



First-Order Partial Differential Equations > Linear Equations > Section 1.3

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

General solution:

$$w = \exp \left[ \frac{1}{a} \int f(x) dx + \frac{1}{b} \int g(y) dy \right] \Phi(bx - ay),$$

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.