

[gex13] First-order ODE: linearity

Here we are seeking the general solution of the ODE,

$$y' - \frac{2y}{x} = x^2 \cos(4x),$$

which is manifestly linear and of 1st order. Mathematica has no problem producing the desired solution via the `DSolve` command. However, the task here is to use the recipe outlined in [gmd10-A], which takes advantage of a guaranteed integrating factor for linear equations.

Solution: