



49.  $y''_{xx} - f'_x y'_x + a^2 e^{2f} y = 0, \quad f = f(x).$

Solution:

$$y = C_1 \sin\left(a \int e^f dx\right) + C_2 \cos\left(a \int e^f dx\right),$$

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

### Reference

**Polyanin, A. D. and Zaitsev, V. F.,** *Handbook of Exact Solutions for Ordinary Differential Equations, 2nd Edition*, Chapman & Hall/CRC, Boca Raton, 2003.