46. $[e^{\alpha x} f(y) + a\beta]y'_x + e^{\beta y} g(x) + a\alpha = 0.$

Solution:

$$\int e^{-\beta y} f(y)\,dy + \int e^{-\alpha x} g(x)\,dx - ae^{-\alpha x-\beta y} = C,$$

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.

