Name: _____

1. [**2.5 points**] Solve the initial value problem $y'' + 8y' - 9y = 0$ with $y(0) = 1$ and $y'(0) = 2$. Express your answer using real numbers only.

2. [**2.5 points**] Find the general solution to $y'' + 2y' + 2y = 0$. Express your answer using real numbers only.

3. [**1 point**] Short answer. Suppose that y_1 and y_2 are solutions to $y'' + p(t)y' + q(t) = 0$ on an open interval I. What useful information does the Wronskian of y_1 and y_2 provide?

4. [**2 points**] Compute the Wronskian of $\sin t$ and $t \sin t$.

5. [**2 points**] Solve the following differential equation: $x\frac{dy}{dx} + xy = 1 - y$.