

32. $xy_{xx}'' = f(x^n e^{ay})y_x'$.

The transformation $z = x^n e^{ay}$, $w = xy'_x$ leads to a first-order separable equation: $z(aw + n)w'_z = [f(z) + 1]w$.

Reference

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

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http://eqworld.ipmnet.ru/en/solutions/ode/ode0332.pdf