



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

9.
$$\frac{\partial w}{\partial x} + [f(w) + yg(x)] \frac{\partial w}{\partial y} = h(x).$$

General solution:

$$yG(x) - \int G(x)f(H(x) - H(x) + w) dx = \Phi(w - H(x)),$$

where $G(x) = \exp\left[-\int g(x) dx\right]$, $H(x) = \int h(x) dx$, and $\Phi(u)$ 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.