



First-Order Partial Differential Equations > Quasilinear Equations > Section 2.3

3.
$$\frac{\partial w}{\partial x} + [aw + f(x)] \frac{\partial w}{\partial y} = g(x).$$

General solution:

$$y = ax[w - G(x)] + a \int G(x) dx + F(x) + \Phi(w - G(x)),$$

where

$$F(x) = \int f(x) dx, \quad G(x) = \int g(x) dx,$$

$\Phi(u)$ 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.