

First-Order Partial Differential Equations > Quasilinear Equations > Section 2.2

1.
$$\frac{\partial w}{\partial x} + \left[aw + yf(x)\right] \frac{\partial w}{\partial y} = 0$$
.

General solution:

$$yF(x) - aw \int F(x) dx = \Phi(w), \qquad F(x) = \exp\left[-\int f(x) dx\right],$$

where $\Phi(w)$ 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/fpde2201.pdf