



First-Order Partial Differential Equations > Linear Equations > Section 1.1

$$2. \quad \frac{\partial w}{\partial x} + [f(x)y + g(x)y^k] \frac{\partial w}{\partial y} = 0.$$

1°. Principal integral: $\Xi = e^{-F} y^{1-k} - (1-k) \int e^{-F} g(x) dx$, where $F = (1-k) \int f(x) dx$.

2°. General solution: $w = \Phi(\Xi)$, where $\Phi(\Xi)$ is an arbitrary function.

Reference

Polyanin, A. D., Zaitsev, V. F., and Moussiaux, A., *Handbook of First Order Partial Differential Equations*, Taylor & Francis, London, 2002.