrt{a} \int e^{\lambda x} f(x)\, dx + C\right] & \text{if } a > 0, \\[2mm] \sqrt{|a|}\, e^{\lambda x} \tanh\left[-\sqrt{|a|} \int e^{\lambda x} f(x)\, dx + C\right] & \text{if } a < 0, \end{cases}
$$

where C is an arbitrary constant.

Reference

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