



First-Order Partial Differential Equations > Linear Equations > Section 1.2

$$12. \quad f(x) \frac{\partial w}{\partial x} + g(y) \frac{\partial w}{\partial y} = h_1(x) + h_2(y).$$

General solution:

$$w = \int \frac{h_1(x)}{f(x)} dx + \int \frac{h_2(y)}{g(y)} dy + \Phi \left( \int \frac{dx}{f(x)} - \int \frac{dy}{g(y)} \right),$$

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.