

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

1.
$$\frac{\partial w}{\partial x} + [f(x)y + g(x)]\frac{\partial w}{\partial y} = 0$$
.

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

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http://eqworld.ipmnet.ru/en/solutions/fpde/fpde1101.pdf