



First-Order Partial Differential Equations > Nonlinear Equations > Section 3.1

$$3. \quad \frac{\partial w}{\partial x} + a \left( \frac{\partial w}{\partial y} \right)^2 = f(x) + g(y).$$

Complete integral:

$$w = -C_1 x + \int f(x) dx + \int \sqrt{\frac{g(y) + C_1}{a}} dy + C_2,$$

where  $C_1$  and  $C_2$  are arbitrary constants.

### Reference

**Polyanin, A. D., Zaitsev, V. F., and Moussiaux, A.,** *Handbook of First Order Partial Differential Equations*, Taylor & Francis, London, 2002.