Worksheet 2/13/2026

1) Check if $y = \sin(2x)$ is a solution of the ODE $y'' + y' + 2y = 0$.

2) Find one solution of the ODE $y'' + y' + y = x + 1$ of the form $y = Ax + B$.

3) Check if $y_1 = \sin(x)$ and $y_2 = e^x$ are linearly independent functions.

4) Check if $y_1 = \sin(x + 1)$ and $y_2 = \cos(x - 2)$ are linearly independent functions.

5) Solve the ODE $y'' + y' - 2y = 0$ by seeking solutions of the form $y = e^{rx}$.

6) Solve the ODE $x^2y'' + xy' - 3y = 0$ by seeking solutions of the form $y = x^r$.