

First-Order Partial Differential Equations > Linear Equations > Section 1.2

3.
$$\frac{\partial w}{\partial x} + a \frac{\partial w}{\partial y} = f(x)e^{\lambda y}$$
.

General solution:

$$w = e^{\lambda(y-ax)} \int f(x)e^{a\lambda x} dx + \Phi(y-ax),$$

where $\Phi(u)$ 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/fpde1203.pdf