

30.
$$y'_x = -\frac{n}{m}\frac{y}{x} + y^k f(x)g(x^n y^m)$$
.

The substitution $z=x^ny^m$ leads to a separable equation: $z_x'=mx^{\frac{n-nk}{m}}f(x)z^{\frac{k+m-1}{m}}g(z)$.

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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http://eqworld.ipmnet.ru/en/solutions/ode/ode0130.pdf