

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

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

- 1°. Principal integral:  $\Xi = e^{-F}y^{1-k} (1-k)\int e^{-F}g(x)\,dx$ , where  $F = (1-k)\int f(x)\,dx$ .
- $2^{\circ}$ . 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/fpde1102.pdf