Worksheet 2/20/2026

1) Solve the initial value problem $y'' + 5y' + 4y = 0, y(0) = 1, y'(0) = -1$.

2) Solve the ODE $y'' - 2y' - 3y = 0$ with initial data $y(0) = 0$. What is the value of $y'(0)$ so that $\lim_{x\to\infty} y(x)$ exists?

3) Solve the ODE $y'' - 2y' + 5y = 0$. Find $\lim_{x\to\infty} y(x)$ and $\lim_{x\to-\infty} y(x)$.

4) Solve the boundary value problem $y'' - 4y' + 4y = 0$, $y(0) = 0$, $y(1) = 1$.