

**CP.4.5.11.a, Sauer3**

Apply Levenberg-Marquardt to fit the model  $y = c_1 e^{-c_2 t} \cos(c_3 t + c_4)$  to the following data points, with an appropriate initial guess. State the initial guess, the regularization parameter  $\lambda$  used, and the RMSE. Plot the best least squares curve and the data points. This problem has multiple solutions with the same RMSE, since  $c_4$  is only determined modulo  $2\pi$ .

$$(t_i, y_i) = \{(0, 3), (2, -5), (3, -2), (5, 2), (6, 1), (8, -1), (10, 0)\}.$$