

For the following problems, you may find it easier to first identify the type of the equation first. Then, use one of the methods described in the class to obtain a solution.

1. Find a general solution of $y' = e^{2x} + 3y$.
2. Find the particular solution of $y' + y = e^{-x}$, $y(0) = 3$.
3. Show that $(ye^x - \sin x)dx - (y^2 - e^x)dy = 0$ is exact and obtain a general solution.