Name: _____

Directions: Show all work. No credit for answers without work.

1. [**5 points**] Suppose that a motorboat is moving at 60 ft/s when its motor breaks, and that 20 seconds later, the boat moves at 30 ft/s. Assuming that the boat encounters resistance that is proportional to its velocity, how far does the boat coast in total?

2. [**3 points**] Given that $y_1 = 1$ and $y_2 = e^{3x}$ are linearly independent solutions to the homogeneous equation $y'' - 3y' = 0$, find a solution that also satisfies $y(0) = 3$ and $y'(0) = -2$.

3. [**2 points**] Complete the following definition. Functions $f_1, f_2, \ldots, f_t$ are linearly dependent on an open interval I if $\ldots$