Math 2280   HOMEWORK #6   Name:

Due 2/14/2025, 8:30 A.M.

Solve the following problems and staple your solutions to this cover sheet. (Computer outputs must be put in the appropriate place in the solution, not attached as an appendix. You may physically cut and paste the output in the problem or allow appropriate space in the printout to add your hand written work.)

1. Sec 4.1 #2
   Hint: Plug in $f(t) = cy(t)$ and $f(t) = y_1(t) + y_2(t)$ in the left side of the ODE and simplify to get the right side, or 0. Use the fact that $y(t)$, $y_1(t)$ and $y_2(t)$ are solutions.

2. Sec 4.1 #3
   Hint: To find $\lim_{t \to \infty} y_2(t)$, use the L'Hospital's rule!

3. Sec 4.1 #8
   Hint: Plug $y(t) = A \cos 5t + B \sin 5t$ into the ODE, combine like terms in the left side, set the coefficients of the sine term and the cosine term of the two sides of the equation equal to each other and solve for A and B. The cosine term on the right side is $\mathbf{0} \cos 5t$.

4. Sec 4.2 #7

5. Sec 4.2 #13

6. Sec 4.2 #9

7. Sec 4.2 #18

8. Sec 4.2 #10

9. Sec 4.3 #7

10. Sec 4.3 #10

11. Sec 4.3 #13

12. Sec 4.3 #25