$$y' = y + 4\pi \cos(4\pi t)y \tag{1}$$

$$\implies y' = (1 + 4\pi \cos(4\pi t))y \tag{2}$$

$$\implies \frac{dy}{dt} = (1 + 4\pi \cos(4\pi t))y \tag{3}$$

$$\implies \frac{dy}{y} = (1 + 4\pi \cos(4\pi t))dt \tag{4}$$

$$\implies \ln|y| = t + \sin(4\pi t) + c \tag{5}$$

$$\implies e^{\ln|y|} = e^{t+\sin(4\pi t)+c} \tag{6}$$

$$\implies |y| = e^{t+\sin(4\pi t)+c} \tag{7}$$

$$\implies y = \pm e^{t+\sin(4\pi t)+c} == Ce^{t+\sin(4\pi t)} \tag{8}$$