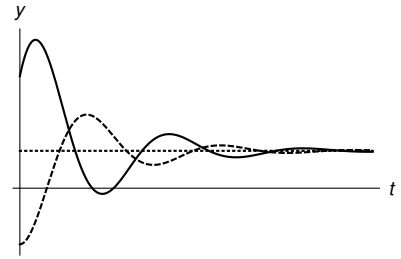


6. [14 points] In the following, we consider the behavior of solutions to a linear, second-order, constant-coefficient differential equation with a forcing term.

- a. [5 points] Write a differential equation of this type that could have the three solution curves given to the right. Explain how you know your answer is correct.



- b. [6 points] Now suppose that the general solution to the problem is  $y = (c_1 + c_2 t + t \ln(t))e^{-t}$ . What is the differential equation, including the forcing term? Explain.

- c. [3 points] If you were finding, by hand, the general solution given in (b), what method or methods could you use? In these methods, what form do you guess for the solution?