Solution (#1651) The complementary function is
$$y = \alpha e^{2x} + \beta e^x + \gamma e^{-x}.$$
The general solution of the inhomogeneous DE is
$$y = \alpha e^{2x} + \beta e^x + \gamma e^{-x} + 3x + \frac{3}{2} + \frac{1}{5}\sin x + \frac{1}{10}\cos x.$$