

Problem 2.

1. Find the Wronskian $W(y_1, y_2)(x)$ of a fundamental set of solutions $y_1(x), y_2(x)$ for the ODE

$$(x \sin(x) + \cos(x))y'' - x \cos(x)y' + \cos(x)y = 0.$$

2. Check that $y_1(x) = x$ is a solution and find another linearly independent solution.
3. Write the general solution, and then find the solution such that

$$y(0) = 1, \quad y'(0) = 1.$$