



First-Order Partial Differential Equations > Linear Equations > Section 1.3

1. $a \frac{\partial w}{\partial x} + b \frac{\partial w}{\partial y} = f(x)w.$

General solution:

$$w = \exp\left[\frac{1}{a} \int f(x) dx\right] \Phi(bx - ay),$$

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.