45. $y'_x = e^{\alpha x - \beta y} f(a e^{\alpha x} + b e^{\beta y}).$

The substitution $w = a e^{\alpha x} + b e^{\beta y}$ leads to a separable equation: $w'_x = e^{\alpha x}[a\alpha + b\beta f(w)].$

Reference

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